

***TRABAJO DE FIN DE GRADO***

***Grado en Odontología***

**TERCEROS MOLARES. EXTRAER O NO EXTRAER**

**Madrid, curso 2020/2021**

Número identificativo

33

## **RESUMEN**

**Introducción:** La extracción de los terceros molares es uno de los procedimientos más comunes en el área de la cirugía bucal, sin embargo, existen cuestiones con relación a la correcta actitud terapéutica para el tratamiento de estos dientes. Por este motivo han surgido múltiples estudios que intentan respaldar la decisión de realizar o no este procedimiento, basándose en evidencia científica. **Objetivos:** Se analizó la tendencia actual en el tratamiento de los terceros molares retenidos, así como los riesgos/secuelas de la extracción y de la no extracción. Además, se valoró las consideraciones generales que se tienen en cuenta a la hora de tomar la decisión de extraer o no extraer. **Metodología:** Para obtener la información se ha recurrido a fuentes bibliográficas electrónicas a través de bases de datos científicas, revistas de alto impacto y buscadores especializados, tras someter la bibliografía a criterios de inclusión y exclusión, se referencian dos libros y 34 artículos. **Resultados y discusión:** Es relativamente fácil tomar la decisión de extraer un tercer molar sintomático (S+) y con patología (E+), asimismo, está generalmente aceptado cuando es asintomático (S-) con patología (E+), o sintomático (S+) sin patología (E-), la mayor controversia la encontramos en los casos asintomáticos (S-) y sin patología (E-), es decir, la extracción profiláctica. **Conclusión:** No existe evidencia que apoye la extracción o la no extracción de un tercer molar retenido asintomático y sin patología, para tomar la decisión los beneficios deben superar a los riesgos.

**Palabras clave:** tercer molar/molares, muelas del juicio combinado con extracción, exodoncia, asintomáticos, patologías asociadas, extracción profiláctica, apiñamiento, impactados, complicación.

## **ABSTRACT**

**Introduction:** The extraction of third molars is one of the most common procedures in oral surgery, however, there are questions regarding the correct therapeutic approach for the treatment of these teeth. Therefore, multiple studies have emerged that attempt to support the decision to use this procedure - or not - based on scientific evidence.

**Objectives:** The current trend in the treatment of retained third molars was analyzed, as well as the risks/sequelae of retention and extraction. In addition, the general considerations taken into account when making the decision to extract or not to extract were assessed.

**Methodology:** In order to obtain the information, electronic bibliographic sources have been used to obtain information through scientific databases, high impact journals and specialized search engines; and after submitting the bibliography to inclusion and exclusion criteria, two books and 34 articles were referenced.

**Results and discussion:** It is relatively easy to make the decision to extract a symptomatic third molar (S+) with disease (D+), likewise, it is generally accepted when it is asymptomatic (S-) with disease (D+) or symptomatic (S+) disease free (D-), the greatest controversy is found in the case that it is asymptomatic (S-) and disease free (D-), that is to say the prophylactic extraction.

**Conclusion:** There is no evidence to support the extraction or non-extraction of an asymptomatic and disease free retained third molar, the benefits must outweigh the risks in order to make the decision.

**Key words:** third molar/molars, wisdom teeth combined with extraction, exodontia, asymptomatic, associated pathology, prophylactic extraction, crowding, impacted, complication.

## ÍNDICE

<b>INTRODUCCIÓN</b> .....	<b>1</b>
<b>Consideraciones anatomoembriológicas</b> .....	<b>2</b>
<b>Terminología</b> .....	<b>5</b>
Diente retenido .....	5
Diente incluído.....	5
Diente enclavado.....	5
Diente impactado.....	5
<b>Etiología de la impactación del tercer molar</b> .....	<b>6</b>
<b>Cambios patológicos</b> .....	<b>7</b>
Infección .....	7
Pericoronaritis .....	7
Caries dental .....	8
Quistes y tumores.....	8
Periodontitis.....	9
Reabsorción de la raíz.....	9
Cambio de la arcada dental y apiñamiento tardío en los incisivos inferiores.....	9
<b>Tratamiento</b> .....	<b>10</b>
Abstención.....	10
Extracción profiláctica.....	10
Extracción.....	10
<b>Técnicas de gestión del diente impactado</b> .....	<b>10</b>
Método conservador.....	11
Operculectomía .....	11
Trasplante autógeno.....	11
Erupción guiada por ortodoncia.....	11
<b>Clasificación de Dodson</b> .....	<b>11</b>
<b>Clasificación de los terceros molares retenidos</b> .....	<b>13</b>
Clasificación de Winter .....	13
Clasificación de Pell y Gregory.....	14
<b>Examen clínico y radiográfico</b> .....	<b>16</b>
<b>Factores que dificultan la extracción</b> .....	<b>17</b>
<b>Indicaciones</b> .....	<b>18</b>
<b>OBJETIVOS</b> .....	<b>18</b>
Objetivo general .....	18
Objetivos específicos .....	18
<b>METODOLOGÍA</b> .....	<b>19</b>
<b>RESULTADOS Y DISCUSIÓN</b> .....	<b>21</b>
<b>CONCLUSIÓN</b> .....	<b>46</b>

**RESPONSABILIDAD SOCIAL ..... 47**  
**BIBLIOGRAFÍA..... 48**

## **INTRODUCCIÓN**

Desde la Antigüedad los terceros molares han tenido un papel importante, se les ha conocido como cordales o “muelas del juicio” ya que se ha asociado su erupción con la edad de la sabiduría, la cordura y el juicio. Normalmente, son los últimos dientes en aparecer en boca y suelen no pasar desapercibidos al ir acompañados de algún síntoma, por lo que con el paso del tiempo se destacó la importancia de los accidentes relacionados a estos dientes.<sup>1</sup>

Los terceros molares presentan una gran dificultad en cuanto a la predictibilidad de su erupción y de los posibles problemas que puedan generar. Muchos clínicos han optado a lo largo del tiempo por extraer estos dientes, incluso cuando no presentan ningún tipo de signo o síntoma, justificando que es más factible realizar este procedimiento y evitar futuras patologías, sin embargo, hoy en día es un tema que genera debate ya que diversos autores concuerdan en que esta actitud no está basada en la evidencia y que existe la posibilidad de que la extracción presente más riesgos que beneficios. Es por este motivo que no existen protocolos unificados en cuanto al tratamiento de los cordales retenidos.<sup>1</sup>

La decisión de comprometer a un paciente a la extracción de un tercer molar puede ser compleja y desafiante. Ningún clínico desea exponer al paciente a riesgos quirúrgicos, dolor y molestias durante la recuperación además de la carga financiera de la cirugía, a menos que haya un beneficio identificable para el paciente. El cirujano

bucal se enfrenta a este dilema diariamente y tiene el reto de decidir si se requiere una intervención y cuándo, junto con el deber de minimizar la morbilidad y el riesgo.<sup>2</sup>

Es posible que la cuestión de los terceros molares y su extracción se esté convirtiendo en una pregunta cada vez más importante para los adolescentes y los adultos jóvenes. Anteriormente, muchas personas habían tenido extracciones al llegar a la pubertad tardía y esto puede haber facilitado la erupción tardía de los terceros molares en el arco dental en una posición funcional. A medida que ha mejorado la higiene bucal en todo el mundo y que los ortodoncistas utilizan cada vez más un plan de tratamiento sin extracciones, la prevalencia de los terceros molares impactados puede aumentar en el futuro. Las investigaciones han demostrado que al menos el 96% de la población tiene un tercer molar y hasta el 36% de los jóvenes pueden tener un tercer molar impactado. Cuando más de un tercio de la población se enfrenta a una decisión sobre la mejor manera de manejar los dientes impactados, esto supone una carga significativa para el sector sanitario.<sup>2</sup>

### **Consideraciones anatomoembriológicas**

Los terceros molares pueden desarrollarse frecuentemente con malformaciones morfológicas, malposición e incluso agenesia. Todos los dientes comienzan a desarrollarse en vida intrauterina y los segundos molares permanentes entran en la fase de desarrollo de la yema dental cerca del nacimiento, sin embargo, los cordales son la excepción ya que se desarrollan completamente después del nacimiento.<sup>1,3</sup>

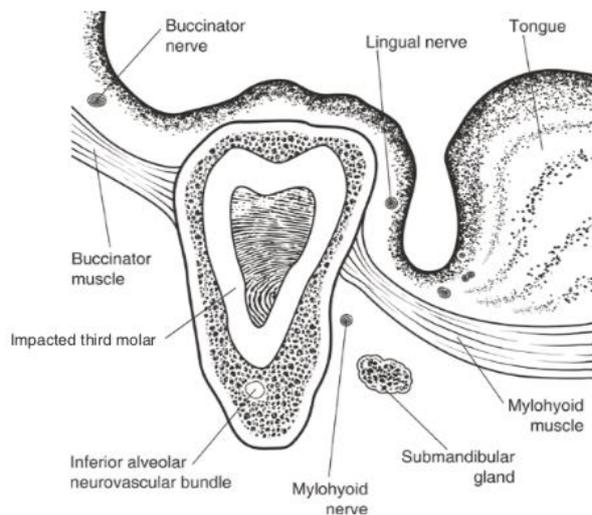
El inicio del desarrollo de los terceros molares no comienza hasta que la lámina dental ectodérmica, que migra distalmente en la boca del niño en crecimiento, se relaciona e interactúa espacialmente con el mesénquima mandibular. La interacción de estos dos tejidos se inicia mucho después del nacimiento, tras un crecimiento significativo de la mandíbula en torno a los 5 años de edad, si estos dos tejidos no interactúan no se formará ningún diente, por lo que como no se produce una interacción similar después de la iniciación de la yema del tercer molar, no se desarrolla ningún otro diente a una edad posterior.<sup>3,4</sup>

Durante los cinco años que transcurren desde el nacimiento hasta la iniciación de los terceros molares, los factores genéticos y los factores ambientales influyen en el crecimiento de la mandíbula y en la migración de la lámina dental, lo que en última instancia puede afectar al momento de la interacción y a la posición final de los dos tejidos necesarios para la iniciación del desarrollo de las yemas dentales. Para que se produzca un patrón dental normal en cuanto a tamaño, forma y posición, los dos tejidos deben estar en el lugar adecuado en el momento adecuado. La alteración del patrón de crecimiento de la mandíbula, así como los cambios en la migración de la lámina dental, se producen debido a fuerzas evolutivas y a factores ambientales como los traumatismos y las enfermedades. Se ha demostrado que los factores ambientales y los teratógenos afectan al desarrollo de los dientes, con efectos devastadores en su tamaño, forma y posición. Por lo tanto, no es sorprendente que se produzcan con frecuencia aberraciones en el patrón normal de los terceros molares.<sup>3,4,5</sup>

Los terceros molares tienen su origen en común con el cordón epitelial del segundo molar permanente. Sus estadios de calcificación comienzan aproximadamente entre los 8 a 10 años, entre los 15 a 16 años la corona estaría completamente formada y alrededor de los 25 años ocurriría la calcificación radicular.<sup>4,5</sup> Los cordales inferiores están situados en la parte posterior del cuerpo de la mandíbula, se desarrollan en la llamada zona fértil del ángulo mandibular, y el crecimiento mandibular influye en su posición, ya que lo arrastra consigo al crecer hacia atrás, resultando en un aumento de la oblicuidad del diente.<sup>1,6,7</sup>

A lo largo del tiempo, la especie humana ha evolucionado y se puede observar como ha habido una disminución en el tamaño tanto de los dientes como de los maxilares superior e inferior, siendo más marcado en la mandíbula; por lo que habrá un menor espacio para la erupción de los terceros molares.<sup>6,8</sup>

Por último, se debe tener en cuenta que los terceros molares se encuentran en espacios muy vascularizados e inervados, además de estar en relación con inserciones musculares importantes (Fig. 1) como las del masetero, buccinador, temporal, pterigoideo interno y velo del paladar, entre otros. Esto lo hace especialmente importante debido a



**Figura 1.** Diagrama esquemático de la región del tercer molar y su relación de las estructuras anatómicas importantes.<sup>3</sup>

que una infección que ocurra asociada a este diente podrá propagarse a través de las inserciones musculares o también por el tejido celular.<sup>1,3</sup>

## **Terminología**

**Diente retenido:** Es un término genérico, es aquel diente que no está en la arcada más allá de la fecha esperada de erupción. Se puede encontrar recubierto por tejido blando y parcial o totalmente recubierto por hueso.<sup>1,3</sup>

**Diente incluído:** Es un diente retenido que conserva el techo óseo y el saco pericoronario íntegro.<sup>1,3</sup>

**Diente enclavado:** Es un diente retenido que ya no conserva el techo óseo. Puede estar abierto a boca o submucoso con saco pericoronario íntegro.<sup>1,3</sup>

**Diente impactado:** Este término hace referencia a aquel diente que no ha podido erupcionar completamente en una posición funcional normal, se encuentra parcial o totalmente no erupcionado y colocado contra un obstáculo (Fig. 2) que impide su erupción normal, como puede ser otro diente, el hueso, tejido blando, un quiste o simplemente la falta de espacio.<sup>3,9,10</sup>



**Figura 2.** Erupción del tercer molar inferior en un espacio limitado.<sup>1</sup>

## **Etiología de la impactación del tercer molar**

Se han propuesto varias teorías para explicar el fenómeno de la impactación. Las siguientes son las más aceptadas:<sup>3,6,8</sup>

1. Discrepancia entre el tamaño del diente y la longitud de la arcada. <sup>3,6,8</sup>
2. Patrón de crecimiento diferencial de las raíces mesiales y distales. <sup>3,6,8</sup>
3. Retraso en la maduración del tercer molar, el desarrollo dental del diente va por detrás del crecimiento y maduración del esqueleto. <sup>3,6,8</sup>
4. La incidencia de la extracción de los molares permanentes disminuye en el período de dentición mixta, lo que proporciona menos espacio para la erupción de los terceros molares. <sup>3,6,8</sup>
5. Desarrollo inadecuado de los huesos maxilares debido al consumo de alimentos más refinados que provocan una menor estimulación funcional para el crecimiento del hueso maxilar. <sup>3,6,8</sup>
6. Teoría de la evolución. <sup>3,6,8</sup>

Además existen causas locales de impactación de los dientes, como la irregularidad en la posición y presión de un diente adyacente, el aumento de la densidad del hueso suprayacente o circundante, inflamación crónica continuada con el consiguiente aumento de la densidad de la mucosa suprayacente, falta de espacio debido al subdesarrollo de los maxilares, retención prolongada del diente primario, pérdida temprana del diente primario, enfermedades adquiridas como la necrosis por infección o absceso, entre otros. <sup>3,6,8</sup>

Aparte de los factores locales, también existen predisponentes sistémicos para la impactación como lo son, las causas prenatales, incluyendo caracteres hereditarios y mestizaje; las causas postnatales en las que podemos encontrar raquitismo, anemia, sífilis congénita, tuberculosis, disfunción endocrina y desnutrición; y, por último, condiciones raras como disostosis cleidocraneal, oxicefalia, progeria, acondroplasia y paladar hendido.<sup>3,6,8</sup>

### **Cambios patológicos**

**Infección:** Los terceros molares pueden originar infecciones mucosas, ganglionares, óseas, sinusitis, tromboflebitis craneofaciales e infecciones a distancia. La más común es la pericoronaritis y es de suma importancia ya que es el origen de las demás infecciones.<sup>3,9,11</sup>

**Pericoronaritis:** Infección del tejido blando que rodea la corona del diente (Fig. 3) y es causada por una acumulación de bacterias y desechos debajo del tejido blando, esto puede resultar en inflamación y dolor. Cuando los terceros molares están impactados, se crea un área que es difícil de limpiar adecuadamente, lo que hace al molar frente al tercer molar, así como al propio

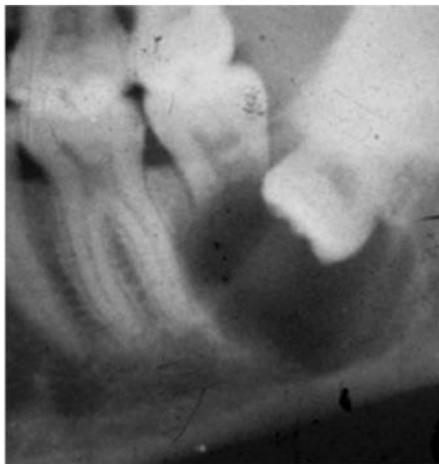


**Figura 3.** Pericoronaritis aguda.<sup>1</sup>

tercer molar, vulnerable a la acumulación de placa, a la inflamación y a la infección. La impactación ósea parcial blanda y la angulación vertical o distal son factores de

riesgo adicionales para la pericoronaritis. Si se trata de forma inadecuada, la infección puede extenderse hacia otros tejidos.<sup>3,9,10,11,12</sup>

**Caries dental:** Debido a la dificultad para mantener una correcta higiene en la zona del tercer molar, se pueden formar con facilidad caries en los terceros molares, además, la angulación de estos puede predisponer a la caries en la superficie distal del segundo molar. Las lesiones tempranas de caries en el segundo molar pueden ser difíciles de distinguir de la llamada “quemadura cervical”, por lo que el tratamiento puede retrasarse. Las lesiones de caries del segundo molar suelen comenzar en la zona de la unión cemento-esmalte debido a un impacto mesioangular u horizontal del tercer molar, y pueden afectar a porciones importantes de la raíz distal del segundo molar.<sup>3,9,10,11</sup>



**Figura 4.** Quiste dentígero de un tercer molar retenido.<sup>1</sup>

**Quistes y tumores:** Pueden desarrollarse quistes (Fig. 4) y tumores a partir del folículo retenido alrededor del tercer molar impactado, por lo tanto, debe ser evaluado periódicamente mediante radiografías. El Cirujano Bucal está familiarizado con el desplazamiento de los dientes de terceros molares asociados a grandes radiolucencias, a veces acompañadas de dolor, hinchazón o alteraciones

funcionales. Estas lesiones a menudo no tienen signos o síntomas, y la condición se descubre incidentalmente durante un estudio radiográfico. Pueden producirse en

cualquier grupo de edad, siendo los extremos de edad los que plantean el mayor desafío en el tratamiento.<sup>1,3,9,10,11</sup>

**Periodontitis:** La impactación repetida de alimentos y la acumulación de restos de comida entre el tercer molar impactado y el segundo molar erupcionado pueden provocar una inflamación del periodonto (Fig. 5) y avanzar hacia una enfermedad periodontal que puede favorecer a la pérdida ósea, afectando al segundo molar, pudiendo llegar incluso a causar una patología endo-periodontal.<sup>3,10,11</sup>



**Figura 5.** Gingivitis por tercer molar inferior.<sup>1</sup>

**Reabsorción de la raíz:** La presión del tercer molar impactado puede provocar la reabsorción radicular del diente adyacente.<sup>9-11</sup>

#### **Cambio de la arcada dental y apiñamiento tardío en los incisivos inferiores:**

Los terceros molares tienen el potencial de generar fuerza en dirección anterior, lo que a su vez podría causar el apiñamiento de los incisivos mandibulares. Existe una hipótesis de que la presión mesial de los terceros molares se transfiere a través de los puntos de contacto que dan lugar a los contactos estrechos de los incisivos inferiores. El apiñamiento tardío se observa con frecuencia simultáneamente a la erupción de los terceros molares, lo que lleva a los clínicos a presumir una relación entre ambos acontecimientos.<sup>3,6,9,11,13</sup>

## **Tratamiento**

**Abstención:** Se define como la vigilancia del estado de los terceros molares hasta que aparezca algún tipo de sintomatología o patología. Para evitar los efectos adversos y los costos de la extracción, algunos abogan por la retención de estos dientes, este enfoque requiere que las personas se sometan a revisiones dentales regulares o "chequeos", para que se pueda detectar si surge algún cambio.<sup>11,13</sup>

**Extracción profiláctica:** Se define como la extracción quirúrgica de terceros molares que no presentan síntomas ni evidencia de enfermedad local, para evitar las posibles complicaciones futuras asociadas a estos dientes.<sup>11,13,14</sup>

**Extracción:** Procedimiento quirúrgico que se realiza cuando el tercer molar ya presenta algún tipo de patología. La extracción puede provocar tanto efectos adversos a corto plazo, como daños temporales en el nervio, osteítis alveolar, infección, hemorragia secundaria, dolor, hinchazón y trismo; así como también, efectos adversos a largo plazo como daño permanente de nervios, estos últimos son poco comunes.<sup>11,13,14</sup>

## **Técnicas de gestión del diente impactado**

Aunque la estrategia de tratamiento estándar suele ser la extirpación quirúrgica del diente impactado, los siguientes métodos que se mencionan a continuación también deben considerarse dependiendo del caso:<sup>3</sup>

**Método conservador:** Es aquel que aboga por la abstención y por un seguimiento regular clínico y radiográfico del tercer molar.<sup>13</sup>

**Operculectomía:** Este procedimiento puede ser considerado en un tercer molar mandibular que ha erupcionado parcialmente, y que tiene suficiente espacio para entrar en oclusión, pero que es impedido por el grueso mucoperiostio superpuesto. Si el diente sigue sin erupcionar completamente, hay que considerar su extracción.<sup>3</sup>

**Trasplante autógeno:** Ocasionalmente, se puede considerar el trasplante autógeno de los terceros molares, normalmente a un sitio de alvéolos de primeros molares. Debido a la baja tasa de éxito con tales procedimientos, no se utiliza ampliamente, excepto en circunstancias especiales.<sup>3</sup>

**Erupción guiada por ortodoncia:** Procedimiento realizado mediante el tratamiento ortodóncico que permite que el diente alcance una posición funcional dentro de la arcada. Aunque suele ser adecuado para caninos maxilares y mandibulares impactados, esta técnica puede aplicarse a premolares e incluso a terceros molares impactados, aunque es poco común.<sup>3</sup>

### **Clasificación de Dodson**

Describir los terceros molares simplemente como asintomáticos es insuficiente. El estado de estos dientes es bidimensional y puede clasificarse en función de los

síntomas y el estado de la enfermedad para evitar la ambigüedad. Utilizando la información obtenida en la historia clínica del paciente y en los exámenes físicos y radiográficos, cualquier tercer molar, erupcionado o impactado, puede ser clasificado en los siguientes 4 grupos:<sup>15</sup>

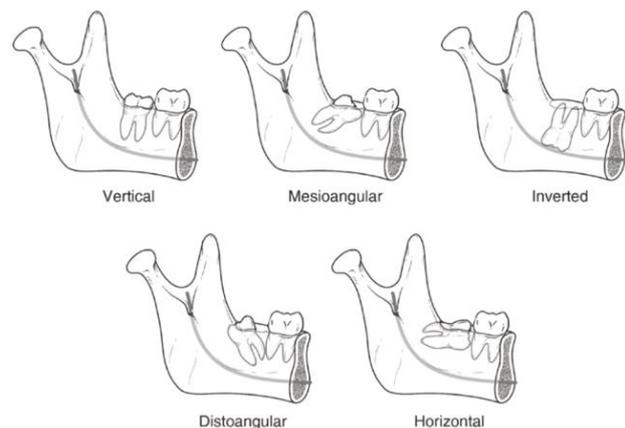
- **Grupo A:** Sintomáticos (S+) y Enfermedad Presente (E+), este grupo se reconoce fácilmente sobre la base de la historia y el examen físico o radiográfico (por ejemplo, pericoronaritis sintomática, caries o inflamación, o dolor de una lesión quística infectada secundariamente).<sup>15,16</sup>
- **Grupo B:** Sintomáticos (S+) y Enfermedad Ausente (E-), este grupo es más sutil. Los ejemplos clínicos incluyen síntomas de dolor por la dentición en el entorno de un espacio adecuado para que el tercer molar erupcione en una posición útil y funcional o quejas vagas de dolor en la región del tercer molar, pero sin una enfermedad específica que explique bien los síntomas. <sup>15,16</sup>
- **Grupo C:** Asintomáticos (S-) y Enfermedad Presente (E+), este grupo también es reconocible. El paciente no informa de ningún síntoma, pero la enfermedad es evidente en el examen clínico (por ejemplo, inflamación de los tejidos blandos, caries, acumulación de placa o aumento de la profundidad de sondaje) o en el examen radiográfico (por ejemplo, lesiones quísticas, caries, reabsorción interna o reabsorción o caries que afectan a los dientes adyacentes). <sup>15,16</sup>
- **Grupo D:** Asintomáticos (S-) y Enfermedad Ausente (E-), este grupo también es fácilmente reconocible. En la anamnesis, el paciente no informa de ningún síntoma y no hay signos de enfermedad evidentes en el examen físico o radiográfico. <sup>15,16</sup>

## Clasificación de los terceros molares retenidos

Los terceros molares impactados se clasifican en función de su ubicación (mandibular o maxilar), estado de erupción, naturaleza del impacto, angulación del impacto y profundidad del impacto en relación con el diente adyacente. Un diente impactado puede ser visible en la boca, puede explorarse con una sonda periodontal o puede observarse sólo mediante evaluación radiográfica.<sup>1,3,9</sup>

**Clasificación de Winter:** Se basa en la relación que existe entre el eje axial del cordal con el eje axial del segundo molar (Fig. 6-7). Describe la angulación y se divide en:<sup>1,3</sup>

- Vertical: El eje axial del cordal está paralelo al eje axial del segundo molar.<sup>1,3</sup>
- Horizontal: El eje axial del cordal está perpendicular al eje axial del segundo molar.<sup>1,3</sup>
- Mesioangular: El eje axial del cordal está inclinado hacia mesial con respecto al eje axial del segundo molar, formando un ángulo de vértice anterosuperior.<sup>1,3</sup>



