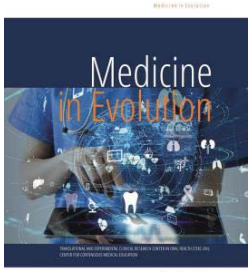
Methods of prophylaxis and management of complications following wisdom tooth extraction



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Abstract

The extraction of wisdom teeth is considered a routine surgical intervention for the dentist, and the complications associated with them are frequent. Complication rates following the extraction of wisdom teeth range from 4.6% to 30.9% with an average of approximately 10%. The incidence of these complications varies depending on local and general factors, the age and general health of the patient, as well as the experience of the operator.

Postoperative complications caused by wisdom molar extraction can be reduced by a thorough clinical and radiological examination during the preoperative stage and by following the principles of extraction in correlation with the local and general status of the patient. The best way to solve the accidents and complications associated with the surgical extraction of the wisdom tooth is prevention.

Keywords: Wisdom tooth, extraction, complications, prophylaxis

INTRODUCTION

Tooth extractions are common in patients of all ages [1]. Removal of wisdom teeth is a common dental procedure aimed at preventing various complications and maintaining oral health [2].

In some cases, the extraction of third molars (M3) can be difficult due to technical difficulties, or other favorable factors: age, sex, smoking, medical history, antithrombotic medication, oral contraceptives, poor oral hygiene, presence of pericoronitis, type of impact, the relationship of the third molar to the inferior alveolar nerve, surgical time, surgical technique, surgeon experience, use of perioperative antibiotics, topical antiseptics, intra-socket medications, and anesthetic technique [3,4]. Reported complication rates for third molar (M3) extraction range from 4.6% to 30.9% with a mean of approximately 10% [4,5].

The incidence of postoperative complications following wisdom molar extraction can be reduced by a pre-extraction clinical and radiological evaluation and by following the principles of extraction in correlation with the general and local status of the patient [6]. The risks of complications are lower for maxillary wisdom teeth than for mandibular wisdom teeth [4,7,8].

Aim and objectives

The aim of this work is to improve the treatment of patients who have post-operative complications following wisdom tooth extraction by establishing the treatment attitude and behavior in correlation with its evolution.

The objective of this paper is to research, through a systematic review type study, comparing multiple studies, the complications following the extraction of wisdom teeth, but also to reduce their incidence.

MATERIAL AND METHODS

In this systematic mini-review study, the relevant articles were selected by searching the specialized literature in three bibliographic databases: MEDLINE, Science Direct and Google Academy.

In order to obtain a compliant search procedure, MeSH terms were used in the search engines of the data sources - by combinations of two or three words that allow a more complex search, eliminating typos, these being: “Third Molar”, “Third Molar Complications”, “Removal of Third Molar”, “Extraction of Third Molar”, “Third Molar Surgery”, “Complications After Third Molar Surgery” or “Complications of Third Molar Extraction”.

The inclusion criteria aimed to select articles that research the incidence of postoperative complications after the extraction of wisdom teeth and to identify risk factors for establishing the treatment attitude and behavior in correlation with its evolution.

In order to be selected, articles must comply with the following rules: they must be cross-sectional studies, prospective or retrospective cohort studies or systematic reviews; not to be older than 12 years; scientific articles developed in English and edited in specialized literature; studies to analyze postoperative complications following the extraction of wisdom teeth and to identify risk factors for establishing the method of prophylaxis and management of associated complications. Studies in which wisdom tooth extraction is not among the topics covered, studies older than 12 years, scientific articles that analyze dental extractions without clearly differentiating the information and results between the two, studies, articles, scientific papers or guidelines that do not met the FDI criteria to evaluate postoperative complications, were excluded.

929 articles were retrieved in a special software for bibliographic reference management (Mendeley, Zotero 4.0, EndNote Basic, George Mason University).

