

IMPACTED MAXILIAN INCISIVES, DIAGNOSIS AND TREATMENT

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Abstract

Impacted teeth are teeth that cannot erupt because it does not have room or may be coming in the wrong direction or position. The incidence of impacted teeth reaches 15%.

The reasons for the impact of the teeth can be:

1. Lack of space in the dental arch.
2. early loss of deciduous teeth.
3. the abnormal position of the follicle,
4. fibrotic thickening of the mucoperiosteum and bone sclerosis,
5. cysts and tumors,
6. dilatations caused by trauma to the deciduous teeth,
7. overgrown teeth and odontomas.

Accurate diagnosis is based on clinical examination and radiography, a treatment plan is made based on the etiology of the impact of the maxillary incisors, local condition, age of the patient, and dental age. For successful treatment, the following should be considered: the position and direction of the impacted tooth, the development of the tooth root, and the space available for the placement of the tooth in the dental arch.

Treatment of impacted maxillary incisors is done by surgical or surgical-orthodontic methods.

The purpose of this paper is to review the current literature on impacted maxillary incisors and to analyze the most contemporary approaches to the etiopathogenesis, clinic, diagnosis, and therapy of impacted teeth, with a special focus on impacted maxillary incisors. Update data on the therapy of impacted maxillary incisors (surgical and orthodontic), as well as the advantages and disadvantages of selected methods and their impact on the long-term prognosis of these anomalies.

Working methodology: The work was carried out in the form of a "literature review" on impacted maxillary incisors.

Conclusion: The most common causes of maxillary incisors are minor teeth and odontomas. . Surgical-orthodontic procedures are undertaken after the elimination of the etiological cause, the creation of the necessary space for the spontaneous eruption of the impacted tooth or to help its placement in a regular position in the dental arch.

Keywords: Teeth, incisors, impact, eruption, orthodontic therapy, surgical therapy.

1. Introduction

The impact of maxillary incisors is a problem at an earlier age. This pathological condition is reported less frequently than that of third molars or canines.^{1,2}

Early referral of patients to mixed dentition, in connection with the delayed eruption of permanent maxillary central incisors, is common, due to the concern of parents and general dentists.^{3,4}

Maxillary incisors are the teeth that appear maximally during speech and smile, in most individuals, therefore, the normal appearance, position, and morphology of these teeth are essential for the phonetics and aesthetics of the face.⁵

Failure of eruption (teething) can occur if pathological obstructions develop in the way of the incisor, such as: overgrown teeth, odontomas, cysts, etc. Overgrowth of teeth and odontomas are the most common cause, with a share of 56-60%.^{6,10}

The reasons for the impact of the teeth are not, in general, clarified, but may be:

- Lack of space in the dental arch.

- Early loss of deciduous teeth.
- Irregular position of the follicle.
- Limited growth of the jaw in the antero-posterior direction.
- Fibrotic thickening of the mucoperiosteum as well as bone sclerosis.
- Teething can be prevented by overgrown teeth as well as some pathological conditions (odontomas, cysts, tumors) .5

Other possible causes of maxillary incision eruption are:

- Ectopic position of the tooth follicle.
- Primary ankylosing teeth.
- Mucosal obstruction in the eruption pathway, which acts as a physical barrier to eruption.
- Endocrine abnormalities. 6

Traumatic causes: obstruction, due to soft tissue repair, during the traumatic and early loss of incisors, is most often the result of an accident and stroke, which results in tooth displacement, usually during the time the child was in the game. It is also possible for this to happen during dental extraction, triggered by the presence of deep caries, or as a result of trauma.6

- The pathognomonic sign, which indicates the absence of the central tooth-central incisor, is the presence of the lateral incisor tooth.
- After determining the general surgical-orthodontic diagnosis, a list of other problems should be compiled, which appear in dental arches. According to the analysis and evaluations made, the clinician should make the assessment, which intervention should be done first, the treatment of the impacted teeth or the abnormalities present in the dental arch.
- As a general rule, priority in treatment should be given to the impacted incisor and all orthodontic procedures will be applied later, until the incisor is placed in the dentition, and then other corrections are treated, in all three planes (sagittal, transverse and vertical).
- During mixed dentition, orthodontic treatment should be planned, to first create the necessary space for the placement of the impacted tooth and then to remove the etiological cause.
- A technique should be used, which provides the following four aspects:
- The device must be able to create enough space to place the impacted teeth, both at the occlusal level and along the entire length of the neighboring tooth roots, and have the ability for controlled crown and root movements.
- Surgical exposure of the impacted tooth crown, together with the attachment of a brace, should be performed in a way, to achieves a good periodontal prognosis.
- For the device to be effective, it must generate light and controlled extrusion forces.
- The final position of the impacted tooth and its agonists is achieved by moving the crown and the roots of each of these teeth, in all three planes.6

2. Literature review

2.1. *Etiology and pathogenesis of maxillary incisor impact*

Eruption of lateral incisors and failure to present central incisors is always considered abnormal. A tooth erupts in the oral cavity after 2/3 of the root formation is completed. An impacted tooth is one that tooth, which fails to erupt in the dental arch, within normal time. Exposure of these teeth and their positioning in the dental arch can be done through surgical and orthodontic methods.