**Figura 6.** Clasificación de Winter (Mandíbula).<sup>3</sup>

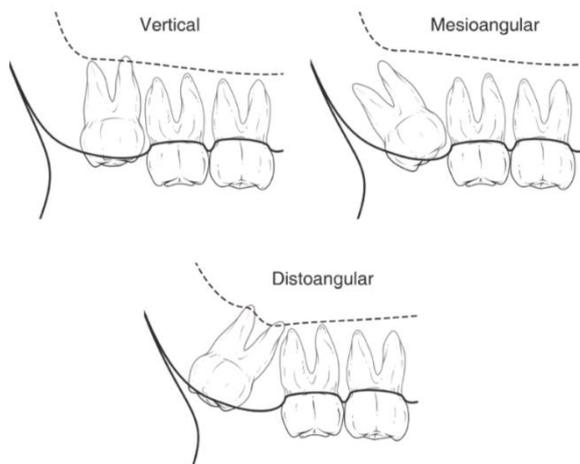


Figura 7. Clasificación de Winter (Maxilar).<sup>3</sup>

- Distoangular: El eje axial del cordal está inclinado hacia distal con respecto al eje axial del segundo molar, formando un ángulo de vértice anteroinferior.<sup>1,3</sup>
- Invertido: La corona del cordal está en sentido opuesto a la corona del segundo molar.<sup>1,3</sup>

**Clasificación de Pell y Gregory:** Se basa en dos relaciones, la primera a la que se le denomina “clase”, es la relación del tamaño de la corona del cordal y el espacio existente entre distal del segundo molar y el borde anterior de la rama ascendente de la mandíbula (Fig. 8), y la segunda a la que se le denomina “posición”, es la profundidad del cordal (Fig. 9).<sup>1,3,9</sup>

- Clase I. La longitud mesiodistal de la corona del cordal es igual o inferior a la distancia que existe entre distal del segundo molar y el borde anterior de la rama de la mandíbula, por lo que tiene suficiente espacio para erupcionar completamente.<sup>1,3,9</sup>

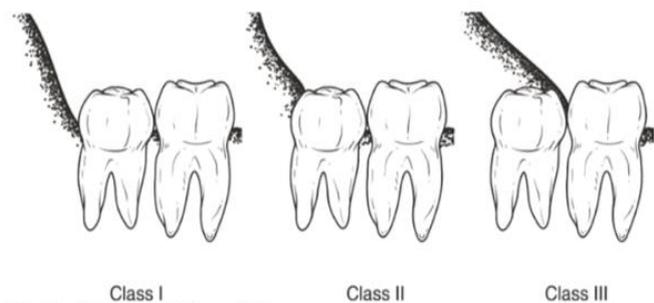
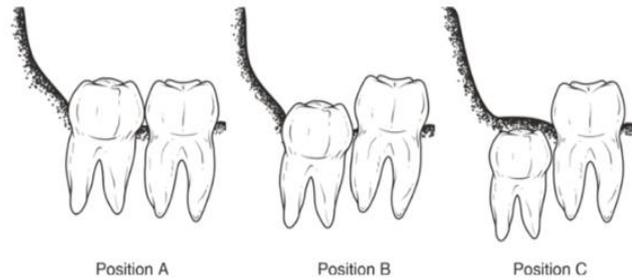


Figura 8. Clases de Pell y Gregory.<sup>3</sup>

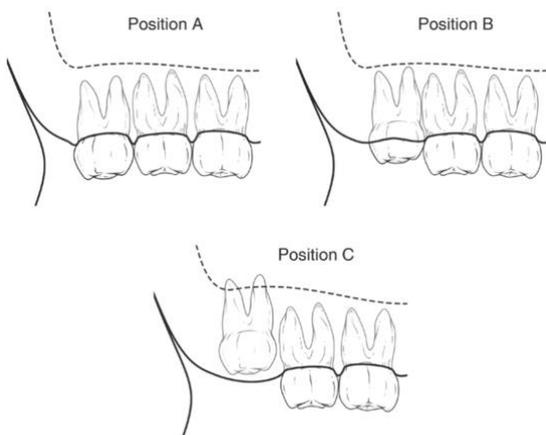
- Clase II. La longitud mesiodistal de la corona del cordal es superior a la distancia entre distal del segundo molar y el borde anterior de la rama de la

mandíbula, es decir, el espacio es menor y solo podrá erupcionar una parte de la corona.<sup>1,3,9</sup>

- Clase III. La distancia que existe entre distal del segundo molar y el borde anterior de la rama de la mandíbula es prácticamente nula, por lo que no hay espacio y el cordal se enclava en la rama.<sup>1,3,9</sup>
- Posición A. El punto más alto del cordal está al nivel, o por arriba de la línea oclusal del segundo molar.<sup>1,3,9</sup>
- Posición B. El punto más alto del cordal está entre la línea oclusal y la línea cervical del segundo molar.<sup>1,3,9</sup>
- Posición C. El punto más alto del cordal está al nivel, o debajo de la línea cervical del segundo molar.<sup>1,3,9</sup>



**Figura 9.** Posiciones de Pell y Gregory.<sup>3</sup>



**Figura 10.** Posiciones de Pell y Gregory (Maxilar).<sup>3</sup>

En el maxilar superior podemos aplicar los mismos criterios tanto para la clasificación de Winter como para la de Pell y Gregory (Fig. 10), relación del cordal con respecto a la tuberosidad del maxilar y el segundo molar, profundidad relativa del cordal en el hueso, y la posición del cordal en relación con el eje longitudinal del segundo molar.<sup>3</sup>

## **Examen clínico y radiográfico**

Como con cualquier otro paciente, se debe realizar una correcta historia clínica junto con la exploración intraoral y extraoral. En estos casos debemos prestar especial atención a cualquier factor que dificulte e incluso contraindique la extracción. Las distintas técnicas radiográficas nos sirven de gran ayuda para el correcto diagnóstico y tratamiento de los terceros molares, por lo que es obligatorio hacer un exhaustivo examen radiológico preoperatorio, en el que se realizarán las radiografías que se consideren necesarias.<sup>1-3</sup>

Se debe valorar el acceso, la posición y profundidad del diente, el patrón radicular, la forma de la corona, el ligamento periodontal, el hueso circundante, el conducto del nervio dentario inferior, forma y disposición radicular del segundo molar, las relaciones con las estructuras y tejidos circundantes, y lesiones patológicas asociadas.<sup>1,3</sup>

Las radiografías que se usan comúnmente para el análisis son, las periapicales, en las que se puede observar las relaciones del tercer molar junto con su posición y morfología; las oclusales, en las que se detalla si el diente está hacia vestibular o hacia lingual/palatino; la ortopantomografía, la cual se usa de forma rutinaria y aporta una visión general; y la tomografía computarizada (TAC) o la tomografía computarizada de haz cónico (CBCT), con las que se pueden obtener imágenes tridimensionales precisas para determinar la relación entre las raíces del tercer molar y el nervio alveolar inferior (Fig. 11). La recomendación reciente es que cuando la

ortopantomografía sugiere una relación estrecha entre las raíces del tercer molar inferior y el nervio, se debe aconsejar la realización de un TAC o CBCT.<sup>1,3</sup>



Figura 11. Relación del tercer molar con el conducto dentario inferior (flecha amarilla).<sup>3</sup>

### **Factores que dificultan la extracción**

- Morfología radicular desfavorable: curvatura excesiva, raíces divergentes, hipercementosis, proximidad al canal.<sup>3,14</sup>
- Corona del tercer molar bloqueada debajo del segundo molar.<sup>3,14</sup>
- Estado del tercer molar: cariado u obturado.
- Estado del segundo molar: cariado, obturado, con corona o cualquier reabsorción.<sup>3,14</sup>
- Esclerosis del hueso adyacente.<sup>3,14</sup>
- Apertura bucal: si el paciente tiene una comisura pequeña, o trismo, el acceso se limita.<sup>3,14</sup>
- Gran saco folicular alrededor de la corona: facilita el procedimiento.<sup>3,14</sup>
- Anchura de la membrana periodontal: en los pacientes que pasan de la mediana edad, el espacio que lo contiene es mucho más pequeño que en los pacientes jóvenes. Esto dificulta la extracción.<sup>3,14</sup>
- Fractura existente de la mandíbula.<sup>3,14</sup>

- Condiciones patológicas locales o sistémicas.<sup>2,3,14</sup>
- Edad del paciente.<sup>2,3,14</sup>

## **Indicaciones**

El acuerdo general indica que un tercer molar debe ser extraído si presenta patologías o síntomas, sin embargo, como se mencionó anteriormente existen otras alternativas de tratamiento que en algunos casos pueden ser viables. Por su parte, el tratamiento de los terceros molares asintomáticos y libres de enfermedad sigue siendo controvertido. La acción terapéutica que se tome debe ser la más adecuada para el paciente y se tienen que valorar los riesgos y beneficios de cada caso en particular.<sup>1,2,9</sup>

## **OBJETIVOS**

### **Objetivo general:**

- Analizar la tendencia actual en el tratamiento de los terceros molares retenidos.

### **Objetivos específicos:**

- Valorar los riesgos/secuelas de la extracción sistemática de los terceros molares.
- Analizar los riesgos/secuelas en los casos de no extracción de los terceros molares.
- Identificar las consideraciones generales que tienen en cuenta distintos autores a la hora de tomar la decisión de extraer o no extraer.

## **METODOLOGÍA**

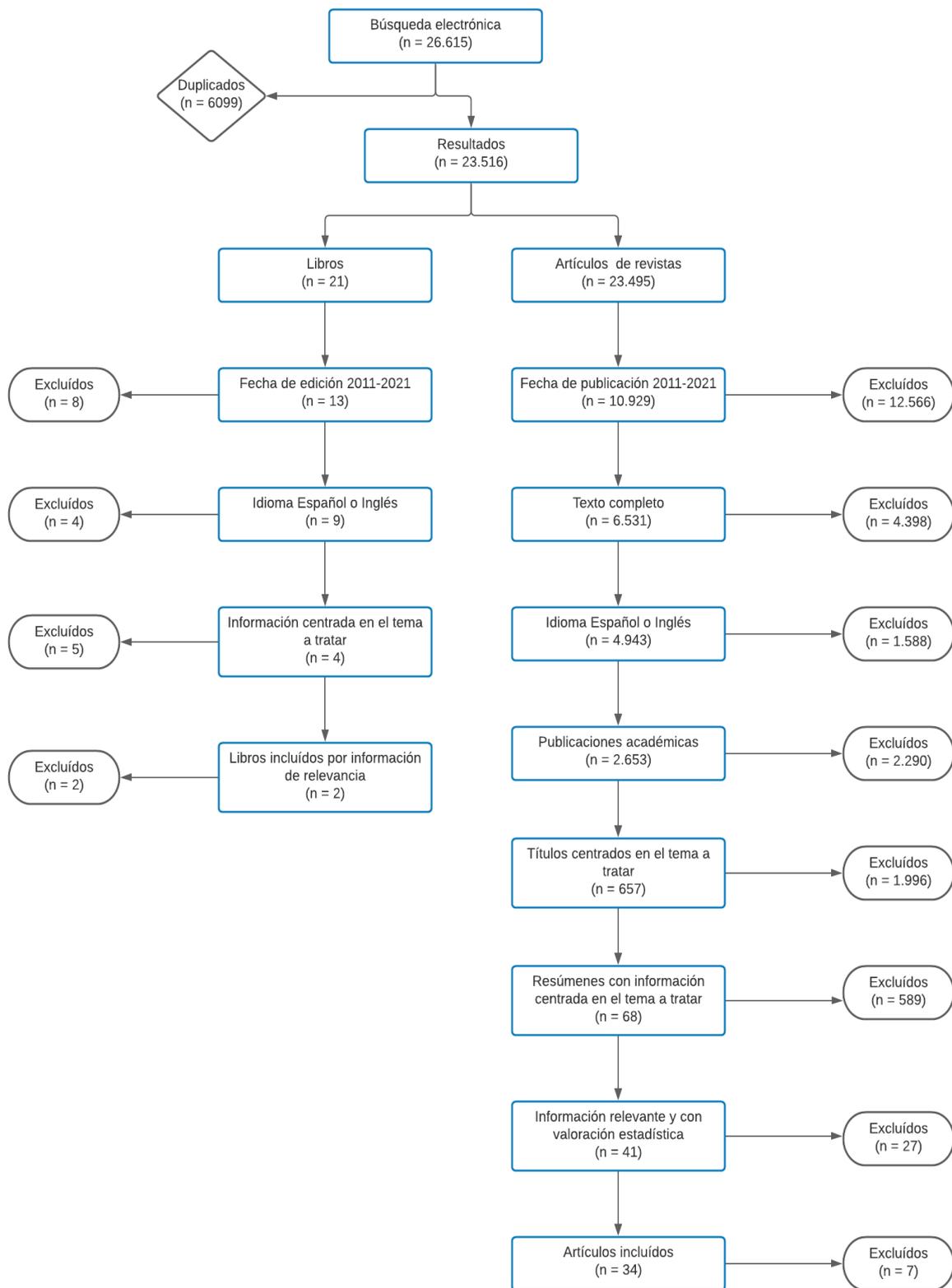
Para la elaboración del presente trabajo se realizó una revisión bibliográfica mediante la búsqueda electrónica a través de las bases de datos Pubmed, Medline, ScienceDirect, Web of Science, Academic Search Ultimate, EBSCO; así como también directamente en revistas de alto impacto como Journal of Dental Research, Journal of Dentistry, Journal of the American Dental Association, International Journal of Oral Science; estos recursos digitales fueron encontrados en la web de la Biblioteca CRAI “Dulce Chacón” de la Universidad Europea. Por otra parte, también se utilizó el buscador especializado Google Scholar.

Se usaron palabras clave como: tercer molar/molares, cordales, muelas del juicio combinado con extracción, exodoncia, asintomáticos, patologías asociadas, extracción profiláctica, apiñamiento, impactados, complicación.

Tras establecer criterios de inclusión y exclusión (Tabla 1), se escogieron 2 libros y 34 artículos que cumplían con los requerimientos del estudio (Fig. 12).

<b>Criterios de inclusión</b>	<b>Criterios de exclusión</b>
Textos completos.	Artículos de revistas desconocidas.
Textos en idioma Español e Inglés.	Textos en otros idiomas.
Artículos o libros con un máximo de 10 años desde su publicación.	Artículos o libros con más de 10 años desde su publicación.
Publicaciones académicas arbitradas.	Información no centrada en el tema a tratar.
	Información de poca relevancia y sin valoración estadística.
	Estudios no controlados.

**Tabla 1.** Criterios de inclusión y exclusión



**Figura 12.** Diagrama de flujo de la selección de la información del estudio

## RESULTADOS Y DISCUSIÓN

Durante la edad adulta, es frecuente que gran parte de la población general se encuentre con la necesidad de solicitar atención odontológica para evaluar y tratar patologías asociadas a terceros molares, las cuales pueden causar diferentes complicaciones.<sup>9</sup> Una alternativa de amplio uso para el tratamiento de estos dientes es la extracción.<sup>13</sup>

Se ha observado que los criterios que se tienen en cuenta para la decisión de extraer o no los terceros molares varían según los autores y guías consultadas. Gran parte considera que la extracción está indicada cuando estos dientes se asocian a patologías.<sup>17,18</sup>

Es interesante señalar la visión que se tiene internacionalmente sobre la acción terapéutica más adecuada para el tratamiento de terceros molares retenidos. La *American Association of Oral and Maxillofacial Surgeons* (AAOMS) recomienda que las decisiones de tratamiento sobre por qué, cuándo o cómo tratar los terceros molares son extremadamente complejas, pero se inclina hacia una tendencia más extraccionista, a diferencia de las guías del *National Institute for Health and Clinical Excellence* del Reino Unido (NICE) y de la *Scottish Intercollegiate Guidelines Network* (SIGN), que concluyen que no se debe realizar la extracción de terceros molares que no presenten sintomatología ni patología, y establecen que la extracción profiláctica debe limitarse a situaciones muy concretas.<sup>2,17</sup>

Por su parte, la *American Public Health Association* también se inclina por una tendencia expectante, indican que para extraer los cordales tiene que existir una patología o necesidad demostrable, por lo que recomiendan la abstención hasta que aparezca algún signo o síntoma. Asimismo, la *American Dental Association* sugiere que la decisión debe estar basada en la evidencia por lo que insta a investigar sobre los riesgos de la extracción profiláctica.<sup>18</sup>

La Sociedad Española de Cirugía Bucal también tiene una visión menos extraccionista, se opone a la extracción sistemática de terceros molares y establece que deberá analizarse siempre la relación riesgo-beneficio. En su guía publicada en el 2018 se afirma que existe suficiente evidencia clínica a favor de la monitorización en el caso de terceros molares total o parcialmente incluidos o impactados asintomáticos (S-) y sin enfermedad (E-).<sup>17</sup>

Todas estas sociedades u organizaciones intentan establecer criterios y protocolos clínicos basados en evidencia científica, sin embargo, aún existen dudas por resolver. Se debe analizar la información disponible y los estudios que la sustentan, para así poder tener más conocimiento sobre cómo actuar en los distintos casos que se presenten.<sup>2,3,13,18</sup>

Los terceros molares sintomáticos (S+) y con enfermedad presente (E+) se reconocen fácilmente. Los pacientes presentan síntomas como dolor intenso, edema o trismo. Los hallazgos del examen físico y radiográfico pueden revelar pericoronaritis aguda,

caries dental o infección localizada o extendida del espacio fascial, o una combinación de las anteriores.<sup>2,11,16</sup>

El tratamiento se centra en abordar la presencia de la enfermedad. Las opciones de tratamiento son la restauración del diente, la terapia periodontal y los cuidados higiénicos, o la extracción. En estos casos, la decisión de extraer es relativamente sencilla y generalmente aceptada, esta sólo se modificaría por una contraindicación significativa del paciente. Los clínicos deben adaptar el tratamiento a cada individuo, teniendo en cuenta aspectos como la capacidad para mantener una higiene adecuada, dificultad para la restauración del diente, el estado de erupción, la funcionalidad, el riesgo de lesión de las estructuras adyacentes y la preferencia del paciente.<sup>2,11,16</sup>

La decisión de extraer un diente sintomático (S+) y sin enfermedad (E-) suele ser recibida favorablemente tanto por la comunidad quirúrgica como por los pacientes y no tiene mayor controversia.<sup>2,11</sup> Es algo más controvertido cuando el tercer molar está asintomático (S-) y con patología (E+), ya que aunque no hayan síntomas, dependiendo de la patología asociada y su evolución, puede que en algunos casos la extracción sea la mejor opción de tratamiento. Es importante destacar que, cuando los autores usan el término “asintomático”, no se refieren a la ausencia de patología, sólo a la ausencia de síntomas.<sup>9,18</sup>

Actualmente la decisión más compleja es sobre la llamada “extracción profiláctica”, la cual se refiere a la extracción de un diente asintomático (S-) y sin patología (E-), y

estaría indicada al valorar los riesgos que puedan causar patología o sintomatología en un futuro.<sup>2,11,16</sup>

La extracción profiláctica es uno de los motivos más frecuentes de derivación a cirugía bucal, sin embargo, este procedimiento es controvertido y genera mucha discusión entre los autores, ya que si se decide realizar, deben ser mayores las ventajas que los riesgos derivados de una intervención quirúrgica. Se ha intentado justificar la extracción profiláctica sistemática de los terceros molares, sin embargo, casi ninguna de las razones dadas está basada en la evidencia científica.<sup>2,17-19</sup>

Hyam<sup>2</sup> realizó un estudio en el que analizó si existen indicaciones para la extracción del tercer molar asintomático (S-) y sin patología (E-) ; propuso una matriz de decisión, la cual sugiere que se debe comenzar siempre con una indicación. Las indicaciones las resume según el estado de la enfermedad y el estado de los síntomas, valorando el riesgo de que el molar desarrolle una patología. Una vez identificada una indicación, establece que la decisión de proceder a la cirugía se verá modificada por la dificultad quirúrgica junto con el riesgo de una posible complicación permanente. La salud actual del paciente y su salud futura modificarán aún más la decisión. Los factores modificadores finales deben incluir los mecanismos de apoyo social y las capacidades financieras del paciente.<sup>2</sup>

Actualmente el motivo más frecuente de extracción de un tercer molar es la aparición de algún cuadro de periocoronaritis, no obstante, la decisión de extraer un tercer molar que presenta esta patología puede ser un poco controvertida. Distintos autores

concuerdan que la opinión del paciente se debe tomar en cuenta a la hora de decidir.<sup>12,13,19</sup> La guía de la Sociedad Española de Cirugía Bucal<sup>17</sup> hace referencia a un estudio realizado por Tang y cols., en el que de 113 pacientes con síntomas de pericoronaritis, 79 escogieron la extracción, ya que les afectaba a su función oral normal y a su estilo de vida.<sup>17</sup>

Yurttutan y cols.<sup>12</sup> evaluaron los cambios en la percepción de la calidad de vida en pacientes con pericoronaritis leve tras el tratamiento mediante un enfoque quirúrgico y periodontal durante un período de estudio de seis meses. De los pacientes, 50 fueron tratados mediante el enfoque periodontal y 50 mediante la extracción de los terceros molares. Se evaluó su calidad de vida relacionada con la salud oral mediante el índice perfil de impacto *OHIP-14* en un formulario de preguntas de evaluación personal y se repitió al primer, tercer y sexto mes. En ambos grupos, las tres puntuaciones totales postoperatorias fueron significativamente inferiores a la puntuación inicial, y se observó una mayor disminución de las puntuaciones en el grupo de tratamiento quirúrgico. Por lo que establecieron que el tratamiento periodontal de los terceros molares mandibulares puede reducir eficazmente los síntomas, pero no los elimina, mientras que la extracción del diente parece ser más eficaz a largo plazo. Cabe destacar que el estudio concluyó que los datos sugieren que se puede mejorar la calidad de vida, especialmente en lo que respecta al dolor y la función oral, sin necesidad de extraer los terceros molares, sin embargo, en el caso de que la pericoronaritis reaparezca durante el seguimiento a largo plazo, la extracción del diente puede ser inevitable<sup>12</sup>.

Los resultados concuerdan con un estudio similar realizado por Passarelli y cols.,<sup>20</sup> el cual tenía como objetivo evaluar el impacto de la calidad de vida de los pacientes comparando un enfoque quirúrgico con un enfoque periodontal. En este se evaluaron 82 pacientes diagnosticados con pericoronaritis. En total, 41 de ellos recibieron un tratamiento periodontal y 41 fueron tratados mediante extracción. La calidad de vida de los pacientes se evaluó igual al estudio anterior. Los pacientes fueron seguidos durante 6 meses. En la línea de base, las puntuaciones del grupo quirúrgico eran más altas que las del grupo periodontal. A la semana, hubo una reducción en términos de la puntuación en ambos grupos, pero el grupo periodontal mostró valores más bajos. El seguimiento a largo plazo mostró una reducción de los valores con una diferencia a favor del grupo quirúrgico. Sin embargo, hubo una reducción de las puntuaciones en ambos grupos, por lo que sugieren que, aunque el tratamiento periodontal ofreció una rápida mejora en términos de calidad de vida durante la primera semana después del tratamiento, después de 1 mes y a los 6 meses, la extracción del tercer molar mandibular siguió siendo el mejor tratamiento, eliminando la aparición de la reinflamación del sitio.<sup>20</sup>

Algunos autores concuerdan que, a diferencia de terceros molares que se encuentran en una posición favorable y que han presentado uno o dos episodios de pericoronaritis leve, en los que se puede optar por un tratamiento periodontal, cuando presentan una infección más severa y de repetición más acusada la opción más adecuada es la extracción.<sup>9,12,17,19,20</sup>

Kunkel y cols.<sup>9</sup> encontraron una preponderancia de 2:1 de pacientes hospitalizados debido a complicaciones derivadas de la extracción de terceros molares frente a los hospitalizados debido a pericoronaritis. Demostraron que la mayoría de las complicaciones graves asociadas a los terceros molares se atribuían a los terceros molares enfermos o a su extracción, y no a la extracción profiláctica. También descubrieron que las infecciones del espacio profundo debidas a la pericoronaritis solían ser consecuencia del primer episodio inflamatorio, por lo que la abstención hasta que el tercer molar presenta algún signo o síntoma no parece tener siempre éxito a la hora de evitar complicaciones graves.<sup>9</sup>

Otra de las patologías asociadas al tercer molar es la enfermedad periodontal, esta se puede presentar en el mismo tercer molar y/o en el segundo molar. En este caso están las opciones de extraer o tratar periodontalmente y para tomar la decisión, se debe tener en cuenta las profundidades de las bolsas periodontales, la pérdida de inserción, la probabilidad de que el paciente mejore y mantenga su higiene oral, y la factibilidad del mantenimiento periodontal, por lo que no hay una alternativa específica y se debe individualizar cada caso.<sup>17</sup>

En el estudio de Hyam<sup>2</sup>, se identifica la periodontitis asociada a los terceros molares como un factor que influye en la reducción de la salud oral. Las personas que presentan enfermedad periodontal alrededor de un tercer molar son más propensas a experimentar un aumento de la profundidad de sondaje con el tiempo. También es probable que desarrollen bolsas periodontales clínicamente significativas en la arcada

dental anterior. Además, el 38% tiene una progresión de la enfermedad en un plazo de 2 años.<sup>2</sup>

Según Dodson y Richardson<sup>15</sup>, si se extraen los terceros molares la salud periodontal de los segundos molares por distal debe permanecer sin cambios o mejorar si anteriormente presentaba bolsas periodontales o pérdida de inserción. No obstante, en clara contradicción con lo anterior, encontraron que después de la extracción en individuos que presentaban un periodonto sano, estos tenían un riesgo de hasta 48% de desarrollar bolsas periodontales en distal del segundo molar.<sup>15,17</sup>

