

EVALUATE THE EFFECTIVENESS OF THE FINGER FLAP FOR COVERING AUTOGENOUS BONE GRAFTS IN SECONDARY ALVEOLAR BONE GRAFTING IN CLEFT OF THE LIP AND PALATE PATIENTS

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ABSTRACT:

Study objectives: Evaluate the effectiveness of the finger flap in covering and protecting the bone graft from loss.

Material and methods: Jawa is a patient with unilateral cleft lip and a palate at the left side, she visited Tishreen Hospital in Lattakia at the age of 10 years old back in (2016), after she underwent a lip closure at the age of two months and closed her palate at the age of two years.

After the case study we decided to undergo secondary alveolar bone grafting by using the finger flap to cover the harvested autogenous bone graft from iliac bone.

Result:The results of the using finger flap to cover the autogenous bone graft in this case were excellent in terms of preserving the graft from loss and starting bone formation in the cleft area.

Conclusion: We can use the finger flap in the coverage of bone grafts with good results in terms of preserving the graft and prevent it from loss.

Keywords: secondary alveolar bone grafting, finger flap.



INTRODUCTION:

Reconstruction of the alveolar cleft is an extremely important part of the habilitation of the cleft palate patient. The primary palate, which consists of the lip and alveolus, begins to close at 6 weeks in utero. Failure of the mesoderm to migrate across at the junction of the medial, lateral, and maxillary processes results in the formation of the alveolar cleft at approximately 7 weeks. Successful bone graft reconstruction of the alveolar cleft can result in several positive outcomes for the patient.

These outcomes become the goals of surgery.^[1]

Cleft patients with a permanent osseous defect of the alveolar arch and maxilla will even after the best surgical and orthodontic treatment be left with the following deficiencies:

1. Limited prospects for orthodontic treatment. The osseous defect makes anonprosthodontic dental rehabilitation impossible and necessitates a dentalbridge to close the gap in the dental arch.

2. Instability of the maxillary segments, particularly of the pre-maxilla in bilateral clefts.

3. Oro-nasal fistulae or mucosal recesses that impede oral hygiene.

4. Insufficient support of the alar base contributing to the nasal asymmetry. [2-8]

Surgical goals :

1. stabilization of dental osteal segments

2. oronasal fistula closure

3. Improvement of alveolar ridge form .

4. prevention of tooth loss (primarily the cuspid) due to a lack of periodontal bone support . [5, 1]

The surgical protocol for the rehabilitation of CLP is controversial, with no consensus regarding the timing and techniques used for each stage of the reconstruction. [3]

However, reconstruction of the alveolar process through an alveolar bone graft is generally approved for the treatment of CLP patients with involvement of the alveolar ridge.

Bone grafts are a necessary component of the care protocol for individuals with CLP and alveolar ridge involvement. However, this method presents high rates of complications such as resorption of the grafted bone, suture dehiscence, soft tissue necrosis (especially of the palate), and graft contamination. [4]

The oral side closure can be accomplished in one of three ways. The most common method is with the

elevation of a sliding full -thickness mucoperiosteal flap, which includes attached alveolar and unattached buccal mucosa , a horizontal is made adjacent to the teeth in the attached gingiva . The flap must be at least the width of the alveolar graft site. This incision is carried to bone ,and care is made to leave attached alveolar mucosa adjacent to the remaining teeth . A vertical incision, which creates a flap whose vestibular base is wider than the alveolar ridge portion, is then made in to the buccal fold and a full thickness mucoperiosteal flap is elevated. The periosteum is incised high in the buccal fold in order to achieve relaxation of the flap.

A second method for obtaining oral closure involves the elevation and advancement of four mucoperiosteal flaps : two palatal and two vestibular .

The third involves the rotation of a buccal mucosal finger flap , which we have used in our study [Figure 1] [1,6,5]

The purpose of the present review was to evaluate the protocol, the surgical technique and the outcomes in this case by using the finger flap.

CASE DETAIL:

Our patient is Jawa, she is ten years old, suffering from unilateral cleft lip and palate at the left side. She underwent a lip closure at the age of two months and closed her palate at the age of two years. She visited the hospital in June 2016. She was transferred to the

Department of Oral and Maxillofacial Surgery. A panoramic image of the patient was requested in addition to a clinical examination. [Figure 2]

After a good case study, it was decided to perform secondary bone grafting and closure of the oronasal fistula by using finger flap to cover the autogenous bone graft harvested from the anterior crest of iliac bone.

