

## Autotransplantation Of Impacted Third Molar With Extraoral RCT

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**Abstract :** Autogenous tooth transplantation is an often overlooked method of repositioning autogenous teeth in another tooth extraction site or a surgically formed recipient site to replace missing teeth due to congenital deformity, grossly decayed carious teeth, mobile teeth due to periodontal disease, teeth lost due to trauma, endodontic failure or any other reason when a suitable donor tooth is available. This is a case report of autotransplantation of impacted #38 with complete root formation into the extraction site of grossly decayed, unrestorable #37. RCT of #38 was done extraorally to remove any chances of resorption. Autogenous tooth transplantation should always be considered as a good treatment modality in feasible cases.

**Keywords:** Autotransplantation, unrestorable teeth, impacted third molar, extraoral root canal treatment

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### I. Introduction

Tooth transplantation is the surgical repositioning of a tooth from one site to another. It is classified into autogenous, homogenous and heterogeneous transplantation. In autogenous transplantation, the tooth from one socket is inserted into another socket in the same person. In homogenous transplantation, the donor and recipient are of same species, and if the donor and the recipient are of different species, then it is called heterogeneous transplantation[1]. A significant number of young patients have premature loss of their first and second molars because of severe caries, periodontal disease, trauma, or endodontic failure. In recent years there is an increasing use of osseointegrated implants in patients with missing teeth, but often these patients are not good candidates for replacement of edentulous areas with titanium dental implants because of their age or simply for financial reasons[2].

Autotransplantation can be defined as the transplantation of embedded, impacted, or erupted teeth from 1 site to another in the same individual into extraction sites or surgically prepared sockets when a suitable donor tooth is available[2], [3]. Review of dental literature shows that one of the first descriptions of autogenic transplantation of teeth was given by a Swedish Dental Surgeon Vidman far back in 1915[4]. In the 1960s, Slagsvold and Bjercke established a protocol for autotransplanting teeth at the University of Oslo in Norway<sup>5-7</sup>. This included indications for transplantation, the surgical procedure, and follow-up guidelines. The predictability of the method was further supported by a long-term follow-up study, which showed that the transplanted teeth had a survival rate of 90% and generally did not differ from normal teeth two to four decades later[8].

Successful transplantation of teeth results in improved aesthetics, dentofacial development, arch form, arch integrity, mastication, and speech. This article highlights a case of “complex tooth autotransplantation” done in the Department of Oral Maxillo Facial Surgery and Department of Conservative Dentistry and Endodontics, Government Dental College, Kozhikode, Kerala, India. The patient is currently on long term follow up and is asymptomatic. Radiological study shows no root resorption till date.

### II. Case Report

A 27-year-old male patient was referred to the Department of Conservative Dentistry and Endodontics with a chief complaint of pain in lower left back tooth region since 1-week. Clinical and radiographic examination revealed grossly carious #37 and horizontally impacted #38. #37 was diagnosed as grossly carious with chronic irreversible pulpitis and symptomatic apical periodontitis with recurrent food lodgment, and #38 was horizontally impacted although being sound mature tooth radiographically. Hence, it was decided to extract #37 and #38 simultaneously and to autotransplant #38 into the extraction site of #37. Complete medical history of the patient was taken and was found to be non-contributory. Treatment plan and postoperative consequences

were explained to the patient; an informed written consent was taken following which the patient was scheduled for a subsequent appointment.

A total of 1000 mg Amoxicillin (Mox, Ranbaxy Ltd., India) and 1 tablet Meftal Forte (Bluecross Ltd., India) was given to the patient 1 h before the procedure to prevent infection, possible resorptive process and post-operative pain. The procedure was started by asking the patient to rinse with Betadine gargles (Win-Medicare Pvt Ltd., India) and proper procedure of surgical disinfection was followed. 2% lignocaine hydrochloride (Lignox 2%, Indoco-Remedies Ltd., India) was administered to anesthetize inferior alveolar, lingual and long buccal nerves. It was decided to extract #37 first followed by impacted #38 thus minimizing the extra-oral time and damage to the periodontal ligament of #38. An intra-crevicular incision was made in relation to #37 and #38. #37 was extracted without damaging the buccal and lingual cortical plates. This was followed by atraumatic removal of impacted #38 with minimal luxation so as to preserve maximum possible periodontal ligament on the root surface. #37 was discarded, and #38 was stored in Hank's balanced salt solution till the time of its transplantation. The match between the recipient site and the donor's tooth was checked by placing #38 into the socket of #37 with light pressure. There was a misfit in the occluso apical dimension of the teeth #37 and #38. The root of #38 was examined, and socket preparation of #37 was planned accordingly. Socket of #37 was prepared by using a slow speed surgical round bur (SS White, Dental Pvt Ltd., USA) along with normal saline 0.9% w/v (Alkem Laboratories Ltd., India) as a coolant. As the tooth #38 could not still be accommodated comfortably in the socket of #37, it was decided to section the roots of #38 horizontally to suit the dimensions of the socket. Since periodontium and cementum of #38 had been manipulated and there was an increasing chance of root resorption with each manipulation, it was decided to treat the disimpacted #38 as avulsed tooth with extraoral time greater than 1 hr. The tooth was immersed in 5.25% NaOCl to remove the entire residual periodontal ligament on the root surface. Extraoral RCT was done using ProTaper Universal files and NaOCl and saline used as irrigant. The canals were obturated with gutta-percha. Root ends were also prepared and filled with Biodentin. Access cavity was sealed with GIC.

