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IMPACTED THIRD MOLARS – SEARCHING FOR SOLUTIONS

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მესამე მოლარის რეტენცია - გადაწყვეტილებების ძიებაში

თბილისის სახელმწიფო სამედიცინო უნივერსიტეტი, ოდონტოლოგიისა და ორთოდონტიის დეპარტამენტები; სტომატოლოგიის კლინიკა და სასწავლო-კვლევითი ცენტრი „უნი-დენტი“, თბილისი, საქართველო

რეზიუმე

კბილთა რკალში კბილების რიცხვის შემცირება შეიძლება გამოწვეული იყოს მათი ამოჭრის შეჩერებით, შეფერხებით ან დაგვიანებით. კბილებს, რომლებიც გარკვეული მიზეზების გამო ვერ ამოიჭრა ეწოდება რეტენირებული. ყველაზე მაღალი ალბათობით სწორედ მესამე მოლარების შემთხვევაში ვხვდებით დისტოპიის, რეტენციისა ან ნახევრად რეტენციის თუ პირველადი ადენტის შემთხვევებს. მრავალი წლის განმავლობაში, რეტენციული დისტოპიური მესამე მოლარების ამოღება ან შენარჩუნება აქტიური დისკუსიის საგანია. სწორედ, რომ კბილის გართულებულ ამოჭრასთან დაკავშირებული რიგი მიზეზების გამო, მესამე მოლარი ხშირად გამხდარა ექსტრაქციის მსხვერპლი.

რეტენციული კბილები ეს არის გავრცელებული სტომატოლოგიური პათოლოგია, რომელიც გვხვდება მოსახლეობის 0,8-60%-ში. მკურნალობის დაგეგმარების დროს აუცილებელია რიგი ფაქტორების გათვალისწინება. მნიშვნელოვანია რეტენირებული კბილის ესთეტიკური და ფუნქციონალური ღირებულების დადგენა, პაციენტის ასაკი, ალვეოლურ მორჩში რეტენირებული კბილის მდებარეობა, მკურნალობის გეგმის სწორი შერჩევა, კბილთა მწკრივის და თანკბილვის მდგომარეობა და ამასთან ერთად პაციენტის თანხმობა ხანგრძლივ მკურნალობაზე.

რეტენირებული კბილების არსებობასთან დაკავშირებული პრობლემის აღმოფხვრასა და მკურნალობის სწორად წარმართვას პირველ რიგში ესაჭიროება მისი ზუსტი დიაგნოსტიკა. რეტენირებული კბილის ადრეული დიაგნოსტიკა ხორციელდება კლინიკური და რენტგენოლოგიური გამოკვლევის საფუძველზე.

ზემოთ ანიშნულიდან გამომდინარე, ჩვენი კვლევის მიზანს წარმოადგენდა კბილთა რეტენციის და ნახევრადრეტენციის გამოვლინება პანორამული რენტგენოგრაფიის საშუალებით. გამოგვევლინა სხვა კბილთა ჯგუფებთან გამოხატული რეტენციის კორელაციური კავშირი და დაგვედგინა ყბაკბილთა სისტემაში კბილთა რაოდენობის შემცირების კანონზომიერება. ამ ამოცანის შესასრულებლისთვის შესწავლილ იქნა 12 დან 35 წლამდე ასაკის პაციენტთა 230 ორთოპანტომოგრაფიული სურათი, მათ შორის 132 ქალის და 98 მამაკაცის.

კვლევის არეალში მოექცა არამხოლოდ რეტენციული კბილების რაოდენობა, არამედ კბილის რეტენციის და ექსტრაქციის შემდგომი გართულებები.

ასევე გამოითქვა მოსაზრება, რომ ასიმპტომური მესამე მოლარების მონიტორინგი შეიძლება განვიხილოთ, როგორც შესაბამისი სტრატეგია. გადაწყვეტილების მიღების პროცესი, კბილის პროფილაქტიკური ექსტრაქციასა და ასიმპტომური მესამე მოლარის კბილების რეტენციასთან დაკავშირებით, უნდა ეფუძნებოდეს საუკეთესო მტკიცებულებებს, კლინიკურ გამოცდილებასთან კომბინაციაში. პროფილაქტიკური ქირურგიული ჩარევის შემთხვევაში დისკუსიის ძირითადი ელემენტი უნდა იყოს პაციენტის უსაფრთხოების, და მასთან დაკავშირებული რისკისა და სარგებლის ანალიზი, რათა თავიდან იქნას აცილებული შესაძლო იატროგენული ფაქტორები. გარდა ამისა, მნიშვნელოვანი როლი ენიჭება პაციენტთა მოსაზრებას და დამოკიდებულებას.