Por su parte, Gupta y cols.<sup>10</sup> realizaron un estudio a un total de 400 pacientes para encontrar la prevalencia de periodontitis y caries en la cara distal de un segundo molar adyacente a un tercer molar mandibular impactado. Los grupos de edad incluidos iban de la segunda a la séptima década. El 60% de los pacientes eran hombres y el 40% mujeres. El tipo de impactación vertical fue más común tanto en hombres como en mujeres, seguido de la impactación mesioangular. El estudio reportó una prevalencia de 39% de periodontitis y 26% de caries en la cara distal del segundo molar mandibular. La prevalencia de periodontitis aumentó con el aumento de la edad, con un 83% y un 100% en la sexta y séptima década de vida respectivamente, y la tasa de progresión de la caries también aumentó de forma constante con la edad, pero fue mayor en la sexta década. Se observó que la periodontitis se asociaba principalmente con la impactación mesioangular y menos en el tipo de impactación distoangular. La mayoría de los dientes impactados horizontalmente estaban asociados con la caries y se observó menos en el tipo de impactación distoangular. Ambos resultaron ser

estadísticamente significativos y concluyeron que estos porcentajes son alarmantes y podrían ser utilizados para extraer profilácticamente los terceros molares impactados y así promover la salud oral del individuo.<sup>10</sup>

En otro estudio, realizado por Chou y cols.<sup>21</sup> se observó la asociación entre la erupción del tercer molar y la presencia de caries y periodontitis distal a los segundos molares en pacientes de edad avanzada. Evaluaron a 70 pacientes con terceros molares unilaterales maxilares o mandibulares que acudieron a las consultas externas de dos hospitales. Se observaron 81 terceros molares erupcionados unilateralmente. Tanto la región distobucal como la región distolingual tenían una mayor profundidad de sondaje en el lado de la no extracción que en el de la extracción, y la tasa de caries era significativamente mayor en el lado de la no extracción que en el de la extracción. Concluyeron que la erupción de los terceros molares, en el mismo o diferente nivel del plano oclusal de los segundos molares, es un factor de riesgo para las enfermedades periodontales y la caries en los segundos molares en pacientes de edad avanzada.<sup>21</sup>

Nunn y cols.<sup>22</sup> analizaron los datos recogidos durante 25 años de 416 hombres adultos inscritos en el "Estudio Longitudinal Dental de Asuntos de Veteranos" de Estados Unidos, para evaluar la asociación de los terceros molares asintomáticos retenidos con el riesgo de patología de los segundos molares adyacentes (caries y/o periodontitis), según el estado del tercer molar (es decir, ausente, erupcionado o no erupcionado). Los molares no erupcionados se clasificaron además como impactados "de tejido blando" u "óseos". Encontraron que la menor prevalencia e incidencia de la patología del segundo molar se producía cuando el tercer molar adyacente estaba

ausente. La presencia de un tercer molar impactado en el tejido blando aumentaba el riesgo de patología del segundo molar 4,88 veces. Tener un tercer molar erupcionado u "óseo" impactado aumentaba el riesgo de patología incidente del segundo molar en 1,74 y 2,16, respectivamente. Y concluyeron que la retención se asociaba con un mayor riesgo de aparición de patología de los segundos molares en hombres adultos de mediana edad y mayores.<sup>22</sup>

Un estudio retrospectivo realizado por Srivastava y cols.,<sup>23</sup> tuvo como objetivo evaluar la incidencia de caries en la cara distal de segundos molares mandibulares y su asociación con la posición y la profundidad de los terceros molares mandibulares impactados. Se incluyeron 150 pacientes y según los resultados obtenidos, el 37,5% de los casos presentaron caries. La incidencia de caries en terceros molares impactados mesioangulares fue del 55% y la mayoría de estos casos eran de posición B y clase I según la clasificación de Pell y Gregory. Concluyeron que la extracción profiláctica de los terceros molares mandibulares está indicada si la angulación está entre 30° y 70° y se justifica por la incidencia de caries distal en los segundos molares.<sup>23</sup>

Por su parte, McArdle y cols.<sup>24</sup> realizaron un estudio de seguimiento para evaluar a un grupo de pacientes con caries cervical distal en sus segundos molares mandibulares. Participaron 239 pacientes (142 hombres y 97 mujeres). En 190 pacientes, estaba afectado sólo un segundo molar, y en 49 ambos estaban afectados (enfermedad bilateral). En total, se extrajeron 288 terceros molares mandibulares, 144 de cada lado. Los 288 dientes estaban parcialmente erupcionados. El examen radiográfico mostró

que todos estaban en contacto o cerca de la unión amelocementaria del segundo molar, y todos estaban impactados mesioangularmente contra el segundo molar. Las angulaciones mesiales de los terceros molares se agruparon en consecuencia: 255 (89%) tenían una angulación de entre 40° y 80°; en 28 (10%) era inferior a 40°, y en 5 (1%) era superior a 80°. Concluyeron que no creen que todos los terceros molares deban extraerse profilácticamente, pero la extracción profiláctica temprana de un tercer molar mesioangular mandibular parcialmente erupcionado evitará la formación de caries cervical distal en el diente adyacente.<sup>24</sup>

Asimismo, McArdle y cols.<sup>25</sup> hacen otro estudio con el objetivo de identificar las indicaciones para la extracción de los terceros molares mesioangulares mandibulares en función de la edad y la salud dental medida por la puntuación en el índice CAOD (dientes cariados, ausentes y obturados), y averiguar si se debe considerar una intervención temprana. Participaron 319 pacientes a los que se les extrajeron 431 terceros molares mesioangulares. Las variables registradas fueron la edad, la indicación primaria de extracción y la puntuación del CAOD. Las indicaciones para la extracción incluyeron caries cervical distal en el segundo molar mandibular (n=180, 44%), pericoronaritis (n=131, 32%) y caries y enfermedades relacionadas (n=62, 15%). La frecuencia de caries cervical distal en el segundo molar mandibular aumentó linealmente a medida que los pacientes envejecían y fue la razón más común por la que se extrajeron los terceros molares mesioangulares. Concluyeron que los resultados sugieren que se debería aconsejar a los pacientes sobre las consecuencias de conservar este tipo de terceros molares, y ofrecerles la extracción profiláctica de los dientes asintomáticos.<sup>25</sup>

Por su parte, un estudio realizado por Yadav y cols.<sup>26</sup> tuvo como objetivo responder la pregunta básica de si la incidencia de caries y posterior extracción del segundo molar debido a terceros molares angulados es lo suficientemente alta como para justificar la extracción profiláctica del tercer molar. Midieron el efecto del tercer molar inclinado sobre el segundo molar en relación con tres parámetros, el nivel y la posición del tercer molar con respecto al segundo molar y la distribución entre las arcadas. Observaron que sólo el 5,4% de los segundos molares maxilares y el 9,6% de los mandibulares estaban afectados por los terceros molares inclinados. Además, sólo el 2,2% de los segundos molares mandibulares y el 2,9% de los maxilares estaban indicados para su extracción. Concluyeron que la caries distal en los segundos molares no es muy común y que la extracción profiláctica de los terceros molares impactados puede considerarse inapropiada. Cabe destacar que los datos no fueron estadísticamente significativos.<sup>26</sup>

El atrapamiento de alimentos alrededor de un tercer molar es un indicador clínico evidente de una higiene bucal reducida o deficiente. Existe muy poca investigación sobre los porcentajes de riesgo que el empaquetamiento de alimentos alrededor de un tercer molar confiere en términos de experiencia de caries en los próximos años. La mayoría de los clínicos estarían de acuerdo en que un tercer molar con problemas de higiene oral y mantenimiento tiene un alto riesgo de desarrollar caries a corto plazo.<sup>2</sup>

Los terceros molares retenidos también pueden desarrollar patologías como quistes y tumores, aproximadamente 1-2 %. Sin embargo, la decisión de extraer de manera profiláctica por este motivo es complicada, ya que no se puede predecir de una manera fiable la evolución de estos casos.<sup>15,17</sup>

El papel de la extracción profiláctica de los terceros molares para prevenir el desarrollo de patologías como los quistes dentales parece limitado. Si bien se admite que puede formarse patología, el número necesario de tratamientos para lograr un beneficio significativo puede ser elevado.<sup>2</sup>

Un estudio retrospectivo realizado por Shin y cols.<sup>27</sup> evaluó la prevalencia de quistes o tumores asociados a terceros molares mandibulares impactados según la edad y el sexo de los pacientes. Detectaron signos radiográficos de enfermedad en 176 lesiones (0,846%) en 165 pacientes. De ellas, 135 (76,4%) lesiones se diagnosticaron como quistes dentígeros, 31 (17,6%) como tumores queratoquísticos y 10 (5,7%) como ameloblastomas. Observaron que la prevalencia de quistes o tumores tendía a aumentar después de los 50 años, el 7,27% en la sexta década, el 18,60% en la séptima y el 11,53% en la octava, con un predominio masculino en los pacientes de mayor edad. Concluyeron que los terceros molares mandibulares impactados en pacientes de edad avanzada de más de 50 años tienen altas posibilidades de desarrollar quistes o tumores, especialmente en los pacientes varones. Sin embargo, destacan que los resultados no deben utilizarse como única evidencia para justificar la extracción profiláctica, y sugieren que se deben realizar otros estudios para

investigar la tasa de supervivencia de los terceros molares mandibulares impactados sin ninguna patología en poblaciones de edad avanzada.<sup>27</sup>

Por otra parte, Vigneswaran y Shilpa<sup>28</sup> estudiaron la incidencia de quistes y tumores asociados a terceros molares impactados en pacientes que acudieron para la extracción quirúrgica del tercer molar con la debida profilaxis terapéutica y hallazgo incidental, durante un periodo de 6 años en 2778 pacientes de los cuales 70 casos reportaron patología asociada a los terceros molares mandibulares impactados. Entre estos 70, el 61,4% de los casos fueron reportados como quistes y tumores y el 38,6% de los casos tenían reacción inflamatoria crónica, incluyendo dos casos con folículo dental normal. Los pacientes con el espacio folicular menor a 2,4 mm también presentaron patología. El 61,4% de los pacientes evaluados para la cirugía del tercer molar mandibular eran sintomáticos, y el resto de los pacientes eran asintomáticos. El pico de incidencia de las patologías asociadas a los terceros molares mandibulares se produjo entre el grupo de edad de 20 y 30 años de vida y la menor incidencia de patología (10%) se produjo en el grupo de mayor edad de los pacientes. Concluyeron que la incidencia de quistes y tumores que se producen alrededor de los dientes impactados mandibulares es baja, sin embargo, en el estudio el espacio folicular menor a 2,4 mm asociado a los terceros molares mandibulares impactados también presentó patología, que se consideraba como tejido folicular normal según la literatura. Esto se descubrió una vez que las muestras de tejido fueron enviadas para el examen histopatológico, demostrando así que sólo el examen clínico y radiográfico no es suficiente para detectar las patologías asociadas con los dientes mandibulares impactados, teniendo en cuenta los principales problemas asociados a los terceros

molares con retención de dichos dientes impactados pueden causar patologías graves y aumentar el riesgo de tasas de complicaciones postoperatorias si no se tratan a una edad temprana y sobre la base de la política de prevenir es mejor que curar, la eliminación profiláctica de los terceros molares mandibulares impactados a una edad temprana, sintomática o asintomática la consideran una mejor modalidad de tratamiento.<sup>28</sup>

Tambuwala y cols.<sup>29</sup> ejecutaron un estudio donde evaluaron los cambios patológicos tempranos en el tejido folicular del tercer molar mandibular completamente impactado. Incluyeron 52 pacientes, de entre 18 y 52 años, de los cuales 25 eran hombres y 27 mujeres. Tenían terceros molares mandibulares impactados, cuya extracción estaba indicada. Se entregaron 52 tejidos foliculares que rodeaban a los terceros molares inferiores impactados, radiográficamente normales, para su análisis histopatológico. Estos dientes no presentaban ningún hallazgo clínico o radiográfico que sugiriera una patología asociada. Los resultados mostraron que, de los 52 folículos, 42 (80,8%) mostraban cambios histológicos sugestivos de un folículo normal, 10 (19,2%) mostraban cambios histológicos que sugerían una patología relacionada con un tercer molar mandibular impactado, 6 (11,5%) mostraron cambios histológicos sugestivos de cambios quísticos, 4 (7,7%) mostraron cambios histológicos sugestivos del folículo infectado. De los 6 folículos que mostraron cambios histológicos sugestivos de quiste, 4 de ellos eran de dientes mesioangulares y 2 de dientes impactados verticalmente. De los 4 folículos que mostraron cambios histológicos sugestivos de folículo infectado, 3 de ellos eran de dientes horizontales y 1 de dientes impactados verticalmente. Teniendo en cuenta el hallazgo anterior, que sugiere una tasa considerablemente alta

(19,23%) de cambios patológicos en el folículo del tercer molar mandibular impactado, concluyeron que es deseable considerar la extracción profiláctica del tercer molar mandibular impactado en los pacientes que se presentan a una edad más temprana, mientras que la extracción de los terceros molares mandibulares impactados por medios profilácticos sigue siendo un enigma para el grupo de mayor edad y debería considerarse apropiada sólo en aquellos casos en los que se establecen causas francas para su extracción.<sup>29</sup>

Un estudio prospectivo realizado por Greeshma y cols.,<sup>30</sup> buscó conocer la incidencia de la asociación del quiste dentígero con terceros molares inferiores impactados radiográficamente normales y llamar la atención de los cirujanos bucales sobre la extracción profiláctica. Se incluyeron 30 pacientes con terceros molares inferiores impactados cuya extracción estaba indicada. El tejido folicular que rodea al diente impactado se sometió a investigaciones histopatológicas. Sólo se consideraron los dientes con un hallazgo radiográfico de espacio pericoronar inferior a 2,5 mm. Se presentaron cambios patológicos sugestivos de quiste dentígero en 7 de los 30 tejidos foliculares y se encontró que era estadísticamente significativo. El estudio concluyó que los cirujanos bucales y maxilofaciales deberían considerar la evaluación histopatológica y el diagnóstico radiográfico en el tratamiento de los terceros molares inferiores impactados. Además, los autores sugieren que las extracciones profilácticas de terceros molares inferiores normales impactados deben considerarse como una opción de tratamiento.<sup>30</sup>

Otra posible patología asociada a un tercer molar retenido es la reabsorción radicular, sin embargo, algunos autores establecen que existe una incidencia menor al 1%.<sup>17</sup> Según Hyam<sup>2</sup>, la reabsorción radicular externa es una preocupación común entre los pacientes, los familiares y los clínicos. Y sugiere que las investigaciones han confirmado que hasta el 7,5% de las personas de entre 21 y 30 años tienen evidencia de reabsorción radicular externa en al menos un lugar de la arcada dental. Curiosamente, una vez que la formación radicular parece estar completa y el paciente ha alcanzado los 30 años, la reabsorción radicular no parece continuar. Esto parece conferir cierta protección contra la reabsorción radicular mediante la extracción de los terceros molares impactados hasta la edad de 30 años, pero muy poco beneficio después de este punto.<sup>2</sup>

Otro tema de mucha controversia es la extracción profiláctica por motivos ortodóncicos. En el pasado se creía que la erupción de los terceros molares se asociaba con la aparición de apiñamiento de dientes del sector anterior mandibular, por lo que varios clínicos justificaban la extracción. Sin embargo, se ha demostrado que la asociación no es significativa, por lo que la extracción no estaría justificada.<sup>2,7</sup>

Según Shallu y Rajesh<sup>19</sup>, entre las muchas variables posibles que contribuyen al apiñamiento de incisivos (por ejemplo, la deriva mesial fisiológica, las fuerzas oclusales sobre los dientes inclinados mesialmente, el vector mesial de la contracción muscular, el tercer molar en desarrollo, los patrones de crecimiento facial mandibular y complejo, la maduración de los tejidos blandos, los factores oclusales y los cambios en el tejido conectivo), resulta difícil diseñar un estudio que pueda aislar todas las

variables y demostrar una relación de causa y efecto entre el tercer molar mandibular y el apiñamiento de incisivos. Y sugieren que los terceros molares no poseen fuerza suficiente para mover otros dientes por lo que no pueden causar el apiñamiento y la superposición de los incisivos, y cualquier asociación de este tipo no es causal.<sup>19</sup>

Otra causa por la que se puede optar por la extracción es por motivos protésicos; si se va a confeccionar algún tipo de prótesis, tanto fijas como removibles, que se extiendan a zonas donde esté un tercer molar incluido, el clínico tiende considerar que la opción quirúrgica es la indicada ya que cualquier patología asociada al tercer molar adyacente puede comprometer el tratamiento prostodóncico.<sup>17</sup>

No obstante, es importante recordar que todos los dientes tienen un posible valor estético y funcional. En algunos casos el tercer molar podría ser usado como pilar de una prótesis, y si este está incluido se podrían usar técnicas combinadas de cirugía y ortodoncia para llevarlo a la posición deseada. Esta alternativa es poco común, pero es importante tenerla en consideración.<sup>17</sup>

Se sabe poco sobre la historia natural de los terceros molares impactados que son dejados en su lugar. Esto se debe, en parte, a la histórica extracción sistemática de los mismos, lo que significa que existen datos limitados sobre los que hacer estimaciones fiables del inicio de la patología cuando los dientes asintomáticos no se extraen.<sup>11</sup>

Algunos autores establecen que en el pasado se ha exagerado la probabilidad de que un tercer molar asintomático (S-) y sin patología (E-) que es dejado en su lugar desarrolle cambios patológicos. Por lo que sugieren que la extracción profiláctica realizada de manera rutinaria no cumple con el estándar de la práctica basada en evidencia.<sup>13,19</sup>

Una revisión sistemática<sup>11</sup> que tuvo como objetivo identificar y evaluar las pruebas pertinentes relacionadas con la efectividad clínica de la extracción profiláctica en comparación con la atención estándar sin la extracción de los terceros molares impactados. Sugirió que la justificación de la extracción profiláctica de los terceros molares impactados es muy debatida en la literatura publicada en el Reino Unido y en todo el mundo, con variaciones en cuanto a lo que se considera el mejor enfoque para el tratamiento. La literatura encontrada por esta revisión es consistente en informar la falta de pruebas a favor o en contra de la extracción profiláctica de estos dientes. Sin embargo, de los estudios incluidos se desprende que la retención de los terceros molares asintomáticos puede dar lugar a futuros síntomas y a la consiguiente extracción en una tasa de entre el 6% y el 31% en un período de 1 a 5 años. En el caso de los participantes a los que se les extrajeron los terceros molares impactados asintomáticos, no se informó de tasas de complicaciones quirúrgicas importantes, aunque se informó de dolor intenso e infección en tasas del 15% y el 6%.<sup>11</sup>

Un estudio que se menciona en la guía publicada por la Sociedad Española de Cirugía Bucal<sup>17</sup>, compara el riesgo entre terceros molares retenidos que desarrollan patología y las complicaciones derivadas de la extracción quirúrgica. El riesgo de cambios

patológicos fue de 0 a 12%, mientras que para las complicaciones postquirúrgicas fue de 11,8 a 21,5%, siendo mayor en pacientes mayores de 25 años.<sup>17</sup> La extracción de los terceros molares mandibulares (independientemente del estado de erupción) es mucho más probable que se asocie a complicaciones postquirúrgicas que la extracción de los terceros molares maxilares.<sup>11</sup>

La importancia de las complicaciones postoperatorias disminuye con la experiencia del cirujano. Cuanto más experimentado sea, menos probable será una complicación significativa. Esto sugiere que para los pacientes que consideran la cirugía profiláctica para dientes asintomáticos, la experiencia del cirujano es un factor de importancia.<sup>2</sup>

Un estudio retrospectivo<sup>31</sup> realizado en un centro sanitario de Omán, investigó las complicaciones asociadas a la extracción de terceros molares. Se extrajeron un total de 1.116 terceros molares (56% mandibulares y 44% maxilares) y la mayoría (67,7%) eran de pacientes mujeres. La edad media en el momento de la extracción fue de  $24 \pm 5$  años y la mayoría de los pacientes (77,7%) tenían entre 20 y 29 años. Las tasas de complicaciones intraoperatorias y postoperatorias fueron del 3,7% y el 8,3%, respectivamente. Las complicaciones intraoperatorias incluyeron la fractura de la tuberosidad (1,2%), la fractura de la raíz (1,1%), la hemorragia (0,7%), la lesión del tejido blando (0,5%) y el daño del diente adyacente (0,2%). Las complicaciones postoperatorias fueron lesiones nerviosas sensoriales (7,2%), hinchazón/dolor/trismo (0,6%) y alveolitis seca (0,5%). Las lesiones nerviosas fueron temporales en 41 pacientes y permanentes en cuatro casos. Se observó una relación estadísticamente significativa entre las personas de 30 a 39 años y la alveolitis seca. La mayoría de las complicaciones derivadas de las extracciones de terceros molares fueron menores y

estuvieron dentro de los rangos reportados en la literatura científica. Sin embargo, el aumento de la edad y la eliminación de hueso se asociaron a un mayor riesgo de complicaciones. Estos resultados pueden ayudar a orientar la planificación del tratamiento, el consentimiento informado y la educación de los pacientes.<sup>31</sup>

Passarelli y cols.<sup>32</sup> realizaron estudio retrospectivo que incluyó 89 extracciones de terceros molares mandibulares realizadas entre enero de 2015 y enero de 2019 por un único cirujano bucal. La mayoría de las extracciones se realizaron en pacientes femeninas. La edad media en el momento de la extracción fue de 35,5 años (rango 81-16) y la mayoría (57%) de los pacientes tenían entre 16 y 30 años. Siguiendo la clasificación de Pell y Gregory, la clase I posición B fue la más representada, ya que 17 (19,1%) de los dientes pertenecían a esta clase, seguida de cerca por la clase II posición B (15,73%). Todas las 89 extracciones requirieron la elevación de un colgajo mucoperióstico y alguna perforación ósea para poder extraer los dientes. En este estudio la tasa de complicaciones postoperatorias fue del 6,7% (3 alveolitis seca, 2 aperturas de la herida y 1 parestesia). El paciente que desarrolló parestesia en el labio inferior se recuperó completamente en un mes.<sup>32</sup>

El riesgo de lesión del nervio alveolar inferior es relativamente bajo (0,68%), el riesgo aumenta con la edad del paciente. El daño del nervio lingual también es una complicación poco frecuente (0,15%), pero que se evita con ahínco. Estos factores combinados sugieren que la extracción de un diente asintomático por parte de un cirujano experimentado en un paciente joven es poco probable que resulte en una reducción significativa de la calidad de vida. Las lesiones nerviosas se producen hasta

en el 2% de los pacientes y suelen ser temporales, pero en el 0,5% (1 de cada 200) de los pacientes, el daño es permanente. El riesgo de lesión nerviosa es más común si el tercer molar impactado está situado cerca del nervio alveolar inferior, siendo probable que el 20% de los pacientes sufran un daño nervioso temporal y el 2% un daño permanente.<sup>11</sup>

El riesgo de infección tras la extracción de los terceros molares es de aproximadamente el 10% en pacientes sanos; sin embargo, puede ser de hasta el 25% en pacientes con baja inmunidad. La alveolitis se produce en el 5-10% de los pacientes que se han sometido a este procedimiento y se presenta en los 3-5 días siguientes a la desaparición del dolor inicial de la cirugía.<sup>11</sup>

Además, la alveolitis seca, la infección secundaria y la parestesia son menos probables en las personas de 35 a 83 años que en las de 12 a 24 años, que experimentan más extracciones de terceros molares. El mayor riesgo de complicaciones se da en las personas de 25 a 34 años.<sup>11</sup>

Algunos autores consideran que la edad es el factor más relevante en cuanto al riesgo de sufrir complicaciones postoperatorias,<sup>9</sup> sin embargo, otros indican que es más importante la complejidad quirúrgica de la extracción.<sup>17</sup>

Hay pocas pruebas disponibles sobre el mejor momento para extraer los terceros molares inferiores impactados. Chen y cols.<sup>33</sup> realizaron un estudio de cohorte retrospectivo en el cual examinaron la asociación entre la edad de los pacientes en

el momento de la extracción de su tercer molar inferior impactado y las secuelas de su segundo molar adyacente con el fin de encontrar un mejor momento para la extracción. Se incluyeron un total de 15.432 pacientes de 16 a 45 años. Los pacientes que se sometieron a una extracción de terceros molares inferiores con más de 22 años tuvieron un riesgo significativamente mayor de tener enfermedad pulpar en el segundo molar adyacente. Se encontró un riesgo significativamente mayor de tener afecciones periodontales del segundo molar adyacente en los individuos mayores de 31 años, con periodontitis previa o con odontectomía complicada. El riesgo de que el segundo molar adyacente se extraiga por una afección intratable fue mayor en los pacientes de más de 35 años. La edad de los pacientes a los que se les extrajo los terceros molares inferiores se asoció de forma independiente con diversas secuelas del segundo molar adyacente. Sugieren que la mejor edad para la extracción para minimizar las complicaciones en el segundo molar adyacente es entre los 19 – 22 años.<sup>33</sup>

El hueso circundante en los pacientes jóvenes es relativamente elástico y más resistente en comparación con los pacientes de más edad, en los que el hueso es más duro, lo que hace necesaria una mayor eliminación de hueso durante la extracción, con más dificultad para separar el diente del hueso, lo que provoca un mayor dolor postoperatorio, hinchazón y trismo. Estos factores deben tenerse en cuenta cuando se aconseja a los pacientes sobre las ventajas y desventajas de la extracción de terceros molares asintomáticos no erupcionados o impactados a una edad más temprana.<sup>9</sup>

Mehra y cols.<sup>34</sup> llevaron a cabo un estudio retrospectivo para analizar el efecto que tienen los terceros molares no erupcionados o parcialmente erupcionados en los patrones de fractura de ángulo y cóndilo de la mandíbula. También evaluaron el tipo de impactación que provoca la fractura del ángulo y el nivel en el que el cóndilo se fractura con mayor frecuencia. El estudio incluyó a un total de 280 pacientes. Los pacientes evaluados habían sido diagnosticados de fracturas de ángulo y de cóndilo. Del total, 150 pacientes eran de fracturas de ángulo ocupando el 53,6% del conjunto de la muestra y 130 eran de fracturas de cóndilo, constituyendo el 46,4% de la muestra. Las fracturas subcondíleas representaron el 87,6% de las fracturas condíleas, mientras que las fracturas de cabeza y cuello condilar supusieron el 7,6 y el 4,6%, respectivamente. De los 150 pacientes con fractura de ángulo, 146 tenían terceros molares y 4 no, mientras que, de las 130 fracturas de cóndilo, el tercer molar estaba presente en 54 pacientes y ausente en 76.

