

CASES REPORT OF CLEFT ALVEOLUS REPAIR WITH PMCB GRAFT

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The cleft alveolus occurs about 75% of cleft lip and palate patients. The purpose of bone grafting is improve the maxillary growth, rehabilitation of continuity of maxillary arch and providing bone for periodontal support for unerupted teeth.

The bone grafting for alveolar cleft defect repair are classified ; primary bone grafting, early secondary bone grafting secondary bone grafting and late secondary bone grafting.

In this article, we reported the cases of PMCB grafts for repair of the alveolar clefts showed potential benefit to the patient to induce a normal maxillary growth and providing bone for periodontal support of unerupted teeth.

I . INTRODUCTION

Various methods of closing maxillary alveolar clefts have been reported. The most frequently published techniques include the labial mucogingival sliding flap, pedicle finger flap, Y - vestibular mucosal advancement flap and bone grafting^{1,2}. Bone grafts is usually done with either a particulate corticocancellous and or a cancellous graft^{3,4,5}.

At the 1964 Pruzansky⁶ referred to primary bone grafting as "a surgery that is needless and sometimes barbaric." He pleaded for a concern for "biological mechanism." Shortly thereafter, others reported less than the intended results, with the greatest objection being the adverse effect on maxillary growth^{6,7}.

From the standpoint of proper development, it seems that any type of cleft repair should be delayed until after growth has ceased. To minimize disturbances in growth and development, various time schedules for early primary soft tissue lip and palate re-

pair and late secondary hard tissue alveolar cleft defect repair have emerged. Yet, it is apparent from the timing the type of graft to be used^{8,9}.

In this article, we obtained good result in functionally and esthetically with PMCB grafts, which was achieved in iliac crest in maxillary cleft alveolus.

II. CASES REPORT

Case 1

Name : Kim M. G. Age / Sex : 8 / M

First visit : 1988. 1. 6

Impression : Unilateral Cleft Alveolus

PDH : Repair of cleft lip and palate at 3 years at birth

P / E : Surgical scar on upper lip

Anterior cross bite

Missing lateral incisor on affected site

(Fig 1)

