

## CIRCUMSTANCE FOR REMOVAL OF IMPACTED MANDIBULAR SECOND AND THIRD MOLARS TEETH

Ukrainian Medical Stomatological Academy (Poltava)

kiani.masoud98@gmail.com

This article is a fragment of the search topic.

**Introduction.** Impaction is defined as failure of tooth eruption caused by a physical obstacle in the eruption path or the abnormal position of the tooth [1]. The most commonly affected are third molars followed by maxillary canines and mandibular second premolars [2,3].

Impaction of a second permanent molar is rare and usually occurs in the mandibular arch with an incidence of 0.06-0.3% [3,4,8].

Surgery for removal of impacted mandibular second and third molars may be associated with several post-operative complications. They may include infection, dry socket, bleeding, nerve injury, delayed healing and periodontal pocketing [4,5].

Local factors related to the failure of eruption include malocclusion disturbances of the deciduous dentition, the position of the adjacent teeth, space deficiency in the dental arch, idiopathic factors, supernumerary teeth, odontomas or cysts [2,4,5].

Impacted mandibular wisdom tooth are wisdom tooth which do not fully erupt into the mouth because of blockage from other teeth. If the third molar tooth do not have an open connection to the mouth, pain can develop with the onset of inflammation or infection to the adjacent teeth (**Figure 1**).

Mandibular third molars teeth likely become impacted because of a mismatch between the size of the teeth and the size of the jaw and horizontal impaction that can damage the second molar roots and cause possible periodontal disease (**Figure 2**).

Impacted mandibular third molars teeth are classified by their direction of impaction, their depth compared to the biting surface of adjacent teeth and the amount of the tooth's crown that extends through gum tissue or bone [1].

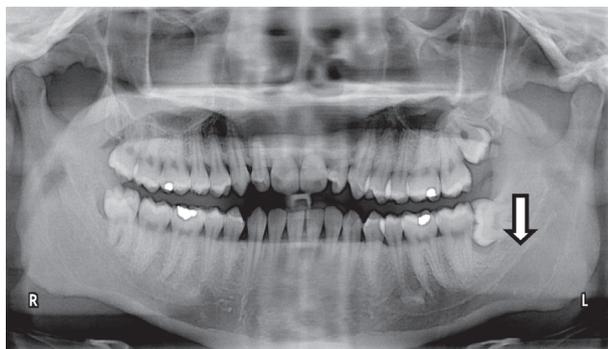


Figure 1. Panoramic radiograph showing horizontally impacted mandibular third molar 38

However, when an impacted second or third molar tooth becomes infected, damages other teeth or causes other dental problems, some of these signs may experience as following [8,9,10]:

- Difficulty opening the mouth (occasionally);
- Prolonged headache or jaw ache;
- Bad breath;
- Pain or tenderness of the gums (gingiva) or jaw bone;
- Redness and swelling of the gums around the impacted tooth;
- Swollen lymph nodes of the neck (occasionally);
- Unpleasant taste when biting down on or near the area;
- Visible gap where a tooth did not emerge.

Infection resulting from impacted mandibular third molars can be initially treated with antibiotics, local debridement or soft tissue surgery of the gum tissue overlying the tooth. Over time, most of these treatments tend to fail and patients develop recurrent symptoms [6,7].

The most common treatment is wisdom tooth extraction. The risks of mandibular wisdom teeth removal are roughly proportional to the difficulty of the extraction. Sometimes, when there is a high risk to the inferior alveolar nerve, only the crown of the tooth will be removed (intentionally leaving the roots) in a procedure called a coronectomy [2,4,9].

The long-term risk of coronectomy is that chronic infection can persist from the tooth remnants. The prognosis for the second molar is good following the wisdom teeth removal with the likelihood of bone loss after surgery increased when the extractions are completed

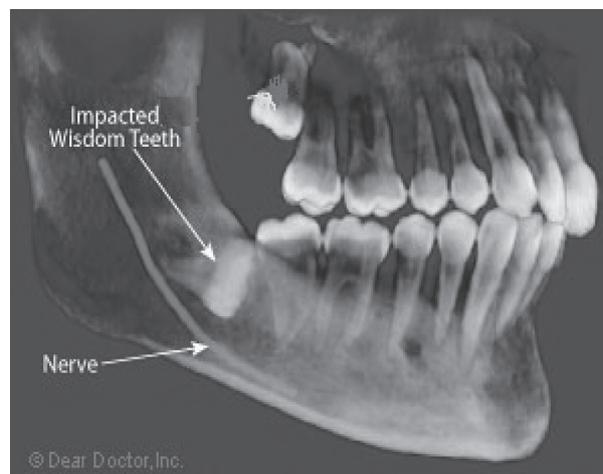


Figure 2. Image showing the lower wisdom tooth having a horizontal impaction that can damage the second molar roots and cause possible periodontal disease.



