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YAN VARES^{A, B, D, E}, SOLOMIYA KYIAK^{A-F}

Management of Asymptomatic and Mandibular Impacted Third Molars that do not Present any Considerable Pathological Changes

Leczenie bezobjawowych i niewykazujących zmian patologicznych zatrzymanych trzecich zębów trzonowych żuchwy

Department of Oral and Maxillofacial Surgery, Lviv Danylo Halytsky National Medical University, Lviv, Ukraine

A – concept, B – data collection, C – statistics, D – data interpretation, E – writing/editing the text, F – compiling the bibliography

Abstract

Background. Tooth impaction is one of the most common pathologies in our everyday practice. Over the recent years there has been a debate over the advisability of removing symptom-free “wisdom teeth” or leaving them in place. One of the main reasons for removal of a symptom-free “wisdom tooth” is high incidence of later complications, low incidence of their eruption, especially after the age of 25, and 2 times greater risk of complications after the age of 24.

Objectives. The aim of our investigation was to systematize a scheme of objective preoperative clinical and roentgenological assessment of mandibular impacted symptom-free “wisdom teeth” to create a rationale for their prophylactic removal.

Material and Methods. 84 clinical cases of patients with impaction of asymptomatic and without any considerable pathological changes mandibular third molars, who have been treated in the Department of Surgical Dentistry and Maxillofacial Surgery of Lviv Danylo Halytsky National Medical University during 2009–2013.

Results. For the justified removal of a symptom-free mandibular impacted third molar, we processed known clinical, roentgenological parameters, which characterize asymptomatic and without any considerable pathologic changes mandibular impacted third molars and do not belong to the list of indications and contraindications to atypical removal. There were no considerable intra- or postoperative complications in the first subgroup (41 cases of patients 18–25 years old); minor complications in the second subgroup (10 cases of 25–45 year old patients). In the case of 68 year-old patient surgery, all complications were related to considerable bone atrophy of the operated area. 5 of 7 clinical cases from control group #1 needed surgical intervention because of the appearance of indications during the next 5 years of follow-up. Mandible third molars from control group #2 during the last five years still have had no pathological changes that may warrant their removal.

Conclusions. Considering the abovementioned, all the chosen criteria facilitate the formation of indications for a proper treatment tactic regarding asymptomatic impacted lower third molars without any considerable pathological changes. The low-to-no percentage of intra- and postoperative complications does not give any reason to leave a wisdom tooth with minor clinical manifestations or an asymptomatic wisdom tooth with bad prognosis in place, since early surgical procedures generate less number of complications, having shorter operative time and postoperative period (*Dent. Med. Probl.* 2014, 51, 1, 35–42).

Key words: asymptomatic third molar, impaction, atypical removal.

Streszczenie

Wprowadzenie. Zatrzymanie zębów jest jedną z częstszych patologii w codziennej praktyce. W ostatnich latach toczy się debata nad kwestią konieczności usuwania bezobjawowych „zębów mądrości” lub ich pozostawienia. Jednym z głównych powodów usuwania bezobjawowych zatrzymanych „zębów mądrości” jest duże prawdopodobieństwo późniejszych powikłań, małe prawdopodobieństwo ich wyrżnięcia się, zwłaszcza po 25 roku życia i dwukrotnie większe ryzyko powikłań po 24 latach.

Cel pracy. Pokazanie całego zakresu objawów klinicznych i radiologicznych zatrzymanych trzecich zębów trzonowych w żuchwie w celu uzasadnienia konieczności ich profilaktycznego usuwania.

Materiał i metody. Materiał stanowiło 84 wyselekcjonowanych pacjentów z bezobjawowo zatrzymanymi trzecimi zębami trzonowymi żuchwy. Byli oni leczeni na Oddziale Stomatologii Chirurgicznej i Chirurgii Szczękowo-Twarzowej w Lwowskim Uniwersytecie Medycznym im. Daniela Halickiego w latach 2009–2013.