Se concluyó que la presencia o ausencia de terceros molares mandibulares impactados tiene un impacto definitivo en el patrón de fractura mandibular. La presencia de un tercer molar no erupcionado tiende a aumentar la susceptibilidad de fractura de la mandíbula en la región angular; sin embargo, su presencia actúa a su vez como factor de protección del cóndilo. La posición y la angulación de los terceros molares impactados son también variables importantes para determinar el lugar de la fractura. La ausencia o la erupción completa de los terceros molares hace que el cóndilo sea más propenso a la fractura y actúa como mecanismo protector del ángulo. La presencia de fracturas de ángulo con terceros molares y de fracturas de cóndilo sin terceros molares resulta ser estadísticamente significativa. Esto demuestra que la

aparición de fracturas se debe principalmente a la discontinuidad del hueso cortical causada por la presencia de terceros molares impactados. Por lo tanto, la extracción profiláctica de los terceros molares mandibulares aumenta el riesgo de fracturas de cóndilo.<sup>34</sup>

Una revisión sistemática<sup>35</sup> evaluó si la extracción de los terceros molares es un factor de riesgo para los trastornos temporomandibulares y concluyó que la extracción de los terceros molares puede ser un riesgo para el desarrollo de los trastornos temporomandibulares. Hay indicadores de que factores inherentes a la cirugía, como la localización, el grado de dificultad quirúrgica y la impactación, parecen agravar este riesgo. Por lo tanto, se sugiere un examen exhaustivo de la ATM en todos los pacientes que vayan a someterse a una extracción de terceros molares, a fin de prevenir daños en la ATM. El riesgo de sesgo varió de baja a moderada debido a problemas metodológicos en la descripción de los métodos de extracción y evaluación. Este estudio destaca la necesidad de realizar ensayos clínicos aleatorios con criterios de diagnóstico y procedimientos quirúrgicos estandarizados.<sup>35</sup>

Por último, es importante destacar que a falta de pruebas que apoyen o refuten la extracción rutinaria del tercer molar, el clínico debe individualizar cada caso y valorar los riesgos y beneficios de los posibles tratamientos, así como también las propias preferencias del paciente.<sup>13,18</sup>

## **CONCLUSIÓN**

- Si un tercer molar presenta sintomatología y/o patología, la decisión de extraer está aceptada, sin embargo, no existe evidencia que apoye la extracción o la no extracción de un tercer molar retenido asintomático y sin patología.
- La cirugía de los terceros molares tiene la posibilidad de generar complicaciones y conllevan a un coste económico que debe contrastarse con los evidentes riesgos de accidentes infecciosos, mecánicos, reflejos y tumorales de un tercer molar retenido, además de proporcionar una mejor salud periodontal por distal del segundo molar.
- La preservación de los terceros molares retenidos obliga a un seguimiento continuo o vigilancia activa programada, ya que podría implicar la aparición de pericoronaritis y derivar a una infección más profunda, la formación de caries y problemas periodontales, la reabsorción de las raíces del diente adyacente o el desarrollo de quistes o tumores.
- Los autores tienen en cuenta la edad, profundidad de la inclusión, grado de inclinación, recubrimiento óseo, tamaño del folículo periodontal, forma y desarrollo de las raíces, la relación con el conducto dentario inferior y el grado de apertura interincisiva, así como también la opinión o preferencia del paciente.

## **RESPONSABILIDAD SOCIAL**

La extracción profiláctica sistemática de los terceros molares supone un coste económico tanto para los pacientes como para el sector sanitario, por lo que al llevar a cabo este procedimiento de manera rutinaria podría implicar un mayor gasto económico que si se decidiera optar por la abstención y monitorización, al menos en un corto y mediano plazo.

En comparación a la extracción profiláctica, la abstención le evita al paciente una intervención innecesaria, que podría ocasionar molestias, algunos días de incapacidad y posibles complicaciones, aparte del gasto económico. Asimismo, para el personal sanitario la extracción equivale a más tiempo de trabajo y posiblemente a un mayor estrés laboral.

## **BIBLIOGRAFÍA**

1. Donado M, Martínez JM. Donado. Cirugía bucal. Patología y técnica. 4th ed. Madrid. MASSON; 2014.
2. Hyam DM. The contemporary management of third molars. Aust Dent J. 2018;63(1):19-26.
3. Varghese G. Management of Impacted Third Molars. En: Bonanthaya K., Panneerselvam E, Manuel S, Kumar VV, Rai A, editores. Oral and Maxillofacial Surgery for the Clinician. Singapore: Springer; 2020. p: 299-318.
4. Kaveri GS, Prakash S. Third Molars: A Threat to Periodontal Health? J Maxillofac Oral Surg. 2012;11(2):220–223.
5. Ghougassian SS, Ghafari JG. Association between mandibular third molar formation and retromolar space. Angle Orthod. 2014;84(6):946–950.
6. Spiotto MT, Juodzbalys G, Daugela P. Mandibular Third Molar Impaction: Review of Literature and a Proposal of a Classification. J Oral Maxillofac Res. 2013;4(2):1–13.
7. Al-Gunaid TH, Bukhari AK, El Khateeb SM, Yamaki M. Relationship of Mandibular Ramus Dimensions to Lower Third Molar Impaction. Eur J Dent. 2019;13(2):213–221.
8. Abu Alhaija ESJ, Albhairan HM, Alkhateeb SN. Mandibular third molar space in different antero-posterior skeletal patterns. Eur J Orthod. 2011;33(5):570-576.
9. Shoshani-Dror D, Shilo D, Ginini JG, Emodi O, Rachmiel A. Controversy regarding the need for prophylactic removal of impacted third molars: An overview. Quintessence Int (Berl). 2018;49(8):653–62.

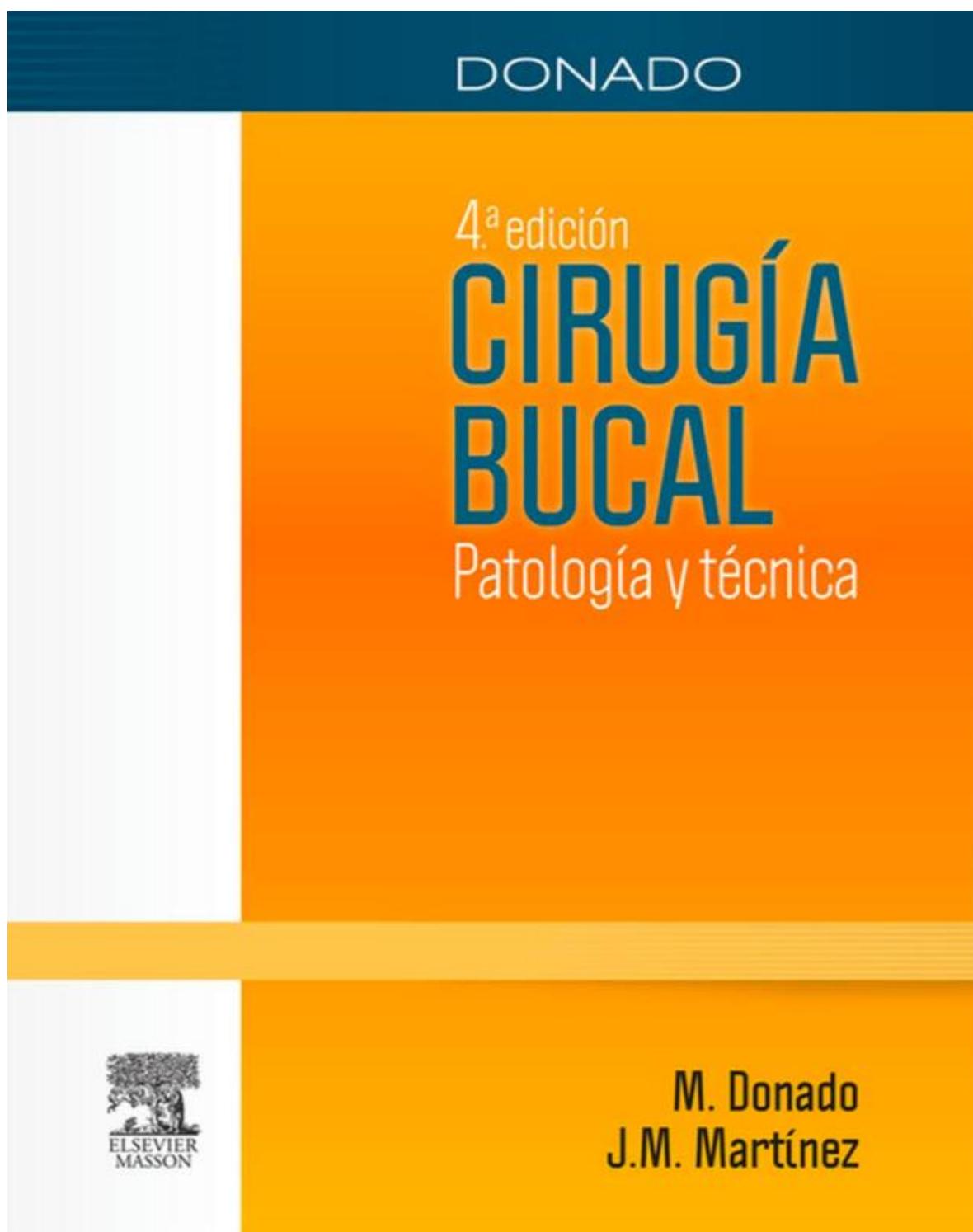
10. Gupta P, Naik SR, Ashok L, Khaitan T, Shukla AK. Prevalence of periodontitis and caries on the distal aspect of mandibular second molar adjacent to impacted mandibular third molar: A guide for oral health promotion. *J Family Med Prim Care*. 2020;9:2370-2374.
11. Hounsome J et al. Prophylactic removal of impacted mandibular third molars: A systematic review and economic evaluation. *Health Technol Assess*. 2020;24(30):1-116.
12. Yurttutan ME, Karaahmetoğlu, Üçok C, Bağış N. Comparison of the quality of life of patients with mandibular third molars and mild pericoronitis treated by extraction or by a periodontal approach. *Br J Oral Maxillofac Surg*. 2020;58(2):179–84.
13. Ghaemina H et al. Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth. *The Cochrane database of systematic reviews* [Internet]. 31 Ago 2016 [citado 11 Dic 2020];(8):CD003879. Disponible en: <https://search-ebscobhost-com.ezproxy.universidadeuropea.es/login.aspx?direct=true&db=mdc&AN=27578151&lang=es&site=ehost-live&scope=site>
14. Coulthard P, Bailey E, Esposito M, Furness S, Renton TF, Worthington HV. Surgical techniques for the removal of mandibular wisdom teeth. *The Cochrane database of systematic reviews* [Internet]. 29 Jul 2014 [citado 11 Dic 2020];(7):CD004345. Disponible en: <https://search-ebscobhost-com.ezproxy.universidadeuropea.es/login.aspx?direct=true&db=mdc&AN=25069437&lang=es&site=ehost-live&scope=site>

15. Dodson TB. How many patients have third molars and how many have one or more asymptomatic, disease-free third molars? *J Oral Maxillofac Surg.* 2012;70(1):4-7.
16. Steed MB. The indications for third-molar extractions. *J Am Dent Assoc.* 2015;145(6):570-573.
17. Sociedad Española de Cirugía Bucal. Guía de diagnóstico e indicaciones para la extracción de los terceros molares. SECIB. 2018. Disponible en: [https://secibonline.com/wp-content/uploads/2018/07/GPC-3M\\_2018-FINAL.pdf](https://secibonline.com/wp-content/uploads/2018/07/GPC-3M_2018-FINAL.pdf)
18. Rodríguez JM, Casero JA. Indicaciones actuales de la extracción del tercer molar. *RCOE.* 2016;21(4):209-214.
19. Shallu B, Rajesh S. IS IT WISDOM TO REMOVE A WISDOM TOOTH? - Extraction versus non-extraction Management of Impacted Tooth. *Indian J Dent Sci.* 2011;2(3):4–6.
20. Passarelli PC et al. Quality of Life of Patients with Mandibular Third Molars and Mild Pericoronitis. A Comparison between Two Different Treatments: Extraction or Periodontal Approach. *MDPI.* 2020;222(9):3-5.
21. Chou YH, Ho PS, Ho KY, Wang WC, Hu KF. Association between the eruption of the third molar and caries and periodontitis distal to the second molars in elderly patients. *Kaohsiung J Med Sci.* 2017;33(5):246–251.
22. Nunn ME, Fish MD, Garcia RI, Kaye EK, Figueroa R, Gohel A, et al. Retained Asymptomatic Third Molars and Risk for Second Molar Pathology. *J Dent Res.* 2013;92(12):1095–1099.

23. Srivastava N, Shetty A, Goswami R, Apparaju V, Bagga V, Kale S. Incidence of distal caries in mandibular second molars due to impacted third molars: Nonintervention strategy of asymptomatic third molars causes harm? A retrospective study. *Int J Appl Basic Med Res.* 2017;7(1):15-19.
24. McArdle LW, McDonald F, Jones J. Distal cervical caries in the mandibular second molar: an indication for the prophylactic removal of third molar teeth? Update. *Brit J Oral Max Surg.* 2015;52(2):185-189.
25. McArdle LW, Jones J, McDonald F. Characteristics of disease related to mesio-angular mandibular third molar teeth. *Brit J Oral Max Surg.* 2019, 57(4):306-311.
26. Yadav P, Pruthi PJ, Nawal RR, Talwar S, Verma M. Saving the 2nd molar from the 3rd is it really the guilt of the tilt? *J Clin Diagnostic Res.* 2016;10(5):17–19.
27. Shin SM, Choi EJ, Moon SY. Prevalence of pathologies related to impacted mandibular third molars. *Springerplus.* 2016;5(1):915-920.
28. Vigneswaran AT, Shilpa S. The incidence of cysts and tumors associated with impacted third molars. *J Pharm Bioallied Sci.* 2015;7(1):251–254.
29. Tambuwala AA et al. An evaluation of pathologic changes in the follicle of impacted mandibular third molars. *J Int oral Heal.* 2015;7(4):58–62.
30. Wali GG, Sridhar V, Shyla HN. A Study on Dentigerous Cystic Changes with Radiographically Normal Impacted Mandibular Third Molars. *J Maxillofac Oral Surg.* 2012;11(4):458–465.
31. Sayed N, Bakathir A, Pasha M, Al-Sudairy S. Complications of Third Molar Extraction. *SQU Med J.* 2019;19(3):230–235.

32. Passarelli PC et al. How frequent are postoperative complications after an impacted mandibular third molar extraction?. *J Bio Reg Hom Ag.* 2020;34(3):1209-1211.
33. Chen YW, Chi LY, Lee OKS. Associations between aging and second molar diseases in patients having adjacent impacted third molar extraction. *J Formos Med Assoc.* 2021;120(1):380–387.
34. Mehra A, Anehosur V, Kumar N. Impacted Mandibular Third Molars and Their Influence on Mandibular Angle and Condyle Fractures. *Craniofac Trauma Reconstr.* 2019;12(4):291–300.
35. Damasceno YSS, Espinosa DG, Normando D. Is the extraction of third molars a risk factor for the temporomandibular disorders? A systematic review. *Clin Oral Investig.* 2020;24(10):3325–3334.
36. Alfadil L, Almajed E. Prevalence of impacted third molars and the reason for extraction in Saudi Arabia. *Saudi Dent J.* 2020;32(5):262-268.

ANEXOS



## The contemporary management of third molars

DM Hyam†‡

†The Canberra Hospital, Canberra, Australian Capital Territory, Australia.

‡Australian National University, Canberra, Australian Capital Territory, Australia.

### ABSTRACT

The management of third molars requires a significant assessment and decision process both for the patient and the clinician. The clinician must always identify the indication for third molar surgery, assess the risks of the proposed procedure, and then modify their plan to account for the patient's current and future health, their social and financial setting, and the patient's tolerance of risk. In doing this, the clinician can tailor a solution to meet the individual patient's needs. This decision to remove a third molar is made in the fluid setting of the patient's quality of life and requires regular review. This article gives the clinician the tools, the matrix, and the confidence to guide patients through this process, and outlines some of the pitfalls and common points of bias within the process.

**Keywords:** Analysis, decision making, third molars, wisdom teeth.

**Abbreviations and acronyms:** WHARFE System = W – Winter lines, H – Height of mandible, A – Angulation, R – Root form, F – Size follicular sac, E – Exit pathway of tooth; IAN = inferior alveolar nerve; OPG = orthopantomogram.

Accepted for publication October 2017.

### INTRODUCTION

The decision to commit a patient to the removal of a third molar can be complex and challenging. No clinician wishes to expose the patient to surgical risk, pain and discomfort during recovery, and the financial burden of surgery, unless there is an identifiable benefit to the patient. Every Oral & Maxillofacial Surgeon faces this dilemma on a daily basis. The clinician faces the challenge of deciding if and when an intervention is required, along with the duty to minimise morbidity and risk.

It is possible that the issue of third molars and their removal is becoming an increasingly important question for teenagers and young adults. Previously, many people had had extractions by the time they reached late puberty, and this may have facilitated the late eruption of third molars into the dental arch in a functional position. As oral hygiene around the world has improved, and as orthodontists increasingly utilize a non-extraction treatment plan, the prevalence of impacted third molars may rise in the future. Research<sup>1</sup> has shown that at least 96% of the population has a third molar. Up to 36% of young people may have an impacted third molar.<sup>2</sup> When more than a third of the population faces a decision about how best to manage impacted teeth, this places a significant burden on the healthcare sector.

Much time and effort has previously been given to reviewing literature in order to determine what evidence is available and what quality evidence can be utilized in the decision making process. A Cochrane review<sup>3</sup> published in 2012 found 'there is no evidence from randomized controlled trials, that prophylactic removal of asymptomatic third molars prevents painful and/or infection complications arising from the retention of these third molars.' The review also found that there was only a single randomized controlled trial which could be classified as being of sufficient rigor to provide evidence in this issue. This trial showed no evidence of a difference in retention or removal. The Cochrane review summarized its findings by 'asking clinician's to rely on clinical experience and patient values and preferences in order to make decisions concerning the treatment of individuals in their care.' Given the lack of strong evidence, a decision making matrix is necessary which allows clinicians to identify and assess the clinical and patient factors of relevance.

### CLASSIFICATION OF THIRD MOLARS

The concept of classification of third molars has matured over the last 10 years. Third molars were originally classified as either being symptomatic or asymptomatic, impacted or non-impacted, erupted,



George Varghese

### 14.1 Introduction

Even as the scope of practicing oral and maxillofacial surgery grows and continues to evolve, the mainstay of practice remains dentoalveolar surgery. In this area, the surgical removal of impacted teeth is one of the commonest procedures that is performed. Among the teeth that are commonly impacted, the mandibular molars rank first, followed by the maxillary third molars and the maxillary canines. Less commonly, impaction of other teeth such as the mandibular canines, maxillary and mandibular premolars, and the second molars are also seen.

#### 14.1.1 Terminology

The term impaction comes from the term “impactus,” which is of Latin origin. Its general usage refers to the failure of an organ or structure in achieving its normal position because of an abnormal mechanical condition.

Archer [1] defined impacted tooth as a tooth that is partially or completely unerupted and is positioned against another tooth or bone or soft tissue so that its further eruption is unlikely.

Lytle [2] proposed a definition that is intimately related to that of Archer. An impacted tooth is a tooth that has failed to erupt into its normal functional position beyond the time usually expected for such appearance. Eruption may have been prevented by adjacent hard or soft tissue including tooth, bone, or dense soft tissue.

**Electronic Supplementary Material** The online version of this chapter ([https://doi.org/10.1007/978-981-15-1346-6\\_14](https://doi.org/10.1007/978-981-15-1346-6_14)) contains supplementary material, which is available to authorized users.

G. Varghese (✉)  
Principal, Professor and Head, Department of Oral and  
Maxillofacial Surgery, Pushpagiri College of Dental Sciences,  
Thruvalla, Kerala, India

Andreasen et al. [3] defined impaction as a cessation of the eruption of a tooth caused by a clinically or radiographically detectable physical impediment in the eruption path or by an ectopic position of the tooth.

- An *unerupted tooth* is the one lying within the jaws, entirely covered by soft tissue, and partially or completely covered by bone. This tooth is undergoing the eruption process and will probably erupt into occlusion based on clinical and radiographic findings.
- A *partially erupted tooth* is one that has failed to erupt fully into a normal position. The term implies that the tooth is partly visible or in communication with the oral cavity.
- An *impacted tooth* is a tooth which is prevented from completely erupting into a normal functional position. The reason may be due to lack of space, obstruction by another tooth, or an abnormal eruption path.

#### 14.1.2 Incidence of Impaction

*Archer observed that the following types of teeth, in order of frequency, are most likely to be impacted:*

maxillary third molars,  
mandibular third molars,  
maxillary cuspids,  
mandibular bicuspid,  
mandibular cuspids,  
maxillary bicuspid,  
maxillary central incisors,  
maxillary lateral incisors.

## Third Molars: A Threat to Periodontal Health??

G. S. Kaveri · Shobha Prakash

Received: 3 February 2011 / Accepted: 5 September 2011 / Published online: 20 September 2011  
© Association of Oral and Maxillofacial Surgeons of India 2011

**Abstract** The third molars have received the fair amount of interest in literature. It has been blamed for problems such as—lower incisor crowding, atypical facial pain, caries etc. They are considered as 'waste bins' in dental practices as they are regarded as functionally non-essential. While making the clinical decision, they are given less importance and often extraction is considered to be the treatment option. Despite periodontal problems that can arise with extracted third molars, retention of third molars can also lead to periodontal problems with the adjacent teeth in addition to teeth farther to third molars. Of late, it is very important to consider the periodontal problems while making the clinical decision. This review paper has been discussed keeping this as prime objective.

**Keywords** Third molar · Periodontitis

### Introduction

Over the years the humble wisdom tooth has come in for a fair amount of attention in the literature. This mass of dentin and enamel, essentially the same as any other tooth in the dentition has been blamed for problems such as lower incisor crowding, atypical facial pain, caries and even disorientation in air crew.

In yester years, third molars were extracted due to infection as preventive measure. With the advent of

antibiotics, this is now unnecessary and outmoded. Third molars were retained in those patients who were susceptible to some forms of periodontal disease in whom first molars were lost at an early age in argument that third molars act as 'spare tyres' of molar tooth loss and can be used as abutments for bridges at later stage.

The therapeutic recommendations with regard to third molars are critical. The clinical decision making to retain or remove the third molars always appears questionable. It is not just the presence or absence of symptomatic or asymptomatic third molar that makes the decision difficult but sometimes the consequences that follow with either of it. One needs to consider the endodontic, prosthodontic, surgical, periodontic, orthodontic prognosis of third molar. It is this inter-disciplinary concern that makes the clinical decision difficult and needs to be totally weighed.

Thus, many dental practitioners do not attach significance to the presence of third molars when making therapeutic recommendations to patients about preservation of the dentition. However, the need for taking a more serious account of third molars and its relation to periodontal health is reviewed in this paper.

### Genesis of Wisdom Teeth

Eruption of the third molars occurs in the later teenage years through the early 20 s. Timing of the eruption varies widely. Eruption can be seen as early as 13–14 years of age, and follows root development. Conversely, it is also possible for delayed root formation to occur, and result in incomplete development of impacted wisdom teeth or late eruption. The third molar is the last to develop in the dental arch. Typical development of the third molar tooth germ begins around the age of 8–9 years with radiographic

G. S. Kaveri · S. Prakash (✉)  
Department of Periodontics, College of Dental Sciences,  
Davangere, Karnataka, India  
e-mail: shobhaprakash5@yahoo.com

G. S. Kaveri  
e-mail: Kaveri.gaddada@gmail.com

## Association between mandibular third molar formation and retromolar space

Saro S. Ghougassian<sup>a</sup>; Joseph G. Ghafari<sup>b</sup>

### ABSTRACT

**Objective:** To assess the association between formation stages of the mandibular third molars and the space distal to the permanent molars (retromolar space).

**Materials and Methods:** The material included pretreatment lateral cephalographs of 96 orthodontic patients (49 males, 47 females; 8–18 years old). The molar formation stage was assessed through the method of Nolla, which rates the degree of calcification on a scale of 10 stages. The retromolar space was measured from the most concave point of the anterior border of the ramus to the distal surface of the first molar (used because the second molars had not yet erupted in the younger patients). Statistical analyses included *t*-tests and analyses of variance for group differences and the Pearson product moment to gauge associations among variables.

**Results:** The formation stage advanced with age, but wide standard deviations were noted. Similarly, the retromolar distance increased with age and was greatest between 10 and 12 years. The correlation between retromolar space and developmental stage was high ( $r = 0.85$ ). On average, an increase of 5 mm of retromolar space corresponds to a 1.8 stage in tooth maturation.

**Conclusions:** The correlation between third molar mineralization and available retromolar space essentially represents the association between one biologic age (dental formation) and another growth-related event (mandibular skeletal growth). The findings do not necessarily reflect successful emergence or nonimpaction of the molars. Longitudinal data are needed to determine such outcomes. (*Angle Orthod.* 2014;84:946–950.)

**KEY WORDS:** Third molar; Dental age; Root formation; Development; Retromolar space

### INTRODUCTION

The study of eruption or impaction of permanent teeth should address three local components: space availability, stage of formation, and size of the tooth. The clinical significance of such investigations regarding the

mandibular third molars is related to the prediction of impaction or eruption of these teeth.

