









## REVIEW PAPER

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# Extraction of asymptomatic impacted third molars – a review

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## ABSTRACT

**Introduction.** The prophylactic extraction of asymptomatic wisdom teeth is defined as the surgical removal of wisdom teeth in the absence of local disease. Early extraction of asymptomatic third molars is considered beneficial to patients to prevent the risk of future pathology, and to minimize operative and postoperative risks. The second concept is watchful monitoring of asymptomatic wisdom teeth, adhering to specific indicators for their extraction.

**Aim.** The aim of this paper is to present and evaluate the indications and effects of prophylactic extraction of asymptomatic impacted third molars in adolescents and adults, compared with their retention and watchful monitoring.

**Material and methods.** This study is based on analysis of literature.

**Conclusion.** There exist clear indications for the extraction of third molars which are associated with pathology. Prophylactic extractions of asymptomatic impacted third molars should be performed only before 20 years of age. In older age, asymptomatic third molars should be retained and watchfully monitored, and removed only in cases of evident clinical or radiological symptoms.

**Keywords.** impaction, surgery, third molars, wisdom teeth

## Introduction

Third molar extractions are one of the most common dental surgical procedures, especially in young adults. Since many third molars require surgical removal, the costs associated with this procedure can be significant. Although the risks associated with third molar extractions are generally minor, like pain and swelling, some complications may be more serious, such as injury to the temporomandibular joint (TMJ), or permanent tongue or lip paraesthesia. Third molars do not always fulfill a functional role in the mouth, however, they

are the most common teeth to be impacted. They can be asymptomatic for many years with a lack of indications for extraction. Conversely, third molars can be the source of many pathologies, including recurrent pericoronitis, development of follicular cysts and dentigerous tumours, deep caries in second and third molars, neuropathic pain, TMJ abnormalities, and periodontal pockets. Due to decisions regarding removal or retention of third molars often being made in late adolescence and early adulthood, understanding the risks and benefits of removal or retention during this time period is impor-

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tant. There are two strategies for managing third molars. The first concept, prophylactic extraction of asymptomatic wisdom teeth, is defined as the surgical removal of wisdom teeth in the absence of local disease. Early extraction of asymptomatic third molars is considered beneficial to patients to prevent the risk of future pathology, and to minimize operative and postoperative risks. The second concept is watchful monitoring of asymptomatic wisdom teeth, adhering to specific indicators for their extraction.<sup>1-10</sup>

The aim of this paper is to present and evaluate the indications and effects of prophylactic extraction of asymptomatic impacted third molars in adolescents and adults, compared with their retention and watchful monitoring.

### Indications for third molar extraction

The current clinical condition and the potential risk of future complications are the most important factors in choosing the appropriate strategy. Mandibular third molars have the greatest incidence of impaction with 33% of the population having at least one impacted tooth.<sup>6</sup> Third molars are frequently impacted due to skeletal insufficiency in the area of their eruption. Sagittal growth of the mandible finishes earlier than eruption of third molars, in many cases leading to impaction. Proper mandibular third molar eruption also depends on a favourable path of eruption. If the tooth bud is medially angulated during the initial stages of calcification and root development, this path of eruption will be unfavourable. Root angulation is also correlated with third molar impaction. Angulated roots are more common in impacted mandibular third molars, as compared to erupted mandibular third molars.<sup>4-6</sup> However, unfavourable prognosis of eruption and impaction of third molars does not always give clinical symptoms and local diseases. Indications for tooth extraction are based upon the recommendations of the American Association of Oral and Maxillofacial Surgeons (AAOMS), and include pericoronitis, operculitis, periodontal ligament damage and bone loss, adjacent tooth root resorption or caries, radiolucency caused by the impacted tooth, impaction of both third and adjacent second molars, unresorable caries, overeruption, and a missing antagonistic tooth.<sup>11</sup> The prophylactic removal of asymptomatic impacted wisdom teeth is defined as the surgical removal of wisdom teeth in the absence of local disease. In most Western countries, the prophylactic extraction of asymptomatic third molars, either impacted or fully erupted, has long been considered as appropriate care. However, prophylactic extraction of asymptomatic wisdom teeth may lead to considerable postoperative complications. The prevalence of asymptomatic impacted third molars varies widely and is influenced by age, gender, and ethnicity. The low frequency of pathologi-

cal changes related to impacted wisdom teeth has been used to promote a more cautious approach. Health risks and cost-effectiveness of the prophylactic removal of asymptomatic impacted wisdom teeth should play a more prominent role in the decision-making process. Moreover, as the costs of surgical extractions are significant, removal of asymptomatic impacted wisdom teeth that may remain disease-free indefinitely produces an unnecessary burden on healthcare resources. Prudent decision-making, with adherence to specific indicators for extraction, may reduce the number of surgical procedures by 60% or more.<sup>12</sup> The decision-making process regarding the prophylactic extraction of asymptomatic impacted wisdom teeth should be based on the patients' perspectives, values, and attitude.

