

A New Bone Substitute in the Definitive Management of Furcation Involvement

A Case Report

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ABSTRACT

Bone xenografts are used for reconstructive surgery in medicine and dentistry. The grafts are osteoconductive, serving as a matrix in bone regeneration. Furcation involvements are one of the most challenging clinical problems in periodontics. Unilab Surgibone is a bone xenograft and has been investigated in many clinical and experimental studies. In this case report, a 50-year old male patient was diagnosed with a class III furcation problem in his upper right first molar. The tooth was surgically treated by resection of the distobuccal root after flap elevation. The extraction defect was grafted with the Unilab Surgibone. After nine months, the patient was evaluated clinically and radiographically. The healing was uneventful. The clinical and radiographic data suggest that Unilab Surgibone supports bone regeneration.

Keywords: Furcation involvement, root resection, xenograft

Un Nuevo Sustituto Óseo en el Tratamiento Definitivo de las Lesiones de Furcación

Un Reporte de Caso

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RESUMEN

Los xenoinjertos óseos se utilizan en la cirugía reconstructiva en medicina y odontología. Los injertos son osteoconductores, y sirven como matriz en la regeneración ósea. Las lesiones de furcación constituyen uno de los problemas clínicos más difíciles en periodoncia. El Unilab Surgibone es un xenoinjerto óseo y ha sido investigado en muchos estudios clínicos y experimentales. En este reporte de caso, a un paciente de 50 años de edad le fue diagnosticado un problema de furcación de clase III en su primer molar superior derecho. El molar fue tratado quirúrgicamente, practicándosele la resección de la raíz distobucal, después de la elevación del colgajo. El defecto de extracción fue injertado con el Unilab Surgibone. Después de nueve meses, el paciente fue evaluado clínica y radiográficamente. La curación transcurrió sin incidentes. Los datos clínicos y radiográficos sugieren que Unilab Surgibone apoya la regeneración ósea.

Palabras claves: Lesiones de furcación, resección de la raíz, xenoinjerto

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INTRODUCTION

Periodontitis is a term used to explain an inflammatory process initiated by the plaque biofilm that leads to loss of periodontal attachment to the root surface and adjacent

alveolar bone and which ultimately results in tooth loss (1, 2). Maxillary molars with inter-radicular loss of periodontal tissue have a high risk of further attachment loss with a poor long-term prognosis (3).

Bone grafting is an important treatment alternative for injuries and defects as a result of trauma, tumours, congenital defects and periodontal disease (4). Xenografts are used clinically due to ready availability and good osteoconductivity which has been proven in both experimental and clinical research (5, 6).

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In this case report, a male patient aged 50 years, diagnosed with class III furcation involvement in his upper right first molar, was treated by root resection and application of a xenograft.

CASE REPORT

A male patient aged 50 years was referred to the Department of Periodontology in November 2011. History and clinical evaluation revealed no systemic diseases. During the intra-oral examination, the gingiva was found to be hyperaemic, oedematous and inflamed. Calculus was also seen. In addition to these findings, chronic periodontitis was diagnosed after careful clinical and radiographic examination. There was a class III furcation involvement (7) in the upper right first molar (Figs. 1, 2). Phase I therapy included plaque



Fig. 1: Clinical view at baseline.



Fig. 2: Radiographic view at baseline.

control, scaling and root planning. Moreover, endodontic treatment of the upper right first molar tooth was completed in order to perform a root resection. During the surgical phase of treatment, the flap was elevated and the disto-buccal root of the upper right first molar was resected using a surgical bur with irrigation. The remaining alveolar socket was filled with the Unilab Surgibone (Unilab Surgibone, Mississauga, Ontario, Canada) xenograft. The flap was repositioned and sutured with 4-0 silk suture; occlusal adjustment

therapy was then done. Postoperatively, an analgesic-anti-inflammatory drug and 0.2% chlorhexidine solution were prescribed. After one week, the sutures were removed and the healing process was observed to be uneventful. The patient was examined clinically and radiographically nine months after the root resection surgery (Figs. 3–5).



Fig. 3: Clinical view nine months after therapy.