The developmental stage of the mandibular third molars has been related to chronologic and skeletal ages.<sup>1–3</sup> However, local morphological and dental factors can affect the stage of development, which may be accelerated or delayed in the presence of anatomical differences among individuals of the same chronologic or skeletal age. Within-mouth variations of up to four stages of maturation have been observed,<sup>4</sup> and a given stage of third molar crown formation could develop within a range of 7 to 8 years in different persons.<sup>5</sup>

Data are lacking regarding the relationship between molar impaction and size (mesio-distal width) of the permanent teeth (molars, premolars, canines, and incisors); however, it is logical to assume that larger teeth are likely to be associated with an increased incidence of crowding.

Researchers have long attempted to establish pretreatment parameters with which to predict impaction or eruption of the mandibular third molars, with inconclusive results.<sup>6,7</sup> Unlike the study of space availability for all other permanent teeth, the environ-

<sup>a</sup> Clinical Associate, Division of Orthodontics and Dentofacial Orthopedics, American University of Beirut Medical Center, Beirut, Lebanon.

<sup>b</sup> Professor and Head, Division of Orthodontics and Dentofacial Orthopedics, American University of Beirut Medical Center, Beirut, Lebanon; Professor, Department of Orthodontics, School of Dentistry, Lebanese University, Beirut, Lebanon; Visiting Scholar, Department of Orthodontics, College of Dentistry, New York University, New York, NY; Adjunct Professor, Department of Orthodontics, School of Dental Medicine, University of Pennsylvania, Philadelphia, Pa.

Corresponding author: Dr Saro S. Ghougassian, Clinical Associate, Division of Orthodontics and Dentofacial Orthopedics, American University of Beirut Medical Center, 6th Floor, 110236 Riyad El-Soih, PO Box 1020-1136 Beirut, Lebanon (e-mail: sar\_gh@hotmail.com)

Accepted: March 2014. Submitted: December 2013.

Published Online: April 28, 2014

© 2014 by The EH Angle Education and Research Foundation, Inc.

## Mandibular Third Molar Impaction: Review of Literature and a Proposal of a Classification

Gintaras Juodzbalyš<sup>1</sup>, Povilas Daugela<sup>1</sup>

<sup>1</sup>Department of Maxillofacial Surgery, Lithuanian University of Health Sciences, Kaunas, Lithuania.

### Corresponding Author:

Gintaras Juodzbalyš  
Vainiku 12  
LT- 46383, Kaunas  
Lithuania  
Phone: +370 37 29 70 55  
Fax: +370 37 32 31 53  
E-mail: [gintaras@stilusoptimus.lt](mailto:gintaras@stilusoptimus.lt)

### ABSTRACT

**Objectives:** The purpose of present article was to review impacted mandibular third molar aetiology, clinical anatomy, radiologic examination, surgical treatment and possible complications, as well as to create new mandibular third molar impaction and extraction difficulty degree classification based on anatomical and radiologic findings and literature review results.

**Material and Methods:** Literature was selected through a search of PubMed, Embase and Cochrane electronic databases. The keywords used for search were mandibular third molar, impacted mandibular third molar, inferior alveolar nerve injury third molar, lingual nerve injury third molar. The search was restricted to English language articles, published from 1976 to April 2013. Additionally, a manual search in the major anatomy and oral surgery journals and books was performed. The publications there selected by including clinical and human anatomy studies.

**Results:** In total 75 literature sources were obtained and reviewed. Impacted mandibular third molar aetiology, clinical anatomy, radiographic examination, surgical extraction of and possible complications, classifications and risk factors were discussed. New mandibular third molar impaction and extraction difficulty degree classification based on anatomical and radiologic findings and literature review results was proposed.

**Conclusions:** The classification proposed here based on anatomical and radiological impacted mandibular third molar features is promising to be a helpful tool for impacted tooth assessment as well as for planning for surgical operation. Further clinical studies should be conducted for new classification validation and reliability evaluation.

**Keywords:** tooth impacted; molar, third; alveolar nerve, inferior; lingual nerve injuries; mandibular canal; classification.

Accepted for publication: 11 June 2013

#### To cite this article:

Juodzbalyš G, Daugela P. Mandibular Third Molar Impaction: Review of Literature and a Proposal of a Classification.

URL : <http://www.ejomr.org/JOMR/archives/2013/2/e1/v4n2e1ht.pdf>

doi: [10.5037/jomr.2013.4201](https://doi.org/10.5037/jomr.2013.4201)

# Relationship of Mandibular Ramus Dimensions to Lower Third Molar Impaction

Talat Hasan Al-Gunaid<sup>1,2</sup> Abdul Kadir Bukhari<sup>3</sup> Sara M. El Khateeb<sup>4,5</sup> Masaki Yamaki<sup>6</sup>

<sup>1</sup> Department of Pediatric Dentistry and Orthodontics, College of Dentistry, Taibah University, KSA

<sup>2</sup> Department of Orthodontics and Pediatric Dentistry, Faculty of Dentistry, Ibb University, Yemen

<sup>3</sup> Department of Pediatric Dentistry and Orthodontics, College of Dentistry, Taibah University, KSA

<sup>4</sup> Department of Basic Dental Sciences, College of Dentistry, Princess Noura Bint Abdulrahman University, KSA

<sup>5</sup> Department of Oral Medicine, Periodontology, Diagnosis and Radiology, Faculty of Dentistry, Ain Shams University, Cairo, Egypt

<sup>6</sup> Department of Oral Life Science, Division of Orthodontics, Graduate School of Medical and Dental Sciences, Niigata University, Japan

**Address for correspondence** Talat Hasan Al-Gunaid, DDS, PhD, Associate Professor and Coordinator, Department of Pediatric Dentistry and Orthodontics, College of Dentistry, Taibah University, KSA (e-mail: gunaid2000@hotmail.com).

Eur J Dent 2019;13:213–221

## Abstract

**Objectives** The aim of this study was to investigate the mandibular ramus features that could contribute to the etiology of mandibular third molar impaction.

**Materials and Methods** Two hundred and forty subjects were divided into two groups: impacted group: 115 subjects presented with an impacted mandibular third molar, and control group: 125 subjects with the normal mandibular third molar eruption. Digital panoramic radiographs were used, and four angular and twelve linear measurements were done. Comparisons between groups were done using Student's t-test. Pearson correlation and linear regression tests were used to assess the degree of relationship between retromolar space and mandibular measurements.

**Results** Control group showed significant greater measurements in most of the variables, whereas the impacted group showed significant larger gonial angle and larger inclination of lower posterior teeth than the control group. Significant correlations were found between retromolar space and coronoid height, ramal heights, ramus notch depths, the inclination of lower posterior teeth, and retromolar space/3M width ratio in both groups.

**Conclusion** The present study found that the configuration of the mandibular ramus appears to be discrete in many aspects in the erupted other than impacted lower third molars subjects, which might be a possible cause for the impaction.

## Keywords

- ramal dimensions
- lower third molar
- impaction

## Introduction

Third molars are the most frequently impacted tooth in the dental arch.<sup>1</sup> The influence of the third molars on the anterior teeth crowding and its stability after orthodontic treatment is controversial. However, no evidence to support or deny the fact that these teeth are the only or even the primary etiological factor in the post-treatment incisor crowding.<sup>2</sup>

The etiology of third molar impaction is unclear. However, it has been reported that it might be linked with the short distance from the distal surface of the second molar to the ramus,<sup>3-6</sup> the mandibular growth amount and direction,<sup>3,7-9</sup> the width and remodeling of the ramus, degree of the third molar maturation, and might be due to the inclination of posterior teeth and discrepancy between the dentition and the jaws.<sup>3</sup>

DOI <https://doi.org/10.1055/s-0039-1693922>  
ISSN 1305-7456.

© 2019 Dental Investigation Society

License terms



## Mandibular third molar space in different antero-posterior skeletal patterns

E. S. J. Abu Alhaija, H. M. AlBhairan and S. N. AlKhateeb

Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan

Correspondence to: Professor E. S. J. Abu Alhaija, Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, PO Box 3030, Irbid, Jordan. E-mail: elham@just.edu.jo

**SUMMARY** Retromolar space has long been identified as a major factor in the aetiology of mandibular third molar impaction. The aims of this study were to compare mandibular third molar space between the different antero-posterior (A-P) skeletal patterns, between erupted and impacted third molars in the different A-P skeletal patterns, and to report on the status of third molar eruption/impaction among the studied subjects.

A total of 432 mandibular third molars in 270 subjects (132 females and 138 males) were investigated from dental pantomograms (DPTs) and lateral cephalograms (LC). The average age for the total sample was  $20.80 \pm 2.03$  years. The subjects were divided into three groups according to their ANB angle as follows: skeletal Class I (144 third molars in 90 subjects), skeletal Class II (145 third molars in 95 subjects), and skeletal Class III (143 third molars in 85 subjects). Each group was subdivided into impacted and erupted subgroups. DPT and LC were traced and the following variables were measured: retromolar space width, third molar width and angulation,  $\beta$  angle, second molar angulation, mandibular length, and gonial angle. Independent *t*-test, analysis of variance, and chi-square test were used for statistical analysis.

Retromolar space width in the Class III subjects was smaller than in the Class I subjects ( $P < 0.05$ ). Mandibular third molars were recorded as impacted in 26, 32, and 42 per cent of the Class I, II, and III subjects, respectively ( $P < 0.001$ ). The impacted groups had a reduced retromolar space width, increased  $\beta$  angle, and reduced third molar angulation in all A-P skeletal patterns. Class III subjects showed increased mandibular third molar impaction with reduced retromolar space width.

### Introduction

The rate of third molar impaction is higher than for other teeth in modern populations (Bishara and Andreasen, 1983; Grover and Lorton, 1985). The mandibular third molar is by far the most frequently impacted tooth after the maxillary third molar (Bishara and Andreasen, 1983; Grover and Lorton, 1985; Alling and Alling, 1993). They account for 98 per cent of all impacted teeth (Bishara, 1999).

It has been reported that approximately 73 per cent of young adults may have at least one impacted mandibular third molar (Hugoson and Kugelberg, 1988). The prevalence of mandibular third molar impaction varies in different populations, ranging from 18 to 32 per cent (Andreasen, 1997). Most studies have reported no gender predilection in Caucasian (Brown *et al.*, 1982), Negro (Kramer and Williams, 1970; Brown *et al.*, 1982), Arab (Haidar and Shalhoub, 1986; Hattab *et al.*, 1995), or Chinese (Montelius, 1932) populations. However, other studies reported a higher frequency in female Caucasians (Murtomaa *et al.*, 1985; Hugoson and Kugelberg, 1988).

The time of eruption of third molars varies significantly between populations, ranging from 14 years in Nigerians (Odusanya and Abayomi, 1991) to 24 years in Greeks

(Haralabakis, 1957), with males 3–6 months ahead of females.

Shortage of space between the second molar and the ramus has long been identified as a major factor in the aetiology of mandibular third molar impaction (Björk, 1963; Olive and Basford, 1981; Alling and Alling, 1993; Hattab and Abu Alhaija, 1999; Behbehani *et al.*, 2006; Uthman, 2007). Björk *et al.* (1956) noted that in subjects with mandibular third molar impaction, the alveolar arch space behind the second molar was reduced in 90 per cent of the cases. It has been reported that the space necessary for the third molar is diminished by several factors, including backward direction of eruption of the dentition (Björk *et al.*, 1956; Richardson, 1977; Capelli, 1991) and vertical direction of condylar growth, which has been associated with less resorption at the anterior aspect of the ramus (Björk, 1963). Another suggested factor that influences third molar impaction is mandibular length (Björk *et al.*, 1956; Richardson, 1977; Capelli, 1991). It has been suggested that a short mandibular length predisposes to mandibular third molar impaction (Björk *et al.*, 1956; Richardson, 1977; Ricketts, 1979). However, Kaplan (1975) and Dierkes (1975) did not find significant differences in



Dana Shoshani-Dror

## Controversy regarding the need for prophylactic removal of impacted third molars: An overview

Dana Shoshani-Dror, DMD, MSc<sup>1</sup>/Dekel Shilo, DMD, PhD<sup>1</sup>/Jiriyis George Ginini, DMD, MSc<sup>2</sup>/Omri Emodi, DMD<sup>3</sup>/Adi Rachmiel, DMD, PhD<sup>4</sup>

**Objective:** Removal of third molars (3Ms) is one of the most common surgical procedures performed by dental surgeons. 3Ms that are associated with pathologic changes such as infection, nonrestorable caries lesions, cysts, tumors, and destruction of adjacent teeth and bone are under consensus for their removal. However, debate exists regarding the prophylactic removal of asymptomatic impacted 3Ms. This review attempts to establish indications for prophylactic extraction of 3Ms. **Method and Materials:** Clinical experience and a summary of the literature are presented concerning the effects of retained 3Ms in relation to caries and periodontal disease, dental arch changes and anterior crowding, cysts and other etiologies, mandibular fractures, temporomandibular pain, and

aging of bone. **Results:** Nearly half of impacted 3Ms are associated with some form of pathology, most frequently caries (20%) and periodontal disease (17%). They increase the probability of fractures and their presence results in difficult fracture reduction and a higher rate of complication. The number of 3Ms decreases rapidly with age, with only 31% remaining at 38 years of age. **Conclusion:** Preventive removal of 3Ms at a young age is justified because retained 3Ms are at high risk of developing various pathologies. In addition, at older ages extraction of 3Ms becomes more complex, with an increased rate of complication due to deteriorated systemic physiologic conditions and changes in bone physiology. (*Quintessence Int* 2018;49:653–662; doi: 10.3290/jqi.a40784)

**Key words:** asymptomatic, extraction, impacted, preventive, third molars

The definition of an impacted tooth is a tooth that is completely or partially unerupted and is positioned against another tooth, bone, or soft tissue in a form which makes further eruption unlikely.<sup>1</sup> Third molar (3M) teeth can be observed on radiographs as early as at the age of 5 and as late as at the age of 16, usually erupting in the oral cavity

between the ages of 18 and 24.<sup>2</sup> 3Ms present the highest rate of impaction, with a female predominance of mandibular 3M impaction.<sup>3,4</sup> Only 50% of 3Ms erupt into the oral cavity.<sup>5</sup> Population studies in Sweden indicate that 80% of adolescent and young adults have four 3Ms and only 5% have no 3Ms. Maxillary 3Ms are most commonly

<sup>1</sup>Resident, Department of Oral and Maxillofacial Surgery, Rambam Health Care Campus, Haifa, Israel, and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel.

<sup>2</sup>Resident, Department of Oral and Maxillofacial Surgery, Rambam Health Care Campus, Haifa, Israel.

<sup>3</sup>Vice Head, Department of Oral and Maxillofacial Surgery, Rambam Health Care Campus, Haifa, Israel, and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel.

<sup>4</sup>Head, Department of Oral and Maxillofacial Surgery, Rambam Health Care Campus, Haifa, Israel, and Bruce Rappaport Faculty of Medicine, Technion-Israel Institute of Technology, Haifa, Israel.

**Correspondence:** Dr Dana Shoshani-Dror, Rambam Health Care Campus, 8 Ha'Aliyah Street, Haifa 35254, Israel. Email: Dana.droeg@mail.huji.ac.il

## Prevalence of periodontitis and caries on the distal aspect of mandibular second molar adjacent to impacted mandibular third molar: A guide for oral health promotion

Prashant Gupta<sup>1</sup>, Shantala R. Naik<sup>1</sup>, L. Ashok<sup>2</sup>, Tanya Khaitan<sup>1</sup>,  
Anjani Kumar Shukla<sup>1</sup>

<sup>1</sup>Department of Oral Medicine and Radiology, Dental Institute – Rajendra Institute of Medical Sciences, Ranchi, <sup>2</sup>Department of Oral Medicine and Radiology, Bapuji Dental College And Hospital, Davangere, Karnataka, India

### ABSTRACT

**Objectives:** Pericoronitis of mandibular third molars is commonly encountered in our day to day practice. Most of the case extraction becomes mandatory. This study was carried out to find the incidence of periodontitis on the distal aspect of the second molar adjacent to impacted third molar. **Materials and Methods:** A total of 400 patients were included in the study. Patient selection was randomly done. Whoever came with a chief complaint of pain in the third molar area were included in the study. They were evaluated both clinically and radiographically with an orthopantomogram. Patients' age, gender, type of impaction, presence or absence of bone loss, type of bone loss, and presence or absence of caries was evaluated radiographically and noted. **Results:** Periodontitis was observed in 39% of the cases and caries in 26% of the cases. **Conclusions:** These percentages are alarming and could be used to prophylactically extract the impacted third molars and thereby promoting the oral health of the individual.

**Keywords:** Bone loss, caries, impaction, molar

### Introduction

Tooth impaction refers to a pathological situation where a tooth does not attain the normal functional position. Impaction occurs due to reduced space for the erupting tooth. Reduced arch size, early exfoliation of deciduous teeth are some of the reasons for impaction.<sup>1</sup> Impacted teeth are associated with various pathologies like caries, pericoronitis, cysts, tumors, and root resorption of adjacent teeth. When it comes to the definition

of an impacted tooth, an impacted tooth is the one which is completely or partially unerupted and is positioned against another tooth, bone or soft tissue, so that its further eruption is unlikely, described according to its anatomic position.<sup>2</sup>

Impacted mandibular third molars are commonly encountered from day to day practice. Patients with impacted mandibular third molars frequently visit only when it is symptomatic. In those, few patients would have tolerated the pain and swelling for once or twice for 1 to 2 years and then visited a dentist. Third molars erupt between the age of 17 and 21 years. Factors that affect the time of third molar impaction are the nature of the diet that may lead to attrition, reduced mesiodistal width of the crown diameter, degree of use of the masticatory apparatus and genetic inheritance.<sup>3</sup>

**Address for correspondence:** Dr. Shantala R Naik,  
Department of Oral Medicine and Radiology, Dental  
Institute – Rajendra Institute of Medical Sciences, Ranchi, India.  
E-mail: shantala\_naik@rediffmail.com

Received: 08-01-2020

Revised: 12-03-2020

Accepted: 30-03-2020

Published: 31-05-2020

#### Access this article online

##### Quick Response Code:



Website:  
www.jfmpc.com

DOI:  
10.4103/jfmpc.jfmpc\_37\_20

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to mix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKJHLP@medknow, reprints@wolterskluwer.com

**How to cite this article:** Gupta P, Naik SR, Ashok L, Khaitan T, Shukla AK. Prevalence of periodontitis and caries on the distal aspect of mandibular second molar adjacent to impacted mandibular third molar: A guide for oral health promotion. *J Family Med Prim Care* 2020;9:2370-4.



## Health Technology Assessment

Volume 24 • Issue 30 • June 2020

ISSN 1366-5278

# Prophylactic removal of impacted mandibular third molars: a systematic review and economic evaluation

*Juliet Hounsome, Gerlinde Pilkington, James Mahon, Angela Boland, Sophie Beale,  
Eleanor Kotas, Tara Renton and Rumona Dickson*

DOI 10.3310/hta24300





## Comparison of the quality of life of patients with mandibular third molars and mild pericoronitis treated by extraction or by a periodontal approach

M.E. Yurttutan<sup>a,\*</sup>, Ö. Karaahmetoğlu<sup>b</sup>, C. Üçok<sup>a</sup>, N. Bağış<sup>c</sup>

<sup>a</sup> Ankara University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Ankara, Turkey

<sup>b</sup> Private Practice, Ankara, Turkey

<sup>c</sup> Ankara University, Faculty of Dentistry, Department of Periodontology, Ankara, Turkey

Available online 19 December 2019

### Abstract

We have evaluated and compared the outcomes after conservatively treated and surgically managed third molars in patients with mild pericoronitis at the first, third, and sixth postoperative months, and we rated patients' quality of life (QoL) using the Oral Health Impact Profile-14 (OHIP-14) index. Of the 128 patients who were originally assessed as eligible we studied 100 patients who fulfilled the protocol, being diagnosed with mild pericoronitis that affected the third molar teeth and who were followed up for six months. Fifty were treated by the periodontal approach and 50 by extraction of third molars. Their oral health-related QoL was assessed using the OHIP-14 index on a personal assessment question form and then repeated at the first, third, and sixth months. The data were analysed using the Mann Whitney, Friedman's, and Wilcoxon's test, as appropriate. There was a significant difference between the total OHIP-14 scores at different time points ( $p < 0.0001$ ). In both groups the three postoperative total OHIP-14 scores were significantly lower than the baseline score, and we noted a further decrease in OHIP-14 scores in the surgical treatment group. Periodontal treatment of mandibular third molar teeth may effectively reduce (but does not eliminate) symptoms, whereas tooth extraction seems to be more effective at the long term.

© 2019 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

**Keywords:** Impacted third molar; pericoronitis; quality of life

### Introduction

Pericoronitis is an acute or chronic periodontal inflammatory disorder that usually affects the lower third molars and is characterised by infection of the mucosa covering a semi-erupted or fully erupted tooth, and is the most common complication of third molars.<sup>1</sup> Extraction of impacted third molars is common within both general dental practice and most hospital oral and maxillofacial surgery departments.<sup>2</sup> The procedure is associated with various postoperative complications such as pain, swelling, discomfort, trismus, and sensory distur-

bances, and fear of an operation can have an adverse effect on people's quality of life (QoL).<sup>3</sup>

From a patient's perspective, QoL denotes a disease-free life, and oral health-related QoL is a perception of how one's quality of life is affected by one's own oral health.<sup>4</sup> Several indices have been used to rate it, among which the most practical and comprehensive one is the Oral Health Impact Profile (OHIP)-49 and its short version OHIP-14.<sup>5,6</sup> It asks questions about the adverse impacts of oral conditions on aspects of wellbeing, including pain, psychosocial state, social interactions, and daily activities.<sup>7</sup>

To date, multiple studies have evaluated QoL after operation,<sup>4,8–11</sup> and have clearly shown that pericoronitis has an adverse effect on it that can be improved by extracting the affected teeth. However, to our knowledge, no study has yet

\* Corresponding author. Tel.: +90 312 296 55 63; Fax: +90 312 212 39 54.  
E-mail addresses: [yurttutan@ankara.edu.tr](mailto:yurttutan@ankara.edu.tr), [yurttutan@yahoo.com](mailto:yurttutan@yahoo.com) (M.E. Yurttutan).

<https://doi.org/10.1016/j.bjoms.2019.10.320>

0266-4356/© 2019 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

## Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth (Review)

Ghaemina H, Nienhuijs MEL, Toedtling V, Perry J, Tummers M, Hoppenreijts TJM, Van der Sanden WJM, Mettes TG

Ghaemina H, Nienhuijs MEL, Toedtling V, Perry J, Tummers M, Hoppenreijts TJM, Van der Sanden WJM, Mettes TG.  
Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth.  
*Cochrane Database of Systematic Reviews* 2020, Issue 5. Art. No.: CD003879.  
DOI: [10.1002/14651858.CD003879.pub5](https://doi.org/10.1002/14651858.CD003879.pub5).

[www.cochranelibrary.com](http://www.cochranelibrary.com)

---

Surgical removal versus retention for the management of asymptomatic disease-free impacted wisdom teeth  
(Review)

Copyright © 2020 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

WILEY

## Surgical techniques for the removal of mandibular wisdom teeth (Review)

Bailey E, Kashbour W, Shah N, Worthington HV, Renton TF, Coulthard P

Bailey E, Kashbour W, Shah N, Worthington HV, Renton TF, Coulthard P.  
Surgical techniques for the removal of mandibular wisdom teeth.  
*Cochrane Database of Systematic Reviews* 2020, Issue 7. Art. No.: CD004345.  
DOI: [10.1002/14651858.CD004345.pub3](https://doi.org/10.1002/14651858.CD004345.pub3).

[www.cochranelibrary.com](http://www.cochranelibrary.com)

---

**Surgical techniques for the removal of mandibular wisdom teeth (Review)**  
Copyright © 2020 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

**WILEY**

## How Many Patients Have Third Molars and How Many Have One or More Asymptomatic, Disease-Free Third Molars?

Thomas B. Dodson, DMD, MPH

The purpose of this report was to summarize the frequencies of third molars (M3s) in general and asymptomatic, disease-free M3s specifically. Estimates of M3 prevalence range so widely (ie, 6.0% to 96%) as to be of little use. The estimates vary depending on definitions, age, clinical versus radiographic assessment, and patient versus population samples. For patient management, it may be more valuable to estimate the prevalence of M3s grouped by clinical rather than anatomic status. Many times, however, M3s are categorized simply as asymptomatic. In many pathologic processes, from cancer to cardiovascular disease, the term *asymptomatic* does not equal an absence of disease. As such, M3s should be categorized based on symptom and disease status. Subjects with all M3s asymptomatic and absent of disease ranged from 12% in a sample of patients referred for M3 evaluation to 29% in a nonpatient volunteer sample. In the patient sample, 37% of the M3s evaluated were asymptomatic and free of disease.

© 2012 American Association of Oral and Maxillofacial Surgeons  
*J Oral Maxillofac Surg* 70:4-7, 2012, Suppl 1

When making recommendations regarding a clinical problem such as third molar (M3) management, it is valuable to understand the magnitude of the problem. A goal of these Proceedings was to estimate M3 prevalence. A goal of the conference was to better understand the management of asymptomatic (Sx-), disease-free (D-) M3s. The second purpose was to estimate the prevalence of Sx-/D- M3s. To address this second purpose, the author has provided a work-

ing definition of Sx-/D- M3s and outlined a classification system for M3s based on symptom and disease status.

### Prevalence of M3s

The first goal of this report was to provide an estimate of the prevalence of M3s. At first blush, this goal appeared deceptively simple. After reviewing more than 20 articles, estimates of M3 prevalence ranged almost from 6.0% to 96%.<sup>1,2</sup> Such a broad range of M3 prevalence estimates is useless information.

Given that the estimates of M3 prevalence range by more than 1 order of magnitude, the author's first response was, why are estimates of the prevalence of M3s so broad? Not surprisingly, the variety of M3s estimates is due to differences in samples, methods of assessment, and definitions. When assessing data regarding M3 frequency, readers should consider these variables and how they may affect the estimates of M3 frequency.