Wyniki. W celu uzasadnienia usunięcia bezobjawowych zatrzymanych trzecich zębów trzonowych żuchwy badano znane parametry kliniczne i radiologiczne charakteryzujące zatrzymane trzecie zęby trzonowe w żuchwie, nie wykazujące wskazań i przeciwwskazań do atypowego usunięcia. Nie było żadnych znaczących powikłań śród- i pooperacyjnych w pierwszej podgrupie (41 przypadków klinicznych u pacjentów w wieku 18–25 lat); nieznaczne komplikacje w drugiej podgrupie (10 przypadków klinicznych u pacjentów w wieku 25–45 lat). U 68-letniego pacjenta wszystkie powikłania były związane ze znaczną atrofią kości żuchwy w obszarze operacyjnym. 5 z 7 przypadków klinicznych w grupie kontrolnej wymagało interwencji chirurgicznej z powodu pojawienia się wskazań w ciągu najbliższych 5 lat obserwacji. Trzecie zęby trzonowe żuchwy z grupy kontrolnej w ciągu pięciu lat nie wykazywały patologicznych zmian, które nakazywałyby ich usunięcie.

Wnioski. Zaproponowane kryteria dają wskazania do odpowiedniego leczenia bezobjawowych i niewykazujących zmian patologicznych zatrzymanych trzecich zębów trzonowych w żuchwie. Niski odsetek powikłań śród- i pooperacyjnych nie daje żadnego powodu do pozostawienia „zęba mądrości” z łagodną chorobą objawową lub bezobjawowego „zęba mądrości” ze złym rokowaniem miejscowym, ponieważ wczesne interwencje chirurgiczne wywołują mniejszą liczbę powikłań, przy czym okres operacyjny i pooperacyjny jest krótszy (*Dent. Med. Probl.* 2014, 51, 1, 35–42).

Słowa kluczowe: bezobjawowy ząb trzonowy, zatrzymanie, atypowe usunięcie.

Tooth impaction is one of the most common pathologies in our everyday practice. Furthermore, it presents the greatest surgical challenge and provokes the biggest controversy when indications for removal are considered. During the recent years there has been a debate over the advisability of removing symptom-free “wisdom teeth” or leaving them in place [1–3]. One of the main reasons for removing a symptom-free “wisdom tooth” is the high incidence of their late complications, low incidence of their eruption, especially after the age of 25, and 2 times greater risk of complications after the age of 24 [4–7].

According to M. Miloro et al., an impacted tooth can cause mild to severe complications if it remains unerupted. Not every impacted tooth causes problems of clinical value but each one has a potential for it [8]. For example, partial retention of a “wisdom tooth” is very common but lack of competence and sometimes carelessness of surgeons may lead to severe complications [8].

Opponents of prophylactic removal of “wisdom teeth” consider that most of third molars, impacted or not, remain without changes, but the risk of iatrogenic complications because of surgical manipulations is higher than the risk to leave asymptomatic tooth that does not [resent considerable pathological changes [9, 10].

The decision to remove impacted teeth should be based on the thorough evaluation of potential benefits and risks. In the case when pathology exists, the decision to remove is not complicated and vice versa; such situations exist when the removal of an asymptomatic impacted tooth is contraindicated, while surgical complications may exceed the possible benefits [8].

The aim of our investigation was to systematize a scheme of objective preoperative clinical and roentgenological assessment of mandibular impacted symptom-free “wisdom teeth” to create a rationale for their prophylactic removal.

Material and Methods

Material and methods of the investigation were 84 clinical cases of patients with impaction of asymptomatic and mandibular third molars that did not present any considerable pathological changes; these patients have been treated in the Department of Surgical Dentistry and Maxillofacial Surgery of Lviv Danylo Halytsky National Medical University during 2009–2013. 52 clinical cases of impacted mandibular third molars that were removed according to the results of the proposed tables compose the main group with 3 subgroups (first subgroup – 41 cases of patients 18–25 years old, second subgroup – 10 cases of 25–45 year old patients, and third subgroup – 1 case of 68 year old patient). Control group # 1 consists of 7 clinical cases of patients that according to the proposed tables needed their mandibular third molars removed but refused to remove them. Control group # 2 consists of 25 clinical cases of patients that according to the proposed tables at the time of diagnostic did not need their mandibular third molars removed.

Results

In order to justify the removal of a symptom-free mandibular impacted third molar, a specialist

needs to compare all possible pathological changes and complications in the area of the tooth in question in case of different treatment tactics. We processed the known clinical, roentgenological parameters, which characterize asymptomatic mandibular impacted third molars that do not present any considerable pathologic changes and do not belong to the list of indications and contra-

indications to atypical removal, but in complex estimation can play a considerable role while planning a tactic concerning the aforementioned teeth. Processed characteristics were classified into a table, which also includes the age and other parameters. The table is classified according to a treatment tactic of an impacted mandibular third molar (Table 1).