Congenital absence of the central incisor, in general, is very rare, compared to other teeth.

2.1.1. Etiological factors

Failure of the tooth can occur as a result of obstructions in the way of tooth eruption, such as:

1. Supernumerary teeth, 2. Odontomas, 3. Cysts, 4. Tumors, 5. Ectopic position of the tooth follicle, etc., which are present in the way of tooth eruption.

Overgrown teeth and odontomas are the main causes, 56-60% of overgrown teeth are present in tooth decay.^{6,10}

Other causes of tooth decay are: 1. Primary ankylosing teeth, 2. Early extraction of deciduous teeth, 3. Obstruction of the mucosa in the eruption pathway, 4. Endocrine abnormalities, 5. Bone diseases. 6. Traumatic causes, 6. Dilation.

The impact of permanent teeth (excluding third molars) is a common phenomenon, with participation, ranging from 2.9% - 13.7%.

2.1.2. Troubleshooting

Maxillary incisors are the teeth that appear maximally during the speech, therefore, the normal appearance, position, and morphology of these teeth are essential for facial aesthetics and phonetics.⁷

Early diagnosis enables the improvement of skeletal relationships and will eliminate functional interventions and correct concerns during the eruption.⁶

2.1.3. Clinical examination

An oral examination should be performed to look at the current condition in the mouth, the buccal-palatal tumuli, and the space required for the incisors (9 mm-central incisors, 7 mm-lateral incisors).⁸

Significant clinical signs are:

- Eruption of lateral incisors and absence of central incisors in the dental arch.
- Reducing or closing the space available for the eruption of permanent maxillary central incisors.
- Presence of rotation and inclination in erupted teeth
- Tissue growths on the palatal or labial side, depending on the location of the tooth.
- Lack of an eruption, which would be palpated in the buccal sulcus, in the period 1-1.5 years, before the impact of the impacted tooth.⁷

Pathognomonic sign: is the eruption of the lateral incisor, in the dental arch and the absence of the central incisor.

Eruption of the lateral incisors, before the central incisors and their eruption, 6 months before the release of the central incisors, are data, which indicate the delayed eruption of the maxillary incisors.

Case examination

- The jaw and the shape of the dental arch should be examined.
- Transverse and sagittal symmetry.
- Distance between canines (intercanine)
- Morphology and position of lateral incisors.
- Disharmony of the maxillary teeth.
- Dimensions of erupted lateral incisors and unerupted central incisors.
- Any discrepancy between the size of the tooth and the size of the arch.

3. Purpose of the work

The purpose of this paper was to analyze, through a review of the current published literature on impacted maxillary incisors:

Attitudes of different authors on the etiopathogenesis, clinic, diagnosis and therapy of impacted teeth, with special focus on impacted maxillary incisors.

Factors to consider when selecting adequate therapy for the treatment of impacted maxillary incisors, surgical and orthodontic surgery.

Analyze the advantages and disadvantages of surgical methods, selected for the treatment of impacted maxillary incisors and their impact on the long-term prognosis of these anomalies.



Fig 1. a) Abnormal lip morphology, lack of filter and midline position of single central incisor.
b) Oral view of the patient with the 'square' anatomy of the incisor and its indeterminate right / left direction.
c) view of the palate with bilateral cracks.

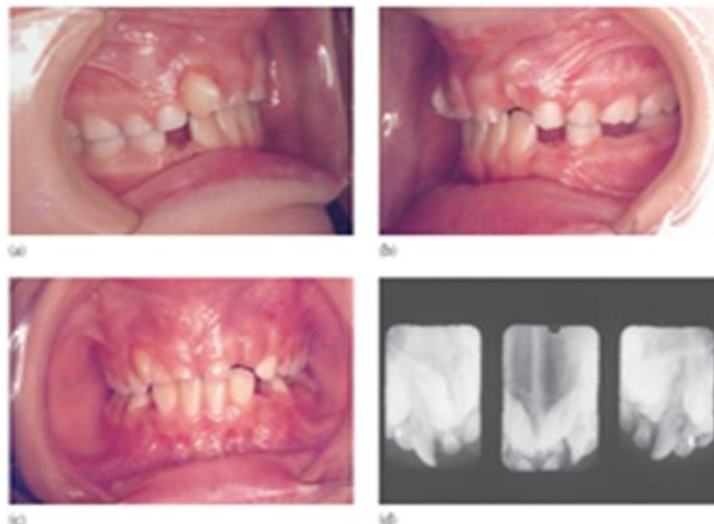


Fig. 2. (a - c) Clinical picture of a patient with enlarged gingiva due to obstructive effect of central incisors. The three mammary incisors are extracted and the permanent lateral incisors erupt rotated and at a mesio-labial angle.
(d) Periapical views of the anterior region show the orientation of the long displaced axis of the central incisors.