While keeping in mind the issues of samples, diagnostic tools, and definitions, the author has summarized a few articles that provide the reader with a flavor of the challenges in reviewing the literature and

Professor, Department of Oral and Maxillofacial Surgery, Harvard School of Dental Medicine, Boston, MA; Director, Center for Applied Clinical Investigation, and Attending Oral and Maxillofacial Surgeon, Massachusetts General Hospital, Boston, MA.

This work was supported in part by the Center for Applied Clinical Investigation, Department of Oral and Maxillofacial Surgery, Massachusetts General Hospital and the Massachusetts General Physicians' Organization.

Conflict of Interest Disclosures: None of the authors reported any disclosures.

Address correspondence and reprint requests to: Dr Dodson, Department of Oral and Maxillofacial Surgery, Massachusetts General Hospital, 55 Fruit Street, Warren Building, Suite 1201, Boston, MA 02114; e-mail: [tb.dodson@partners.org](mailto:tb.dodson@partners.org)  
© 2012 American Association of Oral and Maxillofacial Surgeons  
02782391/12/7009-036-00/0  
<http://dx.doi.org/10.1016/j.joms.2012.04.038>

## ORAL AND MAXILLOFACIAL SURGERY

# The indications for third-molar extractions

Martin B. Steed, DDS

**Editor's note:** This new feature, which will appear occasionally, will focus on content pertinent to the specialty areas of dentistry.

**D**efining the indications for third-molar extraction continues to be a topic of controversy among dentists, other health care professionals, the public and third parties such as insurance companies and government agencies. In a systematic review, Mettes and colleagues<sup>1</sup> found no evidence to support or refute removal of third molars to prevent health-related complications.

The dentist's management of third molars commonly hinges on identifying the presence of symptoms or disease that clearly is attributable to the third molar. Dodson<sup>2</sup> developed a useful guide (Table<sup>3</sup>) that serves as a systematic and unambiguous way to classify third molars. According to Dodson,<sup>2</sup> patients' symptoms are designated as present and attributable to the third molar (Sx+) or as absent (Sx-). In addition, clinical or radiographic evidence of disease is evaluated and designated as present (D+) or absent (D-).

Disease status is of importance to Dodson's classification system and its clinical relevance. Investigators in numerous studies have discussed the epidemiology and management of so-called asymptomatic third molars. The term "asymptomatic" is an insufficient description of the clinical status of the third molar.<sup>4</sup> Just as in many other disease courses, such as diabetes and cardiovascular disease, the absence of symptoms in a third molar does not always reflect true absence of disease. This is illustrated in group C.

At the initial visit, the clinician can ascertain the presence or absence of symptoms by obtaining a thorough medical history from the patient. Many patients report that they are not experiencing any symptoms. Other pa-

## ABSTRACT

**Background.** Defining the indications for third-molar extraction continues to be a topic of controversy.

**Methods.** The dentist's management of third molars commonly hinges on identifying the presence of symptoms or disease that clearly is attributable to the third molar. Use of a guide that serves as a systematic and unambiguous way to classify third molars has been advocated.

**Results.** Patients' symptoms are designated as present and attributable to the third molar (Sx+) or as absent (Sx-). In addition, clinical or radiographic evidence of disease is evaluated and designated as present (D+) or absent (D-).

**Conclusions.** Evidence-based clinical data developed from prospective investigations have shown that an asymptomatic third molar does not necessarily reflect the absence of disease.

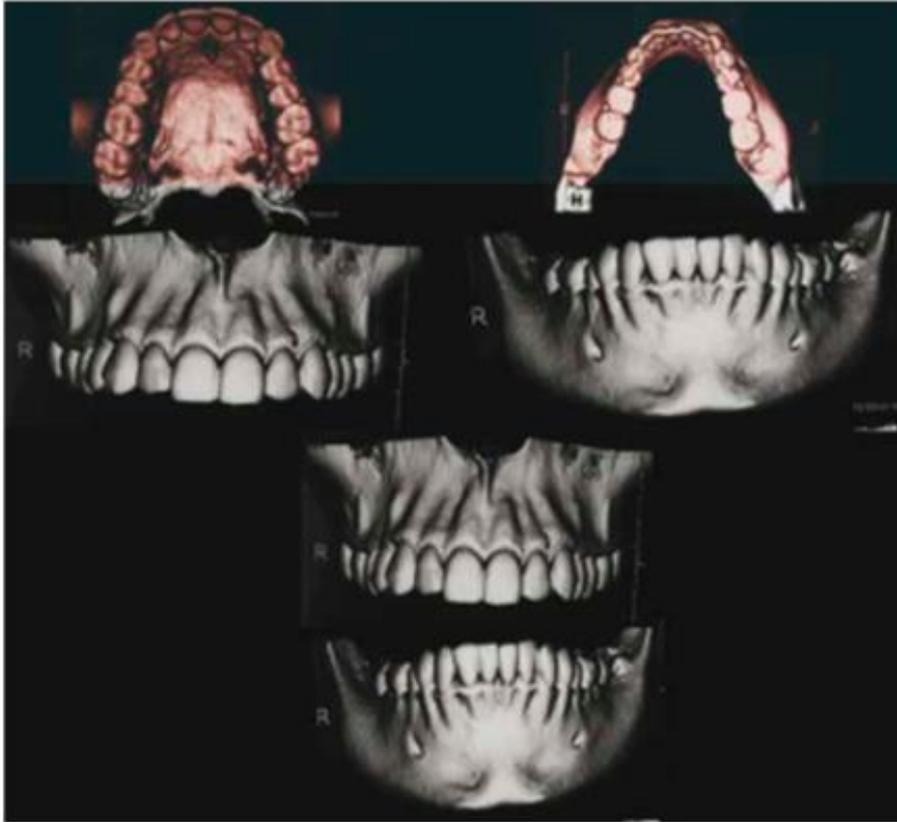
**Practical Implications.** Current data are not sufficient to refute or support prophylactic extraction versus active surveillance for the routine management of third molars that are asymptomatic and free of disease (group D). Although decisions regarding third-molar management usually are straightforward, the evidence supporting extraction versus retention of asymptomatic disease-free (group D) third molars is lacking. Active surveillance, a prescribed program of follow-up and reassessment at regular intervals are recommended for retained third molars rather than waiting for the onset of symptoms.

**Key Words.** Tooth extraction; third molars; literature review; practice guidelines; oral surgical procedures; oral and maxillofacial surgery; evidence-based dentistry.

JADA 2014;145(6):570-573.

doi:10.14219/jada.2014.18

**Dr. Steed** is an associate professor and chief, Department of Oral and Maxillofacial Surgery, College of Dental Medicine, Medical University of South Carolina, 173 Ashley Ave., BSB Room 449 MSC 507, Charleston, S.C. 29425, e-mail [steedma@musc.edu](mailto:steedma@musc.edu). Address correspondence to Dr. Steed.



# **DIAGNÓSTICO E INDICACIONES PARA LA EXTRACCIÓN DE LOS TERCEROS MOLARES**

## **EXTRACCIÓN DE LOS TERCEROS MOLARES**

Sociedad Española de Cirugía Bucal, 2018

## Indicaciones actuales de la extracción del tercer molar

Rodríguez Zafra JM\*, Casero Nieto JA\*\*

### RESUMEN

El objetivo de este artículo es proponer una guía para la derivación de la cirugía de los terceros molares a los servicios especializados. Se ha realizado una revisión bibliográfica basada en las indicaciones de extracción de sociedades científicas y organismos gubernamentales. Se presentan dos guías basadas en la evidencia científica y grados de recomendación para el tratamiento del tercer molar no erupcionado o impactado.

**PALABRAS CLAVE:** cirugía oral, atención primaria de la salud, terceros molares, evidencia científica.

### ABSTRACT

The aim of this paper is to propose guidelines for the derivation of the third molar surgery to specialized services. It has conducted a literature review based on the extraction indication from scientific societies and government agencies. There are two guidelines based on scientific evidence and grades of recommendation for the treatment of third molar unerupted or impacted.

**KEYWORDS:** oral surgery, primary health care, third molar, scientific evidence.

### INTRODUCCIÓN

La extracción quirúrgica de terceros molares es el proceso de cirugía oral más frecuentemente derivado por las unidades de salud bucodental de Atención Primaria. En el Real Decreto 1030/2006, de 15 de septiembre, por el que se establece la cartera de servicios comunes del Sistema Nacional de Salud y el procedimiento para su actualización en atención a la salud bucodental, se establece: tratamiento de procesos agudos odontológicos, entendiendo por tales los procesos infecciosos y/o inflamatorios que afectan al área bucodental, traumatismos oseodentarios, heridas y lesiones en la mucosa oral, así como la patología aguda de la articulación temporomandibular. Incluye consejo bucodental, tratamiento farmacológico de la patología bucal que lo requiera, exodoncias, exodoncias quirúrgicas, cirugía menor de la cavidad oral, revisión oral para la detección precoz de lesiones premalignas y, en su caso, biopsia de lesiones mucosas.

De forma tradicional, se han derivado a los Servicios de Cirugía Maxilofacial las patologías concernientes a los terceros molares para su resolución, sin tener en cuenta la indicación de la extracción quirúrgica de estos. Esto conlleva la saturación de los servicios hospitalarios y un

alto coste económico y social. También hay que tener siempre presente los riesgos quirúrgicos asociados a la extracción quirúrgica del tercer molar.

### RESULTADOS

Los criterios, indicación y justificación de la extracción quirúrgica de los terceros molares varía enormemente según los protocolos y autores consultados.

El diagnóstico de la extracción quirúrgica del tercer molar asociado a patologías es, a menudo, sencilla. Cuando estos molares están asintomáticos, la decisión se torna más conflictiva.

Se han dado numerosas razones para la extracción profiláctica sistemática de los terceros molares aunque ninguna de ellas está basada en la evidencia científica.

La exodoncia preventiva o profiláctica, además de ser el motivo más frecuente de remisión a los servicios de cirugía oral<sup>1</sup>, quizá sea la indicación más controvertida en la actualidad. Se han dado numerosas razones para la extracción profiláctica sistemática de los terceros molares, aunque casi ninguna de ellas está basada en la evidencia científica.

La Sociedad Americana de Cirugía Oral y Maxilofacial recomienda la extracción de los cuatro terceros molares, preferiblemente durante la adolescencia, para minimizar las complicaciones postextracción como dolor e infección<sup>1</sup>. Friedman<sup>1</sup>, estima que de los 10 millones de terceros molares extraídos anualmente en Estados Unidos, el 70-80 % son extracciones profilácticas. De estos molares, solo el 12 % de los que quedaran impactados durante su desarrollo, estarían asociados a condiciones patológicas<sup>2,3</sup> y el 50 % de los terceros molares superiores evolucionaría de forma normal.

\*Doctor en Odontología. Máster en "Odontología Hospitalaria y Pacientes Especiales". Diplomado en "Odontología Médico-Quirúrgica Hospitalaria".

\*\*Doctor en Medicina y Cirugía. Máster en "Odontología Hospitalaria y Pacientes Especiales". Diplomado en "Odontología Médico-Quirúrgica Hospitalaria".

**Correspondencia:** Juan Miguel Rodríguez Zafra. General Aguilera 15-2B. 13001 Ciudad Real.

**Correo electrónico:** rodriguezazfra@naturdental.com

## IS IT WISDOM TO REMOVE A WISDOM TOOTH? - Extraction versus nonextraction Management of Impacted Tooth

Bansal Shailu<sup>1</sup>, Singla Rajesh<sup>2</sup>

Senior Lecturer \*  
Professor and Head\*  
Department of Oral &  
Maxillofacial Surgery  
Sundera Dental College  
and research institute

### Abstract

Prophylactic removal of impacted third molar is the most commonly practiced dental procedure. The indications for removal of asymptomatic impacted third molar have been challenged in recent years. Decisions regarding this question not only should consider the presence of ongoing symptoms or pathology but also anticipate future complications & morbidity associated with retention of the third molars and possible increased risk of extraction at an older age. In this paper we present the currently available evidence against & in support of the prophylactic removal of impacted third molars.

### Key words

Wisdom tooth, prophylactic removal, third molar

### INTRODUCTION

Prophylactic removal of impacted third molar is most commonly dispensed procedure in our day to day practice. According to the American Association of Oral and Maxillofacial Surgeons, "if there is insufficient anatomical space to accommodate normal eruption, removal of such teeth at an early age is a valid and scientifically sound treatment rationale based on medical necessity."<sup>1</sup> As a result, 10 million teeth classified as impactions (teeth that fail to erupt into normal position but remain fully or partially embedded and covered by jawbone or gum tissue) are removed every year from mostly healthy young people.<sup>2</sup>

There are wide variations in rates of third molar surgery.<sup>3,4</sup> There is also some evidence that deprived populations with poor dental health are less likely to have third molars removed than more affluent populations with good dental health.<sup>3,5</sup> However, the reasons for this are complex. Recently indications for the removal of asymptomatic impacted third molar have been challenged. This controversy has initiated the search for evidence based data to justify this practice.

Several reasons are given for the early removal of asymptomatic or pathology-free impacted third molars, almost all of which are not based on reliable evidence: they have no useful role in the mouth; they may increase the risk of pathological changes and symptoms; and if they are removed only when pathological changes occur, patients may be older and the risk of serious complications after surgery may be greater.

On the other hand, the probability of impacted third molars causing pathological changes in the future

may have been exaggerated.<sup>6,7</sup> Many impacted or unerupted third molars may eventually erupt normally and many impacted third molars never cause clinically important problems.<sup>8</sup> In addition, third molar surgery is not risk free; the complications and suffering following third molar surgery may be considerable.<sup>9</sup> Therefore, prophylactic removal should only be carried out if there is good evidence of patient benefit. Third-molar surgery is a multibillion-dollar industry that generates significant income for the dental profession, particularly oral and maxillofacial surgeons. It is driven by misinformation and myths that have been exposed before but that continue to be promulgated by the profession.

### MYTH NUMBER 1—THIRD MOLARS HAVE A HIGH INCIDENCE OF PATHOLOGY

Not more than 12% of impacted teeth have associated pathology. This incidence is the same as for appendicitis (10%) and cholecystitis (12%), yet prophylactic appendectomies and cholecystectomies are not the standard of care.<sup>10</sup> Why then prophylactic third-molar extractions?

Pericoronitis (inflammation of the gingival surrounding the crown of a tooth) is the most common indication for third molar surgery,<sup>11</sup> and mainly occurs in adolescents and young adults but less commonly in older people.<sup>12</sup> A study reported that over 4 years of follow up, 10% of lower third molars develop pericoronitis.<sup>13</sup>

Very few impacted third molars cause dental caries (decay) of second molars, 12 though estimates vary (1% to 4.5%).<sup>9</sup> Fear of second molar caries is not a justification for prophylactic removal.

### Address For Correspondence:

Bansal Shailu, MDS  
Senior Lecturer Department of Oral  
& Maxillofacial Surgery Sundera  
Dental College and Research Institute  
H. H. Gardens, Power House  
Road, Sriganganagar-335001 Rajasthan, India  
PH: +919414343004, +919812167543  
Fax: +911542440102 Email: dshailu23@yahoo.com

Article

# Quality of Life of Patients with Mandibular Third Molars and Mild Pericoronitis. A Comparison between Two Different Treatments: Extraction or Periodontal Approach

P. C. Passarelli <sup>1,\*</sup>, M. A. Lopez <sup>2</sup>, V. Desantis <sup>1</sup>, G. B. Piccirillo <sup>1</sup> , E. Rella <sup>1</sup> , V. Giovannini <sup>1</sup>, A. Speranza <sup>1</sup>, M. De Leonardis <sup>1</sup>, P. F. Manicone <sup>1</sup>, M. Casale <sup>2</sup> and A. D'Addona <sup>1</sup>

<sup>1</sup> Department of Head and Neck, Division of Oral Surgery and Implantology, Institute of Clinical Dentistry, Catholic University of the Sacred Heart, Gemelli University Polyclinic Foundation, 00168 Rome, Italy; desantisviviana@gmail.com (V.D.); giovannpiccirillo@gmail.com (G.B.P.); rellaedoardo@gmail.com (E.R.); valerio.giovannini01@gmail.com (V.G.); alesperanza121@gmail.com (A.S.); marta\_de\_leo@hotmail.it (M.D.L.); paolofrancesco.manicone@policlinicogemelli.it (P.F.M.); antonio.daddona@policlinicogemelli.it (A.D.)

<sup>2</sup> Unit of Otolaryngology, University Campus Bio-Medico, 00128 Rome, Italy; micheleantonio.lopez@gmail.com (M.A.L.); m.casale@unicampus.it (M.C.)

\* Correspondence: piercarmine.passarelli@unicatt.it; Tel: +39-63-015-5278; Fax: +39-63-015-4751

Received: 10 March 2020; Accepted: 27 April 2020; Published: 29 April 2020



**Abstract:** **Background:** The extraction of the mandibular third molar is one of the most frequent intervention in oral surgery. A common indication for wisdom tooth extraction is represented by pericoronitis, which can determine discomfort and pain in patients. The present study aimed to evaluate the impact of patients' quality of life by comparing a surgical approach with a periodontal approach. **Methods:** We evaluated 82 patients diagnosed with pericoronitis that occurred at the third molar site. In total, 41 of them received a periodontal treatment and 41 were treated by extraction. The quality of life (QoL) of the patients was assessed by using the Oral Health Impact Profile-14 (OHIP-14) index. **Results:** A total of 82 patients were included in the study and were followed up for 6 months. Of the patients, 41 received a periodontal treatment and 41 underwent surgical extraction. At the baseline, the OHIP-14 scores of the surgical group were higher (19.71, SD 9.90) than the periodontal group (14.41, SD 8.71). At 1 week, there was a reduction in terms of OHIP-14 in both groups, but the periodontal group showed lower values (12.3, SD 8.11). Long-term follow-up showed a reduction of the OHIP-14 values, with a difference in favor of the surgical group (0.10, SD 0.45). However, there was a reduction in OHIP-14 scores in both groups. **Conclusion:** Although the periodontal treatment offered a rapid improvement in terms of quality of life during the first week after the treatment, after 1 month and 6 months, the extraction of the mandibular third molar extraction remained the best treatment, removing the occurrence of re-inflammation of the site.

**Keywords:** quality of life; mandibular third molar; tooth extraction; oral surgery

## 1. Introduction

Pericoronitis is defined as an acute or chronic periodontal inflammation of the soft tissue around the crown of an impacted or semi-impacted tooth [1]; it usually affects the lower third molars.

The main symptoms can include dysphagia, trismus, and purulence, but also swelling, pain, and fever [2].

The extraction of the mandibular third molar is one of the most frequent interventions in oral surgery [3], and the occurrence of pericoronitis is considered the most frequent indication for the



ORIGINAL ARTICLE

## Association between the eruption of the third molar and caries and periodontitis distal to the second molars in elderly patients



Yu-Hsiang Chou <sup>a</sup>, Pei-Shan Ho <sup>b</sup>, Kun-Yen Ho <sup>c</sup>, Wen-Chen Wang <sup>c</sup>, Kai-Fang Hu <sup>d,\*</sup>

<sup>a</sup> Division of Periodontics, Department of Dentistry, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan

<sup>b</sup> Faculty of Dental Hygiene, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

<sup>c</sup> School of Dentistry, College of Dental Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan

<sup>d</sup> Department of Dentistry, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung, Taiwan

Received 29 August 2016; accepted 15 February 2017  
Available online 27 March 2017

### KEYWORDS

Elderly patients;  
Periodontitis;  
Second molar caries;  
Third molar

**Abstract** The objective of this study was to verify whether caries and periodontal diseases, when present on the distal surface of the second molars (M2s), are associated with the eruption of the third molars (M3s). In this split-mouth study, we evaluated 70 elderly patients with unilateral maxillary or mandibular M3s who presented to the outpatient clinics of two hospitals. Patients underwent comprehensive oral examinations and radiographical measurements, and we assessed the outcomes of periodontal disease and caries. Periodontal measurements included plaque index, bleeding on probing, and periodontal probing pocket depth (PD). Moreover, caries were assessed through visual–tactile examination and radiography. We performed the  $\chi^2$  test to determine factors associated with M3 and non-M3 outcomes. Eighty-one unilateral erupted M3s were observed in the study patients. Both the distobuccal region ( $p < 0.0001$ ) and the distolingual region ( $p = 0.006$ ) had a higher PD on the nonextraction side than the extraction side, and the caries rate was significantly higher on the nonextraction side than on the extraction side ( $p < 0.0001$  on M2 with caries and  $p = 0.003$  on M2 with distal caries). M3 eruption, at the same or different occlusal plane levels of M2, is a risk factor for periodontal diseases and caries in M2s in elderly patients. M3s may continue to negatively impact dental health well into later life.

Conflicts of interest: All authors declare no conflicts of interests.

\* Corresponding author, Department of Dentistry, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Number 100, Tzyou 1st Road, Kaohsiung 807, Taiwan.

E-mail address: [kafang729@yahoo.com.tw](mailto:kafang729@yahoo.com.tw) (K.-F. Hu).

<http://dx.doi.org/10.1016/j.kjms.2017.03.001>

1607-551X/Copyright © 2017, Kaohsiung Medical University. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## RESEARCH REPORTS

Clinical

M.E. Nunn<sup>1\*</sup>, M.D. Fish<sup>2†</sup>, R.J. Garcia<sup>2,3</sup>,  
E.K. Kaye<sup>2</sup>, R. Figueroa<sup>4‡</sup>, A. Gohel<sup>5</sup>,  
M. Ito<sup>6</sup>, H.J. Lee<sup>7</sup>, D.E. Williams<sup>8</sup>,  
and T. Miyamoto<sup>1</sup>

<sup>1</sup>Creighton University School of Dentistry, Department of Periodontology, Omaha, NE, USA; <sup>2</sup>Boston University Henry M. Goldman School of Dental Medicine, Department of Health Policy and Health Services Research, Boston, MA, USA; <sup>3</sup>VA Boston Healthcare System, Boston, MA, USA; <sup>4</sup>Boston University Henry M. Goldman School of Dental Medicine, Department of Oral and Maxillofacial Surgery, Boston, MA, USA; <sup>5</sup>Boston University Henry M. Goldman School of Dental Medicine, Department of Oral and Maxillofacial Radiology, Boston, MA, USA; <sup>6</sup>Nihon University School of Dentistry at Matsudo, Department of Removable Prosthodontics, Chiba, Japan; <sup>7</sup>Seoul National University Bundang Hospital, Department of Periodontology, Seongnam-si, Korea; <sup>8</sup>Creighton University School of Dentistry, Department of Oral and Maxillofacial Surgery, Omaha, NE, USA; <sup>†</sup>Private practice, Hartsdale, NY, USA; and <sup>‡</sup>Private practice, Orlando, FL, USA; \*corresponding author, nunn@creighton.edu

*J Dent Res* 92(12):1095-1099, 2013

### ABSTRACT

Prophylactic extraction of unerupted asymptomatic third molars is the most common oral surgery procedure in the United States. However, limited evidence exists to justify its costs and associated morbidity. We analyzed data collected over 25 years from 416 adult men enrolled in the Veterans Affairs Dental Longitudinal Study to evaluate the association of retained asymptomatic third molars with risk of adjacent second molar pathology (caries and/or periodontitis), based on third molar status (*i.e.*, absent, erupted, or unerupted). Unerupted molars were further categorized as either “soft tissue” or “bony” impacted. We found that the lowest prevalence and incidence of second molar pathology occurred when the adjacent third molar was absent. The presence of a third molar that was soft tissue impacted increased the risk of incident second molar pathology 4.88-fold (95% confidence interval: 2.62, 9.08). Having an erupted or “bony” impacted third molar increased the risk of incident second molar pathology by 1.74 (95% confidence interval: 1.34, 2.25) and 2.16 (95% confidence interval: 1.56, 2.99), respectively. The retention of third molars is associated with increased risk of second molar pathology in middle-aged and older adult men.

**KEY WORDS:** caries, periodontal disease, cohort study, alveolar bone loss, longitudinal study.

DOI: 10.1177/0022034513509281

Received June 14, 2013; Last revision September 23, 2013; Accepted September 24, 2013

A supplemental appendix to this article is published electronically only at <http://jdr.sagepub.com/supplemental>.

© International & American Associations for Dental Research

## Retained Asymptomatic Third Molars and Risk for Second Molar Pathology

### INTRODUCTION

Prophylactic extraction of unerupted asymptomatic third molars is the most common oral surgery procedure in the United States. One rationale given for extracting teeth that are disease-free is to prevent future disease in adjacent teeth. However, there is limited evidence available regarding risk of caries and periodontitis in second molars adjacent to retained third molars.

We have used available longitudinal data from an observational cohort study of adult U.S. men to examine the association of third molar status with prevalent and incident caries and periodontal outcomes in adjacent second molars.

### MATERIALS & METHODS

We used data from the U.S. Department of Veterans Affairs Dental Longitudinal Study, a subset of the closed-panel longitudinal Veterans Affairs Normative Aging Study, based in Boston, Massachusetts. Beginning in 1961, the Normative Aging Study enrolled 2,280 medically healthy male volunteers, aged 25 to 84 yrs, from the Greater Boston area. A subset of 1,231 volunteers enrolled in the Dental Longitudinal Study beginning in 1969 (Kapur *et al.*, 1972). Men were not Veterans Affairs patients and have gotten their medical and dental care in the private sector. Subjects received comprehensive oral examinations approximately every 3 years by a trained, calibrated periodontist. Panoramic and intra-oral full-mouth radiographs were also taken. Interproximal alveolar bone loss was measured from full mouth radiographs with a Schei ruler (Schei *et al.*, 1959). Over 25 years of data were available for analyses.