Table 1. General appearance of the table classified according to a treatment tactic of an impacted mandibular third molar

Tabela 1. Ogólny wygląd tabeli klasyfikacji według taktyki leczenia zatrzymanego trzeciego zęba trzonowego żuchwy

No	Criteria	+	+/-	-	Result
1	Operator's experience	experienced		inexperienced	
2	Age	25–45 years	< 25 years	after 45 years	
3	Weight	normosthenic	asthenic	hypersthenic	
4	Sex	female		male	
5	Frequency of acute respiratory diseases	more than 3 times per year		1 time per year	
6	Patient readiness for systematic observation	not ready		ready	
7	Bad habits	smoker (partial retention)		non-smoker	
8	Severity of gag reflex	no to not severe		severe	
9	Oral hygiene state	bad (in case of partial retention)	moderate to good (in case of partial retention)	bad (in case of full retention)good	
10	Presence of erupted opposite upper third molar	present (in case of high or partial retention)		absent	
11	Presence (in anamnesis) of pericoronaritis	present		absent	
12	Presence of plaque distally on a third molar	present (in case of high or partial retention)		absent	
13	Results of periodontal probe distally to a third molar	depth up to 5 mm (if a third molar is a cause)		periodontal pocket is absent	
14	Degree of third molar follicle enlargement	up to 2.5 mm		no enlargement	
15	Root morphology, risk of crown retention		present (till the age of 45)	present (after the age of 45), absent	
16	Proximity to the mandibular canal	in contact	up to 3 mm	more than 3 mm	
17	Angulation	distal (till 45 years)	vertical (from 25/if place for eruption is available/till 45 years)	the rest of cases	
18	Depth according to the occlusal line	high (partial retention till 45 years and if ortopedic indications)	middle, deep (till 45 years)	all angulations after 45 years	
19	Position in relation to anterior edge of mandibular ramus	no place (till 45 years)	little place (till 45 years)	enough place and after 45 years	
20	Probability of resorption or caries occurrence (evaluation of contact with second molar)	high (till 45 years)	moderate (till 45 years)	low and after 45 years	
21	Presence of a bone and a risk of its loss distally along the second molar.	absent (till 45 years), 1–1.5 mm in case of mesial and horizontal angulation (till 45 years)	absent for more than 1/3 of root length (till 45 years)	absent (after 45)	

Each item may have positive or negative valuation (conduct surgery or not, respectively) in accordance to a clinical case, which has been noted in an appropriate column.

In the scheme of general criteria we included: operator's experience, age, weight, sex of a patient, frequency of acute respiratory diseases, readiness of a patient to systematic observation, bad habits, and severity of gag reflex.

The scheme of clinical criteria contains: an oral hygiene state, presence of an erupted opposite upper third molar, presence (in anamnesis) of pericoronaritis, presence of plaque distally on a third molar, results of periodontal probe distally to a third molar.

In roentgenological characteristics we included: a degree of third molar follicle enlargement, root morphology, proximity to the mandibular canal, angulation, as well as such important characteristic as depth according to the occlusal line, position in relation to the anterior edge of mandibular ramus, evaluation of contact with the second molar, presence of bone and risk of its loss distally along the second molar.



Fig. 1. Panoramic radiography. Clinical case no. 1. Asymptomatic and without any considerable changes impacted mandibular third molar is revealed

Rys. 1. Panoramiczne zdjęcie rengenowskie. Przypadek kliniczny nr 1. Bezobjawowy zatrzymany trzeci zęb trzonowy żuchwy

The third molar removal was conducted using the surgical bur technique. In accordance with the severity of impaction, a proper incision and tooth sectioning were made following the strict conventional scheme and with a minimization of the distal bone removal and the operative time.

Clinical Case no. 1

Patient K., 28 years old, entered our department after a trauma of the maxillofacial area. A panoramic radiography was made (Fig. 1). An asymptomatic impacted mandibular third molar that did not present any considerable changes was revealed. The data was entered into the table (Table 2) and the result was negative, thus, the operative treatment was not conducted.

