



IMPACTED THIRD MOLAR: TO EXTRACT OR NOT TO EXTRACT, THAT IS THE QUESTION...

GÖMÜLÜ ÜÇÜNCÜ MOLAR: ÇEKMEK YA DA ÇEKMEMEK, İŞTE BÜTÜN MESELE...

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Article Info / Makale Bilgisi

Received / Teslim: May 20, 2021

Accepted / Kabul: May 31, 2021

Online Published / Yayınlanma: June 30, 2021

DOI:

Akkıtap MP, Gumru B. Impacted Third Molar: To Extract or Not To Extract, That Is The Question.... Dent & Med J - R. 2021;3(2):66-82.

Abstract

The third molars are the last teeth that erupt in the oral cavity and are also the most commonly impacted teeth in the jaws. Management of the impacted third molars by dental professionals is based on individual assessment of the clinical symptoms and the radiological findings indicative of oral pathology. Although extraction is definitely indicated in case of a pathological condition due to impacted third molars, no consensus has yet been reached on the management of asymptomatic third molars. Many studies revealed that the decision of whether or not to extract the asymptomatic impacted third molars was a challenging and controversial issue among professionals, and that accompanying pathological conditions as well as postoperative complications associated with the extraction of the impacted third molars played a critical role in this decision.

In this review, the clinical and radiological evaluation, classification, associated pathologies, and management of the impacted third molars are discussed comprehensively, and it is aimed to assist dental professionals in the decision of prophylactic extraction of the third molars as well as to provide guidance in the treatment planning of the associated pathologies.

Keywords: impacted third molar, asymptomatic, extraction, pathology.

Özet

Üçüncü molar dişler; oral kavitede en son süren ve aynı zamanda çenelerde en sık gömülü kalan dişlerdir. Gömülü üçüncü molar dişler için diş hekimlerinin yaklaşımı oral patolojinin göstergesi olan klinik semptomlar ve radyolojik bulguların değerlendirilmesine dayanmaktadır. Gömülü üçüncü molar dişlere bağlı patoloji mevcut olması durumunda çekim kesinlikle endike iken, asemptomatik üçüncü molar dişlerin tedavisi konusunda henüz bir fikir birliğine varılamamıştır. Birçok çalışma asemptomatik gömülü üçüncü molar dişlerin çekilip çekilmemesi kararının diş hekimleri için zorlayıcı ve tartışmalı bir konu olduğunu ve eşlik eden patolojik durumların yanı sıra gömülü üçüncü molar dişlerin çekimi ile ilişkili postoperatif komplikasyonların bu konuda kritik bir rol oynadığını ortaya koymuştur.

Bu derlemede, gömülü üçüncü molar dişlerin klinik ve radyolojik değerlendirmesi, sınıflandırması, ilişkili patolojileri ve tedavi yaklaşımları kapsamlı bir şekilde tartışılmakta, profilaktik çekim kararı konusunda hekimlere yardımcı olmak ve ilişkili patolojilerin tedavi planlamasında rehberlik sağlamak amaçlanmaktadır.

Anahtar Kelimeler: gömülü üçüncü molar diş, asemptomatik, çekim, patoloji.

OVERVIEW / GENEL BAKIŞ

Surgical removal of the third molars, which are the most commonly impacted teeth (16.7-68.6% of all impacted teeth), was cited as one of the most frequent surgical procedures performed by oral and maxillofacial surgeons worldwide (1,2).

Third molars may appear on radiographs at the earliest at 5 and at the latest at 16 years of age, and are expected to erupt between the ages of 18 and 24 (3,4). However, they may fail to erupt within the expected time due to local factors (lack of space, retained/ankylosed deciduous teeth, premature loss of deciduous teeth, supernumerary teeth, ectopic positioning of tooth buds, obstruction of eruption path, infection, trauma, cyst/tumour, dilaceration), systemic factors (malnutrition, radiation, anaemia, rickets, vitamin D deficiency, cretinism, endocrine diseases, cleft palate, specific infections such as syphilis and tuberculosis, specific syndromes such as cleidocranial dysostosis, oxycephaly, progeria, and achondroplasia) and also genetic factors (1,4).