We identified 416 subjects who had both first and second molars present in at least 1 quadrant at baseline and had at least 1 follow-up examination. Third molar status was assessed from radiographs by a board-certified oral and maxillofacial surgeon (RF) and a board-certified oral and maxillofacial radiologist (AG). Third molars were categorized for analyses as absent, erupted, or unerupted, with the last subcategorized as either “soft tissue” or “bony” impacted, based on the extent that the radiographic coronal aspect was

1095

Original Article

## Incidence of distal caries in mandibular second molars due to impacted third molars: Nonintervention strategy of asymptomatic third molars causes harm? A retrospective study

Nikhil Srivastava, Akshay Shetty, Rahul Dev Goswami<sup>1</sup>, Vijay Apparaju<sup>2</sup>, Vivek Bagga, Saurabh Kale

Departments of Oral and Maxillofacial Surgery, <sup>1</sup>Oral medicine and Radiology and <sup>2</sup>Periodontics, Sri Rajiv Gandhi College of Dental Sciences and Hospital, Bengaluru, Karnataka, India

### ABSTRACT

**Background:** Removal of impacted third molars is the most common oral surgical procedure. Many investigators have questioned the necessity of removal in patients who are free of symptoms or associated pathologies. **Aim:** The aim of this retrospective study was to evaluate the incidence of caries on distal aspect of mandibular second molars in patients referred for corresponding third molar assessment and to identify its association with angular position and depth of the impacted mandibular third molars based on the classification of Pell and Gregory. **Methodology:** Records of 150 patients with impacted third molar presenting to the Department of Oral and Maxillofacial Surgery, Sri Rajiv Gandhi College of Dental Sciences and Hospital, were assessed retrospectively. The radiographic angulation and depth of mandibular third molar impaction were determined and compared to determine the relationship with incidence of caries on the distal surface of the second molar. **Results:** According to this study results, 37.5% cases show caries on the distal aspect of mandibular second molars. The incidence of caries with mesioangular impacted third molars was 55%. A majority of these mesioangular cases were Level B and Class I as per the Pell and Gregory classification. **Conclusion:** The prophylactic extraction of mandibular third molars is indicated if the angulation is between 30° and 70° and is justified by incidence of distal caries in the second molars.

**Key words:** Angulation, distal cervical caries, impaction, prophylactic removal, third molar

**Submission:** 22-01-2016 **Accepted:** 23-06-2016

### INTRODUCTION

Impaction is the failure of tooth eruption into its anatomical position due to hindrance in the eruption path, improper

positioning of a tooth, absence of space, or other impediments. Impacted teeth are those which are unable to erupt in dental arch within the expected time.<sup>[1]</sup> The impacted third molars are found to have a higher incidence in the mandible than the maxilla.<sup>[2]</sup> Mandibular third molars tend to erupt into the oral cavity by the age of 21 years, and there is higher frequency in females than males.<sup>[3]</sup>

Address for correspondence: Dr. Vijay Apparaju, Department of Periodontics, Sri Rajiv Gandhi College of Dental Sciences and Hospital, Cholaraagac, Hebbal, Bengaluru, Karnataka, India. E-mail: [dr.vijayapparaju@gmail.com](mailto:dr.vijayapparaju@gmail.com)

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

For reprints contact: [reprints@medknow.com](mailto:reprints@medknow.com)

Access this article online	
Quick Response Code: 	Website: <a href="http://www.ijabmr.org">www.ijabmr.org</a>
	DOI: 10.4103/2229-516X.198505

**How to cite this article:** Srivastava N, Shetty A, Goswami RD, Apparaju V, Bagga V, Kale S. Incidence of distal caries in mandibular second molars due to impacted third molars: Nonintervention strategy of asymptomatic third molars causes harm? A retrospective study. *Int J App Basic Med Res* 2017;7:15-9.



## Distal cervical caries in the mandibular second molar: an indication for the prophylactic removal of third molar teeth? Update

Louis W. McArdle<sup>a,\*</sup>, Fraser McDonald<sup>b</sup>, Judith Jones<sup>c</sup>

<sup>a</sup> Department of Oral Surgery, KCL Dental Institute, Guy's & St Thomas's NHS Foundation Trust, Great Maze Pond, London SE1 9RT, United Kingdom

<sup>b</sup> Department of Orthodontics, KCL Dental Institute, Guy's & St Thomas's NHS Foundation Trust, Great Maze Pond, London SE1 9RT, United Kingdom

<sup>c</sup> Department of Oral Surgery, QMUL Dental Institute, The Royal London Hospital NHS Foundation Trust, Whitechapel, London E1 1BB, United Kingdom

Accepted 13 November 2013

Available online 7 December 2013

### Abstract

In 2005 we reported the clinical findings of 100 patients who had mandibular third molars removed because of distal cervical caries in the mandibular second molar. The aim of this follow-up study was to find out whether the findings in a new group of patients corroborate those of our previous study. We report on the clinical features of 239 patients (mean (SD) age 32.1 (7.85) years, range 20–65) who had 288 mandibular third molars removed because of distal cervical caries in the second molar. Patients had better dental health than average, and 67% had a DMF (decayed, missing, or filled) score of 5 or less. In 89% of third molars the mesial angulation was between 40° and 80°. Distal cervical caries in second molars is a late complication of third molar retention. The prophylactic removal of a partially erupted mesioangular third molar will prevent distal cervical caries forming in the second molar tooth.

© 2013 The British Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.

**Keywords:** Third molar; Indications; Distal cervical caries

### Introduction

Current UK clinical guidelines for the management of third molars advise against the prophylactic removal of healthy impacted teeth,<sup>1–3</sup> and suggest that there is no reliable evidence to support it. Consequently, current practice is to remove teeth only if they cause disease.<sup>4</sup>

Partially erupted, mesioangular impacted mandibular third molars that are in contact with the second molar around the amelocemental junction put the second molar at risk of developing distal cervical caries (Fig. 1),<sup>5–8</sup> which is a carious lesion that forms on the distal cervical root surface of the second molar. Mesioangular impaction of the third molar on to the second molar creates a deficient gingival collar and

exposes the distal root surface of the second molar to the oral environment. The area is difficult to keep clean so dental plaque forms and persists, and results in distal cervical caries in the second molar. The third molar must be removed to enable restoration of the second molar, but in certain cases this might not be possible, and the second molar may also need to be extracted.

In 2005 we reported on 100 patients who had mesioangular impacted third molars removed because of the presence of distal cervical caries in the second molar.<sup>8</sup> They tended to be 5 years older than the average for patients having third molars removed and their dental health was also better than average.<sup>8</sup> We suggested that these patients presented with distal cervical caries because earlier in life they had not had any serious third molar disease such as pericoronitis, which would have indicated removal of the tooth.<sup>8</sup> Consequently, retention of these teeth promotes the formation of distal cervical caries in the second molar.

\* Corresponding author. Tel.: +44 020 7 188 3435; fax: +44 0207 1884360.  
E-mail address: [lois.mcardle@kcl.ac.uk](mailto:lois.mcardle@kcl.ac.uk) (L.W. McArdle).

## Characteristics of disease related to mesio-angular mandibular third molar teeth

L.W. McArdle<sup>a,\*</sup>, J. Jones<sup>b</sup>, F. McDonald<sup>c</sup>

<sup>a</sup> Department of Oral Surgery, KCL, Faculty of Dentistry, Oral & Craniofacial Sciences, Guy's Hospital, London Bridge, London SE1 9RT

<sup>b</sup> Department of Oral Surgery, QMUL Institute of Dentistry, Bart's & The London School of Medicine & Dentistry, London E1 2AD

<sup>c</sup> Department of Orthodontics, KCL, Faculty of Dentistry, Oral & Craniofacial Sciences, Guy's Hospital, London Bridge, London SE1 9RT

Accepted 6 February 2019

Available online 3 April 2019

### Abstract

The aim of this study was to identify the indications for the removal of mesio-angular mandibular third molars based on age and dental health as measured by the DMFT (decayed, missing, and filled teeth) score, and to find out if early intervention should be considered. We studied 319 patients who had 431 mesio-angular mandibular third molars removed. Variables recorded were age, primary indication for removal, and the DMFT score. Indications for removal included distal cervical caries (DCC) in the mandibular second molar ( $n = 180$ , 44%), pericoronitis ( $n = 131$ , 32%), and caries and related disease ( $n = 62$ , 15%). The frequency of distal cervical caries (DCC) in the mandibular second molar increased linearly as patients became older and was the most common reason why mesio-angular third molar teeth were removed. This suggests that patients should be advised of the consequences of retaining these types of third molars, and offered prophylactic removal of asymptomatic teeth.

© 2019 Published by Elsevier Ltd on behalf of The British Association of Oral and Maxillofacial Surgeons.

**Keywords:** oral surgery; third molar; disease

### Introduction

Mesio-angular impaction of mandibular third molars (maMd3M) is the most common type of impaction, and can contribute to a variety of common disorders such as pericoronitis, dental caries, and periodontal disease.<sup>1–3</sup> More importantly, mesio-angular mandibular third molars that are partially erupted can cause distal cervical caries (DCC) in the second molar, which can have serious consequences.<sup>4–12</sup> A recent study suggested that this accounts for the loss of up to 40% of second molars, with the remaining 60% requiring restoration.<sup>1</sup> Its incidence varies from 2% – 14% of patients who have third molars removed, but these figures

relate to all categories of teeth rather than to specific types of impaction.<sup>3,5,13–16</sup>

If all, or a large proportion of, partially-erupted third molars lead to DCC in the adjacent tooth, then early intervention and prophylactic removal of the third molar should be considered because the risk of retention could outweigh the cost of early removal.<sup>12</sup> If this is the case, then the National Institute for Health and Care Excellence (NICE) guidance may be in conflict with the reality of retention (particularly of mesio-angular mandibular third molars) because of the risk they pose. However, as we cannot tell which patients will be affected, early intervention must still be questioned.

Our aim therefore was to study the characteristics of patients who had mesio-angular mandibular third molars removed, and to establish whether early intervention should be considered.

\* Corresponding author. Tel.: 020 7188 4345; Fax: 020 7188 4360.

E-mail address: [kwis.mcardle@kcl.ac.uk](mailto:kwis.mcardle@kcl.ac.uk) (L.W. McArdle).

<https://doi.org/10.1016/j.bjoms.2019.02.002>

0266-4356/© 2019 Published by Elsevier Ltd on behalf of The British Association of Oral and Maxillofacial Surgeons.

# Saving the 2<sup>nd</sup> Molar from the 3<sup>rd</sup> Is it Really the Guilt of the Tilt?

PANKAJ YADAV\*, PREETI JAIN PRUTHI<sup>1</sup>, RUCHEKA ROONGTA NAWAL<sup>1</sup>,  
SANGEETA TALWAR<sup>1</sup>, MAHESH VERMA<sup>1</sup>

## ABSTRACT

**Introduction:** Clinicians often relate the distal caries in second molars to angulated third molars, which if left undetected can lead to gross decay that may further require removal of the tooth. Due to this fact, many third molars are advised for prophylactic removal to prevent decay in the second molar. But this approach would only be justified when the incidence of decay/loss of second molar due to third molar are reasonably high. We sought to determine incidence of caries experience and also sequel extraction in second molars associated with the third molars.

**Aim:** The study was conducted to answer the basic question that whether the incidence of caries and subsequent extraction of second molar due to angulated third molars is high enough to justify the prophylactic removal of third molar or not.

**Materials and Methods:** This study was conducted on radiographic records of 1187 patients. The effect of tilted third molar on the second molar was measured in relation with three parameters namely level & position of third molar with respect to second molar and the distribution among arches.

**Results:** The results indicated that out of total number of teeth examined only 5.4% of maxillary and 9.6% of mandibular second molars were affected by tilted third molars. Further, only 2.2% of mandibular and 2.9% of maxillary second molars were indicated for extraction. The data was statistically insignificant.

**Conclusion:** It was concluded that distal caries in second molars is not very common. It may be present in some cases of third molar impactions and prophylactic removal of these impacted teeth may not be considered appropriate.

**Keywords:** Distal caries mandibular second molars, impacted third molar

## INTRODUCTION

Oral hygiene measures fail to completely clean the dental plaque from the difficult, inaccessible areas of teeth and as a result dental caries develop [1]. Partially erupted mesio-angular or horizontally impacted third molars that contact the cemento-enamel junction of the second molar place this tooth at risk of developing caries in the distal cervical region [2-4]. The exposed distal root of the second molar is colonized by various pathologic bacteria and may lead to development of periodontal defect [5]. Major factors related with the impaction of third molar are lack of space, limited skeletal growth, distal eruption of dentition, vertical condylar growth, increased crown size, and late maturation of the third molars [6,7].

Caries in second molar caused by an impacted or angulated third molar occasionally necessitates removal of the third molar and restoration of the carious defect. Furthermore, in some cases where the carious lesions are too large to be restored, the involved second molars are extracted, the result of which is a considerable loss of masticatory function. Distal surface caries on mandibular second molars can lead to problems in restoration owing to the frequent occurrence of subgingival caries accompanied by severe alveolar bone destruction at the distal area of the mandibular second molars. With this in mind, early detection and evaluation of the caries risk of the second molars associated with third molars might be helpful for the prevention of distal caries in the second molars. There has always been a controversy regarding the validity of prophylactic removal of impacted third molars [8,9]. However, in cases where the second molars are at a high risk of developing carious lesions owing to their proximity to the third molars, preventive extraction of the third molars can be recommended as a treatment method for improving the prognosis of second molars [10].

As the studies relating the incidence of distal caries of second molar and the eruption status of the third molar including the angulations and vertical position of third molars are few, the present study was designed to analyse the correlation between the incidence of distal caries in second molars and their associated removal from the oral

cavity due to tilted third molars. Based upon these findings, we can interpret whether the prophylactic removal of third molar to save the second molar is advised or not.

## MATERIALS AND METHODS

A cross-sectional study was conducted and the radiographic data over a period of one year (November 2012-November 2013) was collected from the Department of Oral Medicine and Radiology of Maulana Azad Institute of Dental Sciences, Delhi. A total of 1187 radiographs (642 females and 545 males) of patients with age range: 18-55 years of third molar region (including all the quadrants and both the arches) were reviewed. The variables that we recorded were sex, age, angulation and eruption status of the third molar and proximity of the third molar to the cemento-enamel junction of the second molar. The protocol and guidelines for this study were approved by the Institutional Local Ethics Committee.

The selection criterion for patient inclusion was age range 18-55 years and pathology associated with mandibular second molars, i.e., caries, pulpal or periapical pathology, etc. The exclusion criteria included cases where adjacent second molars were absent and patients were below 18 years of age. Patients with third molars under Nolla's [11] root formation stage 8 were excluded from the study, as were those with largely destroyed third molars (i.e., reduced to mere root fragments).

The mesial angulation of the third molar tooth was calculated by measuring the angle of intersection between the occlusal plane of second molar and the long axis of the third molar. Tracing paper was attached to the intraoral periapical radiograph and dental panoramic radiograph and the occlusal plane of second molar was drawn. This plane was defined as a line through the tips of the cusps of the molar and premolar teeth. The long axis of the third molar was then drawn through the center of the third molar. The angle of intersection between these two planes equates to tilt of the third molar with respect to the second molar [Table/Fig-1].

The degree of impaction of the third molar was determined by

RESEARCH

Open Access



# Prevalence of pathologies related to impacted mandibular third molars

Seung-Min Shin<sup>1</sup>, Eun Joo Choi<sup>2</sup> and Seong-Yong Moon<sup>1\*</sup> 

## Abstract

**Objective:** Prevalence of cysts and tumors related to impacted third molars has been considered important because the risk justifies prophylactic extraction. This retrospective study aimed to evaluate the prevalence of cysts or tumors associated with impacted mandibular third molars (IMTMs) according to patients' age and gender.

**Methods:** Over the period from August 2006 to August 2011, 20,802 third molars from 17,535 patients were removed. Among these, IMTMs without cysts nor tumors were classified as non-pathology group, and IMTMs with cysts and tumors were classified into pathology group. The prevalence of IMTMs and associated cysts or tumors was analyzed in patient groups stratified by age and gender. The pathology group patients were also classified according to histopathological findings and the corresponding age groups.

**Results:** Radiographic signs of disease were detected for 176 lesions (0.846 %) in 165 patients. Of these, 135 (76.4 %) lesions were diagnosed as dentigerous cysts, 31 (17.6 %) as keratocysticodontogenic tumors, and 10 (5.7 %) as ameloblastomas. The prevalence of cysts or tumors tended to increase after 50 years of age, such as 7.27 % in 6th decades, 18.60 % in 7th decades, and 11.53 % in 8th decades, with a male predominance in older patients.

**Conclusions:** IMTMs in old age patients more than 50 years old has high possibilities of developing cyst or tumors especially in male patients. However, these results should not be used as the only evidence for justifying prophylactic extraction, and further studies should investigate the survival rate of IMTMs without any pathologic in older populations.

**Keywords:** Impacted third molar, Pathological lesion, Dentigerous cyst, Ameloblastoma, Surgical extraction

## Background

Although recent studies have investigated the benefits of prophylactic extraction of impacted mandibular third molars (IMTMs), the indications for this procedure remain controversial (Steed 2014) because surgical extraction can result in numerous complications, including nerve damage, infection, and impaired healing in older patients (Baykul et al. 2005). Indications for therapeutic extraction of impacted third molars include recurrent pericoronitis, cysts, nonrestorable caries lesions, and destruction of adjacent periodontal tissues (National Institute for Health and Care Excellence 2000).

Previous literatures reported that cysts and tumors develop around IMTMs in fact with low incidence. The incidence of cysts and tumors ranges from 2 to 6.2 % in most studies (Goldberg et al. 1985; Stathopoulos et al. 2011; Lysell and Rohlin 1988; Samsudin and Mason 1994; Nordenram et al. 1987; Bruce et al. 1980). There are rare reports that high incidence of cyst or tumor formation in the oldest age group with mean age of 46.5 years old (13.3 %) rather than youngest age group with mean age of 20 years (1.5 %).

However, it has not been investigated that incidence of cyst or tumor is changed according to the patients' age and gender. This retrospective study aims to assess the prevalence of cysts or tumors adjacent to IMTMs according to age and gender.

\*Correspondence: msygood@chosun.ac.kr

<sup>1</sup>Department of Oral and Maxillofacial Surgery, School of Dentistry, Chosun University, 375, SeosukDong, DongGu, Gwangju City 501-759, Republic of Korea

Full list of author information is available at the end of the article

## The incidence of cysts and tumors associated with impacted third molars

A. T. Vigneswaran, S. Shilpa

Department of Oral and Maxillofacial Surgery, Sree Balaji Dental College and Hospital, Chennai, Tamil Nadu, India

**Address for correspondence:**  
Dr. A. T. Vigneswaran,  
E-mail: dratvignesh@gmail.com

Received : 31-10-14  
Review completed : 31-10-14  
Accepted : 09-11-14

### ABSTRACT

Incidence of cysts and tumors associated with lower impacted third molars are very low prevalence, which might be because of the fact that most pathologies go unnoticed as many practitioners discard the erupted tissue after surgical removal of the impacted teeth rather than sending the tissue for histopathological examination. Our aim was to evaluate the patients who came for third molar surgical removal with due therapeutic prophylaxis and an incidental finding. A proper study protocol both inclusion and exclusion criteria was strictly followed for all the cases, which were included in the study. The period of study was 6 years and the total number of cases assessed were 2778 patients out of which 70 cases reported pathology associated with the impacted third molars. Among 70 cases 61.4% were reported as cyst and tumors and 38.6% of the cases had chronic inflammatory reaction, including two cases with normal dental follicle. High incidence rate of pathology associated with third molar occurred between age group of 20 and 30 years older age groups showed very low incidence. Most common site of impaction was found to be left side of mandible and positions were vertical and distoangular impactions. Thus was male predominance in the younger groups. The examination is necessary whether the third molars impacted cases were symptomatic or asymptomatic

**KEY WORDS:** Cyst, tumor, 3<sup>rd</sup> molars, impactions

Impaction is the cessation of eruption or failure of a tooth eruption caused by a physical barrier in the eruption path, abnormal positioning of the tooth and the loss of space or other impediments. Various authors have conducted studies to assess the prevalence of erupted and impacted third molar of patients ranging from the young to the elderly within a range of 6–14%. However, studies show low incidence of cysts and tumors associated with impacted third molars which might be because of the fact that most pathologies go unnoticed as many practitioners discard the erupted tissues after surgical removal of the impacted teeth rather than sending the tissues for histopathological examination.<sup>(1)</sup> The literature agrees that concerning to cystic lesions and tumors associated with the impacted teeth, the incidence of dentigerous cyst is the highest among all the other pathologies ranging from about 70% to 100%. The percentage of periodontal pathogens

caries in the second molar and incidence of ameloblastoma, odontoma, odontogenic keratocyst (OKC), paradental cyst, fibrosarcoma, etc., are much less. Salehinejad *et al.* reported that the recurrence of glandular odontogenic cyst of mandible associated with an impacted third molar, which was diagnosed radiographically as dentigerous cyst.<sup>(2)</sup> Patil in 2013<sup>(3)</sup> found out through a retrospective study that 69.7% of impacted third molar in western Indian population with a radiographically normal follicular space were associated with pathologies when subjected to histologic examination.<sup>(4)</sup> Joshi *et al.* concluded through their study in 2013 that radicular cyst is more common in maxilla which goes unnoticed most of the tissues.<sup>(5)</sup>

### Aim

The aim of this study was to determine the incidence of the development of pathology associated with impacted third molars in those patients who were evaluated for third molar surgery—a therapeutic prophylactic and an incidental finding.

### Methodology

In a 6 years long study in the period 2008–2013. The study sample of 70 cases in Chennai associated with pathologies,

Access this article online	
<p>Quick Response Code:</p> 	<p>Website: <a href="http://www.jpbsonline.org">www.jpbsonline.org</a></p> <p>DOI: 10.4103/0975-7406.155940</p>

How to cite this article: Vigneswaran AT, Shilpa S. The incidence of cysts and tumors associated with impacted third molars. J Pharm Bioall Sci 2015;7:5251-4.

## An Evaluation of Pathologic Changes in the Follicle of Impacted Mandibular Third Molars

Aruna Azhar Tambuwala<sup>1</sup>, Rakesh Gulabchand Oswal<sup>2</sup>, Rushikesh Suresh Desale<sup>3</sup>, Nitin Prakash Oswal<sup>4</sup>, Prashant Edwin Mall<sup>5</sup>, Aatif Riyaz Sayed<sup>6</sup>, Aniket Tarachand Pujari<sup>4</sup>

### Contributors:

<sup>1</sup>Professor and HOD, Department of Oral and Maxillofacial Surgery, M.A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India; <sup>2</sup>Reader, Department of Oral and Maxillofacial Surgery, M.A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India; <sup>3</sup>Lecturer, Department of Oral and Maxillofacial Surgery, M.A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India; <sup>4</sup>Post-graduate Student, Department of Oral and Maxillofacial Surgery, M.A. Rangoonwala College of Dental Sciences and Research Centre, Pune, Maharashtra, India.

### Correspondence:

Dr. Tambuwala AA, Professor and HOD, Department of Oral and Maxillofacial Surgery, M.A. Rangoonwala Dental College, Azam Campus, Hidayatulla Road, Pune - 411 001, Maharashtra, India. Phone: +91-9371023684. Email: dr\_aat@rediffmail.com

### How to cite the article:

Tambuwala AA, Oswal RG, Desale RS, Oswal NP, Mall PE, Sayed AR, Pujari AT. An evaluation of pathologic changes in the follicle of impacted mandibular third molars. J Int Oral Health 2015;7(4):58-62.

### Abstract:

**Background:** The purpose of this study was to evaluate the early pathologic changes in the follicular tissue of completely impacted mandibular third molar.

**Materials and Methods:** 52 patients, between 18 and 52 years of age of which 25 were males and 27 were females, were selected. They had impacted mandibular third molars, which were indicated for extraction. After extraction, the follicle was sent for a histopathological evaluation to two different oral pathologists.

**Results:** The results showed that 80.8% of the specimen had normal follicles. 11.5% specimen suggested cystic changes while 7.7% suggested infected follicle.

**Conclusion:** It is desirable to consider prophylactic removal of impacted mandibular third molar presenting at a younger age, whereas their removal remains an enigma for the older age group and should only be considered appropriate in those cases where frank causes for its removal are established.

**Key Words:** Follicular tissue, impacted third molar, pathology

### Introduction

In oral and maxillofacial surgery, removal of the third molar is a common procedure. The most common complaint of patients presenting for treatment of third molars is developmental, pathological, medical deformities which is characteristic of a modern civilization. By definition, impacted tooth is a tooth which is completely or partially unerupted and is positioned against another tooth, bone or soft tissue so that its further eruption is unlikely, described according to its anatomic position.<sup>1</sup>

Lower third molar is the most commonly impacted tooth as compared to any other teeth in the oral cavity.

According to Archer the causes are:

Local causes:

1. Irregularity in the position and pressure of an adjacent tooth
2. Density of overlying/surrounding bone
3. Lack of space due to undeveloped jaw
4. Unduly long retention of primary teeth
5. Premature loss of primary teeth
6. Long continued local inflammation result to increase in density of overlying mucous membrane.

Systemic causes:

1. Prenatal causes
  - Hereditary
  - Miscegenation.
2. Post natal causes
  - Rickets
  - Anemia
  - Congenital syphilis
  - Tuberculosis
  - Endocrine dysfunctions
  - Malnutrition.
3. Syndromes
  - Cleft lip/cleft palate
  - Cleidocranial dysostosis
  - Oxycephaly
  - Progeria.

The formation of a tooth occurs inside a developmental sac known as the dental follicle or the dental sac, which surrounds the papillae of the tooth and enamel. In 2001, Damante characterized the follicle as the remnant of tissues that participate in the odontogenesis and remained circum adjacent to the crown of a tooth, which has not erupted normally. Radiographically the pericoronal follicles present as a slight pericoronal radiolucency around the unerupted teeth with a thin radiopaque border. However, enlargement and asymmetry can occur.

Histologic examination of surgically removed impacted third molar along with dental follicle and its associated pericoronal tissue reveals fibrous connective tissue with remnants of reduced enamel epithelium and the absence of an epithelial lining or chronic inflammatory infiltrate or connective tissue capsule made of collagen fibers and plump fibroblasts.