Patient's parents received and signed a written informed consent form before surgery.

Surgical protocol

Application of chlorhexidine gel in the alveolar cleft, three times per day, 2 days before the surgery.

Secondary alveolar bone grafting by means of iliac crest autogenous bone grafts in this case .

Application of chlorhexidine gel in the alveolar cleft, three times per day, during 15 days after surgery.

Postoperative clinical and radiological evaluations were carried out 15 days and 2 months after the surgical procedure.

The orthodontic treatment is taken up again 6 months after the surgery.

Surgical technique

The surgical procedures were performed under general anesthesia and nasotracheal intubation.

The technique used to harvest the anterior iliac crest bone graft was as follows. A minimal skin incision of 2 cm long was placed 1 cm lateral to the iliac crest posterior to the anterior superior iliac spine, The incision was carried down through the skin, subcutaneous tissue, and fascia, to the cartilagenous cap overlying the crest. Meticulous attention was taken to perform minimal stripping of the musculature on the crest.

An osteotome was then used to divide the bone along the iliac crest parallel to the long axis of the ridge. Two perpendicular horizontal cuts were made with an osteotome, then we removed the cortex bone and Curettes were used to harvest the desired amount of cancellous bone. The surgical site was copiously irrigated, and any potential sources of active bleeding addressed. Microfibrillar collagen was placed into the marrow cavity to aid in hemostasis. The wound was closed in a layered fashion. [Figure 3].

After we have a wide incision of the alveolar cleft .The nasal mucosa was reflected into the nose and the periosteum out of the cleft so that new bone could be grafted onto the bone. A transition was created separating the nasal and oral mucosa, so the bone had proper containment. Closure of the nasal floor mucosa was performed with a simple interrupted 4-0 polyglactin suture. [Figure 4]

Afterwards, cancellous chips of bone were packed in the remaining spaces. Then we closed the cleft and covered the graft with the Finger Flap that we made (buccal flap). The oral mucosa closure was tension free with 4-0 polyglactin interrupted suture. [Figure 5] The patient was admitted for 24-hour observation and discharged within the following day. She was instructed to eat a soft diet for 1 month. The activity restrictions included no kicking balls, lifting weights, school physical education, or swimming. Bathing was allowed after one week. She could resume normal activity within 2 weeks.

The patient return to the hospital for checking after one week and after three months and after six months:

Regarding donor site morbidity:

- 1-The wound was healed after one week.
- 2-Surgical sewing has been removed after one week.
- 3 -No inflammation.
- 4 -No difficulty walking after ten days.
- 5 – No pain except the first day.

Regarding to the cleft site:

- 1 – No inflammation.
- 2 – The graft was covered very well.
- 3 – No suture dehiscence.
- 4- No soft tissue necrosis (especially of the palate).
- 5 - No graft contamination.
- 6- The bone began to form three months later and was clearly visible in the panoramic image.

7-The restoration of the alveolar bone height and width were observed after three months.

8 – The oronasal fistula was closed.

9 – The canine teeth erupted in the cleft site after three months [Figure 6-7-8].

DISCUSSION:

When we decided to do this method to cover the bone graft, we wanted to see whether the finger flap will achieve excellent results or not.

But we are sure now that no matter how to cover the bone graft in the alveolar cleft but it is very important to cover it either by the finger flap or by the sliding flap .

The finger flap may result in a reduction of the depth of the buccal fold. However, success has been reported with this technique.

Although other sources of autogenous bone have been attempted, iliac bone is most commonly used due to its abundance, ease of access, and superior outcomes. The concerns associated with iliac crest harvesting have focused primarily on the possible effects on growth, gait disturbances, hematoma, and donor site morbidity. [7-8]

Several variables can influence the selection of the ideal donor area and the flap design in cases of autogenous bone grafts, including the cleft size, the bone volume required, the need for tooth eruption through the cleft, the

conditions of the donor area, and the repair capacity of the individual. [9]

CONCLUSION:

In conclusion, we would like to highlight the importance of the studies that compared between the used flaps to cover the bone grafts in secondary repair of alveolar cleft. We advise to use finger flap if the cleft width is not very large as we advise to perform several studies about this subject to know when we have to use it.

