International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 9; Issue 03 (C); March 2020; Page No.21632-21635
DOI: http://dx.doi.org/10.24327/ijcar.2020.21635.4255

Research Article

AUTOTRANSPLANTATION OF A MATURE IMPACTED MESIODENS TO REPLACE AN AVULSED MAXILLARY CENTRAL INCISOR – A CASE REPORT

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A R T I C L E I N F O

Article History:
Received 12th December, 2019
Received in revised form 23rd January, 2020
Accepted 7th February, 2020
Published online 28th March, 2020

Key words:
Auto transplantation, Mesiodens, Supernumerary Tooth

A B S T R A C T

Aim: This report presents the aesthetic restoration of an avulsed maxillary central incisor through auto transplantation of an impacted mesiodens.

Summary: A 10-year old male patient with a history of fall 1 week back reported to the Department of Pedodontics. On examination it was found that 11 was avulsed and the radiographs confirmed it. On radiograph, an impacted mesiodens was found lying in the same region. This tooth was atraumatically removed and replaced in the place of 11. After stabilization, root canal treatment was performed and the aesthetics were restored with a polycarbonate crown. Over 1 year, the aesthetics remained excellent, and the transplant functioned normally without any signs or symptoms of root resorption.

INTRODUCTION

Dental auto transplantation is the surgical transposition of a tooth from its original site to another, replacing a lost or compromised tooth, in the same individual.(1) Review of dental literature shows that one of the first descriptions of autogenic transplantation of teeth was given by a Swedish Dental Surgeon Vidman in 1915. (2, 3) Auto transplantation is an evidence-based treatment option, provided that proper case selection has been carried out with in-depth treatment planning. (4, 5)

Auto transplantation is indicated in traumatic tooth loss, tumors, congenitally missing teeth, teeth with bad prognosis and in case of developmental anomalies of teeth.(6) The advantage of this treatment is that it is cost effective, does not interfere with the orofacial growth and allows for rapid recovery of function and aesthetics.(7) The success rate of auto transplantation varies from 74% to100 %, respectively.(8) Auto transplantation is contra-indicated in patients with cardiac anomalies, poor oral hygiene, lack of self-motivation and insufficient alveolar bone support.(9)

Auto transplanted teeth helps in the maintenance and regeneration of alveolar bone, hence the procedure can be performed in growing patients. The current case describes the successful auto transplantation of a mature mesiodens to replace an avulsed maxillary right central incisor.

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Case Report

A 10-year-old male patient reported to the Department of Pedodontics and Preventive Dentistry, P.M.N.M Dental College and hospital, Bagalkot with the complaint of missing upper front tooth.

History and Examination

Patient had a history of fall 1 week back and lost his front tooth. Extra oral examination revealed lacerations on upper and lower lip, for which the patient had taken first aid treatment in a local hospital as well as tetanus prophylaxis. On intra oral examination 11 was avulsed and the socket was filled with blood clot and there was minimal extrusive luxation with respect to 21 (Figure 1).

Radiographic Examination

The orthopantomogram confirmed avulsion of 11 and revealed an impacted supernumerary tooth like radioopacity between right lateral and left central incisor (Figure 2a).The findings were confirmed with an intraoral periapical radiograph which showed the presence of an impacted mesiodens (Figure 2b).Another radiograph was taken by shifting the X-ray tube more to the left to know the position of the supernumerary tooth (tube shift technique).The impacted tooth moved to the opposite side which confirmed its labial position. An increase in periodontal ligament space was found with respect to 21 confirming extrusive luxation.

So a treatment plan was made to reposition 21 as well as surgically extract the mesiodens and auto transplant it in the place of 11. The patient and his guardians were informed

regarding the treatment plan and informed consent was obtained.

Treatment Done

Adequate local anaesthesia was administered and a full thickness mucoperiosteal flap was raised from 12 to 22. A periosteal elevator was inserted through the alveolar socket space of 11, through which the impacted mesiodens was located and exposure of the tooth was done easily as there was no bony coverage over it (Figure 3). Using a periotome, the periodontal attachements were gently released minimizing trauma to the periodontium and the tooth was extracted (Figure 4). The tooth was immediately tried in to the transplant site and was found to be slightly loose. Before transplantation the socket was irrigated with saline to clean off debris followed by which fresh bleeding was induced by forceful irrigation. Bone grafts were placed in the socket followed by insertion of mesiodens. At the same time, proper positioning of 21 was also performed. Initial stabilization with gingival flap sutures (2–0 silk) was done and a semirigid splint was placed (Figure 5). Intra oral periapical radiograph was taken to confirm the position of transplanted teeth in the socket after splinting (Figure 6). The centric relation and occlusion was checked, and occlusal interferences were corrected using a pear-shaped diamond finishing bur.

At the 1-week follow-up, the patient was asymptomatic. Root canal treatment of the transplanted tooth and 21 was carried out 2 weeks post-transplantation (figure 7). The splint was removed after 3 weeks when the transplant was immobile and gingival tissues were healed (Figure 8). Later, a polycarbonate crown was placed over mesiodens for esthetic purpose (Figure 9).This case is being continuously monitored to detect any future resorptive activity.

