

AUTOTRASPLANTATION: REMINISCING AN OBSOLETE TECHNIQUE TO SAVE NATURAL TOOTH

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ABSTRACT:

In this modern era of implant dentistry autotransplantation gives an option to replace missing tooth with natural tooth. Though considered to be an ancient technique, autotransplantation has achieved a great success rate. It involves surgical repositioning of autogenous teeth in surgically formed extraction site to replace congenitally missing teeth, grossly decayed carious teeth, mobile teeth due to periodontal disease, teeth lost due to trauma, endodontic failure or any other reason when suitable tooth is available. This is a case report of autotransplantation of ectopically erupted maxillary lateral incisor with complete root formation into the extraction socket of vertically fracture central incisor to get back esthetics along with the excellent periapical healing and tooth stability.

Key Words: autotransplantation, ectopically erupted tooth, fractured tooth



INTRODUCTION:

Currently, clinician have various treatment approaches for fractured permanent maxillary anterior teeth, such as fixed or removable partial dentures, osseointegrated implants and autotransplanted permanent teeth. Fixed partial denture and implant are the most commonly used options to replace missing anterior teeth. But the major limiting factors are its cost, lifetime maintenance, and shortcomings relative to health of gingiva and marginal integrity. Thus tooth autotransplantation provides a viable, predictable treatment option and most natural one for replacing missing teeth. Also enjoyed good success rate of 74-100% (Tsukiboshi, 2002) Auto

transplantation is a technique of surgical repositioning of tooth in the same person.(Gupta et al., 2015) The purpose of this case report is to demonstrate application of ancient technique in replacing a tooth in this modern age.

CASE DETAIL:

45 year old male patient with non-contributory medical history reported to department of Conservative Dentistry and Endodontics with a chief complaint of pain in upper front tooth. On examination 21(FDI) was tender on percussion and the crown was grade I mobile, associated with swelling and an ectopically erupted lateral incisor (22) on palatal side of 21. Pre-operative radiograph revealed root canal treated tooth (21) restored with post and

core, it also revealed presence of J-shaped radiolucency with periapical lesion. Based on clinical and radiological findings diagnosis of vertical root fracture was made. (figure1:1, 2, 3) But at that time the patient did not want to undergo extraction. Patient reported to department 2 months after examination, at that time he was asymptomatic and there was no swelling in relation to 21. On examination 21 was not mobile suggesting re-cementation of post core crown done elsewhere.

Considering the prognosis of tooth and financial condition of the patient, extraction of 21 and auto transplantation of 22 was planned. Before undergoing the surgery the root canal treatment was performed on donor tooth (22). After administering local anaesthesia (nasopalatine nerve block) with 2% lignocaine containing 1: 200 000 adrenaline (Lox 2%, Neon laboratories limited, Andheri (East), Mumbai, India). The tooth surface was disinfected using Moller's technique. Access cavity was prepared under water coolants using high-speed hand piece (NSK Pana Air, Japan) and Endo Access No. 2, Endo Zee bur (Dentsply Maillefer, Switzerland). Biomechanical preparation done with K files (Dentsply Maillefer, Switzerland) the canals were irrigated with 5.25% sodium hypochlorite solution followed by calcium hydroxide dressing for one week(Heer, 2007)(Singh *et al.*, 2013). Obturation was done using two percent gutta percha (Protaper, Dentsply Maillefer, Switzerland) by using lateral condensation technique. Access cavity was sealed with

glass ionomer cement (GC II, Japan). Autotransplantation was scheduled next day after obturation.

A total of 1000 mg Amoxicilin (Novamox, Cipla Ltd., India) and 400 mg Ibuprofen (Flexon, Aristo Pharmaceutical Pvt Ltd., India) was given to the patient 1 h before the procedure to prevent infection and postoperative pain. Patient's mouth was disinfected with Betadine mouthwash (Win-Medicare Pvt Ltd., India) and standard protocol of surgical disinfection was followed. 2% lignocaine containing 1: 200 000 adrenaline (Lox 2%, Neon laboratories limited, Andheri (East), Mumbai, India) was administered to anesthetize infraorbital and nasopalatine nerves. To reduce extra-oral time and damage to the periodontal ligament of the donor teeth 21 was extracted first.

Extraction of 21, 22 followed by autotransplantation of the lateral incisor took place as a one-stage procedure within 15mins. (figure1:4, 5) The upper central incisor (21) was extracted and the socket was irrigated once with betadine and saline. The donor tooth was extracted atraumatically, apicectomy was done followed by retrograde cavity preparation and retrograde filling with Angelus MTA (Londrina Brazil) and transplanted into the recipient socket. Apicectomy followed by retrograde filling was done in present case as it provides bacteria-tight closure of the root-canal system.(von Arx, 2011) MTA was used as root end filling material as it provides superior periapical seal when compared with other materials and also had shown evidence of healing of the

surrounding tissues.(M Torabinejad et al., 1995)(Mahmoud Torabinejad et al., 1995)(Torabinejad and Pitt Ford, 1996) The transplanted tooth was placed out of occlusion. Fibre splinting was done labially to stabilize the tooth in the socket and silk suturing was done to stabilize the soft tissues. (figure1:6)Antibiotics and analgesics were prescribed. Patient was recalled on 7 the day for follow up, healing was satisfactory, tooth was grade I mobile, no signs inflammatory reaction of the gingiva was seen. Sutures were removed. Two weeks later splint was removed after confirming stability of the tooth. Follow up radiograph were taken at 1, 3, 6 and 9 months interval showed healing of periapical tissues with no signs of root resorption.(figure1:7, 8, 9) After 9 months porcelain fused metal (PFM) crowns were given on teeth 22 and 23 to replace aesthetics. PFM was chosen as there was no sufficient overjet present and also for uninterrupted protrusive movement. These crowns replaced anterior aesthetics to patient's satisfaction. (figure1:10, 11)