## A Study on Dentigerous Cystic Changes with Radiographically Normal Impacted Mandibular Third Molars

Greeshma G. Wali · V. Sridhar · H. N. Shyla

Received: 13 March 2011 / Accepted: 13 June 2011 / Published online: 6 July 2011  
© Association of Oral and Maxillofacial Surgeons of India 2011

### Abstract

**Background** Dentigerous cyst develops in the follicular tissue surrounding the impacted lower third molar. A study was carried out to know the incidence of Association of Dentigerous cyst with radiographically normal impacted lower third molars and to draw the attention of the Oral Surgeons towards the prophylactic removal of impacted third molars.

**Methods** A prospective study was done on 30 patients with impacted lower third molars which were indicated for extraction. The follicle tissue surrounding the impacted tooth was subjected for histopathologic investigations. Only those teeth with a radiographic finding of pericoronal space of less than 2.5 mm were considered. Two Oral Pathologists reviewed the slides for any changes suggestive of cystic pathology.

**Results** Pathologic changes suggestive of Dentigerous cyst was found in 7 of the 30 follicular tissue sent for histopathologic testing. It was found to be statistically significant ( $P < 0.001$ ).

**Conclusion** This study shows statistically high incidence of Dentigerous cyst association with radiographically normal impacted lower third molar teeth. Hence the Oral and Maxillofacial surgeons should consider histopathologic evaluation and radiographic diagnosis in the management

of impacted lower third molars. Prophylactic extractions of normal impacted lower third molars should be considered as a treatment option.

**Keywords** Impacted lower third molars · Prophylactic extraction · Dentigerous cyst

### Introduction

An impacted tooth is one of the most common complaints a patient presents with to the Oral and Maxillofacial Surgeon for treatment. These are developmental pathologies characteristics of a modern civilization. Any tooth in the oral cavity can be impacted, but the most commonly affected tooth is the lower third molar. Transition from eating coarse to refined food, timely management of any dental pathology has lead to insufficient space behind the second molars for the third molars to erupt. Skeletal deficiency due to the process of evolution, lack of co ordination between maturation of the permanent dentition and exfoliation of the primary dentition, genetic inheritance are few of the other reasons explaining the susceptibility of the lower third molars to be impacted [1].

The process of odontogenesis occurs mainly inside a fibrous sac known as a dental sac or follicle. It is also called as a developmental sac since it plays a very important role in the development and the eruptive process of a tooth. The follicle is made up of ectomesenchymal cells and fibers and remains adjacent to the crown of the unerupted or impacted tooth [2]. This follicle is seen as, a more or less uniform radiolucent area with a sclerotic border around the crown of the tooth on radiographs [3]. According to Gorlin [4] during the histological process of tooth development, the odontogenic tissue around the tooth has the propensity to

G. G. Wali  
ITS Dental College and Hospital, Muradnagar, Ghaziabad,  
Uttar Pradesh, India

V. Sridhar (✉)  
Rural Dental College, Loni, Maharashtra, India  
e-mail: docsvnaidoo@yahoo.co.in

H. N. Shyla  
KLE Institute of Dental Sciences, Bangalore, India

## Complications of Third Molar Extraction A retrospective study from a tertiary healthcare centre in Oman

\*Nabeel Sayed, Abdulaziz Bakathir, Mehboob Pasha, Salim Al-Sudairy

### مضاعفات قلع الرحي الثالثة

دراسة استيعادية من مركز رعاية صحية ثالثي في عُمان

نابيل سيد، عبدالعزیز باكثير، محبوب باشا، سالم السديري

**ABSTRACT: Objectives:** This retrospective study aimed to investigate complications associated with the extraction of third molars at a tertiary healthcare centre in Oman. **Methods:** All consecutive patients who underwent extraction of one or more impacted third molars under general anaesthesia at Sultan Qaboos University Hospital, Muscat, Oman, between January 2007 and December 2017 were included. Age, gender, indication for extraction, teeth removed, procedure and complications were recorded. **Results:** A total of 1,116 third molars (56% mandibular and 44% maxillary) were extracted and the majority (67.7%) were from female patients. The mean age at extraction was  $24 \pm 5$  years and most patients (77.7%) were 20-29 years old. The intraoperative and postoperative complication rates were 3.7% and 8.3%, respectively. The intraoperative complications included tuberosity fracture (1.2%), root fracture (1.1%), bleeding (0.7%), soft tissue injury (0.5%) and adjacent tooth damage (0.2%). Postoperative complications were sensory nerve injuries (7.2%), swelling/pain/trismus (0.6%) and dry socket (0.5%). Nerve injury was temporary in 41 patients and permanent in four cases. A statistically significant relationship was observed between those aged 30-39 years and dry socket ( $P = 0.010$ ) as well as bone removal and all postoperative complications ( $P = 0.001$ ). **Conclusion:** Most complications resulting from third molar extractions were minor and within the reported ranges in the scientific literature. However, increased age and bone removal were associated with a higher risk of complications. These findings may help to guide treatment planning, informed consent and patient education.

**Key words:** Third Molar; Tooth Extraction; Complications; Lingual Nerve; Inferior Alveolar Nerve; Oman.

**المخلص:** الهدف من هذه الدراسة الاستيعادية إلى التحقيق في المضاعفات المرتبطة بقلع الرحي الثالثة في مركز رعاية صحية ثالثي في عُمان. **الطريقة:** تم تضمين جميع المرضى المتتاليين الذين خضعوا لقلع رحي ثالثة متضمنة واحدة أو أكثر تحت التخدير العام في مستشفى جامعة السلطان قابوس، مسقط، عمان بين يناير 2007 وديسمبر 2017. تم تسجيل العمر والجنس، ودواعي القلع، والأسنان المقلوعة، والإجراء والمضاعفات. **النتائج:** تم قلع ما مجموعه 1,116 من الأرحاء الثالثة (56% من الفك السفلي و 44% من الفك العلوي) وكان غالبية (67.7%) المرضى من الإناث. كان متوسط العمر عند القلع هو  $24 \pm 5$  سنوات وكان معظم المرضى (77.7%) تتراوح أعمارهم بين 20-29 سنة. كانت معدلات المضاعفات أثناء العملية وما بعد العملية الجراحية 3.7% و 8.3% على التوالي. وشملت المضاعفات أثناء العملية كسر الجذر (1.1%)، والتزيف (0.7%)، وكسر الأضراس (1.2%)، وإصابة الأنسجة الرخوة (0.5%)، وتلف الأسنان المجاورة (0.2%)، وشملت مضاعفات ما بعد الجراحة تورم اللثة/الضرس (0.6%)، وسنخ جاف (0.5%)، وإصابات العصب الحسي (0.2%)، كانت إصابة العصب مؤقتة في 41 مريضاً ودائمة في أربع حالات. وقد لوحظ وجود علاقة معنوية بين إحصائياتها بين الذين تتراوح أعمارهم بين 30-39 سنة والسنخ الجاف ( $P = 0.01$ )، وكذلك بين إزالة العظم وجميع مضاعفات ما بعد العملية الجراحية ( $P = 0.001$ ). **الخلاصة:** كانت معظم المضاعفات الناجمة عن قلع الرحي الثالثة بسيطة وضمن النطاقات الواردة في الأدبيات العلمية. ومع ذلك، ارتبط التقدم بالعمر وإزالة العظم بارتفاع خطر حدوث المضاعفات. قد تساعد هذه النتائج في توجيه تخطيط العلاج والموافقة المسنّنة وثقافة المريض. **كلمات المفتاحية:** الرحي الثالثة؛ قلع السن؛ مضاعفات؛ العصب اللساني؛ العصب السنخي السفلي؛ عُمان.

#### ADVANCES IN KNOWLEDGE

- This study supports the available worldwide literature on the complications of third molar extractions in Oman.
- To the best of the authors' knowledge, the present study is the first to highlight the complications of third molar extractions in Oman.

#### APPLICATION TO PATIENT CARE

- Indications for the removal of third molars and the anticipated outcome should be carefully reviewed during treatment planning.
- This study represents a continued movement towards the use of evidence-based medicine to discuss and explain outcomes, complications and the risk-benefit ratio with patients before any procedure.

**T**HIRD MOLARS ARE THE MOST FREQUENTLY impacted teeth and might fail to erupt into a normal functional position.<sup>1</sup> The prevalence of impacted third molars ranges between 16.7–68.6%

across various populations.<sup>2-9</sup> Studies from the Gulf region have reported an impacted third molars rate of 32–40.5%.<sup>6,9</sup> A recently published study from Oman found that 54.3% of young Omani adults between

Department of Dental and Maxillofacial Surgery, Sultan Qaboos University Hospital, Muscat, Oman

\*Corresponding Author's e-mail: [nsyednabeel@sqj.ou.edu.om](mailto:nsyednabeel@sqj.ou.edu.om)

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

## LETTER TO THE EDITOR

**HOW FREQUENT ARE POSTOPERATIVE COMPLICATIONS AFTER AN IMPACTED MANDIBULAR THIRD MOLAR EXTRACTION?**

P.C. PASSARELLI<sup>1</sup>, E. RELLA<sup>1</sup>, G.B. PICCIRILLO<sup>1</sup>, V. DESANTIS<sup>1</sup>,  
V. GIOVANNINI<sup>1</sup>, A. SPERANZA<sup>1</sup>, M. DE LEONARDIS<sup>1</sup>, P. PAPI<sup>2</sup>, G. POMPA<sup>2</sup>, P.F.  
MANICONE<sup>3</sup> and A. D'ADDONA<sup>3</sup>

<sup>1</sup>Department of Head and Neck, Oral Surgery and Implantology Unit, Institute of Clinical Dentistry, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Gemelli, Rome, Italy;

<sup>2</sup>Department of Oral and Maxillo-facial Sciences, "Sapienza" University of Rome, Rome, Italy;

<sup>3</sup>Department of Head and Neck, Oral Surgery and Implantology Unit, Institute of Clinical Dentistry, Università Cattolica del Sacro Cuore, Fondazione Policlinico Universitario Gemelli, Rome, Italy

Received February 23, 2020 – Accepted April 30, 2020

To the Editor,

Impacted teeth fail to fully erupt in the oral cavity mainly as a result of reduced space in the dental arch. Several studies have shown the mandibular third molar to be the most commonly impacted tooth, with a prevalence reaching 77% (1), followed by the maxillary third molar. An impacted mandibular third molar can cause the development of an infection, commonly called pericoronitis, in the follicular sac of the impacted third molar; this infection can be seen in a percentage as high as 64% (2) of patients with an impacted third molar, and can be quite painful for the patient. The usual therapy for treating an impacted tooth is its extraction, which can be called for not only for treating a tooth that has been the cause of an infection and can negatively affect nutrients intake (3), but also for maintaining the periodontal health of the second molar (4) or for orthodontic and prosthetic needs. Their extraction is particularly important in patients undergoing hematopoietic stem cell transplantation (HSCT) (5). Their extraction is usually a uneventful surgical procedure, but in rare cases it may cause several complications, such as

paresthesia of the lower lip or the development of a dry socket (6). These complications have a widely different reported rate. The aim of this study is to retrospectively highlight the prevalence of these events in our clinic.

## MATERIALS AND METHODS

This retrospective analytical study included 89 mandibular third molar extractions performed between January 2015 to January 2019 by a single oral surgeon. We retrospectively analyzed the extraction data, postoperative data, and patient clinical information. Because of the retrospective nature of the present study, it was granted an exemption in writing by the institutional review board of the Catholic University of the Sacred Heart of Rome.

The positions of the 89 mandibular molars and the distance between the apex and the IAN were analyzed with a bidimensional endooral radiograph, or, when needed, with a tridimensional radiographic exam. The teeth were extracted following a standard

*Key words: oral surgery; third molar; extraction; complications*

*Corresponding Author:*

Dr Pier Carmine Passarelli,  
Department of Head and Neck, Oral Surgery and Implantology Unit,  
Institute of Clinical Dentistry, Università Cattolica del Sacro Cuore,  
Fondazione Policlinico Universitario Gemelli, Rome, Italy  
Tel.: +39 0630155278 - Fax: +39 0630154751  
e-mail: piercarmine.passarelli@unicatt.it

1209

0393-974X (2020)

Copyright © by BLOLIFE, s.a.s.

This publication and/or article is for individual use only and may not be further reproduced without written permission from the copyright holder.

Unauthorized reproduction may result in financial and other penalties.

**DISCLOSURE: ALL AUTHORS REPORT NO CONFLICTS OF INTEREST RELEVANT TO THIS ARTICLE.**

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.jfma-online.com](http://www.jfma-online.com)

## Original Article

# Associations between aging and second molar diseases in patients having adjacent impacted third molar extraction

Ya-Wei Chen <sup>a,b</sup>, Lin-Yang Chi <sup>b,d</sup>, Oscar Kuang-Sheng Lee <sup>a,c,e,f,\*</sup><sup>a</sup> Institute of Clinical Medicine, National Yang-Ming University, Taipei, Taiwan<sup>b</sup> School of Dental Medicine, National Yang-Ming University, Taipei, Taiwan<sup>c</sup> Stem Cell Research Center, National Yang-Ming University, Taipei, Taiwan<sup>d</sup> Taipei City Hospital, Taipei, Taiwan<sup>e</sup> Department of Medical Research, Taipei Veterans General Hospital, Taipei, Taiwan<sup>f</sup> Department of Orthopedics and Traumatology, Taipei Veterans General Hospital, Taipei, Taiwan

Received 7 April 2020; received in revised form 29 May 2020; accepted 3 June 2020

## KEYWORDS

Impacted tooth;  
Second molar  
morbidity;  
Third molar;  
Tooth diseases

**Purpose:** There is limited evidence available regarding when the best time to extract impacted lower third molars (ILM3). Thus, the current study is aimed to examine the association between the age of patients during the time of extraction of their ILM3 and the sequelae of their adjacent second molar (LM2) in order to find a better time to remove ILM3.

**Methods:** Retrospective cohort study was conducted with a total of 15,432 patients from ages 16–45 years old who had their first surgical extraction of ILM3. Statistical analysis was performed to evaluate variables in association with the sequelae of LM2. Adjusted odds ratios (AOR) were calculated to show the influence of the age of patients by multivariate regression model.

**Results:** Patients who had ILM3 extraction over 22 years of age had a significantly higher risk of having LM2 pulpal disease (AOR: from 2.84 in 23–25 age to 11.58 in >35 age). Significantly higher risk of having LM2 periodontal conditions was found in individuals over 31 years of age (AOR: 1.47 in 31–35 age, 1.90 in >35 age), with prior periodontitis (AOR: 1.97) or complicated odontectomy (AOR: 1.43). The risk of LM2 being extracted due to an untreatable condition was highest in patients more than 35 years old (AOR: 14.38).

**Conclusion:** The age of patients having ILM3 extracted was independently associated with various LM2 sequelae. We suggest that patients can have their ILM3 extracted in their college/university age (19–22-year-old) to minimize complications on the adjacent LM2.

Copyright © 2020, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

\* Corresponding author. Institute of Clinical Medicine, National Yang-Ming University, No.155, Section 2, Linong St., Taipei, Taiwan. Fax: +886 2 28757435.

E-mail address: [oscarlee9203@gmail.com](mailto:oscarlee9203@gmail.com) (O.K.-S. Lee).

<https://doi.org/10.1016/j.jfma.2020.06.003>

0929-6646/Copyright © 2020, Formosan Medical Association. Published by Elsevier Taiwan LLC. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Please cite this article as: Chen Y-W et al., Associations between aging and second molar diseases in patients having adjacent impacted third molar extraction, Journal of the Formosan Medical Association, <https://doi.org/10.1016/j.jfma.2020.06.003>

# Impacted Mandibular Third Molars and Their Influence on Mandibular Angle and Condyle Fractures

Anhad Mehra, MDS<sup>1</sup> Venkatesh Anehosur, MDS<sup>1</sup> Niranjana Kumar, M.Ch(Plastic Surgery), FRCS<sup>2</sup>

<sup>1</sup> Department of Oral and Maxillofacial Surgery, SDM College of Dental Sciences and Hospital, Dharwad, Karnataka, India

<sup>2</sup> SDM Craniofacial Unit and Research Centre, SDM College of Medical Sciences and Hospital, Dharwad, Karnataka, India

Address for correspondence: Venkatesh Anehosur, MDS, Department of Oral and Maxillofacial Surgery, SDM College of Dental Sciences and Hospital, Dharwad, Karnataka 580009, India (e-mail: venkyrao12@yahoo.co.in).

Craniofacial Trauma Reconstruction 2019;12:291-300

## Abstract

The aim of this study is to retrospectively analyze the effect unerupted or partially erupted third molars have on the angle and condyle fracture patterns of the mandible. It also focuses on evaluating the type of impaction that causes angle fracture and the level at which the condyle most commonly fractures. The study involves all the patients who had undergone treatment for condylar and angle of the mandible fractures from 2010 to 2017 in our craniofacial center. The case records and orthopantomograms of each patient were taken into consideration and a correlation was established based on gender, age, etiology, presence of third molars, position of third molars, angulation, and root development of third molars. Of the 150 angle fracture patients, 146 had third molars and 4 did not, whereas of the 130 condyle fractures, third molar was present in 54 patients and absent in 76. The prevalence of angle fractures was statistically significant when a third molar was present, whereas the prevalence of condyle fractures was higher when third molar was absent. The results of age, etiology, angulation, position, and root development of third molars were also statistically significant. However, sex of the patient did not influence the fracture pattern. The presence of an impacted third molar or a completely erupted one has a definite influence on the fracture pattern of the mandible. The occurrence of angle and condyle fractures was mostly affected by the continuity of the cortical bone at the angle of the mandible. Hence, prophylactic removal of mandibular third molars does increase the risk of condyle fractures.

## Keywords

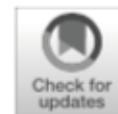
- ▶ mandibular angle
- ▶ mandibular condyle
- ▶ fractures
- ▶ third molar
- ▶ impaction
- ▶ angulation

Despite being the largest and strongest bone of the facial skeleton, its protrusion makes mandible the most vulnerable to fractures.<sup>1</sup> Its susceptibility to trauma can easily be analyzed by studies put forth by different authors.<sup>2</sup> Mandibular fractures have been found to occupy a significant percentage of all maxillofacial injuries, as studies put forth by Gassner et al and Tanaka et al observed that mandibular fractures account for 24.3 and 68.6% of maxillofacial trauma, respectively.<sup>3,4</sup> Biomechanical properties of the mandible, position during injury, overlying soft tissue, force properties (direction, intensity,

location of point, and impact), and the teeth present are some of the range of factors, which decide the pattern of mandibular condyle and angle fractures.<sup>2</sup> The most common sites of fracture of the mandible are condyle (29.1%), angle (24.5%), symphysis (22%), and body (16%). However, there is a broad variation seen in how these findings translate in different researches because statistics put forth by Ogundare et al suggested angle fractures to have the highest incidence at 36%.<sup>5</sup> Meisami et al provided statistics to prove that condylar and angle fractures have almost equal weightage in sites of mandible (25–33%).<sup>6</sup>

received  
July 14, 2018  
accepted after revision  
February 7, 2019  
published online  
April 2, 2019

Copyright © 2019 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.  
Tel: +1(212) 584-4662.  
DOI: <https://doi.org/10.1055/s-0039-1685459>  
ISSN 1943-3875.



## Is the extraction of third molars a risk factor for the temporomandibular disorders? A systematic review

Yohana Sandy Souza Damasceno<sup>1</sup> · Daybelis González Espinosa<sup>1,2</sup> · David Normando<sup>1</sup>

Received: 12 March 2020 / Accepted: 4 April 2020 / Published online: 10 August 2020  
© Springer-Verlag GmbH Germany, part of Springer Nature 2020

### Abstract

**Background** The aim of this study was to evaluate through a systematic review the extraction of third molars as a risk factor for temporomandibular disorders (TMDs).

**Types of studies reviewed** Randomized and nonrandomized controlled clinical trials where patients underwent third molar extraction and with qualitative evaluation of TMDs before and after extraction were included.

**Results** After applying the inclusion criteria, seven nonrandomized clinical studies were included. QUIPS tool showed that four articles presented a moderate and three a high risk of bias (RoB). Six studies reported that TMDs presented higher level after removal of third molars ranging from OR, 1.81 to 2.15/RR, 2.1. However, one study showed no significant association. GRADE showed heterogeneity in relation to general results, which means that confidence in the estimated effects varied from low to moderate GRADE. The quality of clinical recommendations decreased especially due to the risk of bias in some of the included studies evaluated with the QUIPS tool.

**Conclusions and practical implications** Third molar extraction can be associated with the development of TMD signs and symptoms. Furthermore, TMD can be aggravated according to the third molar location, the degree of impaction and surgical difficulty, age, and gender. This systematic review highlights the need to perform randomized clinical trials with diagnostic criteria and standardized surgical procedures.

**Keywords** Temporomandibular joint disorders · Temporomandibular joint dysfunction syndrome · Temporomandibular joint · Third molar · Risk · Oral surgery

### Introduction

Surgical treatment for third molar removal is a common clinical practice in dentistry [1–3]. The benefits include the prevention of caries, pericoronaritis, root resorption on the distal surface of

second molars, and odontogenic cysts [1–4]. However, the prophylactic removal of asymptomatic third molars has been the subject of considerable controversy. There is insufficient evidence to support or refute the prophylactic extraction of asymptomatic impacted third molars, even in adult patients [2–6]. On the other hand, if early removal of third molars could prevent the risk of future pathology or minimize postoperative risks [2–4], then this surgical procedure may result in several types of morbidity, such as hemorrhage [2, 3, 6, 7], alveolitis [2, 3, 5, 6, 8], alveolar osteitis [2, 3, 5–7], bleeding [2, 3, 6–8], abscesses [3, 7], dehiscence [3, 7], maxillary and/or mandibular tuberosity bone fracture [2, 3, 6], injury to the inferior alveolar nerve [2, 3, 5–7], pain [2, 3, 5, 6, 8], swelling [2, 3, 6, 8], injury to adjacent teeth [2], trismus [2, 3, 6, 8], infection [2, 3, 5, 6], and dysfunctions of the stomatognathic system [2, 5, 9].

Among others, one risk that can be associated with removal of third molars is the possibility of developing damage to the temporomandibular joint (TMJ), causing temporomandibular disorders (TMDs), the most prevalent of all chronic conditions of orofacial pain [2, 9–11].

First Author: Yohana Sandy Souza Damasceno

All authors read and approved the final manuscript

**Electronic supplementary material** The online version of this article (<https://doi.org/10.1007/s00784-020-03277-6>) contains supplementary material, which is available to authorized users.

✉ David Normando  
davidnormando@hotmail.com

<sup>1</sup> Department of Orthodontics, Dental School, Faculty of Dentistry, Federal University of Pará (UFPA), Augusto Correa St., no 1, Belém, Pará 66075-110, Brazil

<sup>2</sup> Facultad de Odontología, Universidad Católica Redemptoris Mater, Managua, Nicaragua



King Saud University

Saudi Dental Journal

www.ksu.edu.sa  
www.sciencedirect.com



ORIGINAL ARTICLE

## Prevalence of impacted third molars and the reason for extraction in Saudi Arabia



Lina Alfadil <sup>a,\*</sup>, Emtenan Almajed <sup>b</sup>

<sup>a</sup> Riyadh Elm University, Riyadh, Saudi Arabia

<sup>b</sup> Oral Maxillofacial Surgery Consultant, Department of Oral Maxillofacial Surgery, Prince Sultan Military Medical City, Riyadh, Saudi Arabia

Received 4 November 2019; revised 25 December 2019; accepted 5 January 2020

Available online 13 January 2020

### KEYWORDS

Third molar;  
Impacted;  
Prevalence;  
Extraction;  
Saudi Arabia;  
Winter classification;  
Pell and Gregory classification;  
Referral

**Abstract** *Purpose:* This study aims to record the current pattern of third molar impactions and relevant reasons for extraction in Riyadh, Saudi Arabia. We hypothesized that the principal reason for extraction was elective.

*Material and Methods:* Orthopantomograms (OPG) radiographs and electronic files relating to 4000 patients were retrospectively collected from patients between the ages of 21 and 50 years old. Of these, 1014 were included in this study (514 females, 500 males). The classification was determined according to the Winter, Pell, and Gregory classification. The analysis was done using the chi-square ( $\chi^2$ ) test, with SPSS version 25 (IBM, Inc, Chicago, IL). A *p*-value of  $< 0.05$  was considered statistically significant.

*Results:* A total of 2240 impacted third molars were found with no gender predilection. Impaction was more commonly found in the mandible (58.5%) than the maxilla (41.5%). The most common reason for extraction was 'asymptomatic; prophylactic indication' (66.8%), followed by 'symptomatic' (33.2%). Vertical angulation was most common in the maxilla (56.5%), and mesioangular impaction in the mandible (40.5%).

*Conclusion:* There is a high rate of third molar impaction in the central region of Saudi Arabia. It is more likely to occur in the mandible than the maxilla with no gender predilection. The majority of the patients were referred for elective asymptomatic reasons. Mesio-angular impaction is mostly found in the mandible and vertical angulation in the maxilla. Both arches had a C level depth and Class I Ramus relationship. Further studies should be conducted with the wider Kingdom of Saudi Arabia so that the population can be more accurately represented.

© 2020 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

\* Corresponding author at: Riyadh Elm University, 12734 King Fahad Branch Rd, Riyadh, Saudi Arabia.

E-mail address: [Dr.LinaAlfadil@gmail.com](mailto:Dr.LinaAlfadil@gmail.com) (L. Alfadil).

<sup>†</sup> This research did not receive any specific grant from funding agencies in the public, commercial, or not-for profit sectors.

Peer review under responsibility of King Saud University.



Production and hosting by Elsevier

<https://doi.org/10.1016/j.sdentj.2020.01.002>

1013-9052 © 2020 The Authors. Production and hosting by Elsevier B.V. on behalf of King Saud University.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).