ამგვარად, დროული, სწორი დიაგნოზირებისა და მკურნალობის დაგეგმვის შემთხვევაში კლინიცისტებს შეუძლიათ შეამცირონ კბილების ექტოპიური ამოჭრის, მათი რეტენციის სიხშირე და რაც მთავარია შემდგომი გართულებები, რაც უმეტეს შემთხვევაში სწორედ სიბრძნის კბილთა ექსტრაქციას უკავშირდება.

Introduction

An impacted tooth can be defined as one that is prevented from erupting into position because of malposition or lack of space. For many years, removing or retaining impacted third molars has been a subject of discussion in the dental literature. Whereas the decision to remove third molars associated with pathologic changes is often a straightforward one, prophylactically removing an asymptomatic third molar may not be an easy decision [2,8,11]. Although explanations for and against prophylactic removal of impacted third molars have been offered, these often were contradictory and led to confusion in the minds of dental professionals. The prevalence of third molar impaction ranges from 16.7% to 68.6%. Most studies have reported no sexual predilection in third molar impaction [8,12,13]. However, some studies found a higher frequency in females than in males [11]. Tooth impaction is a common dental condition ranging from 0.8–3.6% of the general population. A tooth normally erupts when half to three-quarters of its final root length has developed. Impaction is usually diagnosed well after the tooth should have erupted [8]. The most commonly impacted teeth are, consecutively, third molars, maxillary canines, mandibular premolars and maxillary central incisors [4,8]. Impaction belongs to the tooth eruption anomaly, named, delayed period of physiological eruption [5]. The reasons of delayed tooth eruption can be of local and systematic nature. The risk of complications is so high that many dentists recommend removing wisdom teeth as a preventative measure as early as possible [1,9].

The complications associated with the removal of impacted third molars should not be underestimated [1,2,11]. The surgery entails incision, stripping of periosteum, bone and tooth removal, and suturing. Pain, swelling, and trismus are almost universal after this procedure, and the incidence of both inferior and lingual nerve damage is high and may be permanent.

Nerve damage with temporary or permanent labial or lingual paresthesia or anesthesia are significant risks of surgery [1,11].

There are well-established indications for the removal of impacted wisdom teeth. However, one of the methods is - prophylactic removal of impacted third molars, free of any pathology and is still a common practice and therefore remains controversial [1,2,13].

In recent times, prophylactic surgery has been justified on the basis that third molars have no role in the mouth, the need to minimize the risk of disease (cysts and tumors) development, reduction of the risk of mandibular angle fracture and other complications, as well as increased difficulty of surgery with age [1,11].

Purpose of “Prophylactic Removal”:

1. Prevent the exacerbation or late development of mandibular incisor crowding arguably attributed due to the eruptive forces of the third molars.
2. Avoid the risks of development of pathological changes or sequelae due to presence of impacted or partially erupted third molars [3,9].

The more common, mandibular third molars are scheduled for extraction for the above reasons. This is likely to be accompanied by the simultaneous sacrifice of maxillary third molars for the prophylactic benefit of avoiding sequel resulting from the unopposed supra-eruption of the opposing tooth [9,13].

And orthodontic clinicians vary greatly in their practice regarding prophylactic removal of third molars after orthodontic treatment [3,9]. Orthodontists believed that unerupted or impacted third molars occasionally produce an anterior force that cause separation in the contact points and subsequent crowding of the mandibular incisors, sufficient space was unavailable for the third molars to erupt, they exert forces on the adjacent teeth, causing crowding. the erupting lower third molars exert an anterior force and they “rarely” or “never” cause crowding of the dentition also third molars are the only or even, the major etiologic factors affecting post treatment changes in incisor alignment. impact of third molar removal on the relapse of mandibular dental arch after orthodontic treatment [3,6].

Materials and Methods

According to the above mentioned, the aim of the study was investigation of impaction and semi-impaction (partial erupted) in permanent dentition in the population of Georgia, revealing the correlation and feedback of expressed impaction and its consequences after extraction in different age. Study was also aimed to determine any regularity in reduction of tooth number of the skeleto-dental system. To comply with this goal, 230 panoramic images of patients (12 to 35 of ages) have been examined.

This study included retrospective review of clinical records and panoramic radiographs of 230 consecutive patients undergoing the orthodontic treatment in the **Dental clinic and training-research center “UniDent”**. Between June 2016 and December 2020. Demographic details of patients were obtained from clinical records.

The panoramic radiographs were taken with the equipment Gendex (DP- 700); the exposure settings were 70 kVp, 13 mA (16 sec / DAR: 122: 00), varying according to the age and biotype. Panoramic radiographs were stored in software form. Therefore, no alterations

related to storage conditions was occurred. All destroyed or defected and artifact radiographs were not included in this study, also radiographs in which the second molar is missing for any reason were not included in the study. Data was recorded in a special form and was analyzed.

