TOOTH AUTOTRANSPLANTATION: AN EVIDENCE BASED CASE REPORT

*Rushi Shelat 1, Divyarajsinh Raulji 2, Dishan Shah 3, Utpal Patel 4, Pathik Dholakia 5

1 Former Postgraduate student, Department of Conservative Dentistry and Endodontics, Narsinhbhai Patel Dental College & Hospital, Hemchandracharya North Gujarat University.
2 Former Postgraduate student, Department of Periodontology and Implantology, K. M. Shah Dental College & Hospital, Sumndeeep Vidyaapeeth University.
3 Former Postgraduate student, Department of Oral and Maxillofacial Surgery, Narsinhbhai Patel Dental College & Hospital, Hemchandracharya North Gujarat University.
4 Former Postgraduate student, Orthodontics and Dentofacia Orthopedics, Narsinhbhai Patel Dental College & Hospital, Hemchandracharya North Gujarat University.
5 Former Postgraduate student, Periodontology and Implantology, Narsinhbhai Patel Dental College & Hospital, Hemchandracharya North Gujarat University.

*Corresponding Author:
Rushi Shelat,
Former Postgraduate student, Department of Conservative Dentistry and Endodontics, Narsinhbhai Patel Dental College & Hospital, Hemchandracharya North Gujarat University.
E-mail: rushidentalplus@gmail.com

Visit our website: www.ihjsgroup.com
How to site this article:

Abstract:
Autogenous tooth transplantation, or autotransplantation, is the surgical movement of a tooth from one location in the oral cavity to another in the same individual. There are high success rates and is an excellent alternative for tooth replacement. Although the indications are limited, careful patient selection and appropriate technique can lead us to exceptional esthetic and functional results. One advantage of this procedure is that placement of an implant supported prosthesis or other form of prosthetic tooth replacement is not needed. The present case is of a 16 years old male patient where a badly carious 46 was extracted and replaced by a developing 48. Follow up revealed that the tooth was non vital and therefore a regenerative endodontic therapy was performed. 24 months follow-up showed excellent bony regeneration around the transplanted tooth which was sound esthetically as well as functionally.

Keywords: Autotransplantation, Dental implant, Endodontic therapy

Introduction

Tooth autotransplantation which was introduced by Apfel in 1950 and popularized by Miller in 1956 is a widely used treatment modality to transplant a sound embedded, impacted or erupted tooth into well prepared extraction socket of other tooth. It is a viable treatment option for replacement of missing tooth when a sound donor tooth is available. Autotransplantation which is regarded as successful treatment modality offers improved arch form, esthetics, mastication, speech, dentofacial development and arch integrity if performed properly. Additionally it also prevents migration of adjacent and opposing teeth while maintaining the natural spacing. Morphology of the alveolar ridge is also maintained through proprioceptive stimulation. The transplantation of a tooth is considered a conservative alternative approach of oral rehabilitation to more invasive methods. The rehabilitation of a missing tooth in a young patient can usually be done by either fixed prosthesis or dental implant. Fixed prosthesis always impart detrimental effects on adjacent teeth due to tooth preparations whereas dental implants are contraindicated in growing patients and also it cannot be used in patients with little financial condition to afford the costly dental implant treatment. Thus, autotransplantation may be considered as a most effective alternative to any other oral rehabilitation method in young growing patient. The present case describes a 16 year old boy in whom a partially developed 48 was transplanted in extraction socket of 46 which was extracted due to gross destruction because of caries. As the transplanted tooth was found to be non-vital after 6 weeks post transplantation regenerative endodontic therapy was instituted. 24 months follow up of the patient suggested excellent bony regeneration around the transplanted tooth which was sound esthetically as well as functionally.
Case Report

A 16 years old boy reported to the department of conservative dentistry & endodontics, Narsinhbhai Patel Dental College, Visnagar with the complaint of pain in relation to the lower right back tooth region since 1 week. Pain was mild, intermittent in nature which was relieved by taking analgesics. Clinical examination revealed presence of grossly destructed lower right first molar due to caries (figure 1). Intra oral periapical radiograph and Orthopantomogram confirmed the clinical findings and showed complete destruction of the crown of the tooth which was involving the root upto the furcation level and presence of periapical radiolucency suggesting perapical pathology (figure 2&3). It also reveals the presence of unerupted partially developed 48 in which two-third root formation was completed. So extraction of 46 tooth followed by transplantation of 48 into the extraction socket was planned.

After administration of local anesthesia Bayonet incision was placed and sufficient exposure of 46 and 48 teeth were done (figure 4 & 5). 46 tooth was extracted as atraumatically as possible to prevent injury to the periodontal tissues (figure 6). Whole tooth along with periapical lesion was sent for histopathological examination to know the etiology of gross destruction. Later histopathological report revealed the presence of central odontogenic fibroma which is a very rare tumor of odontogenic origin.