Initially, article analysis was performed by reading the titles and abstracts to eliminate studies that did not meet the inclusion criteria, then the studies were assessed in full. After reading the titles, 858 were eliminated (they were not appropriate to the chosen theme or were duplicated during archiving), the abstracts of the remaining 71 articles were analyzed, 56 of them were collected, finally 15 studies meet the inclusion criteria.

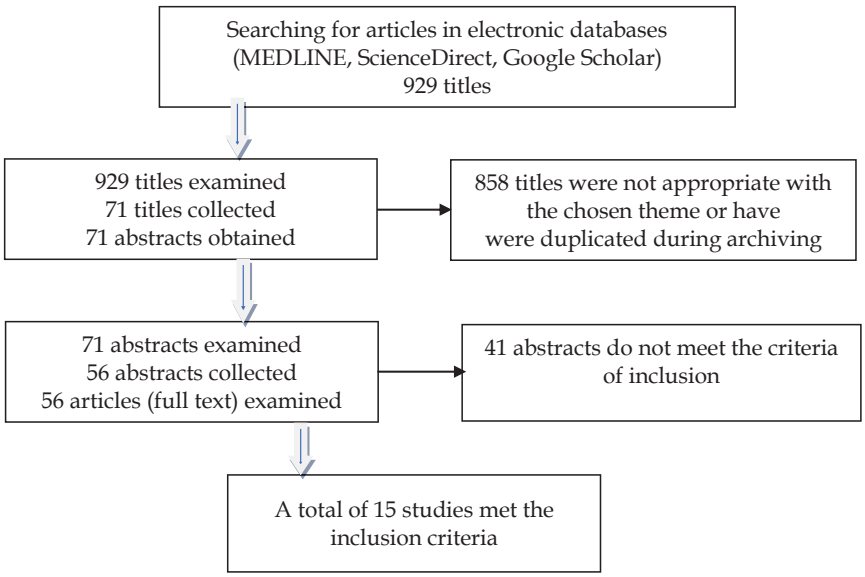

Figure 1. Selection of articles

The 15 studies that correspond to the inclusion criteria were examined and presented, then the data was selected by running a table in Microsoft Excel (Table 1), which contains:

- number of the article in the bibliography;
- material and method;
- results.

The conclusions of the study were obtained after comparing the results of each article.

Table 1. Studies that evaluated postoperative complications caused by the extraction of wisdom teeth

No. Ref.	The method used	Result
4	In this study, all patients who underwent wisdom tooth odontectomy under general anesthesia at the Sultan Qaboos University Hospital in Muscat, Oman, between January 2007 and December 2017, were included. Age, sex, indication for extraction, wisdom teeth extracted, procedure and complications were recorded.	A total of 1116 wisdom teeth were extracted (56% mandibular and 44% maxillary), and the majority (67.7%) were from female patients. The mean age at extraction was 24±5 years, and the majority of patients (77.7%) were 20–29 years old. Intraoperative and postoperative complication rates were 3.7% and 8.3%, respectively. Intraoperative complications included tuberosity fracture (1.2%), root fracture (1.1%), hemorrhage (0.7%), soft tissue injury (0.5%), and injury to adjacent teeth (0.2%). Postoperative complications were paresthesia (7.2%), swelling/pain/trismus (0.6%), and alveolitis (0.5%). Paresthesias were temporary in 41 patients and permanent in 4 cases. A significant relationship was observed between those aged 30-39 years and alveolitis (P=0.010), operative difficulty and postoperative complications (P=0.001).