Table №1. Impaction and partly eruption in different groups of teeth

230 ortho-pantomographic images	Impaction of the teeth n=171				
	Wisdom tooth	Maxillary canine	Maxillary Second molar	Second mandibular premolar	Maxillary second premolar
	109	31	5	18	8
	Impacted third molar n=109				
	n= 109		Fully impacted n= 61		Semi-impacted n= 48
	Upper Jaw (Maxilla)		n = 41		
	Lower Jaw (mandibule)		n = 68		

The statistical processing of obtained materials was performed in SPSS version. Correlation analysis was made to reveal the correlation between impaction and partly eruption in different groups of teeth (Table #1). The results of the study showed that the most frequent is the impacted third molar (wisdom tooth) - in 47,39% (n=109) of cases. Impaction is also common for the maxillary canine – 13,47% (n=31), the second mandibular premolar – 7,8% (n=18), maxillary second molar – 2,17% (n=5) and maxillary second premolar – 3,47% (n=8), respectively. Fully impacted wisdom teeth were revealed in 26,53% cases (n= 61) and teeth partial erupted in 20,86% (n=48) cases. Impaction of maxillary wisdom teeth appeared in – 17,8% (n=41) and mandibular wisdom teeth in – 29,5% (n= 68) (Table №1).

Table №2 - Association of impacted third molars arch with gender

Gender	Impacted Upper maxillary	Impacted lower Mandibular	Total number of impacted teeth
Male n=98	20 (8,7%)	27 (11,7%)	47 (20,4%)
Female n=132	21 (9,1%)	41 (17,7%)	62 (26,8%)
Total number n=230	41 (17,8%)	68 (29,5%)	109(47,39%)

Table №2 presents the distribution of impacted third molars by arch and gender; From the total number of 230 patients, 47,39% (n=109) had all third molars impacted, the prevalence of impacted mandible third molars 29,5% (n= 68) was slightly higher than that of impacted maxillary third molars 17,8% (n=41), which was statically significant ($p < 0,005$). The prevalence of impacted third molars in females (26,9% n=62) was slightly higher than that of males (20,4% n= 47), which was statistically insignificant ($p > 0,23$). In the mandible, females (17,7%) had more impacted third molar teeth than males (11,7%). In the maxilla, females (9,1%) had slightly similar rate of impacted third molar teeth of males (8,7%)

The overall view and research area were not only the number of impacted teeth, but the consequences and further complications of tooth impactions and extraction. Also what was the signs and complications associated with wisdom tooth impaction. Investigation was provide revealing the correlation and feedback between interesting area of list:

- A) The total number of wisdom teeth removed before orthodontic treatment or during treatment.
- B) How many cases of extraction became necessary after orthodontic treatment to avoid tooth alignment problems (Teeth crowding)
- C) How many post-extraction complications were detected (swelling, alveolitis, damage to a neighboring tooth, parestesia).



(Figure 1: Impaction of the mandibular second premolar (a) and canine(b))

The results of the study were processed, summarized and the following data was revealed depended on options:

- Number and need of extracted third molars before orthodontic treatment;
- Urgent need for tooth (third molars) extraction after orthodontic treatment;
- Post-extraction complications as a result of surgery.

The results of the study showed that total number of wisdom extracted teeth before orthodontic treatment was conducted in 13% - teeth. The needs of extraction after orthodontic treatment of the impacted or partially erupted third molars were 42%. And From the number

of patients who had the post-extraction complication (after surgery) revealed in 74% cases. None of the **Prophylactic Removal** was revealed in this study.



Figure 2 a,b : Impaction and semi-impaction of third molars

Conclusion

Removal of impacted (unerupted and partially erupted) third molars, the majority of which are found in the mandible, is the most common surgical procedure in dentistry. Impacted third molars are known to be associated with the risk of different disorders and complications [1,4].

Third molar surgery is a very common procedure, but is associated with many attendant risks and complications. Fortunately, significant complications are rare, but need to be diagnosed and managed early in order to reduce morbidity, and perhaps, mortality. Complications during the impacted teeth surgery are the most common and expected complications. They might be subdivided into **several** groups: Complications associated with impacted or adjacent tooth, soft tissue complications, nerve injuries (paresthesia), bone complications, maxillary sinus complications, complications associated with swallowing [5,9,10].

Impacted wisdom teeth may cause inflammation, pain due to the pressure between both teeth, and infection, if it's partially hidden. In many people, however, the wisdom tooth just stops growing there, so they don't press against or damage the second molar, and nothing happens. Regardless of the pressure applied against the other tooth, if a wisdom tooth gets partially out and then stops emerging, then a condition called pericoronitis inflammation and infection of the soft tissues around a partially erupted tooth is often associated with impacted mandibular third tooth [5,10].

Orthodontic treatment with extraction increased the chance of successful treatment. Moreover, the proportion of successful orthodontic treatment level, was significantly higher than in the non-extraction treatment group [2, 8,11].