Clinical Case no. 2

Patient, 30 years old, entered our department. An asymptomatic impacted mandibular third molar presenting no considerable pathological changes was occasionally revealed during a routine sur-



Fig. 2. Asymptomatic and without any considerable pathological changes impacted mandibular third molar was occasionally revealed while routine radiographic examination. Clinical case no. 2

Rys. 2. Bezobjawowy zatrzymany trzeci zęb trzonowy żuchwy sporadycznie ujawnił się podczas rutynowego badania radiologicznego. Przypadek kliniczny nr 2

Table 2. Data entered into the table from clinical case No. 1 (result was negative, thus, the operative treatment was not conducted)**Tabela 2.** Dane wprowadzone do tabeli przypadku klinicznego nr 1 (wynik końcowy był ujemny, więc leczenie operacyjne nie było prowadzone)

No	Criteria	+	+/-	-	Result
1	Operator's experience	experienced		inexperienced	+
2	Age	25–45 years	< 25 years	after 45 years	+
3	Weight	normosthenic	asthenic	hypersthenic	+
4	Sex	female		male	-
5	Frequency of acute respiratory diseases	more than 3 times per year		1 time per year	-
6	Patient readiness for systematic observation	not ready		ready	+
7	Bad habits	smoker (partial retention)		non-smoker	-
8	Severity of gag reflex	no to not severe		severe	-
9	Oral hygiene state	bad (in case of partial retention)	moderate to good (in case of partial retention)	bad (in case of full retention) good	+/-
10	Presence of erupted opposite upper third molar	present (in case of high or partial retention)		absent	+
11	Presence (in anamnesis) of pericoronaritis	present		absent	-
12	Presence of plaque distally on a third molar	present (in case of high or partial retention)		absent	-
13	Results of periodontal probe distally to a third molar.	depth up to 5 mm (if a third molar is a cause)		periodontal pocket is absent	-
14	Degree of third molar follicle enlargement	up to 2.5 mm		no enlargement	+/-
15	Root morphology, risk of crown retention		present (till the age of 45)	present (after the age of 45), absent	-
16	Proximity to the mandibular canal	in contact	up to 3 mm	more than 3 mm	+
17	Angulation	distal (till 45 years)	vertical (from 25/if place for eruption is available/till 45 years)	the rest of cases	+
18	Depth according to the occlusal line	high (partial retention till 45 years and if orthopedic indications)	middle, deep (till 45 years)	all angulations after 45 years	+/-
19	Position in relation to anterior edge of mandibular ramus	no place (till 45 years)	little place (till 45 years)	enough place and after 45 years	-
20	Probability of resorption or caries occurrence (evaluation of contact with the second molar)	high (till 45 years)	moderate (till 45 years)	low and after 45 years	+
21	Presence of a bone and a risk of its loss distally along the second molar	absent (till 45 years), 1–1.5 mm in case of mesial and horizontal angulation (till 45 years)	absent for more than 1/3 of root length (till 45 years)	absent (after 45)	-
				Do not remove “-”	

gical radiographic examination (Fig. 2). The patient and impaction information were entered into our table. The final result was positive (Table 3), thus, the operative treatment was conducted following the strict conventional surgical protocol of

atypical removal and considering the strategy of minimal surgical trauma.

There were no considerable intra- or post-operative complications in the first subgroup (41 cases of patients 18–25 years old); minor com-

Table 3. Data entered into the table from clinical case no. 2 (final result was positive, thus the operative treatment was conducted)

Tabela 3. Dane wprowadzone do tabeli przypadku klinicznego nr 2 (wynik końcowy był pozytywny, więc leczenie operacyjne zostało przeprowadzone)