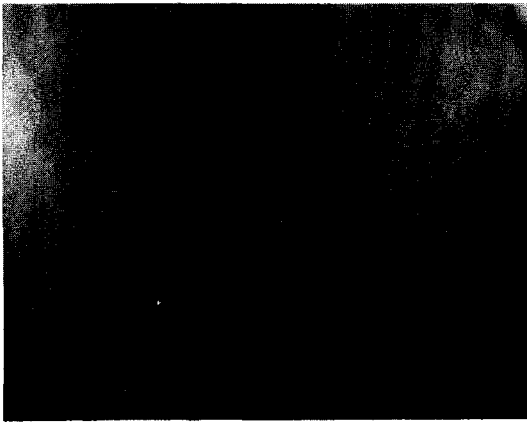


Fig. 1: Pre-operative occlusal view

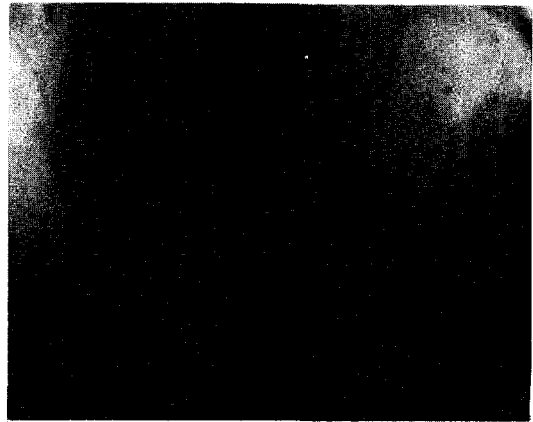


Fig. 2: Six months after PMCB graft

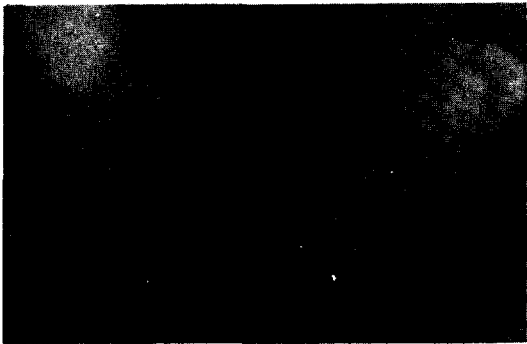


Fig. 3: Pre-operative

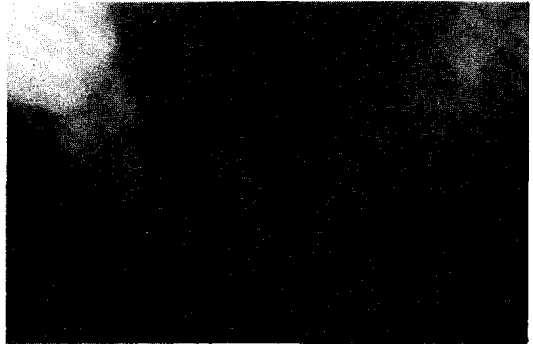


Fig. 4: Six months after PMCB graft

Treatment: Labial mucogingival sliding flap with PMCB graft (Fig 2)
Complication: No

Case 2

Name: Gea H. W. Age/Sex: 6/M
First visit: 1990. 6. 21
Impression: Unilateral Cleft Alveolus
PDH: Repair of cleft palate at 1 year at birth
P/E: Labioversion of deciduous lateral incisor on affected site
Flattening of lip and philtrum
Oronasal fistulae (Fig 3)

Treatment: Labial mucogingival sliding flap with PMCB graft (Fig 4)

Complication: No

Case 3

Name: Lee J. S. Age/Sex: 10/M
First visit: 1970. 7. 30
Impression: Bilateral Cleft Alveolus
PDH: Cleft lip and palate repair at 6 years old
P/E: Surgical scar on upper lip
Crowding of maxillary anterior teeth
Missing of lateral incisor
Treatment: V-Vestibular mucosal advancement flap with PMCB graft (Fig 5,6)
Complication: No

Case 4

Name: Kim B. C. Age/Sex: 25/M
First visit: 1988. 10. 24
Impression: Unilateral Cleft Alveolus

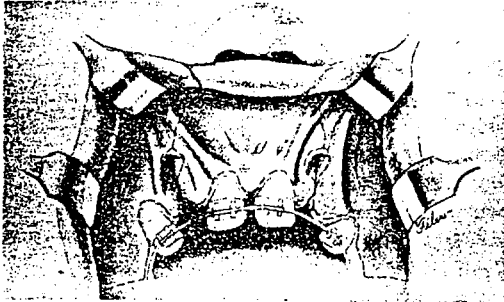


Fig. 5: Pattern of incision in bilateral clefts

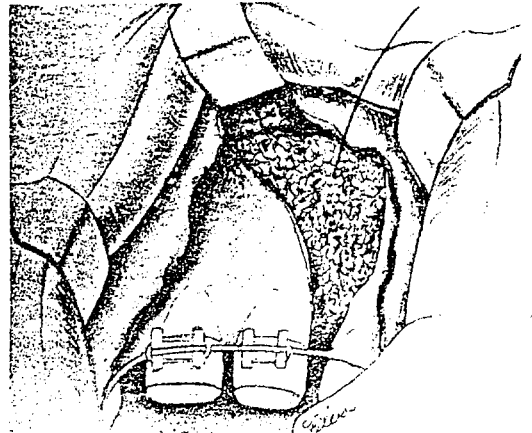


Fig. 6: Packed PMCB on the cleft defect



Fig. 7: Pre-operative occlusal view

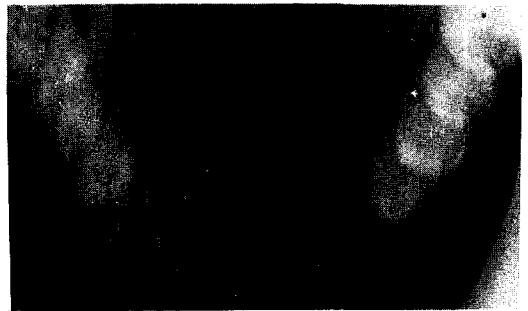


Fig. 8: Six months after PMCB graft

PDH: Cleft repair at 14 years old

P/E: Surgical scar on upper lip

Crowding of maxillary anterior teeth

Missing of lateral incisor (Fig 7)