**Figure 3. Panoramic radiograph showing horizontally impacted left and right mandibular second and third molars.**

in people who are 25 years of age or older. A treatment controversy exists about the need for and timing of the removal of disease-free impacted wisdom teeth that are not causing problems.

Supporters of early removal cite the increasing risks for extraction over time and the costs of monitoring the wisdom teeth that are not removed.

Supporters for retaining wisdom teeth cite the risk and cost of unnecessary surgery [6, 11].

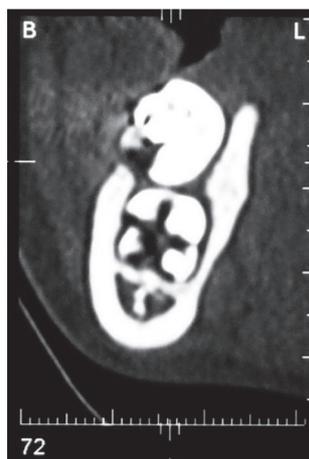
Problems associated with impacted second molars are caries, periodontitis, resorption of adjacent teeth, cyst formation, malocclusion and pain [5, 10, 11]. Treatment options for an impacted molar include extraction, orthodontic uprighting, surgical uprighting, transplantation, surgical-orthodontic approach, and dental implant replacement.

Generally, the impaction of mandibular second molars is a rare complication in tooth eruption. The presence of deeply horizontally impacted lower second and third molars is even more unusual [6, 7, 12]. The arrested eruption of the lower second and third molars can determine disturbances of mastication and aesthetics. Moreover, an increased risk of caries in the distal side of the first lower molar is possible [2, 5]. Indeed, orthodontic treatment, transplantation and extraction of impacted second molars have been suggested to avoid potential damage to the first molar root [3, 9, 11].

**The aim of this study** is the management and the outcome of the surgical treatment of an unusual case of impacted mandibular second and third molars.

**Clinical Report.** A 20-year-old male with an unremarkable medical terms, came to the Department of Surgical Stomatology and Maxillofacial Surgery with Plastic and Reconstructive Surgery of Head and Neck, Ukrainian Medical Stomatological Academy, Poltava, Ukraine, in Monday, June 6th, 2016, for the management of his impacted mandibular second and third molars.

During a clinical intraoral examination, we noticed the presence of a horizontally inclined tooth on the left side of the lower arch, distal to the first molar. A panoramic radiograph showed that the left mandibular second molar was deeply impacted horizontally, with the mesial cusps below the first molar's root apices. The left mandibular third molar laid above and parallel to the second molar. The panoramic radiograph also showed the presence of unerupted teeth numbers 18, 25, 27, 28 and 38 (Figure 3). CT scans of the mandible revealed



**Figure 4. Mesial CT scan of the mandible revealing the relationship of the inferior alveolar canal with the second molar.**

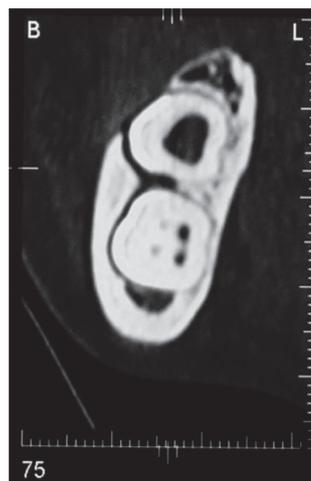
the relationship of the inferior alveolar canal with the second molar (Figures 4 and 5). Surgical intervention was performed under local anesthesia. Local nerve block anesthesia of the inferior dental, lingual and buccal nerves used two carpules of 1.7 mL of 4% ubestezine forte (Articaine) with 1:100000 adrenalin (3M ESPE, U.S.A). The left mandibular second and third molars were extracted using a mucoperiosteal vestibular flap that was limited to the first molar, lifting a full thickness flap. The osteotomy necessary to visualize the impacted third molar was performed using a tungsten carbide bur mounted on a high speed dental handpiece (Figure 6). To minimize the quantity of bone removed, the wisdom tooth was sectioned into two parts with a carbide fissure bur mounted on a high speed dental handpiece (Figure 7). After sectioning, the two segments were removed (Figure 8). Sequentially, another osteotomy was performed to approach the impacted second molar.