No. Ref.	The method used	Result
9	In this study, patients with included lower wisdom teeth were examined. The impaction position of the lower wisdom tooth was classified according to Winter's classification. The mandibular wisdom molar odontectomy was performed by the same surgeon under local anesthesia. Operative time was measured from the time the incision was made to the completion of the suture. Postoperative complications evaluated were pain, swelling and trismus.	120 patients aged 19-42 were treated. Patients aged 35 to 42 years had a lower pain score (p=0.5) on day 1. Trismus was significantly less in younger patients on days 2 and 5 (p=0.007 and (p=0.01), respectively). Pain, swelling and trismus increased with operative difficulty. Distoangular impaction position was associated with a higher VAS (Visual Analog Scale) pain score on days 1 and 2 (p=0.01, 0, 0.04). Distoangular and horizontal impaction positions are associated with a greater degree of swelling and trismus. The vertical impaction position was associated with the lowest degree of swelling and trismus.
10	In this study, specialized literature was researched to reduce the incidence of postoperative complications after the extraction of wisdom teeth. Numerous topics were investigated, including patient age, flap type, the effect of smoking, use of antibacterial mouthwashes, preemptive analgesia, and the role of antibiotics and corticosteroids in healing.	The advancing age of the patient increased the rate of complications. The results of the studies regarding the flap type are contradictory. Systematic research proves that smoking cessation reduces postoperative complications. The role of preventive analgesia has not been studied in wisdom tooth odontectomy. The use of chlorhexidine mouthwashes in the prevention of alveolitis and local infection has been studied, but meta-analyses have not proven their effect. Antibiotics have been shown to prevent alveolitis and local infection. Also, corticosteroids reduce postoperative trismus and swelling; the role of steroids in reducing pain has not been proven.
11	5 electronic databases (1999-2016) were searched to identify relevant studies [Cochrane Library (4 April 2016 and 29 April 2016), MEDLINE (4 April 2016 and 29 April 2016), EMBASE (4 April 2016 and 29 April 2016), EconLit (4 April 2016 and 29 April 2016) and NHS Economic Evaluation Database (4 April 2016)]. Studies comparing prophylactic extraction of the included lower wisdom tooth and standard treatment were included. Clinical outcomes considered were pathology associated with wisdom molar inclusion, postoperative complications after extraction, and adverse effects of treatment. Cost-effectiveness outcomes included UK costs and health quality-of-life measures. In addition, the review group constructed a de novo economic model to compare the cost-effectiveness of a prophylactic wisdom tooth extraction strategy versus standard treatment.	The clinical review selected 4 cohort studies and 9 reviews. In the 2 studies that reported postoperative complications, no serious complications were reported. Pathological changes due to inclusion of asymptomatic mandibular wisdom teeth were reported by three studies. In these studies, the rate of odontectomy for the included mandibular wisdom tooth ranged from 5.5% to 31.4%; this variation may be explained by the different follow-up periods (1-5 years). The findings of this review are consistent with findings from previous systematic reviews. 2 published cost-effectiveness studies were identified. The authors of both studies concluded that there is currently no economic evidence to support the prophylactic extraction of included lower wisdom teeth. The results generated by the evaluation group's lifetime economic model indicated that the cost-effectiveness ratio per quality year for comparing a prophylactic extraction strategy and standard treatment is £11,741 for 20-year-olds with molars of asymptomatic lower minds included. The cost per person associated with prophylactic extraction is £55.71, with an annual gain of 0.005 per person. The cost-effectiveness ratio for each quality-adjusted life-year was found to be robust when a series of sensitivity analyzes were performed.
12	In this prospective study, patients requiring wisdom tooth extraction were analyzed and were examined four times during treatment in the context of the study. Data were collected by pre-, peri- and postoperative (days 3 and 10) surveys. Uni- and multivariable logistic regression was used to assess the probability of postoperative pain	In total, 6010 patients with a mean age of 25.2 (± 11.2) underwent 6347 surgical interventions for the extraction of 15357 wisdom teeth. Postoperative complications were pain, trismus, and swelling, all of which were transient, with postoperative reduction on days 3 to 10. Increasing patient age was associated with increased pain, trismus, and

