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CASE REPORT

Secondary Closure of Alveolar Clefts with Mandibular Symphyseal Bone Grafts and with Platelet-Rich Fibrin Under Local Anesthesia: Three Case Reports

Yavuz Fındık, Timuçin Baykul

ABSTRACT

Secondary alveolar bone grafting is a method that enables an excellent oral rehabilitation of the patients having cleft palate. Many types of bone grafts have been used for reconstruction of the cleft, including autogenous bone and bone substitutes. Platelet-rich fibrin (PRF) has been shown to be effective in grafting the defect. The aim of this presentation is to report the closure of an alveolar cleft with the use of symphyseal bone grafts harvested with platelet rich fibrin under local anesthesia. PRF may be a good treatment choice depending on the early radiographical view of the defect and uneventfull healing.

Keywords: Platelet rich fibrin, Alveolar cleft, Bone grafting.

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INTRODUCTION

Secondary alveolar bone grafting is a method that enables an excellent oral rehabilitation of the patients having cleft palate. The reconstruction of the cleft area not only provides a good oral hygiene but also neighboring teeth can erupt into the grafted area. Many types of bone grafts have been used for reconstruction of the cleft, including autogenous bone and bone substitutes.[1-3] Mandibular symphyseal bone has been used successfully in alveolar cleft bone grafting.[4,5] More recently, the use of bone growth factors, such as, Platelet-rich fibrin (PRF) has been shown to be effective in grafting the defect. PRF contains many growth factors including platelet derived growth factors (PDGF), vascular endothelial growth factors (VEGF), and transforming growth factor-b (TGF-b).[6] The aim of this presentation is to report the closure of an alveolar cleft with the use of symphyseal bone grafts harvested with platelet rich fibrin under local anesthesia.

CASE REPORT

The 12, 13 and 14-year-old male patients was consulted to our department for their unilateral alveolar cleft. The surgical plan consisted of reconstructing the cleft with symphyseal bone graft combined with platelet rich fibrin under local anesthesia. The operation is performed under local anesthesia with infraorbital, anterior and medial superior alveolar and nasopalatinus nerve blocks. After the preparation of the buccal and palatinal mucoperiosteal flaps and repair of the nasal mucosa (Fig. 1), bone grafts were harvested by a raw from mandibular symphyseal region and then grafts were milled by a manuel graft grinder (Fig. 2). The 9 ml autologous blood was drawn from patient. Blood was centrifuged in a standard laboratory centrifuge for 12 minutes at 2700 rpm. After the preparation procedure, PRF was harvested with symphyseal cancellous bone chips

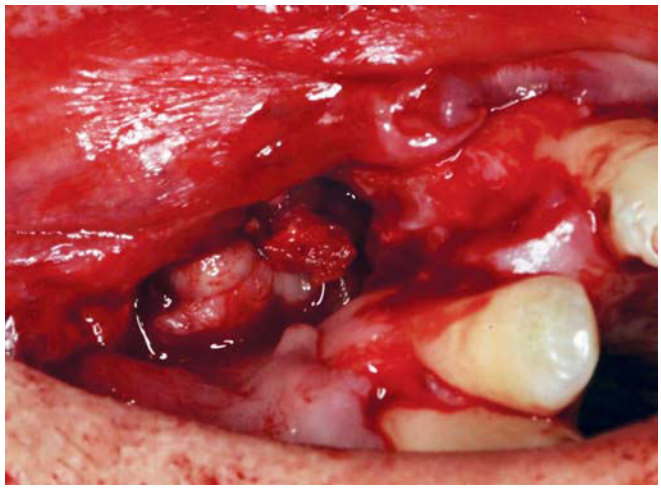

Fig. 1: Closure of the nasal flor

and placed at the base of the defect (Fig. 3). Then the defect was closed with cortical bone. Buccal flaps were elongated from both distal and mesial aspects of the alveolar defect and closed primarly. Postoperative complications did not occur in two patients. Only one patient's bone graft was exposed but with oral hygiene recommendations, graft was recovered smoothly. After alveolar cleft repair, orthodontic tooth movement, was initiated in 3 to 4 months and patients follow-up is still ongoing (Fig. 4).

