EVALUATION OF SECONDARY ALVEOLAR BONE GRAFTING PROCEDURES

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ABSTRACT

The most common procedure followed globally for the bony repair of a cleft palate is by grafting the iliac crest in the defect. The objective of this study was to evaluate the success of the alveolar bone grafting procedures carried out at our institute by using the Berglands Index. A total of 12 patients were evaluated by taking periapical radiographs of the grafted site 6 months post surgery. It was found that 77% of the patients had a bone level of more than 3/4. It was also deduced that the success rate of the grafted bone was 100% when the bone was grafted before the eruption of the canine while success rate dropped to 40% in patients in which the procedure was performed after the eruption of the canine.

INTRODUCTION

A cleft palate is the embryological failure of the hard palate to fuse together while the child is in utero. A cleft lip is caused by failure of the tissue surrounding the lip to fuse together during the same period. Most children who have this condition at birth can be helped by surgery. The most common protocol for cleft lip and palate repair is before three months of age the lip is repaired and at 6 months the soft tissue defect in the palate is approximated. The alveolar bone grafting (ABG) done to fill the bony defect is most commonly done at 8-15 years.1

In autograft materials the Iliac crest is the most popular site as the cancellous bone is abundant over here which rapidly transforms into alveolar bone. Other contemporary materials are not in common use and are not as successful as iliac bone grafts.3,4

METHODOLOGY

The purpose of this study was to evaluate the success of alveolar bone grafts with iliac crest being the donor site performed at Islamic International Dental Hospital, using the Bergland’s Index.5 All surgical procedures were carried out by the same surgeon with the same team at the same hospital setting

A total of 15 patients have undergone secondary alveolar bone grafting at this center in the past two years. All the patients who had undergone surgery at least 6 months prior to this study were recalled for the
radiographic evaluation. Seven females and five males (12 patients in total) were willing to come for the non-mandatory evaluation. Out of these 10 patients had unilateral clefts and two had bilateral cleft. The mean age at the time of operation of these patients was 13.4 with a range of 9-24 years.

The periapical radiographs taken at the same angulation using a film holder were used to measure the bone status at the cleft site.

An acetate sheet was then mounted on the peri-apical films to evaluate the success of the bone grafting according to the Bergland index6 (Figures 1 and 2).

RESULTS

Frequency distribution of the scores of the alveolar bone height are summarized in figure 3 while the mean scores of patients in which ABG was performed before and after canine eruption are summarized in figure 4. The incidence of succesfull bone grafting before and after the eruption of the canine is summarized in figure 5.

DISCUSSION

Bergland, Semb and Abyholm in 1986 proposed a method of evaluating the success of alveolar bone
An evaluation of secondary alveolar bone grafting procedures

grafting by measuring the alveolar crest height in relation to the adjacent teeth.⁶,⁷ According to them a graft was considered successful if the root coverage was at or more than 2/3 of the adjacent teeth six months after grafting, i.e. the a Bergland index score of 1 and 2.⁶,⁷ In the present study the overall success rate of alveolar bone grafting was 77% of the total cases operated upon, this is better than the radiographs evaluated by Williams et al⁵ from the CSAG study in UK where the success rate was determined to be 59% with serious deficiency (Grade F) in 29% of the cases as compared to 15% in cases performed at our center. It should also be appreciated that after the implementation of the recommendations put forth after the CSAG study Revington and McNamara in a recent multicenter study in the UK have determined the success rate to be 86% in 2006 radiographs.⁸

The studies carried out by Meazzini et al⁹, Bergland et al⁶,⁷ and Bayerlein et al¹⁰ suggest better formation of bone at the cleft site when the ABG was performed before the eruption of the canine in the alveolar segment. This study tends to agree with the aforementioned authors, as the mean Bergland’s index score achieved in the patients in which the ABG was performed before the canine eruption was 1.8 with a 100% successful bone formation. This was not as good as in the patients in which the ABG was performed after the eruption of the canine, the index score being at 3 and with 40% of patients in which the bone formation was successful.

CONCLUSION

1. Alveolar bone grafting with bone from the iliac crest is a viable procedure for the repair of the alveolar defect.
2. This procedure should ideally be performed before the eruption of the adjacent tooth (canine or lateral incisor) in the grafted bone for optimal bone formation in the site.
3. A multi center study with a larger patient pool should be performed to validate the results obtained in this study

REFERENCES


Fig 5: The Incidence of successful bone grafting before and after the eruption of canine