No. Ref.	The method used	Result
	on day 3 and 10 according to several local and general risk factors (age, sex, indication for extraction, operative technique, anesthesia and clinician experience).	swelling and a greater risk of injury to the inferior alveolar nerve. Postoperative complications of extraction were more frequent in patients over 25 years old. Other risk factors for postoperative complications were female sex, depth of inclusion and experience of the clinician.
13	In this study, a retrospective matched-pair analysis was performed comparing patients aged at least 65 years (group A) with a control group of patients aged 15 to 20 years (group B). Age group was a risk factor in this study. Outcome variables were general health as defined by the modified Charlson score (MCS) and the American Society of Anesthesiologists (ASA) score, general surgical risks caused by antithrombotic or anticoagulant medication, and specific local surgical risks and complications.	Patients in group A had more comorbidities, indicating higher MCS and ASA scores (P<.001). Older patients with antithrombotic treatments (P<.001), had higher rates of ankylosis (P<.001) and proximity to anatomical structures (P<.001) presented more intra- and postoperative complications (P<. 001), thus increasing the degree of difficulty and operative time of the wisdom molar extraction (P<.001).
14	In this study, relevant articles were selected through a search of the PubMed, Scopus and Cochrane databases using the search terms: "three molars" sau "teeth of wisdom", "complications" and "age", "recovery", "infections", "periodontal diseases", "complications of the temporomandibular joints", "nervous involvement", "oro-sinus communication" and "mandibular fracture".	Relevant studies were identified and are reported for the following complications and their relationship to patient age: 1) healing time; 2) incidence of fractures; 3) infection rates; 4) periodontal damage; 5) nerve involvement; 6) complications of the temporomandibular joint; 7) nerve damage; and 8) oro-sinus communications.
15	In this study, the specialized literature of the last 25 years was searched in the PubMed database using the keywords: affected third molar, age, tooth wisdom, age and postoperative complications, age and inflammatory reaction of the tissue, tooth extraction and age. In addition, hand searches of key texts, references, and reviews relevant to the study were conducted.	The influence of age on postoperative complications after wisdom tooth odontectomy was associated with other local and general factors. The studies reviewed showed that no specific age demonstrated increased morbidity. Pain, swelling and trismus were the most common complications associated with advancing age.
16	In this study, 100 patients were selected, 54 female and 46 male, aged between 18 and 42 years. Wisdom molar odontectomy was performed with osteotomy and full-thickness mucoperiosteal flap. Pain, swelling and trismus were evaluated preoperatively on days 2 and 7 postoperatively. Data were analyzed using SPSS and significance testing was performed using Chi-square (x2) test and unpaired t-test.	Statistical analysis of the data indicated that pain, trismus, and swelling were more reduced in younger patients than in older patients when preoperative and postoperative results were compared.
17	In this cross-sectional study, complications after odontectomy of wisdom teeth were investigated on a sample of 210 patients. The risk factors were general (age and sex), and local.	210 patients had a total of 605 molars extracted. The mean age of the sample was 21.6±9.2 years, with 1.4 females to 1 male. Postoperative complications were recorded in 54 extractions of wisdom teeth. The most common complications were infection (42.6%), followed by root fractures (11.1%) and swelling (11.1%). Complications were influenced by 3 factors: age over 25 years (p=0.002- OR 2.21), location (p=0.006- OR 2.36), osteotomy (p=0.002- OR 3.03) and molar sectioning (p=0.00002 - OR 3.59).
18	In this systematic review type study, the specialized literature was searched in the bibliographic databases MEDLINE (PubMed), Embase and Cochrane Library. Scientific papers had to meet the following criteria to be included in	A total of 37 studies were included for qualitative analyses. Available data have shown that the asymptomatic impacted wisdom tooth frequently causes pathologies associated with the advancing age of the patient. Carious lesions and periodontal