One of the most relevant causes of prophylactic extractions of impacted third molars is the surgical extraction of asymptomatic wisdom teeth following orthodontic therapy to prevent late incisor crowding. The results of research are controversial and they do not correspond to each other. According to Mettes et al., it is not possible to predict whether a given adolescent participant will benefit from the extraction of impacted third molars with regard to late incisor crowding.<sup>13</sup> The length of the arch increases in some participants while in others the arch length decreases during the observation period. The length of the arch in the whole sample does not change differently on the extraction side when compared with the control side of the same patients. The extraction side has a more favourable development than the control side in 70% of cases; however, the control side has a more favourable development in 30%.<sup>14</sup> The other trial shows no significant difference between both groups. The conclusion drawn from this randomized prospective study is that removal of impacted third molars to reduce or prevent late incisor crowding cannot be justified. Despite a remarkable agreement regarding third molar prognosis, orthodontists and oral maxillofacial surgeons were unable to predict lower third molar eruption by examining a simple panoramic radiograph.<sup>15</sup> Moreover, the shortening of the arches is to some extent due to the pressure exerted by the erupting second molars. However, a reliable association between this event and third molars cannot be made until jaw growth and root development is completed. Mettes et al., compared extraction of asymptomatic wisdom teeth with their retention and only evaluated the effects on crowding after a 5 year follow-up. Three measurements of crowding were assessed: intercanine width (ICW), arch length (AL) and Little's irregularity index (LII), and the results were inconsistent.<sup>13</sup> The main limitation of these studies is a loss of future follow-up in the retention group of older aged patients. According to Friedman et al., third molars do not possess sufficient force to move other teeth. It is not possible for lower

third molars, which develop in the spongy interior cancellous tissue of bone with no firm support, to push 14 other teeth with roots implanted vertically, like the pegs of a picket fence, so that the incisors in the middle twist and overlap.<sup>16</sup> Similar results are presented in a study by Costa et al., where no significant differences were found in lower incisor crowding between patients from whom third molars were extracted, and from those on whom no intervention was performed; thus, the prophylactic extraction of third molars is not justified.<sup>17</sup> On the other hand, severe crowding is an indication for third molar extraction.<sup>17</sup> Furthermore, a crowding problem may be multifactorial in origin, and the third molar can be influential in individual cases.<sup>14</sup> Prophylactic extraction is an attempt to avoid or minimize periodontal morbidity associated with the retention of impacted third molars. The general conclusions from both retrospective and prospective clinical observations are that impacted third molars represent a serious periodontal hazard, which cannot be overcome by the usual procedures for pocket eradication, and delay in removal of impacted third molars beyond 25-30 years of age is detrimental to the periodontal health of the second molars.<sup>14</sup> Maxillary third molars are principally a source of future periodontal problems. Many studies have stressed the importance of prophylactic extraction of third molars to prevent periodontal pathology and the potential systemic health problems associated with periodontal disease.<sup>18</sup> The prophylactic extraction of asymptomatic third molars should be performed before the onset of symptoms. A common symptom of periodontal pathology is a pocket depth of 4 mm or deeper. Although these pockets in the second and third molar area may be influenced by the eruption status of the third molar, it is unclear whether a 4 mm pocket is always indicative of periodontal disease, as it is usually based on attachment loss and the presence of inflammation, rather than just pocket depth.<sup>2</sup> Previous studies reported that 38% of second molar distal sites with 4 mm or more pocket depths at baseline had an increase in pocket depth of 2 mm or more during the follow-up period of 2.2 years.<sup>19</sup> Prophylactic asymptomatic extraction of impacted third molars reduces probing pocket depths (PPD) and probing attachment levels (PAL).<sup>20</sup> Reduction of these indices positively correlates with clinical improvement. Young patients may benefit from early extraction of mandibular third molars, especially in the presence of certain cofactors.<sup>20</sup> Attachment loss is a more preferred periodontal pathology symptom than deep periodontal pockets. The average rate of attachment loss at distal sites of second molars was minimal over a 2-year period, regardless of third molar retention or extraction.<sup>2</sup>

The dentist's management of third molars commonly hinges on identifying the presence of symptoms or diseases that are clearly attributable to the third molar.

