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## Treatment of external inflammatory root resorption after autogenous tooth transplantation: case report

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This paper describes a case of autogenous tooth transplantation. An external inflammatory root resorption developed in a 30-year-old female patient and was successfully treated with the placement of calcium hydroxide-based intracanal dressings. Autotransplantation of tooth 32 into the extraction socket of tooth 30 was carried out with no intraoperative complications and uneventful postoperative course. However, the patient did not appear on the 14th postoperative day to initiate endodontic therapy of the transplanted tooth. She did not return for 3 months, at which time the clinical and periapical radiographic examinations revealed the presence of external inflammatory root resorption. Endodontic treatment was initiated immediately. Root canals were prepared and filled with a calcium hydroxide-based intracanal dressing (Calen paste), changed every 21 days during a 6-month period, and were thereafter obturated with Sealapex calcium hydroxide-based sealer and gutta-percha points. After 2 years of follow-up, the transplanted tooth was symptom free with no exacerbated sensibility to percussion, normal mobility, occlusion, and masticatory function. Probing revealed no periodontal pockets or other pathological signs. Radiographic examination showed the periradicular area with normal appearance, completely healed resorption areas, and presence of an intact lamina dura. (*Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2006;102:e51-e54)

Autogenous tooth transplantation or dental autotransplantation is defined as the transplantation of impacted or erupted teeth from their original sites into extraction sockets or surgically prepared recipient sites in the same individual. It is a viable treatment option for replacing missing teeth when suitable donor teeth are available<sup>1</sup> and is generally indicated in cases of dental agenesis, nontreatable root fractures, and prematurely lost teeth from trauma, caries disease, or periodontal causes.<sup>2</sup> The success rate of autogenously transplanted teeth ranges from 68% to 96%.<sup>1,3</sup> Nevertheless, a number of preoperative, transoperative, and postoperative factors might interfere with the prognosis of cases of autotransplantation, such as the age of the patient, root development stage, type of tooth transplanted, periodontal ligament and pulp tissue vitality, extra-alveolar time and storage medium of the donor tooth, damage to

Hertwig's epithelial root sheath during extraction, and characteristics of the recipient site.<sup>4</sup>

The major complications of dental autotransplantation are external inflammatory root resorption and replacement resorption (ankylosis). Inflammatory resorption is caused by the irritation derived from pulp necrosis and subsequent infection,<sup>5,6</sup> whereas ankylosis is caused by damage to the periodontal ligament during the surgical procedure.<sup>7</sup>

This paper describes a case of autogenous tooth transplantation in which the external inflammatory root resorption was controlled and healed by the placement of calcium hydroxide-based intracanal dressings.

### CASE REPORT

A 30-year-old female patient with adequate general health was referred to a private dental office for endodontic treatment of tooth 30. However, periapical radiographs revealed the existence of a nontreatable root fracture that indicated the tooth for extraction. Clinical and radiographic examinations showed that tooth 32 was healthy with complete root formation. It was well positioned within the dental arch, which made it suitable for autotransplantation. The donor tooth presented normal morphology, apparently uncomplicated extraction, and absence of periodontal involvement, which are important prerequisites for teeth being transplanted. The steps, benefits, and risks of the technique were fully explained to the patient,

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and she was scheduled for treatment after written informed consent was obtained.

The surgical procedures were carried out under mandibular block local anesthetic. Tooth 32 remained in its original socket until removal of tooth 30 and preparation of the recipient extraction wound, which was delicately curetted and irrigated with sterile saline. Tooth 32 was carefully extracted to avoid damage to the root surface and positioned into the recipient site to check adaptation. Because of differences in root shape and length, the donor tooth was repositioned back in its original socket, and the recipient site was remodeled with a round implant bur (center punch bur, 3 mm, Degussa AG, Dusseldorf, Germany) under copious sterile saline irrigation. After fitting of the transplanted third molar, 4-0 silk sutures were used to approximate the soft tissues and to improve tooth stabilization. A soft periodontal packing was placed as a functional splint. There were no intraoperative complications. The autogenously transplanted tooth was maintained in normal occlusion to facilitate the healing process. Routine postoperative instructions were given to the patient, and daily 0.12% chlorhexidine gluconate mouth rinses were prescribed for 15 days.

The patient returned 1 week after the intervention for suture removal. Normal healing process and comfort during mastication were observed, and the postoperative course was uneventful and uncomplicated. The patient was requested to return 14 days postoperatively to initiate the endodontic therapy of the transplanted tooth. However, the patient did not show on the scheduled date and returned 3 months after the autotransplantation. At this time, the clinical and periapical radiographic examinations revealed the presence of external inflammatory root resorption (Fig. 1).

The endodontic treatment was initiated immediately after isolation with a rubber dam. The root canals were instrumented manually under strict asepsis with copious irrigation, aspiration, and flushing with 2.5% sodium hypochlorite. Besides the fact that there was a large external resorption, there was no connection to the pulp space and no bleeding on instrumentation. The root canals were dried and filled with EDTA (17%) that was stirred for 3 minutes with a K-file to remove smear layer. The canals were then filled with a calcium hydroxide-based intracanal dressing (Calen paste, 2.5 g Ca(OH)<sub>2</sub>, 0.5 g zinc oxide pro analysis, 0.05 g colophony, 1.75 mL polyethylene glycol 400; SS White Artigos Dentários, Rio de Janeiro, RJ, Brazil), which was changed every 21 days during a 6-month period. Rapid healing was observed radiographically within this period (Fig. 2). Hereafter, root canals were permanently obturated with a calcium hydroxide-based sealer (Sealapex, Sybron Endo, Orange, CA) and gutta-percha points. The gutta-percha points were coated with sealer along their entire length (including the tip) and placed in the root canal to the working length. Active lateral condensation was performed with the aid of finger spreaders (Fig. 3).

After 2 years of follow-up, the transplanted tooth was symptom free with no increased tenderness to percussion, normal mobility, occlusion, and masticatory function. Probing revealed no periodontal pockets or other pathological



Fig. 1. Periapical radiograph showing the presence of external inflammatory root resorption 3 months after autogenous transplantation of tooth 32 into the recipient extraction socket of tooth 30.

signs. Radiographic examination showed the periradicular area with normal appearance, completely healed resorption areas, and presence of an intact lamina dura (Fig. 4).

## DISCUSSION

Autotransplantation is considered a viable treatment option for replacement of missing teeth and an alternative to conventional prosthetic and implant rehabilitation, from therapeutic and economic standpoints.<sup>3</sup>

In cases of dental transplantation, it has been reported that the donor tooth should ideally present one third to three fourths of root formation to allow normal root development (apexogenesis) and revascularization of the pulp tissue.<sup>1,3,8</sup> Kallu et al.,<sup>1</sup> in a descriptive retrospective study of autogenous tooth transplantations, observed that only 92 out of 273 autotransplanted teeth maintained pulp vitality after the procedure and recommended that donor teeth

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