No. Ref.	The method used	Result
	the study: be systematic reviews or meta-analyses. Relevant reports were selected using inclusion and exclusion criteria. Pathology related to the inclusion of wisdom teeth included carious lesions, periodontal involvement, second molar root resorption and pericoronitis. The methodological quality of each study was reviewed using a pathology-specific tool to assess the risk of complications.	damage were common, especially in partially erupted wisdom teeth and impacted lower wisdom teeth in mesio-position.
19	In this prospective cohort study, patients who presented for odontectomy of the lower wisdom molar included in position A, class I were selected. For 1 year, between July 2014 and June 2015, a total of 40 patients were enrolled in the study. Assessment of patient variables and radiographic variables was done preoperatively. Depending on the duration of the operative time, the patients were divided into three groups: Group I, Group II and Group III. Postoperative complications such as swelling, trismus and pain were evaluated in each patient.	Among the six risk factors analyzed in the study were local factors: anatomic morphology of the wisdom molar, interarcade opening, external oblique ridge and were found to be factors influencing the operative time. Swelling, trismus, and pain were significant among groups and were related to operative time.
20	In this study, the patients who required the odontectomy of the lower wisdom molar in our institution between January 2007 and December 2008 were selected. The data related to the patients were obtained, such as: the impaction position of the wisdom molar, the indication and degree of difficulty of the odontectomy based on the Pederson criteria. Postoperative pain, swelling, and trismus were assessed on day 1, day 2, day 3, day 5, and the first week. A p value of less than 0.05 was considered significant.	150 patients aged 16 to 38 years (25.9 ± 4.47) met the inclusion criteria. Males were 66 (44.0%) while females were 84 (56.0%), resulting in a male-female ratio of 1:1.3. Age, gender and degree of difficulty index did not influence pain and trismus during the postoperative evaluation period ($p > 0.05$). Postoperative swelling was not influenced by gender, but patients over 25 years of age with a higher degree of difficulty presented more facial swelling.
21	In this prospective study performed by three surgeons who extracted 354 mandibular wisdom teeth over a 4-year period (1994-1998). Data on patient, dental, and surgical variables were collected as patients were treated. Difficulty of extraction was estimated preoperatively using radiographic features and compared intraoperatively.	The univariate analysis identified the following factors that prolong the operative time and increase the operative difficulty: advancing age of the patient, ethnicity, male patients, overweight patients, wisdom molar inclusion depth, wisdom molar horizontal impaction position, unfavorable disposition of the roots, the proximity of the inferior alveolar canal. Multivariate analysis showed that increasing age ($P = 0.014$), overweight patient ($P = 0.024$), ethnicity ($P = 0.019$), depth of inclusion ($P = 0.001$), bone impact ($p = 0.008$) and unfavorable disposition of roots ($P = 0.009$) were the independent risk factors for extraction difficulty.
22	This study was conducted in Triveni Institute of Dental Sciences, Hospital & Research Centre, Bilaspur, Chhattisgarh. All wisdom molar odontectomies that were performed between April 2016 and March 2017 were retrospectively analyzed and included in the study. The presence of postoperative complications, such as pain (more than 3 days), paresthesia, mandibular fracture, alveolitis, hemorrhage, trismus, or swelling, together with the patients' data and the type of impaction, were observed. Data were tabulated using SPSS software. Variables were analyzed and P value less than 0.05 was considered significant.	There were 117 men and 113 women who underwent transalveolar wisdom tooth extraction. The average age of women was 47.21 +/- 12.2 years, and of men 48.32 +/- 11.5 years. In our study, pain was the most common, observed in 57.4% of patients. Pain was followed by swelling which was observed in 42.2% of patients. Trismus ranked third, being observed in 23.2% of patients. There was a significant difference in the level of pain among the three age groups with pain most commonly seen in the 20s (21.6%) and least commonly seen in those aged between 20 and 40 years old (15.2%).

RESULTS

Of the 15 articles collected, 13% were descriptive studies, 53.33% were cohort studies (of which 33.33% were prospective and 20% were retrospective), 33.33% were reviews.

All the studies analyzed the postoperative complications following the extraction of wisdom teeth, but in 33.33% of them only the lower wisdom tooth was analyzed (since in general the odontectomy of the upper wisdom tooth encountered fewer operative difficulties than the lower one), and in 13 % of them were also analyzed for intraoperative complications.