Mandibular third molars are presented to have a higher impaction incidence in comparison to their maxillary counterparts, and the tendency of third molar impaction is reported to be higher in females compared to males (1,5).

Most impacted third molars may remain asymptomatic throughout life, whereas some may cause various pathological conditions including pericoronitis, dental caries, pulpitis, periodontitis, marginal bone loss, external root resorption (ERR), neuropathic pain, odontogenic cyst/tumour, mandibular fracture, and late anterior crowding depending on factors such as eruption status and position.

While the indication for both "disease-positive and symptom-positive" or "disease-positive and symptom-free" impacted third molars is therapeutic removal, the necessity of prophylactic removal of "disease-free and symptom-free" impacted third molars is still controversial (2,6). A large number of asymptomatic third molars are extracted without any pathological signs. Some researchers argued that prophylactic removal was not suitable for the asymptomatic impacted third molars (2,6). In this context, the decision of extraction should not be generalized and the necessity should be assessed individually for each case.

In this review, the clinical and radiographic assessment, classification, associated pathologies, and management of the impacted third molars are discussed and it is aimed to assist dental professionals in the decision of prophylactic extraction and to guide the treatment planning of associated pathologies.

CLINICAL AND RADIOGRAPHIC ASSESSMENT

Assessment of impacted third molars is performed by clinical and radiographic evaluations. The clinical evaluation includes inspection and palpation of the temporomandibular joint (TMJ) and movement of the mandible, determination of mobility characteristics of lips and cheeks, size and contours of the tongue, and appearance of soft tissue overlying the impacted teeth (4,7). Radiographic assessment of the impacted third molars includes relationship with the adjacent teeth, size of the follicular sac, morphology of the root, density

of the surrounding bone, relation to the inferior alveolar nerve/vessels, the bucco-lingual position, relationship with the mandibular corpus/ramus, and possible presence of pathologies (4,7,8).

Panoramic radiography (OPTG) is preferred as the primary imaging modality in assessment of the impacted third molars and associated pathologies. Although OPTG helps diagnosis, follow-up of tooth eruption, and evaluation of treatment results, it has the potential to be misinterpreted due to reasons such as magnification, distortion, and blurring and may not be sufficient in most cases with pathologies including caries, marginal bone loss, and ERR due to the superimposition of anatomical structures and adjacent teeth to the relevant area (9). On the other hand, cone beam computed tomography (CBCT) supplies more accurate diagnostic data in terms of relationship of the impacted tooth with the adjacent tooth, the nasal floor, the maxillary sinus, and the mandibular canal without overlapping of the anatomical structures in three dimensions (10).

CLASSIFICATION

Third molars have been classified in many different ways over the years. Among these, the Winter classification (1926) used to indicate the angulation of the third molars, the Pell&Gregory classification (1933) used to indicate the relationship between the third molar, the anterior border of the mandibular ramus and the second molar, and the impaction depth, and Archer classification (1975) used to indicate both the angulation and the depth of impaction are still frequently preferred as the best-known classifications (11-13) (Table 1).

Table 1. Classifications of third molar impaction (11-13).

	Winter Classification (1926)
Mandibular Impacted Third Molar	<ul style="list-style-type: none"> • Vertical: The long axis of the third molar parallel to the long axis of the second molar • Horizontal: The long axis of the third molar perpendicular to the long axis of the second molar • Mesioangular: The long axis of the tooth tilted toward the second molar in a mesial direction • Distoangular: The long axis of the third molar angled distally or tilted backwards to the long axis of the second molar • Linguoangular: Combined with the previous factors, the tooth can be lingually (tilted toward the tongue) impacted • Buccoangular: Combined with the previous factors, the tooth can be buccally (tilted toward the cheek) impacted • Complete lingual: The tooth, in effect, horizontally impacted but in a cheek-tongue direction. • Unusual (inverted): The tooth reversed and positioned upside down
	Pell and Gregory Classification (1933)
	<ul style="list-style-type: none"> • Class 1: Sufficient space for accommodation of the mesiodistal diameter of the third molar crown