Dodson developed a useful guide that serves as a systematic and unambiguous way to classify third molars. According to Dodson, 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-).<sup>21</sup>

**Table 1.** Dodson's classification

Group	Symptoms attributable to third molars (Sx)	Clinical or radiographic evidence of disease (D)
Group A: pericoronitis, dental caries, infection (facial space infection, pulp necrosis)	Yes	Yes
Group B: myofascial or deafferentation pain (atypical)	Yes	No
Group C: periodontitis, periodontal attachment loss, coronal caries, cyst or tumour associated with the tooth	No	Yes
Group D: non-functional (unopposed and soon to supra-erupt), orthodontic indications, planned orthognathic surgery, removable prosthetics	No	No

This classification may change the description of asymptomatic third molars and indications for their extraction. The absence of symptoms which are common indications for third molar extractions, does not always reflect the true absence of disease.<sup>21</sup> Data presented in this classification is not sufficient to refute or support prophylactic extraction of third molars in group D versus active surveillance. Active surveillance, a prescribed program of follow-up and reassessment at regular intervals, is recommended for retained third molars, rather than waiting for the onset of symptoms to initiate a follow-up.<sup>21</sup> Ventä et al., recommends the preventive extraction of third molars at a young age in 3 groups of teeth: partially impacted teeth in the horizontal position, partially erupted teeth in the vertical position, and incomplete roots growing close to the mandibular canal. About one fourth of retained and disease-free third molars need to be removed preventively at a young age, whereas the rest should be treated according to signs and symptoms.<sup>22</sup> The estimated risk of complications, inclination of molars, age, degree of impaction, and patient sex, in decreasing order, are the main factors influencing the decision to extract third molars. The surgical experience of the dental professional does not seem to influence treatment decision.<sup>23</sup>

One of the most relevant factors for prophylactic extraction of third molars is a high incidence of pathology. However, this incidence is the same as for appendicitis (10%) and cholecystitis (12%), yet prophylactic appendectomies and cholecystectomies are

not the standard of care. No more than 12% of impacted teeth have an associated pathology.<sup>16</sup> Moreover, the risk of pathology in impacted third molars does not increase with age. The most severe pathologies related to third molars are dentigerous tumours and follicular cysts. The prevalence of cyst and tumour development around mandibular molars ranges between 2% and 6.2% in the long term.<sup>24</sup> On the contrary, histologically detected pathologic changes in the follicles of impacted third molars are found in 23% of asymptomatic third molars.<sup>25</sup> Simsek et al., detected cystic changes in 10% and inflammatory changes in 62% of extracted asymptomatic lower third molars.<sup>26</sup> There is no relation between the angular position of the tooth and pathologic changes.<sup>25,26</sup> Asymptomatic third molars should be actively monitored. Conversely, cyst formation is determined by age and tooth development. The occurrence of squamous metaplasia is greater in patients older than 20 years of age, demonstrating that the prevalence of squamous metaplasia increases with age. Moreover, a significant association is also observed between inflammation and squamous metaplasia.<sup>27</sup> These two factors support the argument for early extraction of impacted third molars. Pericoronal radiolucencies wider than 2.5 mm seem to dysregulate cell death and increase anti-apoptotic bcl-2 protein activity, which increases the likelihood of pathological changes arising in the follicle of third molars.<sup>24</sup> A study of more than 1756 patients who had retained more than 2000 mandibular impacted teeth for an average of 27 years, found that only 0.81% experienced cystic formation.<sup>16</sup> According to the same authors, even a single episode of pericoronitis is not a reason to extract a third molar, and should only be considered if the problem fails to respond to conservative treatment or recurs. Overall, 20% of cases consist of pathologies and pericoronitis associated with impacted third molars.<sup>16</sup> Most discomfort experienced during the eruption of wisdom teeth is equivalent to teething and disappears on full eruption. Most infections of the gum tissue around the erupting or partially erupted teeth can be prevented by good oral hygiene. Infection occurs in fewer than 10% of third molars, most of which can be cured with antibiotics, oral rinsing, or removal of excess tissue around the tooth, without requiring extraction of the tooth itself. One of the suggested indications for removal of third molars is the suspicion of possible pathology in second molars. Current literature reports a low prevalence of second molar external resorption (0.3 to 7%), although this percentage can be four times higher if, instead of analyzing panoramic radiographs, Cone Beam Computed Tomography (CBCT) is used. Second molar resorption is selected by more than 11% of the clinicians as an indication to extract third molars.<sup>24</sup> Additionally, impacted third molars and distal surfaces of second molars are prone to