DISCUSSION

The principles of surgical repair for unilateral clefts are include: proper closure of nasal floor mucosa to seal the communication between the nose and oral cavity; filling the defect with grafted bone; and approximation of the oral mucosa on the labial and palatal aspects to achieve a watertight closure over the grafted bone. Potential advantages of the alveolar bone grafting include preventing collapse of the alveolar segments, stabilizing the maxillary arch, providing stable alveolar bone for the canine and the lateral incisors to erupt into the arch, maintaining bony support of teeth adjacent to the cleft, restoring the maxilla at the piriform rim, providing improved stability and esthetics by supporting the alar base, and eliminating the oronasal fistula.[7] Ýliac crest is the most commonly used donor site for autogenous cancellous bone, on the other hand bone grafts harvested from different sites have been recommended in order to reduce morbidity.[8] Mandibular symphyseal bone has also some advantages, such as obtaining from the same operative site, less donor site morbidity and ease of harvesting, but lesser amount of donor bone generally makes the iliac crest the preferable choice. But still, it can be used in smaller or narrow defects as preferred in the presented cases.

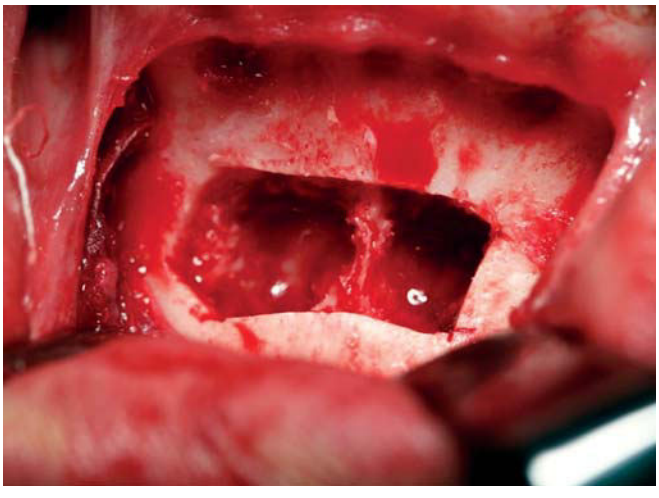

Fig. 2: Bone grafts harvested from the mandibular symphyseal region

Fig. 3: Placement of the grafts and PRF to the cleft

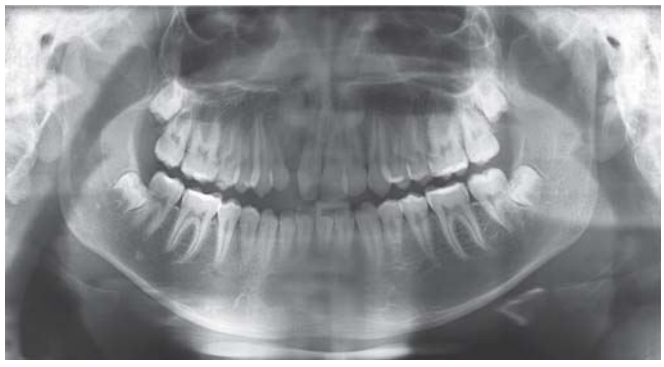

Fig. 4: Panaromic view of the cleft after 1 year

For healing period, to enhance bone regeneration, growth factors such as bone morphogenic proteins (BMPs) and platelet derived growth factors (PDGF) in combination with different kinds of bone substitutes were examined and good results were reported.[6] The main advantage of growth factor-aided tissue engineering is the shortening of the healing time and ossification phase. Symphyseal bone was harvested with PRF to take these advantages in the reported cases.

Successful results were obtained with this technique and alveolar clefts were reconstructed and oronasal fistulas were closed at one stage. Although number of cases are not enough, it can be suggested that symphyseal bone harvested with PRF may be a good treatment choice depending on the early radiographical view of the defect and uneventfull healing.

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ABOUT THE AUTHORS

Yavuz Fındık (Corresponding Author)

Assistant Professor, Department of Oral and Maxillofacial Surgery Faculty of Dentistry, Süleyman Demirel University, Turkey, e-mail: yavuzfindik32@hotmail.com

Timuçin Baykul

Professor, Department of Oral and Maxillofacial Surgery, Süleyman Demirel University, Turkey