The mandibular second molar also was sectioned into two parts with a carbide fissure bur mounted on a high speed dental handpiece (Figure 9). The two segments of the second molar were removed. The remaining socket was rinsed with physiological saline. Then we fill it with Calcium Sulfate Granular (NewPlaster NP170; ClassImplant, Italy) to help bone regeneration in the obtained socket (Figure 10). Primary closure of the flap was performed using a 3/0 silk suture. The patient was prescribed an antibiotic (Amoxicillin 500 mg 2 times a day for 7 days), a non-steroidal anti-inflammatory drug (NSAIDs) (Ibuprofen 400 mg orally every 6 hours for 3 days).

Postoperative instructions and use of the prescribed drugs were printed sheet of paper that was given to the patient. Beginning the day after surgery, patient oral rinsed 3 times a day with chlorhexidine 0.05% for 12 days. The sutures were removed 12 days later. On the tenth day after the intervention, the patient did not complain of pain and he showed neither paresthesia nor

the relationship of the inferior alveolar canal with the second molar (Figures 4 and 5).

Surgical intervention was performed under local anesthesia. Local nerve block anesthesia of the inferior dental, lingual and buccal nerves used two carpules of 1.7 mL of 4% ubestezine forte (Articaine) with 1:100000 adrenalin (3M ESPE, U.S.A). The left mandibular second and third molars were extracted using a mucoperiosteal vestibular flap that was limited to the first molar, lifting a full thickness flap. The osteotomy necessary to



**Figure 5. Distal CT scan of the mandible revealing the relationship of the inferior alveolar canal with the second molar.**



Figure 6. Osteotomy was accomplished to imagine the impacted wisdom tooth..



Figure 7. Third molar divided into two parts.



Figure 8. Two segments of the wisdom tooth were removed.



Figure 9. Second molar was also divided into two parts.

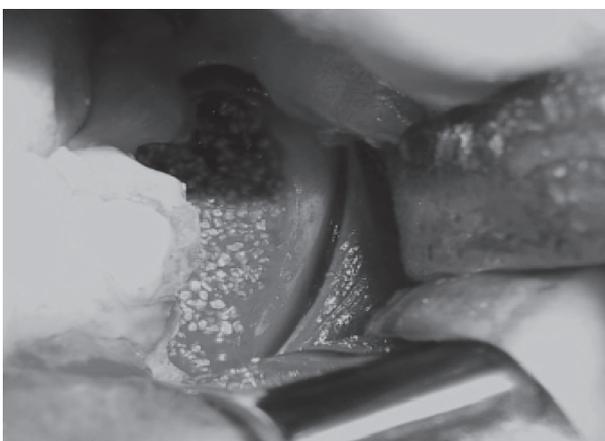


Figure 10. Residual socket was filled with Calcium Sulfate Granular.

anesthesia in the region of the chin. No sign of infection was observed. Three months after the intervention, a panoramic radiograph showed bone healing and regeneration in the surgical site.

**Discussion.** According to the classification by Andreasen and Kurol, the absence of eruption of the second molar could be caused by three events [1,12]:

1. Impaction.
2. Primary retention.
3. Secondary retention.

Impaction of the second molar is usually determined by a physical obstacle because of lack of space, odontomas, supernumerary teeth, odontogenic tumors, giant cell fibromatosis in the eruption line, and collision between the follicles of the second and third molars.

However, the third molar cannot be considered as a cause of lower second molar impaction. Indeed, it is not involved in either the time or in the path of the eruption of the lower second molar. Simply extracting it does not lead to the proper eruption of an impacted second molar. An ectopic eruption pathway could also be considered as a cause of the impaction of the second molar.

The eruption of the second molar arrested before the rupture of the gum is called primary retention. It is usually due to unknown causes. In some cases, it is observed in patients affected by syndromes with a compromised osteoclastic activity.

Finally, secondary retention is the cessation of the eruption after gingival rupture, without the presence of a physical obstacle. This event is more common than primary retention, and it is determined by ankylosis, especially in the interradicular zone.

In objectivity; in this patient, the presence of various unerupted and malpositioned teeth numbers 18, 25, 27, 28 and 38 was observed.

In this case, different therapeutic approaches could be proposed for second and third molar impaction and malposition: surgical removal of the third molar, surgical exposure of the second molar and positioning of the orthodontic buttons for traction and to force its proper eruption; surgical removal of the third molar and transplantation of the second molar in a correct position; surgical removal of the second molar and replacement of the third molar in a correct position and surgical extraction of both the second and third molars.

The most successful therapeutic option could be orthodontic, although it can't be used in the deeper impacted second molars, as in this case [10, 11, 12].