	<ul style="list-style-type: none"> • Class 2: The space between the ramus and distal side of second molar less than the mesiodistal diameter of the third molar • Class 3: All/most of the third molar is located within the ramus
	<ul style="list-style-type: none"> • Class A: The occlusal plane of the third molar is above or at the level of the occlusal plane of the second molar • Class B: The occlusal plane of the third molar lies between the cervical line and the occlusal plane of the second molar • Class C: The occlusal plane of the third molar lies below the cervical line of the second molar
<p>Maxillary and Mandibular Impacted Third Molar</p>	<p>Archer Classification (1975)</p>
	<ul style="list-style-type: none"> • Vertical: The impacted tooth has not erupted completely and the crown of the third molar lies near the root of the second molar • Horizontal: The impacted tooth lies horizontally in the alveolar bone, with the crown towards the second molar and the root tips towards the distal side • Mesioangular: The impacted tooth is positioned with the crown pointing in the mesial direction towards the second molar and the roots pointed distally • Distoangular: The impacted tooth is positioned with the crown pointing in the distal direction towards the second molar and roots pointed mesially • Buccoangular: The impacted tooth is positioned in such a way in the alveolar bone that the occlusal surface of the crown is towards the buccal aspect • Linguoangular: The impacted tooth is positioned in such a way in the alveolar bone that the occlusal surface of the crown is towards the lingual aspect • Inverted: The impacted tooth is completely inverted with the root tip towards the occlusal surface and the crown of the tooth towards the root of the second molar
	<ul style="list-style-type: none"> • Class A: The occlusal surface of the impacted tooth is at approximately the same level as the occlusal surface of the second molar • Class B: The occlusal surface of the impacted tooth is at the middle of the crown of the adjacent second molar • Class C: The occlusal surface of the crown of the impacted tooth is below the cervical line of the adjacent molar or ever deeper, contiguously or even above its roots

Partially/fully impacted third molars were also classified as complete bony impaction, partial bony impaction, and soft tissue impaction considering the nature of the overlying tissue (8,14). Additionally, Rood and Shehab (1990) conducted a classification of the relationship of the lower third molar to the mandibular canal in OPTG (15). Recently, Maglione et al. proposed a radiological CBCT classification for positional relationship of mandibular canal and mandibular third molar (16).

ASSOCIATED PATHOLOGIES

Impacted third molars may remain asymptomatic or be associated with a variety of pathological conditions that are detailed below (8) (Figure 1).

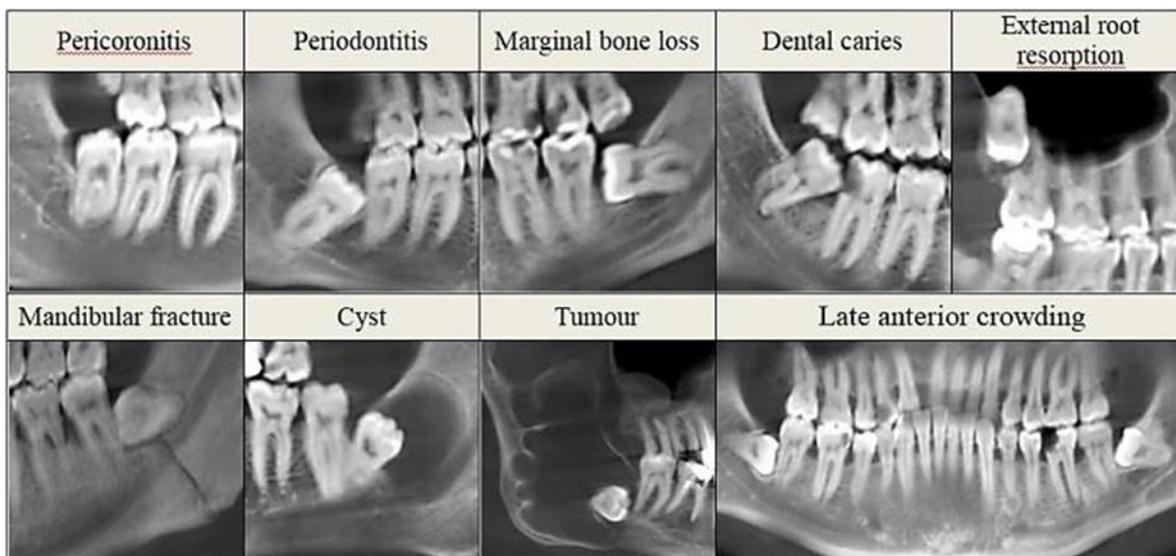


Figure 1. Pathologies related to third molar impaction

Pericoronitis

Pericoronitis, which is considered to be an inflammation of the soft tissue covering the partially/fully impacted third molar and is usually accompanied by pain and swelling around the crown, is the most common pathology associated with the impacted third molars (2,8). However, the eruption process with a likelihood of causing minor gingivitis with similar symptoms may be mistakenly diagnosed as pericoronitis by clinicians (8).