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FIGURES:

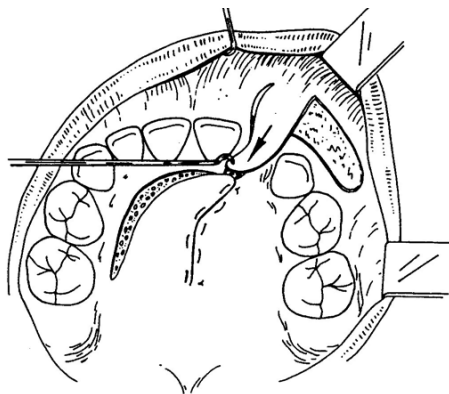


Figure 2 : the finger flap

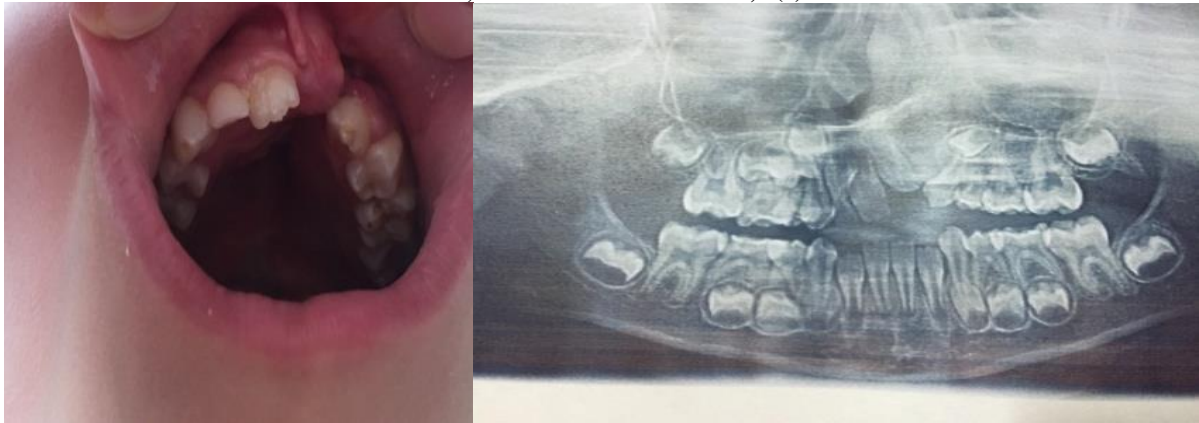


Figure 2 : alveolar cleft , fistula , the panoramic image

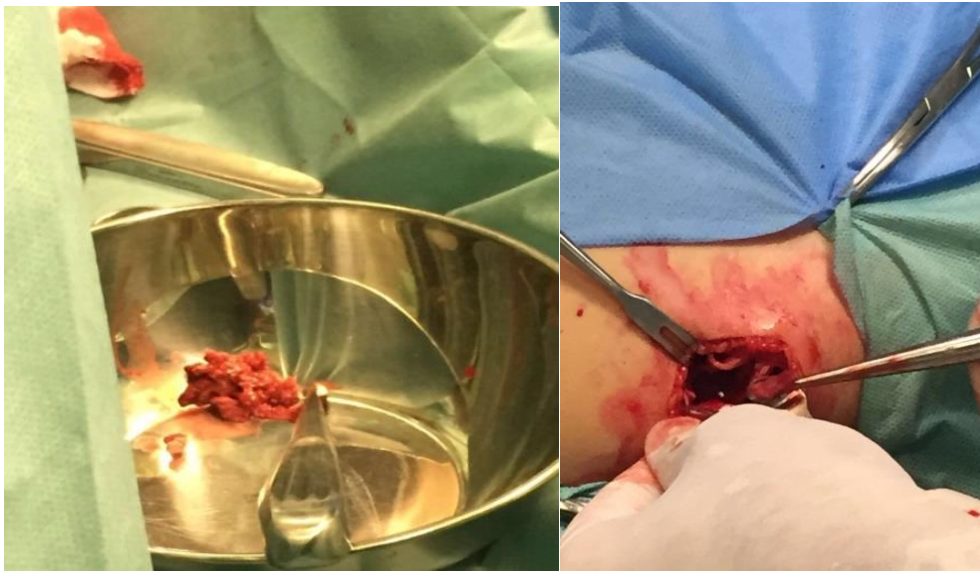


Figure 3 : the harvested graft



Figure 4: the finger flap



Figure 5: interrupted suture.



Figure 6: after three months



Figure 7: after six months



Figure 8 : after six months