In 60% of the studies it was demonstrated that among the most frequent postoperative complications were pain, swelling and trismus. According to the analyzed studies, it was found that the postoperative complications caused by wisdom molar extraction are 80% more frequent in patients over 25 years old, compared to patients up to 25 years old, and in 60% of the studies some authors highlight the advantages of extraction prophylactic treatment of asymptomatic wisdom teeth in young patients, preferably before the age of 25, although the studies analyzed showed that no specific age demonstrates an increased morbidity.

The articles selected in the study were distributed as follows: 26.66% in Europe (1 in Great Britain, 2 in Belgium and 1 in Germany), 20% in America (1 in Connecticut, 1 in San Francisco and 1 in Brazil), 6.66% in Africa (Nigeria) and 46.66% in Asia (2 in Saudi Arabia, 1 in Bangladesh, 3 in India and 1 in Iraq) (Figure 2).

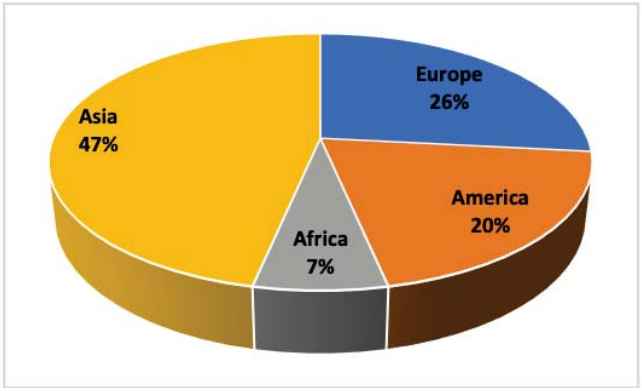

Figure 2. Graphic representation of the distribution by continent regarding the interest in scientific research of postoperative complications caused by the extraction of wisdom teeth

In 73% of the analyzed studies, it was demonstrated that, in addition to the age factor, the postoperative complications following the wisdom molar extraction are also caused by the operative difficulty that can be assessed preoperatively radiographically, given the position and depth of inclusion of the wisdom molar. Extraction of asymptomatic wisdom teeth up to the age of 25 years associated with preventive antibacterial and analgesic therapy decreased the frequency of post-extraction alveolitis and reduced the healing period of patients, in 20% of the studies.

DISCUSSIONS

Severity of pain, degree of swelling and trismus are the main indicators of postoperative complications in patients caused by wisdom tooth odontectomy [9]. There is a significant influence of age on postoperative morbidity after wisdom tooth odontectomy. A greater degree of trismus and facial swelling was recorded in elderly patients. This finding is in agreement with some studies. Bruce et al, while investigating the role of age on postoperative morbidity associated with mandibular wisdom teeth, found that patients over 35 years of age experienced more swelling and trismus [23]. Chiapasco et al believe that the

correlation between age and postoperative complications could be related to the increase in bone density, which can lead to an increase in the degree of operative difficulty [24].

The type of inclusion dictates the degree of difficulty of extraction and therefore the severity of postoperative complications. It appears that the difficulty encountered in descending order was distoangular, horizontal, vertical, and mesioangular. Chiapasco et al in their study reported a complication rate of 6.5% in association with distoangular impaction, as opposed to 2.7% with vertical impaction. They concluded that this observation could be an increase in the degree of operative difficulty that is associated with this type of inclusion [24].