Braimah *et al.* demonstrated that the extra bacterial load beneath the soft tissue in addition to that in the pathological pockets may lead to a favourable area for the emergence of pericoronitis (5). Although several studies demonstrated that pericoronitis is more commonly associated with vertical impaction (17,18), there are also studies reporting that it is more common in mesioangular impaction (5).

Dental Caries

The distal surface of the second molar adjacent to the impacted third molar is prone to debris accumulation. Persistent food lodgement, failure to clean the relevant area, and lack of oral hygiene practices may cause the development and progression of the distal caries in the second molars, especially in the cemento-enamel junction (CEJ) which is particularly vulnerable for caries inception (19). Unfortunately, the distal caries in the adjacent second molar are often diagnosed late and may ultimately lead to pulpitis/apical periodontitis that require endodontic treatment or extraction (2,20).

Several studies demonstrated that the contact and pressure on the second molars causes the development of the distal caries (10). Recently published data showed that horizontally impacted or partially

erupted mesioangular third molars having contact points at/below the CEJ of the second molars pose a higher risk of causing distal caries compared to those with contact points above the CEJ (20). Besides, Chen *et al.* suggested that food impaction between the second and third molars may occur more commonly and cleaning may be more demanding when the third molar is either buccally or lingually dispositioned (21).

Periodontitis

The impacted third molars have been recognized as a high risk for periodontal pathology affecting the distal aspect of the adjacent second molars (22). Blakey *et al.* reported significant improvement in the periodontal status of the distal aspect of the second molars as well as in the overall periodontal health with removal of the impacted third molars (23). On the contrary, some studies suggested that the impacted third molar removal has a negative impact on the periodontal status of the second molar (24).

Partially impacted third molars are reported to constitute a serious periodontal risk factor (25). It was suggested that the surgical removal of a partially impacted tooth usually results in greater weakening of the periodontal tissues distal to the second molar compared to a fully impacted tooth (26). Furthermore, mesioangular impaction, which creates an area difficult to clean properly and more suitable for food entrapment and bacterial colonization, was reported to be mostly associated with periodontitis (17).

Marginal bone loss

Marginal bone loss on the distal aspect of the adjacent second molar plays an important part in predicting the prognosis of the tooth and deciding on surgical intervention. More specifically, regarding the prognosis of the second molars, both horizontal and mesioangular positions of the impacted third molars were reported to increase the risk of adjacent bone loss. Moreover, a study evaluating the effect of age and gender on bone loss in the second molars adjacent to the impacted third molars revealed that age was an important consideration in patients with severe bone loss, but gender was not reported to play a statistically significant role (22).

External root resorption

ERR in the contact area of the second molar with the adjacent impacted third molar results from the mechanical pressure (27). Several studies showed that the eruption movement of the tooth does not end with the termination of root formation and closure of the apex and the mechanical pressure exerted on the adjacent tooth that stimulates the formation and progression of ERR continues, so the probability of ERR may increase with age (10,28).

Most studies revealed that the horizontal and mesioangular positions of the impacted third molars may create a large contact area with the second molar and a greater pressure for resorption. As well as these angulations, the deep position of the impacted third molar, such as Class B or C impaction, was associated with a higher ERR frequency in the second molars (10,28,29).

The most common locations of ERR are reported to be the cervical and middle part (28), cervical and apical part (29), and apical part of the root of the second molar (27). Furthermore, in a study on the association

between the location and the severity of ERR, severe ERRs were commonly observed in the apical region of the root, while mild ERRs were found in the cervical part (28).