DISCUSSION:

The autotransplantation surgery was first time performed by the French dentist Ambroise Pare in 1564 and this technique for molars was described in 1956, and until today the general guidelines of this surgical technique are practically the same.(Ravi Kumar P, Jyothi M, Sirisha K, Racca K, 2012) Recently, with the use of cone beam computed tomography it is possible to fabricate accurate surgical template which can be used to prepare the recipient site just before

transplantation which ultimately results in decreased extra oral time and improved prognosis.(Cross et al., 2013)

The success rate of autotransplantation vary from 74% to 100%. (Tsukiboshi, 2002) This rate can be increased by following some simple biological principles. The most significant contributory factor for success of autotransplantation is favourable periodontal ligament healing which in turn depends on the number of viable cells preserved on the root surface.(Lee et al., 2001) The extraoral time should be from 3 to 16 min.(Ustad et al., 2013) Trauma to periodontal ligament during transplantation may lead to ankyloses, external root resorption.(Hermann et al., 2012)(Stewart et al., 2012)(Waldon et al., 2012) Root resorption is most common cause of failure of cases. Thus it is necessary to extract donor tooth as atraumatically as possible to prevent risk of most prevalent inflammatory and replacement root resorption.(Waldon et al., 2012)(Ding et al., 2010)

In comparison to implant technology, autotransplantation preserve the natural dentition. It also has added advantage of bone induction around transplanted tooth.(Tsukiboshi, 2002) The differentiated osteoblasts may form bone around the transplant that is observed as a rapid bone regeneration and appearance of lamina dura. (Tsukiboshi, 2002) Thus immediate transplantation following extraction at recipient site is a good treatment option as compared to implant as it promotes rapid healing at

recipient site, saves time and also the treatment cost will be less comparatively.(Kumar et al., 2013)(Yoshino et al., 2012)(Herrera-Gimbernat et al., 2011)

Following transplantation tooth should be stabilized from 2 weeks to 2 months depending on the mobility of transplant. In present case mobility was reduced within 2 weeks hence splint was removed. Usually suture splinting stabilizes the transplant and preferred technique but in case it is not stable with this then splinting is done with wire or adhesive resins splints.(Ustad et al., 2013) Rigid splinting or excessive tying will adversely affect the healing outcome of the transplanted tooth.(Cohen et al., 1995) Taking the above principles into consideration

appreciable results in autotransplantation can be achieved.

CONCLUSION

From the present case it can be concluded that, in the present era of implant dentistry autotransplantation can be considered as a viable treatment option to replace anterior teeth. If properly planned and performed, it can be a reliable alternative mainly in patients with low socioeconomic conditions, allowing reestablishment of the mastication and aesthetics as well as to contribute clinically for bone formation stimulus at the transplanted site. Appropriate planning, surgical technique knowledge, the operator's ability to perform the procedure, and the patient's compliance play a vital role in the success of autotransplantation.

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FIGURES:

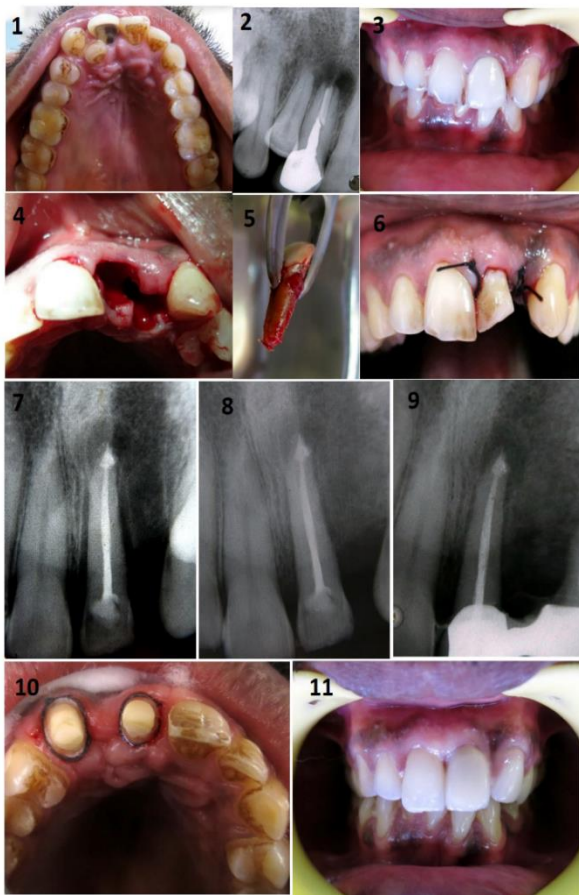


Figure:1) Preoperative photograph (occlusal view) 2) Preoperative intraoral periapical radiograph 3) Preoperative photograph (labial view) 4) Extraction of 21 and 22 was done 5) extracted 21 6) Autotransplantation done. Tooth stabilized with sutures. 7) One week follow up radiograph 8) Three months follow up radiograph 9) Nine months follow up radiograph 10) Tooth preparation done for porcelain fused metal crowns 11) Postoperative photograph after esthetic rehabilitation