Fig. 3. (a, b) The anterior and occlusal clinical picture of a patient with an incisor, illustrating the crest with buccal-lingual and vertical defects.

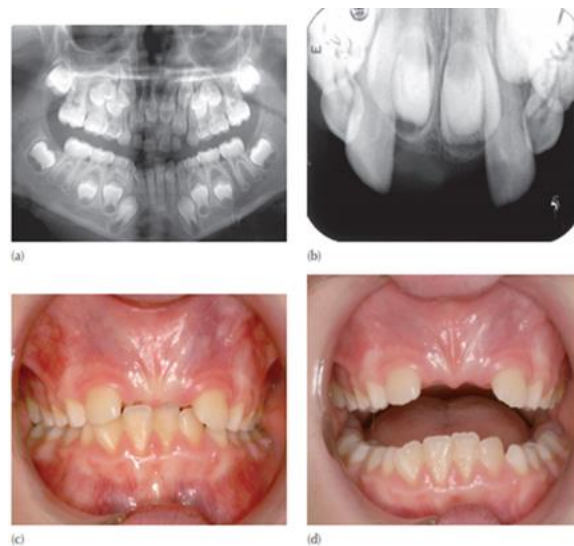
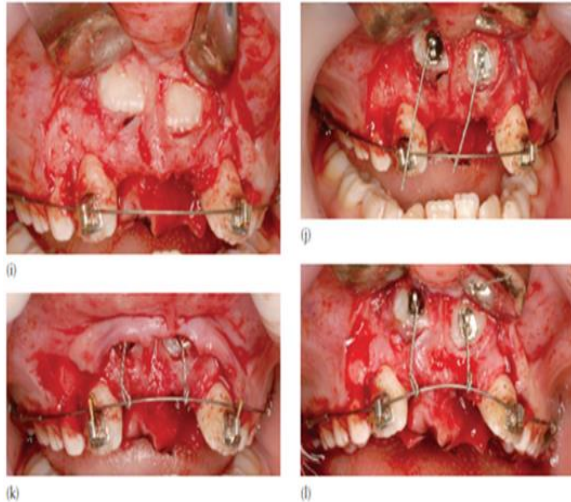


Fig. 4. Impacted central incisors due to overgrown teeth.
 (a) Pre-treatment panoramic view.
 (b) Periapical radiograph taken on the same date.
 (c) Oral anterior view.
 (d) The degree of contact of the mandibular incisors is obvious.



- (i) A minimum area of the labial surface
- (j) Bracelet binding.
- (k) Placing the panties and attaching them to the labial arch.
- (l) Application of vertical traction forces.

Continuation of the photo: 4
 (m) The lamp is put back in place



- (n) Near the time when the teeth have erupted, a labial arch is placed where the brace of the tooth is attached.
- (o) Anterior oral view at the end of stage 1
- (p) The root of the lateral incisor is in the palatal direction.
- (q) Panoramic view at the end of phase 1
- (r) Periapical view.2

4. Conclusion

Based on the reviewed literature, we have reached the following conclusions:

- Impacted teeth are considered teeth that have not erupted by their chronological age, regardless of the obstacles in the way of their exit.
- The most common causes of maxillary incisors are an overgrowth of teeth and odontomas.

Failure of the permanent maxillary central incisors to fail is rare, with a frequency of 0.006% to 0.2%.

- The choice of surgical and orthodontic therapy should be based on individual cases, in close collaboration between the orthodontist, oral surgeon, and patient.
- The age of the patient, the dental age, and the normal time of tooth eruption should be taken into account to assess the ideal time to intervene.
- All surgical-orthodontic procedures should be performed after the elimination of the etiological cause and the creation of the necessary space for the placement of the impacted tooth.
- Impact incisors erupt in up to 70% of cases, after removal of the obstruction.
- Surgical exposure of the impacted tooth can be done with the closed method and open method.
- To monitor tooth eruption, long-term follow-up is needed in the regular position in the dental floss.
- All interventions must meet the functional and aesthetic aspects of the patient.

Abbreviations used in the paper:

NTM- Temporo-Mandibular Node.

Rtg-X-rays.

CT- Computed tomography.

MRI- Magnetic resonance.

USG- Ultrasonography.

CEJ- Cement- Enamel Level.

Recommendation

- Early diagnosis of the anomaly by the general dentist, referral to the orthodontist or oral surgeon.
- Professional intervention in order to eliminate the causes, in a timely manner.
- Prevention of anomalies by preventing early tooth loss in milk dentition due to caries (prevention of caries by fluoridation and hygiene, etc.).
- Long-term monitoring of the therapy undertaken to place the teeth in the correct position in the dental arch.

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Photo sources:

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