Neuropathic pain

Occasionally, patients may present with the complaint of jaw pain without signs of clinical or radiographic pathology. In such cases, the impacted third molar removal usually relieves this pain, although the mechanism has not yet been explained. Approximately 1-2% of the mandibular third molars are removed to relieve this pain. In a patient presenting with such complaints, the surgeon should ensure that all other possible pain sources have been eliminated before recommending surgical extraction of the third molar, and inform the patient that removing the third molar may not completely relieve this pain (30).

Cyst and tumour development

Most studies reported the development of cysts/tumours related with impacted third molars with a very low incidence ranging from 2% to 6.2% (8,31). In the third molar region, the most frequently reported odontogenic cyst is dentigerous cyst and the most common tumour is ameloblastoma (32). The probability of malignancies including epidermoid and odontogenic carcinoma was also reported. The incidence was reported to be 2.31% for cysts and 0.79% for tumours of which only 0.02% were malignant (33).

Mandibular fracture

The impacted third molars create an area of low resistance and increase the fracture risk at the mandibular angle because the impacted tooth covers most of the osseous portion reducing the amount of bone in the angle area (4,34). Reitzik *et al.* demonstrated that the mandible with impacted third molars was fractured at about 60% of the force required to fracture the mandible with fully erupted third molars (35). Several studies recommended the extraction of impacted third molars in order to reduce the angle fracture risk (36). On the contrary, Zhu *et al.* suggested that the condylar fracture frequency was lower in patients with impacted third molars (34). Similarly, Bodner *et al.* reported that leaving partially impacted mandibular third molars in place without extraction contributed to the prevention of condylar fractures (37).

Late crowding in the lower incisors

Third molars have been shown among the causes of late crowding in the lower incisors (8). However, it remains controversial whether the third molars support the development of malocclusion or relapse following orthodontic movements and whether they affect post-orthodontic stability (4,8). While some studies suggested a cause and effect relationship between the presence of impacted third molars and late crowding in the lower incisors (38,39), others could not show such a relationship (40).

Friedman *et al.* argued that the lower third molars cannot cause crowding in the lower incisors because they develop in the cancellous bone without any firm support and cannot possess sufficient force to push the other teeth (6). In contrast, Vego and Kaplan reported that individuals with congenital absence of third molars showed greater dental stability and less anterior crowding compared to those with third molars (41,42).

MANAGEMENT

In the treatment planning of the impacted third molars, the patient's complaint, history, physical evaluation, radiological assessment, diagnosis, and prognosis should be considered. The management includes observation, exposure, transplantation, and extraction (8).

Observation

Long-term observation is appropriate when the patient is over 40 years of age, has an impacted third molar fully covered with bone, and has no history or symptoms of a pathological condition such as an enlarged follicular sac (8,30). Most impacted teeth retain the eruption potential and, if no indication for a direct surgical management arises, annual/biannual evaluation may be recommended (8).

Exposure

Exposure is preferred for the impacted third molars that may erupt with appropriate occlusion but could not erupt due to the obstruction caused by conditions such as follicle, sclerotic bone, hypertrophic soft tissue, and odontoma. This management approach may also be considered in the absence of the second molar (8).

Transplantation

Transplantation of the impacted third molar is a conservative alternative approach for oral rehabilitation of young patients with compromised or absent first molars and may be preferred instead of the insertion of dental prostheses or implants (43,44).

The impacted third molar transplant procedure is indicated when adolescent patients have extensively carious first permanent molar with compromised tooth structure or have excellent chance of developing third molar with incomplete root formation or when missing first molar tooth in cases of severe juvenile periodontitis (44).

Extraction

The impacted third molar extraction is performed therapeutically to eliminate associated pathology or prophylactically to prevent the anticipated pathological development and minimize the risks during and after surgery (8). Additionally, extraction may be indicated for restorative and orthodontic purposes.

a) Indications for the third molar extraction

Therapeutic extraction of the impacted third molar is an appropriate indication for relieving pain and discomfort in cases with concomitant pathologies and clinical manifestations such as recurrent pericoronitis, cyst/tumour development, non-restorable caries, and marginal bone loss distal to the second molar (10,29).

Prophylactic removal of asymptomatic impacted third molars, which is defined as the surgical removal of the teeth in the absence of local disease, is recommended for reducing the morbidity due to tooth retention in young patients (31). Many researchers emphasized that the term "asymptomatic" does not mean "disease

free” or “unlikely to develop pathological changes” and that asymptomatic impacted third molars have the potential to trigger pathological changes (2).