caries. According to Nunn et al., the presence of a third molar that is soft tissue impacted leads to a 4.88-fold increase in the risk of incidence of second molar pathology. Having an erupted or “bony” impacted third molar increases the risk of incidence for second molar pathology by 1.74 and 2.16, respectively. The retention of third molars is associated with increased risk of second molar pathology in middle aged and older adult men.<sup>28</sup> According to Huang et al., the incidence of caries on the distal surface of the second molars is less than 1%. Caries rate for third molars is approximately 3.3% on the occlusal surfaces.<sup>2</sup> The incidence of caries on the distal surfaces of second molars is extremely low, whether third molars are extracted or retained. In patients who returned for a 2-year follow-up examination, fewer than 0.5% of surfaces displayed evidence of caries overall.<sup>2</sup> This complication depends on the depth of impaction and position of the impacted tooth. The probability of developing caries in the distal aspect of the second molars increases when the angulation between the third and the second molars is between 43° and 71°, or if the distance between the cemento-enamel junction of the two teeth is between 3 and 10 mm.<sup>24</sup> Similar rates of angulation as an indication for prophylactic extraction are suggested by Srivastava et al.<sup>29</sup> Fernandes et al., analyzed how many third molars survived 1 year of study period symptom-free. After 1 year, only 37 teeth had been extracted from the 676 teeth examined. 94.53% of all teeth survived the study period. After 1 year, 562 teeth (81.13%) of all 676 teeth observed survived the study period symptom-free. About 114 teeth (16.87%) developed some form of symptoms over the study period. It is very interesting to note that the development of symptoms is not necessarily translated into extraction, and unfortunately a small amount of teeth (1.48%) were extracted without any symptoms recorded by the clinician or any symptoms that could be remembered by the patients themselves.<sup>3</sup>

There are differences in management with third molars between general dentists and oral surgeons. Oral surgeons recommend third molar extraction more often than general dentists. Another noteworthy aspect of third molar management is patient adherence to the dental professional's recommendation. Although many patients are referred for third molar extraction by their general dentist or orthodontist, studies usually only focus on patients who present to oral surgery clinics. Adolescent patients and their parents may or may not follow their dentist's recommendation to retain or extract third molars.<sup>30,31</sup> In the study of Cunha-Cruz et al., the main reasons for recommending extraction were to prevent future problems (79%), unfavourable third molar orientation, and third molars that were unlikely to erupt in the dentist's opinion (57%). The least common reasons for recommending third molar extraction are

pericoronitis, periodontal concerns, dental caries and other pathologies. Dentists recommended retention and monitoring in 46% of participants. The main reason for recommending retention was that it was too early to decide (73%), followed by favourable eruption (26%), and fully erupted third molars (16%).<sup>31</sup> When dentists recommended extraction, 55% of participants adhered to this recommendation during follow-up, and the main reason was the availability of insurance. General dentists frequently recommended extraction of third molars for reasons not related to symptoms or pathology, but rather to prevent future problems.<sup>31</sup> Although evidence on the benefits of asymptomatic third molar extraction is conflicting, dentists recommend prophylactic extraction on the basis of unfavourable prognosis and for prevention of future possible problems. According to general dentists, monitoring of asymptomatic third molars is a more cost-effective strategy for the management of third molars.<sup>31</sup>