Simultaneously 48 tooth was removed as atraumatically as possible (figure 7), flushed with saline and was placed in the extraction socket of 46. (figure 8) Sutures were placed (figure 9). Splinting was done with the help of ligature wire to stabilize the transplanted tooth for 4 weeks. (Figure 10 & 11)

After 6 weeks vitality test was carried out and the transplanted tooth was found to be non-vital. Patient was kept on follow up period for upto 3 months. It was found on the follow up visit that there was external resorption of the roots hence endodontic therapy was instituted.(figure 12) Under the rubber dam acces opening was done (figure 13) and cleaning and shaping was completed and calcium hydroxide was placed as as intracanal medicament. During next appointment revascularization therapy was initiated, Bleeding was induced with sterile file followed by placement of PRF and Biodentin and restored by composite (figure 14). 2months following the therapy splint was removed and tooth was found to be stable. Radiographs at the interval of 5 months, 9 months and 18 months suggested new bone formation around the transplanted tooth. (Figure 15& 16) After 18 months of follow up tooth was found to be esthetically sound and functionally efficient. (Figure 17 & 18)
Fig 5: Preparation of recipient site (extraction socket of 46)

Fig 6: Extracted 46

Fig 7: Atraumatically extracted 48 tooth

Fig 8: Autotransplantation of 48 tooth in place of 46 tooth

Fig 9: Suture

Fig 10: Immediate post-operative radiograph

Fig 11: Splinting with ligature wire

Fig 12: 3 month post-operative radiograph showing external root resorption

Fig 13: Access opening under rubber dam

Fig 14: Biodentin placement & composite restoration

Fig 15: 5 month follow up

Fig 16: 9 month follow up

Fig 17: 18 month follow up

Fig 18: Clinical photograph following 18 months
The earliest reports of tooth transplantation involve slaves in ancient Egypt who were forced to give their teeth to their pharaohs. However, allotransplantation — transplantation of a tooth from one individual to another — was eventually abandoned because of problems of histocompatibility and replaced with autotransplantation. The procedure of autotransplantation was first introduced in literature in the 1950s, initially by Apfel and then by Miller in 1956, who presented case reports of an autogenous transplantation to replace a missing first molar.

Tooth auto transplantation can be considered a useful treatment plan with numerous advantages like transplanted tooth maintains functional and occlusal harmony with adjacent dentition, specifically if this procedure was undertaken during the patient’s pubertal growth spurt. Accelerated healing and regeneration process of the pulpal tissue, particularly when the root apex is open. A successful transplant preserves the alveolar bone, diminishes the extent of resorption of newly formed alveolar bone and provides functional stimulation.

The success of auto transplantation procedure depends on a number of factors, which include:

- Involving a healthy individual
- Optimum oral hygiene
- Open apices of the tooth being transplanted

A healthy periapical area with no signs of inflammatory responses or root resorption affecting the donor tooth. Preservation of intact periodontal ligament tissues around the transplanted tooth through careful handling and through reducing the extra-oral time during the procedure.

Loss of pulp vitality and root resorption are major complications of the procedure. However, in about 92% of transplantation procedures involving donor teeth with open apices of roots, revascularization of the pulpal tissues will occur, which is essential for the pulp vitality and normal root development.

In presented case 3 month following autotransplantation external root resorption was noted and tooth was non-vital. Possible reason for resorption would be presence pre-existing periapical pathology. According to Pagliarin & Benato and Clokie et al, the receptor site should not exhibit any periodontal lesions or acute infection for success. So, following external root resorption endodontic revascularization therapy was carried out. Patient was followed up for 18 months which revealed the bony regeneration around transplanted tooth and tooth was found to be esthetically sound and functionally efficient.

**Conclusion**

It can be concluded that autogenous tooth transplantation, when well indicated, planned and performed, can be a viable alternative mainly in young patients, allowing the reestablishment of the functionality (mastication) and aesthetics as well as to contribute clinically for bone formation stimulus at the transplanted site.

**References**

2. Dube k, Dr Bonny Paul B, Shankaran A, Sharma A ; Successful Autotransplantation of an Immature Third Molar- A Case Report Journal of Dental and Medical Sciences Volume 4, Issue 1, Jan.- Feb. 2013
3. Heer J; Calcium hydroxide therapy and bony regeneration following autogenous tooth transplantation: case report and three year follow up; BRITISH DENTAL JOURNAL VOLUME 203 NO. 7 OCT 13 2007
5. Fernandez S, Habibullah M, Nalam G, Nair P ; Think before you extract- a case of autotransplantation ; BMJ Case Reports 2011; doi:10.1136/bcr.06.2011.4380
8. Unni K, Singh V ; Autotransplantation of teeth – An overview; Amrita Journal of Medicine Vol. 8, No: 2 July-Dec 2012; 1 – 44

**Conflict of interest: Nil**

**Source of fund: Self**

Shelat R. et. al.