An orthodontic movement of the second molar was excluded because of the lack of supporting bone and the deep impaction of the tooth. Moreover, the arc of rotation in the repositioning should be less than 90 degrees because if it were more than this, the possibilities

of postsurgical pulp revascularization would decrease. Indeed, the apexes of the involved teeth could already be closed, therefore, deep impaction and advanced age of the diagnosis are the factors associated with a poor result of the treatment. In this case, transplantation or surgical repositioning were not possible because of the deep impaction of the teeth and the lack of supporting bone. Therefore, the surgical removal of the second and third left mandibular molars was decided.

Preoperative assessment of surgical difficulty is fundamental to correctly plan the extraction of impacted third molars. In this case, it was extremely important to assess the various elements that could influence the extraction, such as angulation, relative depth, form of the root, number of roots, relationship of the tooth to the ramus, proximity to the mandibular canal and lack of periodontal membrane space. We decided to section both the second and third molars to limit the bone removal that was however necessary because of the position of the two impacted teeth.

Great attention was paid not to damage the inferior alveolar nerve and not to cause iatrogenic mandibular fracture. On the tenth day after the intervention, the patient showed neither paresthesia nor anesthesia in the region of the chin. No intraoral dehiscence was present. No signs of infection were observed.

**Conclusions.** The arrested eruption of the mandibular second and third molars teeth is an extremely rare condition. Different therapeutic options should be considered. In this case, we decided to perform the surgical removal of the second and third molars because of the age of the patient, the deep impaction of the second molar and the lack of supporting bone.

**Perspective for Further Research.** It is important to diagnose arrested eruption of the permanent lower second and third molars as early as possible because orthodontic treatment at a late stage could be complicated and present difficult clinical problems.

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### КЛІНІЧНИЙ ВИПАДОК ВИДАЛЕННЯ РЕТИНОВАНИХ ДРУГОГО ТА ТРЕТЬОГО МОЛЯРІВ НИЖНЬОЇ ЩЕЛЕПИ

**Масуд Кіані, Панькевич А. І., Локес К. П., Скікевич М.**

**Резюме.** Як правило, ретенція другого моляра нижньої щелепи є рідкісним ускладненням прорізування зубів. Горизонтальне положення другого і третього молярів зустрічаються ще рідше.

У даній роботі представлений клінічний випадок 20-річного пацієнта з ретенцією другого і третього молярів нижньої щелепи. На панорамній рентгенограмі має місце горизонтальне положення другого моляра, мезіальні горби якого розташовуються нижче рівня апексів першого моляра. Лівий третій моляр розташовується вище і паралельно другому моляру. Панорамна рентгенограма також показала наявність непрорізуваних зубів 18, 25, 27, 28 і 38.

КТ щелепи показала взаємозв'язок нижньощелепного каналу з другим моляром. За класифікацією Andreassen і Kurol, відсутність прорізування другого моляра може бути викликана трьома факторами: власне ретенцією, первинною та вторинною ретенцією.

Затримка прорізування другого моляра зазвичай визначається фізичною перешкодою через нестачу місця, наявності одонтом, понадкомплектних зубів, одонтогенних пухлин, гігантоклітинного фіброматозу в області прорізування зубів і фолікулів другого і третього молярів.

Затримка прорізування другого і третього молярів нижньої щелепи є надзвичайно рідкісним захворюванням. Різні варіанти лікування повинні бути розглянуті. У цьому випадку було виконано хірургічне видалення другого і третього моляра в зв'язку з віком пацієнта, глибоким положенням другого моляра і відсутністю опорної кістки.

**Ключові слова:** другий моляр, третій моляр, ретиновані моляри, видалення ретинованих молярів.

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### КЛИНИЧЕСКИЙ СЛУЧАЙ УДАЛЕНИЯ РЕТИНИРОВАННЫХ ВТОРОГО И ТРЕТЬЕГО МОЛЯРОВ НИЖНЕЙ ЧЕЛЮСТИ

**Масуд Киани, Панькевич А. И., Локес К. П., Скикевич М.**

**Резюме.** Как правило, ретенция второго моляра нижней челюсти является редким осложнением прорезывания зубов. Горизонтальное положение второго и третьего моляров встречаются еще более редко.

В данной работе представлен клинический случай 20-летнего пациента с ретенцией второго и третьего моляров нижней челюсти. На панорамной рентгенограмме имеет место горизонтальное положение второго моляра, мезиальные бугры которого располагаются ниже уровня апексов первого моляра. Левый третий моляр располагается выше и параллельно второму моляру. Панорамная рентгенограмма также показала наличие непрорезавшихся зубов 18, 25, 27, 28 и 38.

