

## Case Report

## Restoring A Young Boy's Smile via Tooth Autotransplantation

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**Abstract:** Teeth autotransplantation has been used for centuries. This method has been used in many new situations and has constantly been making breakthrough discoveries. We report a case of a 16-year-old-boy, who has a horizontally impacted central incisor (tooth n°11) with the presence of a mesiodens. The computed tomography revealed the high position of the impacted tooth and an enlargement in the dental sac. We extracted the mesiodens and placed the impacted tooth immediately in its socket. A soft splint was used for one month, two weeks later endodontic treatment was performed. Two-year follow-up autotransplanted tooth is periodontally well-integrated. **Aim:** To demonstrate the prospects of tooth autotransplantation in younger people when dental implant and prosthesis are not yet indicated.

**Keywords:** Tooth autotransplantation, impacted tooth, tooth supernumerary.

### 1.1 INTRODUCTION:

Dental smile is very important in our society and maxillary central incisors as an integral part of it require more attention and preservation.

In many cases impacted maxillary central incisor was associated with a supernumerary tooth called mesiodens. In those cases decision making treatment is difficult, it may require a multidisciplinary intervention (orthodontic traction, surgical extraction...) (Chokron, A. *et al.*, 2010).

The aim of this work is to present the importance of tooth autotransplantation as an uncommon surgical technique in the treatment of dental inclusion.

### 1.2 Case Presentation:

We report a case of a healthy sixteen-year-old boy, who came to our clinic to take charge of an unsightly smile. Figure 1



**Figure 1: Initial smile of a patient aged 16 with a mesiodens in the site of tooth n° 11 (impacted)**

Clinical examination revealed a mesiodens in the site of tooth n° 11; tooth n° 21 was in its normal position, but discolored by enamel hypoplasia.

We found a fistula on the apex of the atypical tooth, the cold test being positive.

A panoramic X-ray and a computed tomography were performed and showed the presence of a dentigerous cyst surrounding the crown of tooth n°11, with a backflow of the vestibular cortical. The tooth n°11 is in a horizontal position, highly located and in contact with the nasal cavity. Figure 2

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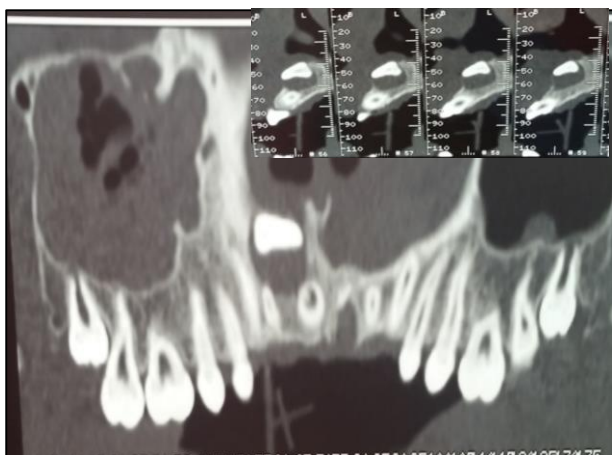
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**Figure 2: CT scan: high position of the upper central right incisor with a dentigerous cyst**

Several solutions are proposed to overcome this situation:

- Extraction of the supernumerary tooth and traction of the tooth n°11 with an orthodontic treatment
- Extraction of tooth n°11 and adjunction of a composite resin on the crown of the mesiodens to make it look like a central incisor until the end of growth and then placing an implant
- Extraction of the supernumerary tooth and of tooth n°11 and temporizing with a partial removable denture to maintain the place for a future implantation of the site
- Extraction of the supernumerary tooth and transplantation of tooth n° 11 if completely safe extracted

The first alternative was discarded after consulting the orthodontist because of the high location of tooth n°11 and a suspicion of root angulation.

We exposed the three other alternatives to the father and the patient, and with their agreement we retained the last proposition. After an atraumatic extraction of tooth n°11 with an enucleation of the cyst, we replaced this tooth in its place.

We extracted the supernumerary tooth, and finally we transplanted tooth n°11 in its extraction site, and we set up a soft splint to the adjacent teeth.

After two weeks, we conduct an endodontic treatment to prevent pathological resorption or ankylosis.

After more than two years of follow-up, we report a well-integrated tooth, with a well-defined desmodontal ligament, and without any sign of ankylosis or inflammatory resorption. Figure 3



**Figure 3: The patient’s new smile after autotransplantation of tooth n° 11(a) and root treatment (b) ; after a two-year follow-up**

### 1.3 DISCUSSION:

While tooth transplantation is not a common treatment modality, this case shows that it can be an alternative therapy when a suitable donor tooth is available.

**Numerous factors** (Tsukiboshi, M. 2002) **affect the prognosis of autotransplantation, such as:**

- The root edification of the tooth to be transplanted must reach at least half or three-quarters of its development for better results. Therefore, any tooth, whether its root is open or closed, can be a donor tooth (Kim, S. *et al.*, 2013).
- The recipient site should have sufficient alveolar bone support in all dimensions, an appropriate amount of attached keratinized tissue, and no inflammation.
- The duration and method of splinting after surgery are important variables. Flexible splinting allows functional movement of the teeth by stimulating the activity of periodontal ligament cells (PLC) and functional rearrangement.
- Regarding the timing of the endodontic treatment of the transplanted tooth, preoperative root canal therapy is preferred. Otherwise, root canal therapy after 2 weeks of surgery should be performed on an impacted donor tooth.
- The decisive factor of the prognosis is the healing of PLC, which depends on the vitality of the cells attached to the root surface of the donor tooth. Therefore, extraction without damaging the root surface and fast reimplantation are the key points for the success of the process. Andreasen *et al.*, (Andreasen, J.O., & Andreasen, F.M. 1994) reported that extra-alveolar time should not exceed 18 minutes. This is why in our clinical case we put the tooth back into its socket while waiting for the preparation of the recipient site.

To reduce the extra oral time, the fabrication of a duplicated tooth model based on a CBCT scan was used (Verweij, J. P. *et al.*, 2017).

Finally, the patient's attendance and cooperation during the medical control appointments are essential.

According to Tsukiboshi, M. (2002), successful transplants must show normal pocket depth, physiological mobility, no clinical discomfort, and normal periodontal ligament space and lamina dura. After a two-year follow-up, our case fulfilled the criteria mentioned above and showed successful results.

#### 1.4 Highlights:

- When it involves adequate clinical research, careful case selection, and an appropriate technique, autotransplantation could be an excellent choice of treatment.
- This surgical technique offers an alternative solution to tooth loss and presents a good compromise in terms of aesthetics, price, and osteo-integration especially in the case of a pediatric patient for whom implant treatment or prosthetic dentistry are not possible.

No ethics approval required. The patient gave consent for the material in this paper to be published.

#### Non Conflict of Interests

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