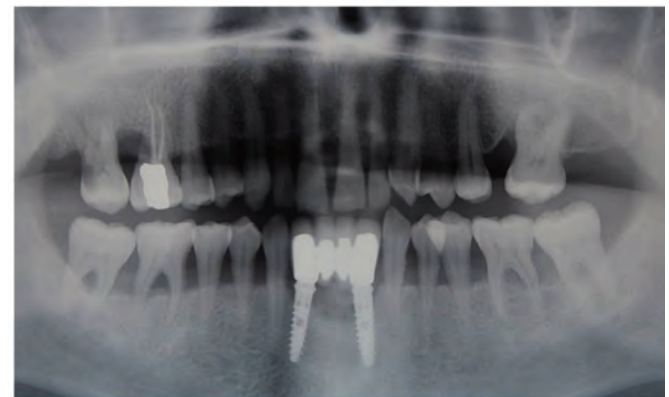


Fig. 4: Radiographic view nine months after therapy.



Fig. 5: Radiographic view of upper right first molar nine months after therapy.

DISCUSSION

Multiple publications document the successful use of Unilab Surgibone as a bone replacement graft. The results are generally positive, with only Charalambides *et al* (8) reporting poor results.

The xenograft was investigated in experimentally created cranial defects in rats, and both short-term and long-term results proved that it is biocompatible, osteoconductive and has no important adverse effects on bone regeneration (5, 6). The regenerative effect of the graft on bone regeneration was investigated in alveolar sockets in experimental animals (9).

Although application of biomaterials for ridge preservation following extraction is a common procedure, reports of grafting following root resection are not common. Develioglu *et al* (10) examined the effectiveness of grafting an alveolar socket with particular Ceraform (Teknimed, Vicen Bigore, France) after a root resection of a mandibular molar. The results showed that the material was not very resorbable, with low effects on bone regeneration.

Moreover, the literature contains a case report that shows the treatment of a through-and-through bone lesion with autologous growth factors and xenogeneic bone graft (11). Addition of growth factor to the graft material improved the regenerative process, resulting in rapid hard and soft tissue healing (11). We used no growth factors, therefore rapid and meaningful hard tissue healing was not observed.

Barone *et al* (12), in a clinical and histomorphometric study, investigated the rapid ridge preservation in case of xenograft versus extraction alone after tooth removal. The results proved that the ridge preservation technique with porcine bone in combination with collagen membrane significantly limited the resorption of hard tissue ridge after tooth extraction compared with tooth removal alone. The index case presents only the use of a xenograft and does not offer parallel findings with this case.

A similar study presents the comparison of magnesium-enriched hydroxyapatite and porcine bone in human extraction socket healing. Four-month results showed the same biologic behaviour in bone formation and resorption process for the used biomaterials (13). Although the observation time was shorter than our case, the finding of minimal bone formation was similar with ours.

Bashara *et al* (14) investigated the effect of permanent grafting materials on the preservation of the buccal bone plate after tooth extraction. The titanium granules were detected to have promising osteoconductive properties. In the index case, we also showed the osteoconductive properties of Unilab Surgibone material.

In addition to others, in a study, the extraction sockets healed with bovine xenografts, irradiated cancellous allograft, and solvent-dehydrated allografts were observed histomorphometrically. Four to six months after implanta-

tion, it was suggested that the deproteinized bovine bone mineral showed more osteoconductive effects than irradiated cancellous allograft or solvent-dehydrated allografts (15). The tools used in that study were different from those used in our study, which accounts for potentially different results.

In the index case, we resected the disto-buccal root of an upper molar with furcation involvement due to its advanced attachment and bone loss. Most of the time, this decision is an inevitable consequence. Root resection may be valuable when the tooth in question has a high strategic value or when specific problems exist associated with treatment alternatives such as dental implants (3, 16, 17). Additional grafting can be helpful for rapid bone regeneration. No complications were detected in our case during the observation period. The patient can perform adequate plaque control, and the furcation area can be cleaned with a proxbrush. There were no occlusal problems. Minimal bone regeneration was seen (Figs. 3–5).

The patient is under control and it can be concluded that the application of this biomaterial only in such cases is not a good alternative because of its limited effect on bone regeneration and the low resorption rates. However, application in combination with other osteoinductive materials could be more effective.

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