КТ челюсти показала взаимосвязь нижнечелюстного канала со вторым моляром. По классификации Andreassen и Kurol, отсутствие прорезывания второго моляра может быть вызвано тремя факторами: собственно ретенцией, первичной и вторичной ретенцией.

Задержка прорезывания второго коренного зуба обычно определяется физическим препятствием из-за недостатка места, наличием одонтом, сверхкомплектных зубов, одонтогенных опухолей, гигантоклеточного фиброматоза в области прорезывания зубов и фолликулами второго и третьего моляров.

Задержка прорезывания второго и третьего моляров нижней челюсти является чрезвычайно редким заболеванием. Различные варианты лечения должны быть рассмотрены. В этом случае было выполнено хирургическое удаление второго и третьего моляра в связи с возрастом пациента, глубоким положением второго моляра и отсутствием опорной кости.

**Ключевые слова:** второй моляр, третий моляр, ретинированные моляры, удаление ретинированных моляров.

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### CIRCUMSTANCE FOR REMOVAL OF IMPACTED MANDIBULAR SECOND AND THIRD MOLARS TEETH

**Masoud Kiani, Pankevych A. I., Lokes K. P., Skikevich M.**

**Abstract.** Impaction is defined as failure of tooth eruption caused by a physical obstacle in the eruption path or the abnormal position of the tooth. The most commonly affected are third molars followed by maxillary canines and mandibular second premolars.

Impaction of a second permanent molar is rare and usually occurs in the mandibular arch with an incidence of 0.06-0.3%.

Surgery for removal of impacted mandibular second and third molars may be associated with several postoperative complications. They may include infection, dry socket, bleeding, nerve injury, delayed healing and periodontal pocketing.

Impacted mandibular wisdom tooth are wisdom tooth which do not fully erupt into the mouth because of blockage from other teeth. If the third molar tooth do not have an open connection to the mouth, pain can develop with the onset of inflammation or infection to the adjacent teeth.

Mandibular third molars teeth likely become impacted because of a mismatch between the size of the teeth and the size of the jaw and horizontal impaction that can damage the second molar roots and cause possible periodontal disease.

Problems associated with impacted second molars are caries, periodontitis, resorption of adjacent teeth, cyst formation, malocclusion and pain. Treatment options for an impacted molar include extraction, orthodontic uprighting, surgical uprighting, transplantation, surgical-orthodontic approach, and dental implant replacement.

Generally, the impaction of mandibular second molars is a rare complication in tooth eruption. The presence of deeply horizontally impacted lower second and third molars is even more unusual. The arrested eruption of the lower second and third molars can determine disturbances of mastication and aesthetics. Moreover, an increased risk of caries in the distal side of the first lower molar is possible.

This study about a 20-year-old male with impacted mandibular second and third molars. A panoramic radiograph showed that the left mandibular second molar was deeply impacted horizontally, with the mesial cusps below the first molar's root apices. The left mandibular third molar laid above and parallel to the second molar. The panoramic radiograph also showed the presence of unerupted teeth numbers 18, 25, 27, 28 and 38. CT scans of the mandible revealed the relationship of the inferior alveolar canal with the second molar. According to the classification by Andreasen and Kuroi, the absence of eruption of the second molar could be caused by three events: impaction, primary retention and secondary retention.

Impaction of the second molar is usually determined by a physical obstacle because of lack of space, odontomas, supernumerary teeth, odontogenic tumors, giant cell fibromatosis in the eruption line, and collision between the follicles of the second and third molars.

However, the third molar cannot be considered as a cause of lower second molar impaction. Indeed, it is not involved in either the time or in the path of the eruption of the lower second molar. Simply extracting it does not lead to the proper eruption of an impacted second molar. An ectopic eruption pathway could also be considered as a cause of the impaction of the second molar.

The eruption of the second molar arrested before the rupture of the gum is called primary retention. It is usually due to unknown causes. In some cases, it is observed in patients affected by syndromes with a compromised osteoclastic activity.

Finally, secondary retention is the cessation of the eruption after gingival rupture, without the presence of a physical obstacle. This event is more common than primary retention, and it is determined by ankylosis, especially in the interradicular zone.

The arrested eruption of the mandibular second and third molars teeth is an extremely rare condition. Different therapeutic options should be considered.

In this case, we decided to perform the surgical removal of the second and third molars because of the age of the patient, the deep impaction of the second molar and the lack of supporting bone.

It is important to diagnose arrested eruption of the permanent lower second and third molars as early as possible because orthodontic treatment at a late stage could be complicated and present difficult clinical problems.

**Keywords:** second molar, third molar, impacted molars, removal impacted molars.

*Рецензент – проф. Аветіков Д. С.*

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