Given the ongoing discussion about prophylactic wisdom tooth extraction, the overall aim of some studies was to gain insight into the current indications for wisdom tooth extraction and the postoperative recovery process associated with this type of oral surgery [12]. The study demonstrated significant associations between patient age and the occurrence of immediate and persistent postoperative morbidity. The ability to recover from surgery decreases as we age and the risk of postoperative complications increases. Complication rates increase due to changes in bone physiology, deterioration of systemic physiologic conditions, and potentially prolonged operating time and increased operative difficulty. In addition, the incidence of indications for symptomatic wisdom tooth extraction increased with age. Asymptomatic wisdom molar involvement eventually leads to associated pathologic changes such as carious lesions, severe second molar periodontitis, pulpal or periapical pathology, root resorption, and development of an odontogenic cyst or tumors. Symptoms such as trismus and swelling are related to invasiveness, operative difficulty and, consequently, the duration of the surgical procedure [12].

Risk factors associated with overall complications in the present study were age over 25 years, third molar location, depth of inclusion, and molar morphology such as root divergence [17]. The study showed that patients over the age of 25 were 46% more likely to develop complications than those under this age. In one study, the older patient group (over 30 years old) showed a higher degree of swelling compared to the younger patient group (under 30 years old). This increase in complication may be associated with changes in bone density. In relation to tooth location, our results confirm the common clinical observation that mandibular wisdom teeth are more difficult to extract than their maxillary counterparts. Due to the fact that the density of the bone cortex is higher at the level of the mandibular arch and the presence of the inferior alveolar canal [17].

One study found that depth of inclusion was correlated with prolonged operative time and increased operative difficulty in wisdom tooth extraction. The results of this study suggested that age over 25, tooth location, depth and position of inclusion as well as root divergence was associated with a higher risk of complications. This information is important both in evaluating the indications for wisdom tooth extraction and in formulating informed consent [17].

The wisdom tooth has been widely discussed and has been the subject of over 10,000 medical articles. However, no consensus therapeutic guidelines have been developed regarding the management of wisdom teeth. Because of the controversy discouraging prophylactic extraction of wisdom teeth, the aim of this systematic review was to analyze the occurrence of pathologies associated with the inclusion of asymptomatic wisdom teeth. However, it is important to mention that the absence of symptoms does not equal the absence of pathologies, which have been repeatedly demonstrated by Dodson and Marciani. Due to the differences in methods and the different age categories examined in the included studies, large variations in the prevalence of pathologies were found. Data on the long-term effects of wisdom tooth inclusion have remained limited. The average follow-up time was only 4 years, which is insufficient to make accurate predictions about the development of pathologies in the future [18].

Several international guidelines on the clinical management of wisdom teeth have been reported to assist clinicians in making treatment decisions. These included the United Kingdom NICE 2000 guidelines, SIGN 2000 and the 2012 KCE Report. The guidelines, in the main, were against the prophylactic extraction of wisdom teeth due to the lack of clinical evidence that the included wisdom teeth will develop associated pathologies over time. With this argument, the guidelines therefore concluded that retention systematically outperforms extraction, despite the fact that there is no evidence to suggest that these teeth would remain free of pathology and symptoms. In the current ongoing disagreement, clinicians have largely relied on their own experience in making clinical decisions. Thus, great variation continued to exist among clinicians in their assessment and beliefs about the need for wisdom tooth extraction [18].

The level of surgical difficulty had no significant effect on postoperative pain and trismus, but had a variable effect on facial swelling, which was found to be significant on postoperative day 7. The result of this study differs from those of Benediktsdottir et al. [25] and Yuasa and Sagiura who reported a significant association between high preoperative Pederson index and high VAS pain score [26].

Preoperative assessment of surgical difficulty is fundamental to planning the extraction of the impacted wisdom tooth. The study evaluated the effect of factors on operative difficulty, some of these factors are demographic (age and sex) and others are dental factors (impaction, angulation and location of the included molar). Renton et al. [27] and Gbotoloran et al. [28] observed that surgical difficulty increased with increasing age of the patient.

Yuasa et al. [29] and Park [30] studied additional factors (depth of inclusion, relationship to the mandibular ramus, relationship to the mandibular canal, unfavorable root morphology, root divergence and periodontal space) which complicates the operative difficulty of the included wisdom molar odontectomy.