After waiting for 15 min to allow the Biodentin and GIC to set properly, the tooth was immersed in fluoride solution for 5 min and then coated with doxycycline to prevent resorption. Occlusion interferences were checked and removed extra orally before final transplantation. Then #38 was autotransplanted into the prepared socket of #37. 3-0 silk suture (Sutures India Pvt Ltd., India) was used for suturing of the flap for close approximation and stabilization. Non-rigid intraradicular splinting was done with malleable orthodontic wire (Tru-Arch, Ormco Ltd., USA) for adequate fixation. Postoperative radiograph was taken to check the position of #38. A Periodontal pack (Coe pack, G C India) as a surgical dressing was applied to protect the transplanted #38 against infection and promote wound healing. The patient was instructed to avoid the use of the operated side for few days, to have soft, lukewarm semi-solid diet and to perform daily rinse with 0.2% w/v chlorhexidine gluconate (Rexidin, Indoco-Remedies Ltd., India) twice a day till further instructions. Patient was put on Amoxicillin 500 mg (Mox 500, Ranbaxy Ltd., India) thrice a day, Metronidazole 400 mg (Metron, Ulticare-Alkem Laboratories, India) thrice daily and Meftal Forte (Bluecross Pharmaceutical Pvt Ltd., India) thrice daily for 7 days. The surgical dressing was removed 3 days post-surgery and sutures were removed after 7 days, healing was found to be satisfactory.

### **III. Discussion**

The earliest known cases of tooth transplantation can be found in Incas civilization and in ancient Egypt where slaves were forced to give their teeth to their pharaohs[9]. The dental surgical intervention of this type was first documented by Abulcassis in 1050; however, the first recorded surgery with details about tooth bud transplantation was performed by the French dentist Ambroise Pare in 1564. A transplantation technique for molars was described in 1956, and until today the general guidelines of this surgical technique are practically the same[10]. High success rates of autotransplantation have been reported over the past decade varying from 74% to 100%[11]. Success rate of autotransplantation can be increased by following some simple biological principles. The critical factor for success is favorable periodontal ligament healing, which depends on the number of viable cells preserved on the root surface[12]. To increase the success rate of autogenous tooth transplantation, a healthy periodontal membrane should be present on the transplanted tooth, and the root morphology of the transplanted tooth should be simple. In addition, infection should be absent in the recipient site. During surgery, the extra oral period should be short, and trauma should be minimized[13]. The periodontal ligament is sensitive to pH and osmotic potential, and its viability is reduced if extraoral dry time is long[14]. Previous studies showed that the viability of periodontal ligament exposed to the extraoral space decreased rapidly after 18 minutes[15]. The prognosis of auto transplanted teeth is facilitated by an optimum periodontal, pulpal, and periapical condition.

In autogenous tooth transplantation, the initial stability affects the prognosis, because sufficient initial stability can avoid dislocation of the auto transplanted teeth[11]. Fixation with splint and sutures has been used to stabilize the auto transplanted teeth[16]. However, studies increasingly show that long-term firm fixation may

have negative effects on healing, whereas non-rigid fixation for 7–10 days stimulates the activation of alveolar ligament cells and bone healing[17].

Tooth transplantation was judged successful if the tooth was fixed in its socket without residual inflammation; masticatory function was satisfactory and without discomfort; the tooth was not mobile; no pathologic condition was apparent radiographically; the laminadura appeared normal radiographically; the tooth showed radiographic evidence of root growth; and the depth of the pocket, gingival contour, and gingival color were all normal[18].

#### IV. Figures And Tables



Figure 1: Second molar and impacted third molar seen in the patients mouth



Figure 2: Radiological assessment of unrestorable second molar and impacted third molar



Figure 3: Injection to anesthetize the operative area.



Figure 4: Extraction of the unrestorable second molar



Figure 5: Extraction socket of the second molar.



Figure 6: Size misfit of the third molar which is in the socket of the extracted second molar



Figure 7a: Extraoral Root canal treatment of the disimpacted third molar.



Figure 7b: Extraoral Root canal treatment of the disimpacted third molar.



Figure 8: Reducing the Occluso-Apical height of the disimpacted third molar to accommodate it in the socket of second molar



Figure 9: The disimpacted third molar accommodated in the socket of second molar after completing extra oral RCT and height reduction. Wire stabilization is seen.



Figure 10: Radiographic image of the transplanted lower third molar.

## V. Conclusion

Though autogenous transplantation of the teeth is a promising procedure, it is susceptible to many variations in planning to execution. The case showcased is currently on follow up. In young patients with nonrestorable molars and impacted third molars at one-third to seven-eighths root development, autotransplantation is a predictable and cost-effective alternative to dental implants. Therefore, clinicians who treat growing adolescents should keep this option in mind during treatment planning. The authors want to emphasize that the conclusions of our study are based on results obtained from short-term human study. We recommend that more clinical human studies are needed in the future to test the clinical relevance of our findings.

Studies using contemporary treatment methods should be performed to identify and measure intentional replantation prognostic and treatment variables.

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