Although the necessity of prophylactic removal of asymptomatic impacted third molars is still a matter of debate, possible indications have been put forward by Stordeur and Eyssen as follows: i) To reduce the development of future pathologies ii) For orthodontic reasons to prevent future crowding iii) If surgery at an older age will increase the complication risk iv) In specific medical/surgical situations (45).

b) Contraindications for the third molar extraction

The decision of extraction should be based on comprehensive assessment of the potential benefits versus risks. Extraction is contraindicated in cases where the surgical complication and sequelae risks outweigh the potential benefits. Common contraindications are associated with three main conditions including advanced age, poor health, and surgical damage to adjacent structures (30).

With advancing age, the possibility of fracture increases as the flexibility of the bone decreases, and the incidence of cardiovascular/lung diseases and other health problems increases. Extraction of impacted third molars without pathological symptoms is considered a contraindication, as the response to surgical trauma is less tolerant and the recovery period is prolonged. Certain diseases such as congenital coagulopathies, asthma, and epilepsy may compromise the medical status of younger people and the impacted third molars may need to be removed before the incipient pathological process becomes fulminant. The compromised medical status of not only elderly but also young patients remains a relative contraindication to surgical removal of the impacted third molars and requires consultation with the patient’s physician (30).

Retention of the impacted third molar located close to the nerves, teeth, and other vital structures such as sinuses may be a more appropriate approach. Moreover, in elderly patients, the impacted third molar surgery may result in considerable bone defects that may lead to the eventual loss of adjacent teeth rather than improving or maintaining periodontal health, and this may also be considered a contraindication (30).

c) International guidelines

Various clinical practice guidelines are available that have been developed to help clinicians make decisions about the appropriate management of the impacted third molars. In 1979, a number of indications for impacted third molar extraction were proposed by the National Institutes of Health Consensus Development Conference, including infection, non-restorable carious lesions, destruction in adjacent bone, and cysts/tumours (46). In 2000, the National Institute of Health and Clinical Excellence (NICE) presented a guideline which supported no prophylactic impacted teeth removal and proposed recurrent pericoronitis, non-restorable caries, irreversible pulpitis and periapical pathologies, ERR of adjacent teeth, cellulitis, abscesses, osteomyelitis, follicular diseases such as cysts/tumours, tooth fractures, possible surgical interventions or reconstructive jaw surgery, and tumour resection procedures as indications for the therapeutic impacted third molar removal (47). In the years following implementation of these guidelines, there was a slight decrease in the impacted third molar removal (48).

In 2007, the American Association of Oral and Maxillofacial Surgeons (AAOMS) updated the basic aspects regarding the third molars and their extraction and asserted that all third molars, whether impacted or not, pose a significant risk to the patients' well-being and recommended extraction in all cases, including those that are asymptomatic (49).

d) Complications and risks following surgery

The extraction of third molars may result in a variety of postoperative complications with reported rates ranging from 6.9 to 30.6% which may be related to age/medical status of the patient, position of the tooth, knowledge/experience of the dental surgeon, surgical equipment/technique, and improper irrigation during surgical procedure (38). The most frequently reported postoperative complications of third molar removal include pain, bleeding, oedema and dysphagia, secondary infection and abscess formation, alveolar osteitis, TMJ symptoms (muscle and/or jaw pain, trismus, TMJ noise), trauma to nervous tissue, oroantral perforation and fistula (38,50). Although very rarely, iatrogenic mandibular fracture, iatrogenic damage to the adjacent second molar or buccal fat herniation may also occur (8).

Pain

Pain emerges within 6-24 hours following the third molar surgery and reaches its maximum intensity in the first 12 hours (28,30). The presence of acute inflammation such as pericoronitis, periodontitis, submucous/pericoronal abscesses during the surgical removal of the impacted tooth may lead to increased postoperative pain. The large amount of bone covering the distal portion of the tooth crown and the necessity of mucoperiosteal flap incision may also cause the pain to be more severe due to the prolonged operation time and more soft tissue handling (50). Also, women may be more susceptible to postoperative pain compared to men (30).

