CASE REPORT

A New Home for a Streetless Occupant: A Case Report

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ABSTRACT

This is a case report of a 14-year-old female patient in whom a premolar from a donor was used as an allotransplant to replace her missing lower premolar. The treatment results over 6 months showed successful periodontal healing and functioning of the allotransplanted tooth. The aim of this paper is to report a procedure, allotransplantation of tooth, which is followed from ages but less preferred and documented and is surrounded by variable prognosis and also highlight the use of a intentionally extracted tooth for orthodontic purpose, which otherwise goes as a waste and moreover the use of this technique can supplement the need of an implant for the time being in the young patient without compromising her alveolar bone height, functioning, and esthetics.

Keywords: Allotransplantation, Missing lower premolar, Pedodontics.

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INTRODUCTION

Allotransplantation of tooth is the transplantation of tooth sourced from a genetically nonidentical member of the same species as the recipient. From being a method of rather poor prognosis, allotransplantation has developed to be a safe treatment procedure.¹

The earliest reports of tooth transplantation involve slaves in ancient Egypt who were forced to give their teeth to their pharaohs.² Success rate varies widely with reported results from 0% to near 100%.³

The long-term success of an allotransplanted tooth has been influenced by a number of factors such as surgical trauma, damage to periodontal ligament or the cemental layer of the root surface, the effect of splinting, developmental stage of the graft, immune reactions against the donor histocompatibility antigens.⁴

Many authors suggest a low success rate of tooth allografts and attribute this to lack of histocompatibility. Unno et al. demonstrated that even after an immunological rejection occurs to delete the donor cells the periodontal tissue could regenerate whereas the pulp tissue could transform into the sparse connective tissue⁵ the recent development of implant in the field of dentistry has made the transplant of the tooth a story of past but placement of implant in the young child is not a widely accepted treatment even the data over the use of dental implant in young patient is not enough to support its use as a option moreover the cost of implants, allotransplantation of teeth could still be an effective alternative to implant.

This case report is a follow-up of tooth allotransplantation of mandibular 1st premolar from different donors in place of unrestorable mandibular right second premolar.

CASE DESCRIPTION

A 14-year-old girl was referred by the local dentist to the Department of Pedodontic and Preventive Dentistry, Seema Dental College and Hospital after a failed attempt to extract the mandibular right premolar. On intra oral examination nothing was visible but on extra orally swelling was seen on swelling was due to the periapical lesion wrt 46 that was confirmed on radiographic and clinical examination (Fig. 1A). On Intraoral periapical (IOPA) radiograph of the respected ^{1,3–5}Department of Pedodontics, Seema Dental College and Hospital, Rishikesh, Uttarakhand, India

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site, a noninfected broken root was diagnosed in relation to right lower second premolar (Fig. 1B).

To maintain the functional matrix in the arch during growth period, allotransplant was planned as treatment after the extraction of root. Patients who had reported for the extraction of the mandibular right premolar for orthodontic reasons were recalled to the department. This donor was investigated for hepatitis B, C and HIV which turned out to be negative. Informed consents were obtained from both the donors and the recipient. Under local anesthesia the teeth of donor were carefully extracted with minimal trauma after completing an endodontic treatment RCT (Fig. 2).

The tooth was placed immediately in a chilled solution of 2% chlorhexidine (Fig. 3). Holding the tooth by the crown, the root surface was thoroughly cleaned off all the blood with the same solution using syringe. The apical end of tooth was closed by the biodentine. Throughout the procedure, care was taken to ensure that the root surfaces of this teeth were left undisturbed. This was to ensure minimal damage to the periodontal fibers. The teeth were then transplanted to the recipient's after the extraction of root stem extraction of recipient and this procedure is done within 10 minutes of extraction and was splinted with splint (Fig. 4A). Before transplantation the socket was irrigated with saline to clean off debris following which fresh bleeding was induced by forceful irrigation. Intra oral periapical radiograph was taken to

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Figs 1A and B: (A) Preoperative photograph with swelling; (B) Preoperative Intraoral periapical radiograph shows with root stem



Fig. 2: Endodontic treatment done of donors tooth



Fig. 3: Donors tooth extracted and placed in 2% chlorhexidine



Figs 4A and B: (A) Postoperative photograph with splinting; (B) Postoperative radiograph

confirm the position of transplanted teeth in the socket before splinting (Fig. 4B).

The wound healed uneventfully after 4 weeks (Fig. 5A) and prosthesis porcelain crown was given on the tooth. Subsequently,

periodic follow-up showed that the allograft is clinically firm and radiographically no inflammation or replacement resorption (Fig. 5B). This case is being continuously monitored to detect any future resorptive activity.





Figs 5A and B: Photograph with PFM crown and intraoral periapical radiograph after 6 months

DISCUSSION

Autotransplant has proven to be more efficient then allotransplant the two type of response, depending on the treatment used has been shown. A acute inflammatory response with stored teeth in the initial phase chronic inflammatory response with fresh teeth at about 18 days after transplantation.⁶

Schwartz et al. has reported that despite of a progressing replacement resorption frequently present, the allografts seem to function clinically sufficient, symptomless and often with clinically normal gingival condition for many years.³

Despite a progressive replacement resorption, which is a frequent complication of a transplanted tooth, allografts function effectively, symptomless often with clinically normal gingiva for many years.⁴

The mean functional time of the allografts was 6.8 years, with the teeth remaining free of symptoms. Although Iványi and Komínek demonstrated a significant increase in the function time of allografts only up to 2 years after matching histocompatibility antigens, a long term function time of allotransplanted teeth (10–16 years) has been described in a series of allografts carried out even before the discovery of human leukocyte antigen system in man.⁷ The complication to be taken care of (immediate or delayed) includes pulp necrosis, progressive root resorption and ankylosis/infraocclusion, which jeopardize the long-term result of the allotransplant. The first complication is eliminated in the present case as root canal treatment was done for the donor tooth prior to its extraction. The other two are not seen as the follow-up radiograph shows normal periodontal ligament space.

The prognosis of allotransplant is limited due to replacement resorption as periodontal ligament (PDL) seems to elicit immune response and rejection. Use of chlorhexidine solution, short handling time of the transplant undoubtedly would contribute to the survival of periodontal ligament cells.⁴

CONCLUSION

As implant being contraindicated below the age of 18 year allotransplant is one of the alternative in young patient although it survive for few years the alveolar height is maintained by the allotransplanted tooth which is not possible by any other prosthetic mean other then implant the patient can receive the implant on a the respective site after he/she complete their growth phase.

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