No	Criteria	+	+/-	-	Result
1	Operator's experience	experienced		inexperienced	+
2	Age	25–45 years	< 25 years	after 45 years	+
3	Weight	normosthenic	asthenic	hypersthenic	+
4	Sex	female		male	+
5	Frequency of acute respiratory diseases	more than 3 times per year		1 time per year	-
6	Patient readiness for systematic observation	not ready		ready	+
7	Bad habits	smoker (partial retention)		non-smoker	-
8	Severity of gag reflex	no to not severe		severe	-
9	Oral hygiene state	bad (in case of partial retention)	moderate to good (in case of partial retention)	bad (in case of full retention)good	+/-
10	Presence of erupted opposite upper third molar	present (in case of high or partial retention)		absent	+
11	Presence (in anamnesis) of pericoronaritis	present		absent	+
12	Presence of plaque distally on a third molar	present (in case of high or partial retention)		absent	
13	Results of periodontal probe distally to a third molar.	depth up to 5 mm (if a third molar is a cause)		periodontal pocket is absent	
14	Degree of third molar follicle enlargement	up to 2.5 mm		no enlargement	+/-
15	Root morphology, risk of crown retention		present (till the age of 45)	present (after the age of 45), absent	-
16	Proximity to the mandibular canal	in contact	up to 3 mm	more than 3 mm	-
17	Angulation	distal (till 45 years)	vertical (from 25/if place for eruption is present/till 45 years)	the rest of cases	-
18	Depth according to the occlusal line	high (partial retention till 45 years and if orthopedic indications)	middle, deep (till 45 years)	all angulations after 45 years	+
19	Position in relation to anterior edge of mandibular ramus	no place (till 45 years)	little place (till 45 years)	enough place and after 45 years	+/-
20	Probability of resorption or caries occurrence (evaluation of contact with the second molar)	high (till 45 years)	moderate (till 45 years)	low and after 45 years	+
21	Presence of a bone and a risk of its loss distally along the second molar.	absent (till 45 years), 1–1.5 mm in case of mesial and horizontal angulation (till 45 years)	absent for more than 1/3 of root length (till 45 years)	absent (after 45)	+
				Remove “+”	

plications in the second subgroup (10 cases of 25–45-year-old patients) like fracture of the root tip of third molar, more severe trismus in postoperative period and generally longer intraoperative

time and postoperative period than in subgroup # 1. In the case of a 68-year-old patient, surgery was complicated because of considerable bone atrophy of the operated area.

Patients from control group # 1 were subjected to annual long-term follow-ups. Five of 7 clinical cases from control group needed surgical intervention because of the appearance of indications during the next 5 years of follow-ups.

Patients from control group # 2 were also subjected to annual long-term follow-ups and still for the last 5 years there were no pathological changes in those teeth that may warrant their removal.

Discussion

On the basis of our own observations and analysis of specialized literature, we revealed that 17–32% of the population has third molars, and 73.5% of them are mandibular ones. Almost one third of impacted third molars are those with perspective of eruption. Symptomatic impacted mandibular third molars make 20%, 8–10% of which are with pericoronitis, and the rest (80%) are asymptomatic, respectively. Postoperative complications occur in 30–40% of cases where pain is not considered, but trism and swelling make approximately 9 and 11% respectively. More risk of pathological changes is caused by partial retention, while the postoperative period in this case runs with minor complications. Taking into consideration our research, we can agree with some studies [4–7] that the risk of complications resulting from the removal of a third molar grows approximately twice after the age of 24. Hence, the best time for their removal is the age of 17–24 [11].

We consider that if impacted mandibular third molar has more characteristics from the positive valuation column from the table it belongs to risk group. That means the surgeon in the future

should expect the development of any pathology that will warrant the removal of aforementioned impacted mandibular tooth.

Moreover, if these patients do not undergo at least an annual follow-up, the pathology may develop in an uncontrolled manner and a number of impacted mandibular third molar pathologic changes may be clinically “silent”.

Undesired progression of pathological changes, if not mentioned, increases with time; other risk factors like age etc. can lead to more complicated procedures of removal. Hence, surgeons should consider all factors, since the tooth that has mostly positive valuation in our table will, in most cases, develop a pathology finally requiring the removal of the tooth.

Considering the above-mentioned, all the chosen criteria facilitate the formation of indications for a proper treatment tactic regarding asymptomatic impacted mandibular third molars that do not present any considerable pathological changes.

Knowledge of clinical, roentgenological assessment of a mandibular “wisdom tooth” and further step-by-step surgical technique of its removal provide a great possibility of successful intra- and post-operative management of patients with vertical, mesioangular, horizontal and dis-tioangular impaction without any severe complications. The low-to-no percentage of intra- and post-operative complications does not give any reason to leave a “wisdom tooth” with minor clinical manifestations or an asymptomatic “wisdom tooth” with bad prognosis in place, since early surgical procedures generate less number of complications, having shorter operative time and postoperative period.

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Address for correspondence:

Kyyak Solomiya
Kotlyarevskogo 28/3
Lviv 79013
Ukraine
Tel.: +38 050 132 42 26
E-mail: solomiyakyyak@ukr.net

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