AUTOGENOUS TRANSPLANTATION OF AN IMPACTED MAXILLARY CANINE: A CASE REPORT

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Abstract

Maxillary canines play a vital role in dental and facial appearance, arch development and functional occlusion. When surgical exposure procedures can not be performed due to surgical or orthodontic contraindications or the patient does not accept the treatment, autotransplantation should be considered. A 35 year-old woman with a complaint of maxillary primary canine decay and impacted maxillary canine addressed the medical office. A palatal mucoperiosteal flap was elevated. The primary canine tooth and the permanent canine were gently extracted. A new socket with appropriate size and position with the permanent canine was prepared with implant surgical drills. Then, the tooth was correctly positioned and splinted. The centric and lateral mandibular movements were checked. After 1 week, root canal treatment was performed. At one-year follow-up, no clinical mobility was observed and the patient did not report any intraoral pain and discomfort.

Keywords: autogenous transplantation, autotransplantation, impacted maxillary canine

1. INTRODUCTION

The term of tooth transplantation is defined as the transfer of a tooth from one site to another, in the same person or from one person to another. Autotransplantation is described as the transfer of an embedded or impacted or erupted tooth to the extraction sites or into surgically prepared sockets, in the same person [1]. The maxillary canines are the second most frequently impacted teeth after third molar teeth and also the most frequent in the anterior area [2]. This situation appears as the maxillary canines develop deep within the maxilla and the eruption path to travel is longer compared with any other tooth [3]. Various treatment options are available. Autotransplantation is one of the preferred options for an impacted maxillary canine. The reasons for autotransplantation of a canine tooth are to improve the aspect of the mouth, to complete the upper arch, to prevent drifting of other teeth and to avoid the need for fixed prosthesis [4]. After autogenous tooth transplantation, periodontal healing involves a periodontal ligament along the root surface and the alveolar part of the periodontal ligament in the socket [5]. The aim of this case report is to present the autogenous transplantation of an impacted maxillary canine tooth.

2. CASE REPORT

A 35 year-old woman was referred to the Atatürk University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, with a chief complaint of maxillary primary canine decay. The radiological examination revealed the presence of an impacted maxillary canine (Fig. 1).

Fig. 1. Preoperative panoramic radiograph
Three methods can be used to localize the impacted maxillary canine, as follows: inspection, palpation and radiography [6]. In our case, inspection and palpation did not provide any data about the position of the impacted tooth. However, the radiographic analysis showed that the impacted tooth was located palatally. The essential requirements for transplantation were provided. The tooth was not too deeply placed and was not too close to the adjacent tooth. Additionally, its root was reasonably straight. The mouth was clean and healthy (Fig. 2). There was adequate space at the site of transplantation. The occlusion was within normal limits, without too deep overbite, which could cause an excess lateral stress on the replanted tooth.

A palatal mucoperiosteal flap was used, with incision around the necks of the teeth from the distal proximal of the maxillary first molar to the distal proximal of the maxillary right canine tooth. Extraction of the primary canine was decided, because of structural destruction and advanced decay. The primary canine tooth was extracted and the permanent canine was gently elevated from its bed, extracted and put into saline. The length and thickness of the root of the extracted permanent canine tooth was determined. A new socket, of appropriate size and position with the permanent canine, was prepared with implant surgical drills (Fig. 3), for providing a good fit between the transplant tooth and the new socket in the alveolar bone [7].

After the tooth was correctly positioned, the palatal flap was repositioned and sutured. Then, the periodontal splint, which could hold the tooth in the correct place, was made (Fig. 4). Disocclusion in the centric and lateral mandibular movements was achieved for the implanted maxillary canine. After 1 week, root canal treatment was performed.
At the 1-year follow-up, periodontal examination revealed normal mobility, all periodontal probing depths being less than 3 mm (Fig. 6).

Fig.6. 1-year follow-up radiograph

3. DISCUSSION

Maxillary canines play a vital role in dental and facial appearance, arch development and functional occlusion [3]. These teeth are frequently impacted and various treatment options are available [2], such as: observation and monitoring, surgical exposure, orthodontic extrusion, autotransplantation, and extraction and prosthetic rehabilitation with implants or fixed prosthesis [8]. Surgical exposure of the teeth and allowance to erupt naturally during growth and development or by using orthodontic forces to move the tooth into occlusion are the most preferred treatment option [3]. When this procedure can not be performed due to surgical or orthodontic contraindications, because of anatomical proximity to adjacent teeth or when the patient does not accept the treatment, autotransplantation should be considered. The requirements for this procedure are: atraumatic surgical removal of the tooth, preparation of an appropriate socket at the donor site and sterile reimplantation of the tooth into the prepared socket in the correct position as fast as possible [8]. In addition, the success and prognosis of autotransplantation depends on a number of factors, including patient age, developmental stage of the transplanted tooth, type of transplanted tooth, extraoral handling time, vital ligament cells on the root, splinting with adequate fixation and sufficient duration, endodontic technique, maintenance of a good oral hygiene [9].

Preparation of the donor socket is one of the main challenges of autotransplantation [8,10]. The use of dental implant drills to prepare the donor socket avoids thermal damage of the bone as much as possible and makes the recipient alveolar bone compatible with the impacted tooth. The drilling speed was controlled, which allowed high-torque and low speed hand-piece running. This resulted in a minimal temperature rise, while maintaining sufficient drilling accuracy [11].

There are concerns about the long-term success of the autotransplanted teeth. Patel et al. (8) concluded that the average survival time of autotransplanted teeth was of 14.5 years, ranging between 1.4 and 27.8 years. Success rates are expected to be >90% if the patients are younger than 40 years (9). Long-term studies gave 89.19% and, respectively, 87.88% survival rates for 56 autotransplanted maxillary canines and 37 autotransplanted maxillary canines [12].

4. CONCLUSIONS

Autogenous transplantation has many advantages, such as: extends the lifetime of natural teeth, positively influences the psychology of the patient, provides bone volume in the related region and permits an implant therapy in advanced stages. Additionally, ensuring a gingival aesthetic emergence profile is one of the most important advantages. In this case report, the 1-week and monthly for 6-month and 1 year follow-ups showed no clinical mobility, while the patient did not report any intraoral pain and discomfort, and no inflammation was radiographically evidenced.

References