It should also be emphasized that the outcome and best result of orthodontic treatment significantly correlates with the extraction of third molars before orthodontic treatment. Also, study revealed an increased number of necessary extractions of wisdom teeth after orthodontic treatment (to avoid future orthodontic complications) [1,4,10].

It should be noted that this study considers full interaction between a high number of surgical complications. Accordingly, we can conclude that due to the high probability of

surgical complications, timely and targeted extraction is preferred, in the context of which we discuss prophylactic extraction and its necessity.

In conclusion, if tooth extraction is unavoidable, it is advisable to perform the extraction without less hassle, loss, expense, and complication, and most important is to be on time [8,11]. Surgeons must put first the interests of the patient during the evaluation of risks and benefits of third molar removal. Therefore, it is necessary to know the pathologic conditions associated with impacted mandibular third molars [6,10].

Among the reasons why some clinicians do not consider the preventive extraction of the germ of the third mandibular molars there is the possibility of postoperative complications. Furthermore, an additional source of debate is represented by the evidence that third molar germectomy seems to be connected to less morbidity than extraction of third molars with formed roots. So, some authors underline the necessity of carrying out a very careful assessing of cost-benefit ratio for evaluating the indications of third molar early or delayed extraction [12].

Prophylactic Removal: Is it Justified? It is sometimes recommended that non-functional wisdom teeth are best removed in teenagers and young adults. This is sound preventive dentistry. There is variation among general dental surgeons in their management of asymptomatic impacted third molar teeth. The decision-making process, about prophylactic removal versus the retention of asymptomatic impacted third molar teeth, should be based on the best available evidence and must be combined with clinical experience. The key element of judgment in cases of prophylactic surgical removal should first be a patient's safety risk-benefit analysis to avoid possible iatrogenic injuries. In addition, patients' perspectives, values, and attitudes should also play a prominent role [2,3,9].

The importance of an interdisciplinary approach between orthodontists, dental surgeons and sometimes periodontists regarding management of impacted teeth is crucial and should be highlighted [8,9].

Thus, providing the accurate and timely diagnosis as well as proper treatment planning will help the clinicians elucidate the prevalence of impaction or ectopic eruption and, most importantly, avoiding further complications, in most cases related with wisdom tooth extraction.

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БЕШКЕНАДЗЕ Э., ЗЕРЕКИДЗЕ Т., БАХТИАРИ БАХРАМИ П., СЕЙЕДРАУФИ С.
РЕТЕНЦИЯ ЗУБА МУДРОСТИ - В ПОИСКАХ РЕШЕНИЙ

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РЕЗЮМЕ

Ретенция отдельных зубов зачастую является причиной формирования аномалий зубных рядов, их смыкания, функциональных и эстетических нарушений. По различным данным встречаемость ретенции зубов составляет от 0,8% до 60% среди всех зубочелюстных аномалий. Ретенция зубов может быть как самостоятельной аномалией, так и как симптомом, осложняющим клиническую картину и течение других зубочелюстных аномалий. Однако, в ряде случаев, зубоальвеолярное вытяжение ретенированного зуба не приводит к желаемым результатам. Это связано с особенностями положения ретенированных зубов и с состоянием костной ткани, окружающей его.

В течение многих лет удаление ретенированных третьих моляров было предметом дискуссии в научной стоматологической литературе. Хотя, решение об удалении третьих моляров, ассоциированных с патологическими изменениями, простая задача, профилактическое удаление бессимптомного третьего моляра может оказаться нелегким решением. Зуб признается ретенированным, если в то время, как зуб должен был уже прорезаться, его коронковая часть находится в толще костной ткани на

определенном удалении от поверхности альвеолярного гребня. Кроме того, зуб считается ретенированным, когда его периодонт не сообщается с полостью рта.

Целью исследования было изучение статистики Ретенции и полу-Ретенции (частичное прорезывание) постоянного зубного, выявление корреляции и обратной связи, выраженной Ретенции и последствий удаления зуба в разном возрасте.

Для этой цели было исследовано 230 панорамных изображений пациентов (132 женщин и 98 мужчин), в возрасте от 12 до 35 лет. Исследование было направлено не только на изучение количества ретенции зубов, но и на последствия и дальнейшие осложнения после удаления зуба.

Было высказано предположение, что тщательный мониторинг бессимптомных третьих моляров может быть подходящей стратегией. Ключевым элементом решения профилактического хирургического вмешательства прежде всего, должен быть анализ риска и пользы для безопасности пациента, чтобы избежать возможных ятрогенных повреждений. Таким образом, при своевременной постановке диагноза и правильном планировании лечения клиницисты могут снизить частоту эктопического прорезывания зубов и ретенции и, что наиболее важно, дальнейших осложнений, которые в большинстве случаев связаны с удалением зуба мудрости.