Bleeding

The possibility of postoperative bleeding can be minimized by using a good surgical technique. Comprehensive preparation and preoperative planning (e.g. determination of international normalized ratio, factor replacement, haematology consultation) are required prior to surgery as it may be difficult to achieve immediate postoperative haemostasis in patients with acquired/congenital coagulopathies (30).

Oedema and dysphagia

Oedema is an expected sequela of the third molar surgery and usually peaks at the end of the second postoperative day and resolves within 5-7 days (30). Postoperative oedema directly results from prolonged operation time and damage to the periosteum, and may be frequently accompanied by dysphagia in cases with mucoperiosteal incision and flap reflection manipulation (50).

Secondary infection and abscess formation

Infection subsequent to the impacted third molar removal is almost always a minor complication with an incidence of 1.7% to 2.7% and occurs in the first postoperative week. Approximately 50% of infections are reported to be localized subperiosteal abscess type infections occurring 2 to 4 weeks after an uneventful

postoperative period, while the remaining 50% include important postoperative infections that warrant surgery, antibiotic use, and hospitalization (30,50).

Alveolar osteitis

Following the third molar surgery, alveolar osteitis incidence ranges from 3% to 25% (30). The risk of the alveolar osteitis, which increases with traumatic and difficult extraction, the lack of surgical experience, and tobacco use, is not considered a reason for the prophylactic third molar removal (8). Alveolar osteitis was reported not to be associated with incision type, flap design, suture, presence of acute inflammation, pre-operative antibiotic therapy, skills of the surgeon, quantity of the local vasoconstrictor used, filling of alveolus with blood during suturing, and oral hygiene, however the use of elevator with exaggerated force was indicated to increase the possibility of alveolar osteitis due to damage to the alveolar walls (50).

Temporomandibular joint symptoms

One of the risk factors associated with the third molar removal is the probability of TMJ damage and signs and symptoms of temporomandibular disorders (TMDs) including persistent joint/muscle pain, reduced jaw opening (trismus), and TMJ noise (click or crunching). Location and eruption/impaction degree of the tooth, increased surgical difficulty, and demographic characteristics such as age and gender were considered to be associated with the increase in TMD signs and symptoms (51-53).

Results of most studies assessing the third molar removal as a risk factor in the development of TMDs vary widely (65,66). While some studies demonstrated a statistical relationship between the third molar removal and the development of TMD signs and symptoms (52,53), others failed to provide reliable results due to the low quality detected in bias assessment risk (51).

Oroantral perforation and fistula

Surgical maxillary third molar removal is usually considered to be easier due to the more flexible and less dense bone and the absence of large vessels or nerves, but the spatial proximity of the floor of the maxillary sinus increases the risk of oroantral perforation with subsequent fistula formation (54).

Oroantral perforation is considered a frequent complication of maxillary third molar surgery like fracture of the tuberosity, fracture of the roots, and displacement of the tooth/roots into the sinus (54). In case the oroantral communication fails to close spontaneously, epithelialization occurs usually after at least 48-72 hours and an oroantral fistula, which is a pathological communication between the oral cavity and the maxillary sinus, develops (55).

Trauma to nervous tissue

Mandibular third molar surgery places both the lingual nerve and the inferior alveolar nerve at risk of injury which is usually experienced due to the orientation of the third molar, the depth of impaction, and the anatomical relationship between the third molar and the inferior alveolar nerve canal (30,50). While the lingual nerve is mostly injured during the course of soft tissue flap reflection, the inferior alveolar nerve is damaged during manipulation of roots and elevation from the socket (30). The sensory nerve damage rate following

third molar surgery ranged from 0.5% to 20% (2,8,28) with only a small proportion remaining permanent (up to 1% of cases) (8).

SUMMARY / SONUÇ

The management of third molars requires a comprehensive evaluation and decision course for both the clinician and the patient. The clinician should investigate about whether the tooth require removal or will cause acquired disease/symptoms in the future, weigh the risks and benefits of both the sequelae of its retention in the mouth and the proposed surgical procedure, and then revise his/her plans to account for the patient's medical status along with the tolerance of risk associated with the surgical procedure. The patient should be enlightened about all possible options and be included in the decision process.

Acknowledgements / Teşekkür

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