

Autotransplantation of tooth in geriatric patient

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ABSTRACT

Case report of a 70-year-old female patient showing the effective rehabilitation of function and esthetics with the help of a fixed bridge in which an autotransplanted tooth was used as abutment in the upper arch. The case report emphasizes the possibility of using autotransplants - in geriatric patients; and - as an abutment for fixed prosthesis in rehabilitating occlusion.

KEYWORDS: Abutment, autotransplantation, canine tooth, fixed prosthesis, geriatric patient

Introduction

Autotransplantation of tooth is a procedure which involves the extraction of a tooth from one location and its replantation in a different location in the same individual. The new location may be a fresh extraction socket after extraction of a nonrestorable tooth or an artificially drilled socket on an edentulous alveolar ridge.^[1]

Cost effectiveness is the obvious advantage for which clinicians prefer this procedure, which enables the utilization of a tooth that is hitherto nonfunctional to be transferred to a functional position to replace a lost tooth in the same person.^[2,3]

There are no absolute disadvantages, but autotransplantation includes challenges which are surgical, technique sensitivity, relatively low versatility in their applications (e.g., tooth and space size discrepancy), availability of donor tooth and low predictability in results compared to conventional prosthetic (implants, bridge, and dentures) restorations. However, if the clinician handles the procedure scientifically, success is guaranteed.^[4]

Autotransplantation of teeth is more practiced in younger children and adults with missing teeth or unrestorable tooth

many times in conjunction with orthodontic treatment.^[5,6] Literature pertaining to the application of this procedure in geriatrics is sparse. This case report substantiates the use of autotransplantation as a viable treatment in rehabilitating occlusion of a geriatric patient and the use of transplanted tooth as an abutment for a fixed prosthesis.

Case Report

Female patient aged 70 years presented with the chief complaint of loose prosthesis in the upper anterior tooth region. On clinical examination she had a failed anterior bridge spanning from upper right lateral incisor to upper left canine because of abutment (upper left canine) fracture. Following teeth were present: 2, 4, 5, 6, 7, 8, 11, 13, 21, 22, 27, and 28. 11, 27, and 28 were grossly destructed [Figures 1-3].

Treatment plan

As the patient had majority of her upper teeth in good function, it was decided to restore the failed abutment (upper left canine) with autotransplanted lower left canine followed by total extraction in the lower arch and then restoring with upper fixed prosthesis and lower single complete denture. To improve the prognosis, the extraction of upper left canine and autotransplantation procedure were scheduled on a single day. Routine blood investigations and systemic examination were carried out to rule out any infective disorders.

Autotransplantation procedure

The lower left canine was chosen as the donor tooth because of its morphological similarity to the upper left canine and

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because of its smaller root diameter it would fit better in the extraction socket without requiring surgical recountouring of the socket. Local anesthesia was given in upper and lower left canine region. To reduce the extraoral time, root canal treatment was performed before extracting the donor tooth for transplantation. The upper left canine was extracted followed by the lower left canine [Figure 4]. Extraction was done as atraumatically as possible not to damage the periodontal structure of the transplant tooth. Immediately the donor tooth was placed in chilled chlorhexidine diluted with saline solution. The tooth was carefully held by the crown portion, apicectomy done, and the tooth apex sealed with glass ionomer cement. Then the donor tooth was fitted in the prepared transplant site.[Figure 5] The transplanted tooth was fixed with a wire composite splint and occlusal interference was relieved [Figure 6]. The extraoral exposure of the transplanted tooth was less than 10 min. Postoperatively the patient was put on only analgesics and chlorhexidine mouthwash and advised to be on soft diet and maintain good oral hygiene.

The transplanted tooth was splinted for one month. A temporary bridge was fabricated with acrylic to maintain the esthetics [Figure 7]. Lower complete arch extraction was done and alveolar ridge was allowed to heal. After 3 months once the tooth had stabilized clinically and radiographically,

a permanent restoration was planned. An upper bridge spanning from upper right canine to upper left second premolar was fabricated and cemented. Later a complete denture was fabricated for the lower arch [Figure 8].