The third molar, also known as the wisdom molar, is the last tooth to develop in the maxillary arches. These molars remain impacted most frequently due to the lack of space. The clinician should have knowledge of the possible complications so that he can identify the high-risk patient group and manage any complication, and should also evaluate preoperative radiographic investigations such as (OPG) to determine bone height alveolar, peri-apical intra-oral radiographs (to determine the angulation of the included teeth) and Cone Beam Computed Tomography (to assess the relationship with the neighboring anatomical structures in the three planes) and other blood tests to determine the glycemic status along with the time of bleeding and coagulation which will reduce postoperative bleeding associated with healing complications. It has been shown that postoperative complications caused by wisdom tooth extraction generally occur between the ages of 18-25 years. The incidence of complications following wisdom tooth extraction has been reported to range from 2.6% to 30.9%. Pain and swelling are one of the most common complications. Trismus occurs as a result of trauma and inflammation of the masticatory muscles and is difficult to manage without mouth-opening exercises. The swelling is maximum on days 2-3 postoperatively and disappears after 7 days. Postextraction alveolitis is another major complication that causes severe pain 3-5 days after extraction. The incidence of postextraction alveolitis varies between 1%-30% [19].

Torres et al. [31] found that the use of panoramic radiography does not allow clinicians to accurately predict the operative difficulty of the extraction of the lower wisdom tooth regardless of their level of experience. Ghaeminia et al. [32] evaluated the role of cone beam computed tomography (CBCT) in the management of patients with included lower wisdom teeth at high risk of inferior alveolar nerve injury and found that CBCT provides

optimal risk assessment and more accurate surgical planning, in comparison with panoramic radiography [33].

Valmaseda et al. showed that the incidence of complications after wisdom tooth extraction was 10% [34]. Avendano et al. showed that the overall complication rate was 15.62% and the most common complication was pain, its incidence was 57.3% [35]. In a study by Azam et al. the incidence of pain was 28% after wisdom tooth extraction [36]. Benediktsdottir et al. showed mild pain in 53% cases, severe pain in 47% cases, and severe pain even after one week postoperatively in 15.2% cases [25]. The most frequent complications after the extraction of wisdom teeth were pain, swelling and trismus [37].

The position and depth of the inclusion provides a predictability of the operative difficulty of the extraction of the wisdom tooth and, therefore, the severity of the inflammatory reaction of the postoperative tissue. The most common inclusion position was the mesioangular position followed by horizontal, vertical and distoangular. To reduce the incidence of postoperative complications, it is essential to analyze the degree of operative difficulty [19].

CONCLUSIONS

The most frequent postoperative complications caused by the extraction of wisdom teeth reported in the specialized literature were pain, swelling and trismus.

The risks of complications are lower for maxillary wisdom teeth than for mandibular wisdom teeth, this is due to the fact that the cortex of the mandible has a higher density and also due to the presence of the lower alveolar canal.

In the majority of studies, age was a significant risk factor in the influence of postoperative complications, these being increased with increasing age due to the increase in bone density and the deterioration of systemic physiological conditions, which can lead to an increase in the degree of operative difficulty, which argues the recommendation extraction of the wisdom tooth until the age of 25.

Among the risk factors associated with the postoperative complications of the extraction of the wisdom tooth were identified the age over 25 years and the operative difficulty given by the depth and position of inclusion of the wisdom tooth as well as its root morphology, and in this sense in order to to avoid possible postoperative complications, preoperative radiological examination (OPG, bitewing, CBCT) as well as odontectomy of the wisdom molar in the stage of formation (when only ⅓ or ⅔ of the root is formed) is essential to avoid the development of an unfavorable root morphology.

Regarding the controversy of the prophylactic extraction of wisdom teeth or the preservation of asymptomatic wisdom teeth, the average follow-up time of the included wisdom teeth was only 4 years, which is insufficient to make accurate predictions on the development of pathologies in the future, and in the continuing contradiction, the clinicians' decisions were largely based on their own.

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