Treatment: Labial mucogingival sliding flap with PMCB graft (Fig 8)

Complication: Infection with partial necrosis of the flap

Case 5

Name: Kang B. S. Age/Sex: 19/M

First visit: 1988. 10. 24

Impression: Unilateral Cleft Alveolus

PDH: Cleft repair at 12 years old

P/E: Surgical scar on upper lip

Crowding of maxillary anterior teeth

Missing of lateral incisor

Flattening of lip and philtrum

Treatment: Labial mucogingival sliding flap with PMCB graft

Complication: Wound dehiscence

We treated the five patients of cleft alveolus with PMCB graft. Three patients were no complications but two patients had complications, which were infection with partial necrosis of the flap and wound dehiscence (Table 1).

Table 1. Treatment and complications of our patient.

case	Sex / age	Impression	Treatment	Complications
1	8 / M	Unilateral	Labial mucogingival sliding flap with PMCB graft	No
2	6 / M	Unilateral	Labial mucogingival sliding flap with PMCB graft	No
3	10 / M	Bilateral	V - Vestibular mucosal advancement flap with PMCB graft	No
4	25 / M	Unilateral	Labial mucogingival sliding flap with PMCB graft	Infection Partial necrosis of flap
5	19 / M	Unilateral	Labial mucogingival sliding flap with PMCB graft	Wound dehiscence

III. DISCUSSION

The use of grafts for repair of the alveolar cleft has increased in the past 20 years. Reconstruction of alveolar clefts with bone grafts is a commonly used and well documented surgical procedure. Currently, the material of choice for grafting of alveolar clefts is autogenous particulate cancellous bone and marrow (PMCB). Various donor site have been described in the literature, including tibia, rib, and trochanter, but the iliac crest is preferred as donor site in most center^{10,11}. Recently report have been published on the use of calvarium and the mandibular symphysis as donor site. The intramembranous bone grafts is to reduce morbidity of harvesting of bone graft¹⁰. Marx, et al¹². showed autogenous particulate bone to be superior to allogeneic bone both quantitatively and qualitatively for the repair of alveolar clefts.

The goals of alveolar cleft repair, according to Epker and Wolford¹³, are stabilization of dento - osseous segments, improvement of alveolar continuity, prevention of periodontal loss of teeth adjacent to the cleft and provision of alar base support.

To minimized the disturbance in growth and development, various time schedules for early primary soft tissue lip and palate repair and secondary hard tissue alveolar cleft defect repair have emerged. Yet, it is apparent from the literature that complicit still exists as to the timing and type of grafts to be used.

The bone grafting for alveolar cleft defect repair are classified by operation time ; primary bone grafting, early secondary bone grafting, secondary bone grafting and late secondary bone grafting. Primary bone grafting under 2 years old age is known unsatisfactory postoperative result. If the bone graft was too early it lead to limitation of lateral growth of maxilla and cause of malocclusion¹³. Early secondary bone grafting in age of 2 year to 5 years are prevention of lareral nasal cartilage deformity and periodontal bone loss¹⁴. The secondary bone grafting at mixed dentition in age of 5 year to 16 years is the most succesful. In this time the grafted bones are responded to surrounding tissue, which are act as precursor of maxillary growth and restored the defected alveolar bone¹⁵. Late secondary bone grafting over the 16 years old have following advantages, which are

decreased the loss of adjacent teeth in defected area, obstruct the cleft defect and prevention of surrounding alveolar bone¹⁶⁾.

The advantages of bone graftings were ' 1) stabilization of the maxillary arch ; 2) united growth of the maxilla resulting in improvement of alveolar continuity and prosthetic optimization ; 3) presence of alveolar bone for tooth eruption and orthodontic movement ; 4) maintenance of proper dental occlusion resulting in proportional growth of the maxilla with the mandible ; 5) prevention of the periodontal bone loss ; and 6) closure of the oronasal fistula. When it became apparent on follow - up that the surgery did not fulfill all these expectation, disagreements arose as to the indications, timing and surgical management of the grafting procedure^{6,9)}.