In previous research, many patients reported pain and swelling associated with third molars and wanted third molars extracted to prevent a recurrence of these symptoms, which decreased their quality of life. The severity of any pre-surgical morbidity may help clinicians and patients select treatment alternatives in circumstances where clinical indicators alone do not provide a clear-cut indication of whether to proceed with surgery. Patients whose quality of life is adversely affected by pre-surgical conditions may elect to have surgery, even when clinical criteria suggests that surgery and conservative management could be equally effective. The concept of prophylactic extraction of third molars must consider the patient's quality of life, by aiming to reduce the first symptoms or future possible recurrent pain or swelling. In the study of Slade et al., one third of patients said they were seeking third molar surgery because of current or previous symptoms of pain or swelling, and 17% reported one or more of the 12 non-pain-specific Oral Health Impact Profile (OHIP) questionnaire items.<sup>32</sup> A contemporary view is that health involves more than the absence of disease. The quality of life, social, psychological aspects, and interaction are now accepted as an integral part of overall health. These findings showed that if patients had third molar symptoms of pain and swelling sufficient to prompt them to seek surgery, their quality of life is adversely affected. The fear for future pain or swelling may be an important indication for prophylactic extraction of asymptomatic third molars.<sup>32</sup> It is worth noting that when offered the choice of retention or extraction, most patients (60%) with asymptomatic, disease-free third molars elected for extraction. When symptoms or diseases related to third molars are present, more than 95% of patients chose extraction as the preferred treatment.<sup>33</sup>

### Postoperative complications

Extraction of third molars is associated with postoperative complications, with reported rates ranging between 6.9-30.6%. According to Schwartz-Arad et al., the total complication rate of third molar extractions was 16.9%.<sup>11</sup> Their development is conditioned by local and general factors including tooth position, age and health status of the patient, knowledge and experience of the surgeon and surgical equipment, surgical technique, and inappropriate irrigation during surgery.<sup>5</sup> The complications associated with removal of impacted teeth might be more serious when compared with the same observed complications in younger patients. Zhang et al., detected a higher incidence of postoperative complications in the group of patients above 23 years old with mature teeth with closed apical foramen, than in patients below 23 years old with immature teeth without a closed apical foramen.<sup>34</sup> Immediate complications include pain, trismus, swelling, dysphagia, while delayed complications include bleeding, dry socket, wound dehiscence, delayed wound healing, infections, periodontal pocketing, and nerve injury.<sup>5,11</sup> The rates of frequency of swelling and mild pain after extraction of impacted third molars were 10% and 40%, respectively.<sup>5</sup> Difficult extraction of impacted third molars may trigger periodontal pocketing distal to the second molars. According to Coleman et al., probing sites after 6 months post-extraction remain unchanged and extraction of the impacted maxillary third molar does not result in significant periodontal defects on the distal aspect of the adjacent second molar. Moreover, in many cases it results in an improvement of the probing depths of these teeth.<sup>35</sup> Postoperative complications depend on the degree of impaction. Partially impacted teeth show the highest degree of complications. The incidence of postoperative dry socket in the presence of caries or pericoronitis is reported as 21.9%, compared to 7.1% without any symptoms.<sup>11</sup> Preoperative pericoronal inflammation is also a risk factor for complications after third molar surgery.<sup>4,36</sup> This further supports the idea of prophylactic extraction of asymptomatic third molars to eliminate possible, recurrent complications associated with these teeth. These complications are also age-dependent. The lowest complication rate was observed in the 10-to-18-year age group (4.8%) whereas in the >36-year age group, the complication rate was more than four times higher. Reduction in complications in the 10-to-18-years group highlights the importance of extracting third molars at an early stage, prior to the completion of root formation.<sup>4,11</sup> Younger patients are less prone to postoperative complications.<sup>19</sup> Reduction of dry socket, pain and swelling in adolescents and young adults are indications for prophylactic extractions of asymptomatic third molars. Conversely, partially impacted teeth had a higher incidence of postoperative lingual numbness (14.9%), compared to fully impacted teeth (9.7%).<sup>7</sup> Old-

