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脛骨骨移植在齒槽裂病人的應用：病例報告

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唇顎裂是顏面部常見的先天性發育異常的疾病，這類的病人也常合併有齒槽裂的情形，使得齒槽骨形成不連續的狀況，這樣會影響到上顎骨的發育、恆牙的萌發、以及造成進食與語言的困難。因此，利用自體骨移植來重建上顎骨的連貫性，是相當重要的。本篇提出一位雙側性唇顎裂的病人，在唇裂和顎裂的部份均接受過修復手術。但是，在雙側的齒槽裂均尚未做自體骨移植，此次我們採用脛骨做為自體骨移植的來源，結果發現脛骨骨移植手術，是一種手術過程簡單，而且手術後的併發症及後遺症均很小。

關鍵字：齒槽裂，脛骨骨移植

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Tibia bone graft in the alveolar cleft: case report

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The congenital defects of cleft lip and palate are the most common facial deformity. This deformity usually was combined with alveolar cleft. The lack of alveolar continuity, it can affect maxillary growth, eruption of permanent teeth, and results in feeding problems or speech disorders. Autogenous bone grafts have been used to restore alveolar continuity, which is an extremely important to reconstruct the integrity of maxilla. Here we report a case of bilateral cleft lip and palate. She had received surgical repair for cleft lip and palate at her childhood. But she had not sought autogenous bone grafting for alveolar cleft. We harvested the proximal tibia bone grafts to repair the alveolar cleft. The procedure for proximal tibia bone graft is easy, has less operative risk, and result in a lower postoperative morbidity rate.

Key words: Alveolar cleft, Tibia bone graft

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Introduction

Cleft lip with or without cleft palate is one of the most common physical abnormalities present at birth. Cleft lip affects the upper lip and cleft palate the roof of the mouth. Cleft lip and palate, combined or separated, affects approximately 1 in 750 births in the USA. A higher incidence rate is noted with the combined form. Cleft lip and palate is generally more severe and prevalent in males, whereas cleft palate is more frequently found in females [1,2]. Among various races, the Orientals have the highest rate of cleft lip and palate (1:500), followed by the Caucasians (1:1000), and being lowest in the blacks (1:2000)[3]. Primary cleft lip and palate repair done during infancy and early childhood improves the facial appearance, speech and deglutition. Reconstruction of the alveolar cleft is an extremely important part of the rehabilitation of the cleft palate patient. Alveolar bone grafts also improve alveolar ridge form, which is particularly important prior to dental reconstruction.

Bone grafting in the maxillofacial region has been used for a long time in oral and maxillofacial surgery. Various indications, donor sites, and techniques have been reported. Possible donor sites in the human body include the calvarial symphysis of the mandible, rib, iliac crest, and tibia bone. Relatively few authors have reported the tibia as a donor site. The use of tibia bone grafts in oral and maxillofacial surgery was formally introduced into the literature [4] in 1992. Recently tibia bone grafts have become the choice for autogenous bone grafting. We present a case used the proximal tibia bone grafts as late secondary bone grafting for repair of residual cleft defects in the alveolar process.

Case report

The patient was a 22 year-old girl. She visited our oral and maxillofacial surgery department on September 26, 2000 with the complaint of palatal fistula for a long time and asked for correction. Tracing the patient's

Fig 1. A 22-year-old patient with a palatal fistula, severe malocclusion and multiple residual roots.

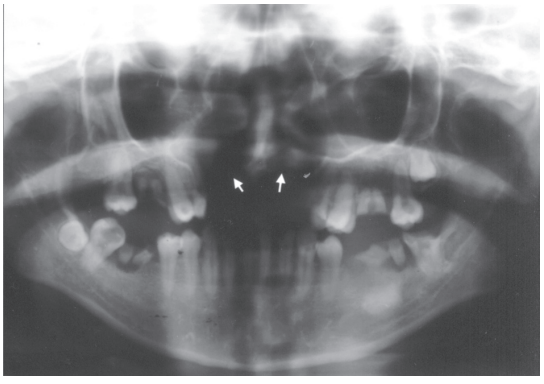

Fig 2. Panorex views the bilateral alveolar clefts (white arrow) and multiple residual roots.

medical history, we found that she was born with congenital bilateral cleft lip and palate. There was a familial inheritance history of cleft palate among her family members. Her mother was also a patient with cleft lip and palate. She received lip repair at the age of 3 months old, and palatal repair was given at 10 year-old. However, a palatal fistula and an alveolar cleft were left postoperatively, but she had not sought any operation for fistula closure or alveolar bone grafting.