DISCUSSION

The most important factor in the success of an autogenous tooth transplantation is the health of the periodontal ligament attached to the transplanted tooth. To preserve the viability of periodontal ligament tissue, extra-oral time limits have not been clearly established, but it is generally accepted that shorter times improve the prognosis for autologous transplantation and intentional replantation .[10,11]

Auto transplantation appears to be a viable treatment option to restore esthetics and function, especially when a suitable donor tooth is available. [12] In young individuals, successful tooth transplantation also facilitates dentofacial development, mastication, and speech along with maintenance of the attached gingiva with a natural shape, colour and level.

The age of the patient, type and development stage of the donor tooth are also important factors that affect the success of auto transplantation.[13]In addition, infection should be absent in the recipient site, the extraoral period should be short and trauma should be minimized for a better result.

In the present case, a fixed partial denture or an implant would have been an unfavourable treatment option as the patient was an adolescent with incomplete facial growth.[14] A removable partial denture would have caused atrophy of the alveolar ridge and thereby compromised the appearance and placementof implants or fixed prostheses after facial growth was complete. In this case, since mesiodens was available with an acceptable anatomic root form and tooth size to replace the avulsed right central incisor, auto transplantation was chosen as the treatment option.

Various techniques have been described to stabilize transplanted teeth, including loose fixation with sutures, ligatures, orthodontic brackets, acid-etch composite and wire splints, and ligature wires or orthodontic appliances .[15] The reported duration of splinting varies 4–6 weeks .[16] In the present case, a short-term (3-week) semi-rigid splint was used.

The outcome of auto transplantation can be considered successful if there is no progressive root resorption, the adjacent periodontal tissues adjacent are normal.

Presently patient is chewing satisfactorily and without discomfort; the tooth is not mobile and no other pathological condition was seen on the radiograph.

CONCLUSION

Auto transplantation can be considered as a successful and atraumatic treatment option in growing patients, especially when compared with treatment alternatives such as interim removable prostheses. This is especially significant when an anterior tooth is missing in adolescents with remaining facial growth and compromised aesthetics. Even if it survives for a few years the alveolar anatomy will be maintained for future implant therapy. The procedure is successful and cost effective.

Figure 1 Pre-operative photograph showing avulsion of 11 and extrusive luxation of 21

Figure 2a OPG showing radioopaque mass between right lateral and left central incisor

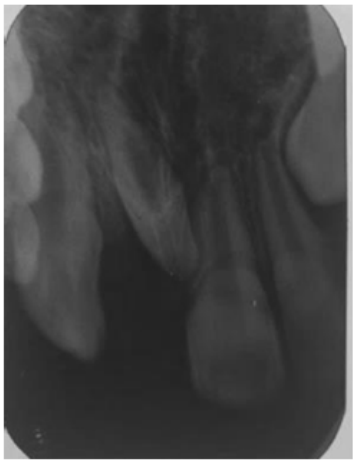

Figure 2b IOPA confirming an impacted mesiodens between right lateral and left central incisor

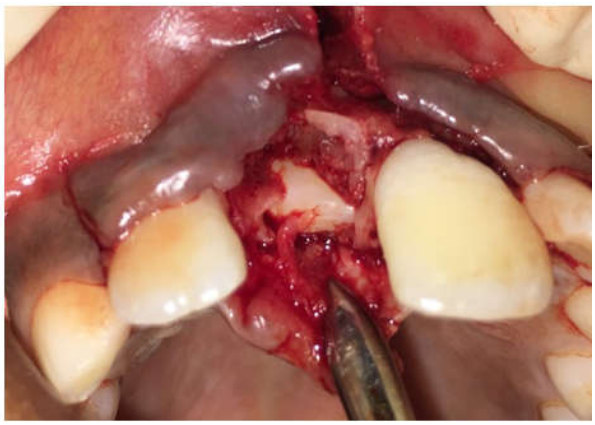

Figure 3 Flap reflected, exposure of impacted mesiodens

Figure 4 Surgically extracted mesiodens

Figure 5 Mesiodens placed at the site of 11; Proper positioning of 21 done; Gingival sutures placed and splinting performed

Figure 6 IOPA immediately after transplantation.

Figure 7 RCT performed 2 weeks post-transplantation

Figure 8 3 week post transplantation; splint removed

Figure 9 Polycarbonate crown placed over mesiodens for esthetic purpose

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How to cite this article:

Dr. Sreedevi S, Dr Shivaprakash P.K and Dr. Mahantesha T (2020) 'Autotransplantation of A Mature Impacted Mesiodens To Replace an Avulsed Maxillary Central Incisor – A Case Report', *International Journal of Current Advanced Research,* 09(03), pp. 21632-21635. DOI: http://dx.doi.org/10.24327/ijcar.2020. 21635.4255

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