er age also increases the risk of temporary lingual and inferior alveolar nerve damage.<sup>34,37</sup> Patients in the youngest age group were found to have a lower risk of an extended operation time than older patients. Shorter time required for extraction in younger patients was likely associated with the structure of bone and the level of tooth development.<sup>37</sup> The higher risk of postoperative complications in elderly patients might be due to the different techniques of tooth extraction used in the elderly, because of the higher density of bone. Osteoporotic or sclerotic bone, dental ankylosis, use of various drugs for coagulation may all predispose to postoperative complications and more difficult surgical extraction of third molars in a more advanced age.<sup>6</sup> Another explanation may be that erupted molars in older patients have been used for mastication and are therefore more tightly connected to the alveolar bone by the periodontal ligament.<sup>5</sup> Many oral surgeons recommend prophylactic extractions of asymptomatic third molars at a younger age because of the simpler technique of extraction, shorter procedure time and lower risk of postoperative complications. Most postoperative complications such as dry socket, swelling, trismus, pain and delayed-onset infections (DOI) are less severe in younger patients after prophylactic extraction of asymptomatic third molars. In contrast, previous research reported that the rates of lip or tongue paraesthesia was significantly higher in patients who underwent third molar extraction. Moreover, these effects lasted longer than the immediate postsurgical period. Paraesthesia has been reported to occur in about 1% to 6% of patients undergoing third molar extraction.<sup>2</sup> Occurrence of these complications depends on third molar orientation, depth of impaction and anatomical relationships between third molars and the mandibular canal. Deep impaction of third molars significantly increases surgical difficulties and the risk of inferior alveolar or lingual nerve damage. In our opinion, it is the most severe and possibly permanent postsurgical complication, and should be taken into consideration when making the decision to extract asymptomatic impacted third molars.

TMJ symptoms are often associated with third molar eruption or impaction and they are indications for third molar removal. It is worth noting that the rate of TMJ symptoms reported by patients who had undergone a third molar extraction was much higher than expected. More than 30% of patients presented with either joint pain or muscular pain.<sup>2</sup> A growing body of evidence has indicated that third molar extractions may result in TMJ symptoms. Prophylactic extractions of third molars do not relieve TMJ symptoms and signs such as clicking, jaw pain on wide opening, pain in temples, but may even cause or exacerbate such symptoms.<sup>2</sup>

The second group of postoperative complications is delayed-onset infections (DOI) after mandibular third-molar extractions. They are rare and are charac-

terized by swelling, usually with a purulent discharge at the extraction site, developing approximately a month after surgery. The incidence reported in the literature ranges between 0.5% and 1.8%.<sup>4</sup> According to Brunello et al., DOI incidence was reported in 3.7% and included dehiscence, swelling, trismus, exudate, purulent discharge, lymph node enlargement, and pain on palpation. The median time elapsing from the extraction to the DOI was 35 days. Younger age and longer surgical procedures seemed to be more often associated with this complication.<sup>4</sup>

The most important issue in case of watchful monitoring of asymptomatic third molars is the time interval of monitoring. According to Huang et al., a 2-year monitoring period is most recommended because when third molars were not extracted, considerable eruption occurred during this period.<sup>2</sup> A similar period of active surveillance is recommended by Dodson et al.<sup>38</sup> Active surveillance is characterized as a regularly scheduled set of follow-up visits that include both clinical and radiographic examinations. 50% of all third molars that were classified as partially erupted at the time of enrolment were classified as fully erupted at the end of the study. Even 18% of teeth classified as soft tissue impactions at baseline were considered fully erupted 2 years later.<sup>2,39</sup> Venta et al., reported on eruption for patients in their early 20s.<sup>39</sup>

There is still an ongoing disagreement regarding the prophylactic extraction of asymptomatic impacted wisdom teeth. There were no reliable methods to predict future pathologies related to impacted third molars. The limited information on the prevalence of pathology related to third molars in older patients suggests that prophylactic extraction of all impacted third molars before adulthood may not be justified. Longer follow-up periods are required to obtain more concrete data. Other diagnostic methods that are also indicated for third molar eruption prediction should be investigated, such as longitudinal radiographs or 3D images. Most applied techniques for the prediction of third molar impaction or eruption have involved the use of panoramic radiographs, lateral and postero-anterior cephalograms, focusing essentially on the relationship between the third molar and the space available in the retromolar area.<sup>40</sup> Additionally, the decision about whether to recommend extraction or retention of asymptomatic wisdom teeth may also be influenced by factors such as cost and possible professional liability.

## Conclusion

The decision to extract pathology-free third molars should be based on the risks and benefits of extraction, as well as the consequences of their retention in the mouth. The patient should be involved in the decision and informed of all possible options. There exist clear indications for the extraction of third molars which are

associated with pathology. Prophylactic extractions of asymptomatic impacted third molars should be performed only before 20 years of age. In older age, asymptomatic third molars should be retained and watchfully monitored, and removed only in cases of evident clinical or radiological symptoms. Active surveillance allows the dental professional to detect possible pathology before the onset of disease. The detection of these signs is an indication for tooth extraction.

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