Repair of the cleft palate with the use of demineralized xenogenic bone graft combined with platelet rich plasma

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ABSTRACT

Background: The purpose of this study was to find the best method of repairing a huge cleft palate.

Patients and Methods: The surgical operation was carried out on 20 children referred to the Department of plastic surgery in a Sulaimania Teaching Hospital suffering from cleft palate who were treated by the use of decalcified xenogenic bone graft combined with platelets rich plasma which eliminate the need to harvest autogenous iliac bone graft.

Results: Six months postoperatively, clinical results were satisfied and perfect without any complications.

Conclusion: The use of demineralized xenogenic bone graft combined with PRP is considered the best substitute for autogenous bone graft to treat cleft palate.

Key words: Cleft palate, xenogenic bone graft. (J Bagh Coll Dentistry 2007; 19(1)69-71)

INTRODUCTION

Cleft palate is a congenital deformity but if it is too large, the oral and maxillofacial surgeon will face a great difficulty in repairing the cleft because of the need of a large amount of bone graft (1-4). The surgical closure of the cleft palate is preferred to be done within the first year of the child's life but in this period of the child's life it is very risky to take a huge amount of autogenous bone graft and at the same time we can not use bone substitutes because it is very difficult in handling (5-11). So for these reasons, the use of demineralized xenogenic bone graft combined with platelets rich plasma is considered the treatment of choice to treat such cases.

PATIENTS AND METHODS

Preparation of the Xenogenic Bone graft (Figure 1)

The same size of the fistula track of bovine bone was selected, and all soft tissues were carefully removed. Then multiple cuts in the bone graft were made. After that the bone was cleaned well according to protocol established by Reddi and Huggins (10), then the bone was demineralized with dilute 10% hydrochloric acid for about 7-10 days. Then it was washed in sterile water followed by absolute ethanol and anhydrous diethyl ether. The bone was stored to refrigerate for one hour to be ready for use. (Figure 1)

Platelet-Rich Plasma (PRP) preparation

Ten ml of blood was drawn from each patient combined with 1.1 ml of anticoagulant citrate dextrose phosphate to prevent coagulation. The blood should be chilled by centrifuging at room temperature for 10-15 minutes. The PRP was carefully removed, avoiding contamination with red cells or buffy coat, and placed in plastic tube. PRP should be stored at room temperature and is stable for about 3 hours and to be added to demineralized bone to be grafted in the recipient patient.

The patients were evaluated clinically and radiographically to exclude any systemic diseases that interfere with bone grafting operation. At the same time the amount and shape of bone graft needed was prepared.

Surgical operation
Under general anaesthesia, the incision was made around the cleft with a No 11 blade. Careful dissection of the nasal mucosa layer was made, and a piece of prepared decalcified xenogenic bone graft combined with PRP was placed in the fistula, and closure of the fistula was done in layers. The baby received fluids through an intravenous catheter in lieu, and prescription of antibiotics was given to prevent infection immediately after surgery. Stitches either dissolved or were removed in about a week after surgery.

**DISCUSSION**

Usually bone grafting involves taking bone tissue from one location and transplanting it to another location. The problem with the usual techniques is that surgeons must open another site to take an autogenous bone graft and transplant this bone to the recipient site. In this study we found that the use of decalcified xenogenic bone graft combined with PRP gives perfect results.

**RESULTS**

**Clinical findings**

The patients were followed up postoperatively for clinical evaluation especially first week, and then followed up by telephoned questionnaire. Perfect results of closure of fistula tract and there were no complications.

Thus, one can easily see that PRP permits the bone to heal faster and more efficiently. Surgery for cleft palate is usually performed when the child is about one year old, before starting to talk. In cases of small cleft after excision of internal epithelial tissue only approximation of the soft tissue is needed. In the present study all the cases were referred to the department of oral and maxillofacial surgery complaining from huge cleft palate. In these cases the needs for a large amount of bone graft is essential for successful repair of the fistula tract. The use of decalcified xenogenic bone graft combined with PRP eliminating the need to harvest autogenous iliac bone graft.
REFERENCES