All patients in our cases radiographic and clinical signs of bone bridging postoperatively ; in no patient was there dissolution or loss of the bone graft. But one case of the complication was developed in which of infection with partial necrosis of the flap. Whether the absolute amount and density within the alveolar cleft was more or less than that produced by autogenous bone was extremely difficult to discern during the follow - up period, because autogenous bone grafts usually appear almost radiolucent at three to six months postoperatively while the bone is remodeling. In contrast, the allogeneic bone remains radiopaque longer since it takes longer for the host to resorb the bone.

But offered the advantages of autogenous particulate cancellous bone and marrow has being responsive to postsurgical functional demands. A significant morbidity is associated with autogenous grafting procedure, however. Postoperative pain and the potential for a cosmetic defect, seroma, hematoma, dehiscence and wound infection exist at virtually every donor site. Iliac graft bears the additional risks of significant blood loss, temporary or permanent gait disturbance, bowel herniation and neurosensory disturbance. A substantial risks of pneumothorax with rib harvests exists, and cranial bone grafting may resulting in dural tears, leptomenigeal cysts, meningitis and subdu-

ral hematoma or epidural hematoma^{17,18,19)}.

More recently, the allogeneic bone has used to grafting material for cleft repair instead of autogenous bone. Allogeneic bone can be easily produced, sterilized, and indefinitely preserved in such a manner as to maintain its morphology, solubility, and chemical properties. It possessed only minimal antigenicity and its use negates the need for a second operative site²⁰⁾. But several questions remain unanswered concerning the final outcome for use of allogeneic bone to repair of alveolar cleft.

If the ability of allogeneic bone to assist the closing of alveolar clefts is accepted, the most important question that remains to be answered is whether unerupted teeth erupt through the grafts ; providing bone for periodontal support of unerupted teeth is one of the major reasons why alveolar cleft grafts are performed. Wait and Kersten²¹⁾ reported that 75% of unerupted canine teeth showed movement into autogenous ilium bone grafts, while pickerill²²⁾ said that teeth did not erupt into a rib grafts. Neither of these studies reported complete eruption of teeth through the grafts into the mouths.

In conclusion, this article on the use of PMCB for alveolar cleft grafts shows potential benefit to the patient to induce a normal maxillary growth and providing bone for periodontal support of unerupted teeth.

IV. SUMMARY

We obtained a good result in cases of alveolar clefts repair with particulate marrow cancellous bone grafting. The grafted bone was functionally remodeled in radiographs and improved the cosmetics of the patients.

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치조골 파열환자의 자가망상골 이식을 이용한 치험례

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치조골 파열은 전체 구개파열 환자의 약 75% 정도 발생하며 발생원인은 유전적 요인이 강하며 환경적 요인으로 모체의 영양장애, 방사선조사, 스테로이드투여, 저산소증, 양수변화 바이러스에 의한 질환 등을 들 수 있다. 치조골 파열시 상악골의 전후방관계의 전방골결손 및 수평관계의 후방골결손, 인접치아에 대한 골지지력 결여, 측절치의 조기결손, 그리고 안모의 외형에도 많은 변화를 줄 수 있다. 치조골 파열에 대한 골이식은 치조골을 안정시키고, 치조골의 연속성 도모 및 인접치아에 대한 골지지와 치아상실 예방 및 비익저부를 제공하는데 그 목적이 있다. 골이식은 시기에 따라 2세미만에 실시하는 일차 골이식술, 2세에서 5세사이에 시술하는 조기 이차 골 이식술, 5세에서 16세 사이에 실시하는 이차 골 이식술, 그리고 16세 이후에 실시하는 말기 이차골 이식술 등이 있으며 이중 혼합치열기인 5세에서 16세 사이에 실시하는 이차골 이식술이 가장 성공률이 높은 것으로 알려져 있다. 본 교실에서는 치조골 파열환자에 자가망상골을 이용한 골이식술을 시행하여 비교적 양호한 결과를 얻었기에 이에 보고하는 바이다.