Auto Transplantation of Ectopically Erupted Premolar: A Case Report

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The autogenous tooth transplantation is a viable option for tooth replacement. The tooth indicated for transplantation depends on the development of its root that should have growth up to two-third with open apex. This condition allows the replacement of lost teeth or ectopically erupted tooth in children and young patients. This case report presents a clinical case of autotransplantation of a premolar in a 19-year-old female, who had the ectopically erupted tooth near the lower molar. The procedure involved transplantation of lingually erupted mandibular right second premolar into the edentulous space of missing premolar. The concept of a traumatic extraction was used, disruption of the root sheath was avoided with the minimal time interval for replacement. After replacement tooth splinting was done and followed for 6 months. The tooth was found nonresponsive, endodontic treatment was done. This report reveals successful transplantation of a mandibular premolar into its own place.

Keywords: Autotransplantation, Periodontal ligament cells, Pulp vitality, Root resorption

INTRODUCTION

The earliest reports of tooth transplantation were in ancient Egypt who was forced to give their teeth to their pharaohs. Autotransplantation came into existence as allotransplantation of the tooth from one individual to another is associated with histocompatibility problems. Autogenous tooth transplantation is the surgical movement of a vital or endodontically treated tooth from its original location to another site in the mouth within the same individual. Autogenous tooth transplantation is first documented in 1954 by Hale.¹ Autotransplantation once thought to be experimental, recent studies show high success rate and is an excellent option for tooth replacement.² Careful patient selection and appropriate use of technique can give adequate esthetic and functional results with autotransplantation. This article indicates the use of autogenous tooth transplantation using a case report.

CASE REPORT

A 19-year-old female came to the department for the replacement of lower right second premolar 45 with an implant. The tooth has erupted lingually and distally near the first molar and second mandibular molars. Periapical radiographs of the donor’s tooth are taken to determine the labiolingual and mesiodistal dimensions, root formation. Literature review revealed the successful indication of autotransplantation in this case (Figures 1 and 2).

Under aseptic conditions lingually erupted premolar was extracted a traumatically under local anesthesia with least trauma to the periodontium. After extraction, the tooth should be handled very carefully by holding the crown part only. The tooth is preserved in coconut water till the preparation of recipient site. This maintains the vitality of periodontal membrane cells which in turn helps in integration to the bone at the recipient site (Figures 3 and 4).

The recipient area was prepared with the use of implant drill based on the diameter of the root measured near the cementoenamel junction. The extracted tooth was then placed in the prepared socket. The Minimal time interval between extraction and transplantation is important to maintain the vitality of periodontal membrane (Figures 5 and 6).
Occlusion was checked after the tooth was placed in its final position. The tooth should be kept in slight infra occlusion to allow it to erupt into proper occlusion over the next few months (Figures 7 and 8).

The flap closure is done with silk sutures. Arch bar splinting was done to immobilize the tooth for 1-2 weeks (Figures 9 and 10). Alternatively, composite wire splint was used. Postoperative soft diet was followed for few days, instructed to avoid...
mastication on the surgical side, instructed to maintain optimal oral hygiene. The patient was given preoperative and postoperative antibiotics along with chlorhexidine mouthwash (Figure 11a and b).

The patient was recalled the day after surgery to ensure the transplanted tooth retained its new position, stability of splint, swelling, edema, and hematoma formation. The patient was reviewed at weekly intervals for 1 month. At 1 week follow-up, the patient was in excellent condition with neither symptoms nor signal of any problem. After 2 weeks, the clinical examination showed a satisfactory esthetics and the periapical radiograph revealed no signs of root resorption. Arch bar splinting was removed after 2 weeks (Figures 12 and 13).

Figure 7: Tooth kept in infra occlusion

Figure 8: Tooth in final position, flap closed

Figure 9: Tooth splinting done with arch bar

Figure 10: Intraoral periapical immediately after transplantation

Figure 11: (a and b) One week follow-up

Figure 12: One month follow-up
After 1 month, the patient was reviewed every month till 6 months. During this period, the tooth was assessed for pulp vitality, periapical radiolucency, or root resorption. It showed the formation of periodontal ligament space with no signs of root resorption or periapical infection. During the follow-up period tooth was nonresponsive with no signs of vitality. Root canal treatment was done 3 months posttransplantation followed by crown fixation (Figures 14 and 15).

Six months follow-up showed no signs of root resorption (Figure 16a and b).

**DISCUSSION**

Tooth transplantation can be classified into autogenous, allogogenous, homogenous, and heterogeneous. Autogenous tooth transplantation is the surgical movement of a tooth from one location in mouth to another in the same individual. Studies demonstrated that autotransplantation of teeth is as successful as endosseous dental implant placement. Minimum acceptable success rates for endosseous titanium dental implants are 85% after 5 years and 80% after 10 years. The literature review showed success rate is found up to 95% and 98% in long-term follow-up. Autotransplantation of tooth is indicated in cases of impacted teeth, ectopically erupted teeth, premature tooth loss, traumatic tooth loss, congenitally missing tooth with crowding in the opposing arch, after extraction of teeth with bad prognosis. It has the advantages of a better alternative to prosthesis, avoidance of adjacent teeth preparation, comparative cost-effectiveness. The disadvantage with this technique is a poor prediction of outcome, loss of the tooth in the long-term because of possible complications of root resorption and loss of attachment. It is contraindicated for cases of poor oral hygiene, poor self-motivation, recipient site with insufficient alveolar width to accommodate the donor tooth, resorbed alveolar ridge.

**Evaluation of Success**

Success is defined as normal periapical healing, without any inflammatory pulpal changes or progressive root resorption. Pain, marginal periodontal attachment level, and mobility; root resorption evaluates the success of acceptance of transplanted tooth. If the transplanted tooth resides in its new socket without residual inflammation,
masticatory function is satisfactory and is without discomfort, the tooth is not mobile, a pathologic condition is not apparent on the radiographs, the lamina dura appears normal on radiographs, gingival contour, color are within normal limits then the success of transplanted tooth is found to be adequate. Complete periapical healing and periodontal health are more reliable parameters of prognosis and success because slight external root resorption is often not radiographically detectable. Replacement resorption may be seen at 3-4 months to 1-year after the procedure, whereas inflammatory resorption may take about 3-4 weeks to become evident on radiographs. Andreasen\(^8,9\) found 95% and 98% long-term survival rates for incomplete and complete root formation of 370 transplanted premolars observed over 13 years.

**CONCLUSION**

Although autotransplantation is not established as a traditional means of replacing a missing tooth. Recent studies demonstrate that autotransplantation of teeth is as successful as endosseous dental implant placement.\(^10,11\) For younger patients, autotransplantation can be considered as a temporary measure as the transplant replaces missing teeth by preserving alveolar bone until growth has ceased and then if necessary, the patient can become a candidate for implants. In conditions of proper patient selection, the presence of a suitable donor tooth, adequate recipient site, autogenous transplantation is considered as a viable option for treatment of an edentulous space especially in younger patients as it provides a biological and economical treatment alternative.

**REFERENCES**