Follow-up after 1 year shows good functional occlusion and clinically the transplanted tooth is stable with normal gingival health.

Discussion

Autotransplantation has previously been viewed with uncertainty. The success rate of autogenous tooth transplantation in the 1950s was approximately 50%. These poor results were due to a lack of understanding of the biological principles involved and poor clinical results of reported cases due to lack of information on clinical techniques. Another barrier to the acceptance of the technique has been the misconception that autotransplantation can only be successful when immature, developing teeth are transplanted.^[6,7]



Figure 1: Preoperative photographs: Maxillary arch



Figure 2: Preoperative photographs: Mandibular arch



Figure 3: Preoperative radiograph



Figure 4: Autotransplantation of lower left canine to upper left canine region (1)



Figure 5: Autotransplantation of lower left canine to upper left canine region (2)



Figure 6: Stabilization of transplant



Figure 7: Temporary bridge



Figure 8: Permanent restoration

Because too little was known of the causes and prevention of root resorption of transplanted autogenous teeth, the procedure was used infrequently. Since the 1990s, many studies have examined the healing of periodontal tissues and periodontal membrane and dental root resorption, and the transplant success rate has increased considerably, drawing new clinical interest. Tsukiboshi reported a 90% survival rate and an 82% success rate for 250 cases observed for 6 years. Lundberg and Isaksson reported a 94% success rate in cases with incompletely formed roots and 84% in cases with completely formed roots and a higher success rate in cases with immature teeth, whereas Majare *et al.* reported a high success rate for cases with mature teeth. Edetanlen *et al.* reported successful autotransplantation with mature tooth in a cleft palate patient. Success of autotransplantation is viewed in terms of survival, with or without root filling.^[8,9]

The factors that lead to success have been extensively investigated.^[7-9] The causes of tooth loss following transplantation from most common to least common are inflammatory resorption, replacement resorption (ankylosis),

marginal periodontitis, apical periodontitis, caries, and trauma. Inflammatory resorption may become evident after 3 or 4 weeks, while replacement resorption may not become evident until 3 or 4 months after transplantation. The most significant determinant for survival of the transplant is the continued vitality of the periodontal membrane. In cases where the periodontal ligament is traumatized during transplantation, external root resorption and ankylosis are often noted. The incidence of both types of resorption can be decreased with atraumatic extraction of the donor tooth and immediate transfer to the recipient site to minimize the risk of injury to the periodontal ligament. Pulp can be retained in an immature tooth where chances of revascularization is more. The pulp of a completely mature tooth cannot regenerate. If pulp tissue is retained in a mature tooth, it will necrose and lead to apical periodontitis and failure of the transplant. Therefore, if the tooth to be transplanted is accessible, endodontic treatment should be completed before transplantation. Marginal periodontitis and caries can be prevented with good oral hygiene and regular dental follow up. Trauma becomes a cause for failure if the transplanted tooth is not restored properly. Proper prosthetic planning is very important for the long-term survival of the transplanted

tooth. The experience of the surgeon also affects the success because this procedure is technique-sensitive.^[1,6,8,10]

There is renewed interest with regard to natural tooth transplantation, both allo- and autotransplantation. Primarily this interest stems from the cost effectiveness of the procedure when compared with implant-supported prosthesis. Between allotransplantation and autotransplantation, surely autotransplantation is likely to have a better success rate as the antigen antibody reaction does not exist.^[2,3]

This case report emphasizes the possibility and success of autotransplantation in clinics; it also emphasizes that transplantation is only technique sensitive but less equipment sensitive.^[7] It further stresses that an otherwise extracted and discarded tooth can be used to make natural functional unit.^[5]

Conclusion

This case report just demonstrates that

- The tooth that would otherwise have been extracted or left within bone can be used to make biologically functioning units
- Autotransplant can be a treatment option for all age groups
- Autotransplant could be a successful procedure if done under aseptic and atraumatic condition and it can be a normal routine procedure if required by patient; and
- Autotransplantation could be a preferred Rx choice to reduce cost of treatment.

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