In general, she was thin slightly and her profile was revealed with maxillary deficiency. Oral and radiographic examination showed an oronasal fistula at anterior palatal region about 1 cm in size. There also showed a bilateral cleft palate without bone graft, multiple missing teeth, malalignment of maxillary teeth and severe malocclusion (Fig. 1, 2). A bilateral palatal sliding flap, buccal rotational flap, and tongue flap were planned to close the fistula. The tibia bone was recommended as a harvest site for alveolar defect. On 16 March 2001, the patient was placed in a supine position, and the right leg was elevated into a flexed position using a towel roll placed under the knee. The area of the knee was prepared in sterile fashion using an iodine preparation and then draped to view the entire knee, the proximal tibia, and the femur directly above the knee. The regional anatomy was then palpated and outlined using a sterile marking pen. After locating Gerdy's tubercle, the overlying soft tissue was infiltrated with 2 mL of 2% xylocaine with 1:100.000 epinephrine. A 2- to 3-cm oblique incision was made, and dissection was performed in a layered fashion through the subcutaneous tissue, iliotibial tract, and periosteum. The periosteum was incised and reflected it to expose the bony surface of the tibia. A cortical window was made with a small fissure bur with copious irrigation. Cancellous bone was harvested medially and inferiorly with orthopedic curettes (Fig. 3). At the completion of marrow procurement, the wound is closed in layers and reinforced by steri-stip without the need for drainage. The adequate tibia bones were packed into the bilateral alveolar cleft.

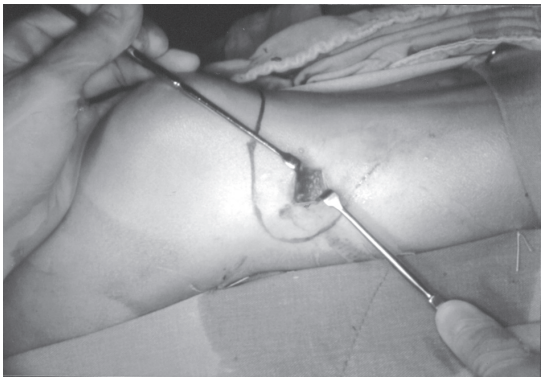

Fig 3. The periosteum was incised and reflected it to expose the bony surface of the tibia.

The patient had a smooth recovery and she was able to walk on the first postoperative day. However, a（5x5）mm oronasal fistula occurred at previous closure site on 1-month postoperatively. Finally, the oronasal fistula was closure with the tongue flap. During postoperative follow-up, the gait was not disturbed

and the scar on the donor site was unremarkable. The consolidated grafts in bilateral alveolar cleft were noted at 1-year postoperative follow-up (Fig. 4).

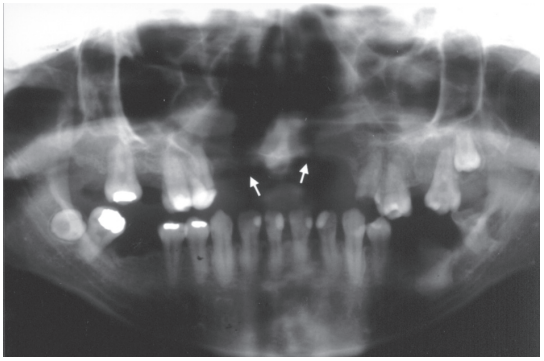

Fig 4. The maxillary arch (white arrow) was continued at 1 year after grafting procedure.

Discussion

Cleft lip and cleft palate are congenital defects, or birth defects, which occur very early in pregnancy. The majority of clefts appear to be due to a combination of genetics and environmental factors. The main factor is genetic and some environmental factors were suggested including[1, 2] infection, X-ray, drugs, and malnutrition. Failure of normal fusion or inadequate development of the processes will affect the integrity of the upper lip, alveolar process, soft palate or hard palate [3, 5, 6].

The most controversial area in alveolar bone graft surgery relates to timing. Although primary bone graft at less than age 2 had been performed for many years, it was abandoned because of adverse effects noted in facial growth and arch form. Early secondary bone graft, between ages 2 and 6, is the eruption of the lateral incisor. The most common time for alveolar cleft grafting is between ages 9 and 11, before the time the permanent canine erupts and when half to two thirds of the root has formed. The timing is critical; it can affect maxillary growth, alveolar ridge continuity, and the support of erupting teeth. There may be an answer for our patient who lost anterior maxillary teeth without bone grafting at her childhood or adolescence.

In oral and maxillofacial surgery, bone-grafting procedures are common. Although there is evidence that the different alternative graft materials may be used successfully, the autogenous bone graft remains the first choice for reconstruction of maxillofacial defects. The most frequently used extraoral donor site is the iliac crest due to the large amount of cortical and cancellous bone, which can be harvested. However, the tibia bone has been recommended as a harvest site for medium defects. Caton[4] reported that bilateral proximal tibial harvesting was appropriated for those maxillofacial procedure. The proximal tibial bone is easy to harvest 10-25 mL of cancellous bone, which is sufficient for secondary alveolar defects and bilateral sinus floor elevation procedures.

Postoperative local hematoma, paraesthesias of the nerve cutaneous femoris, damage to the femoral nerve, hernias and fractures of the iliac bone are described as pos-

sible complications of the iliac bone procedure. Long-term postoperative complications of tibia harvest were reported such as hematoma, gait disturbance, tibia fracture, or shortening the limb. Many studies[7,8,9] have compared these two donor site bone grafts for technique of harvest, morbidity, and postoperative complications. However, the tibia bone graft is easier and quicker with less morbidity and lower complications. Reported complications of tibia bone graft ranged from 1.3% to 3.8% compared with rates of 8.6% to 9.2% for iliac crest grafts. In Sivarajasingam's[7] study, tibia bone and the iliac crest grafts had similar optical densities at recipient sites at 6 days, 6 weeks, and 3 months. However, subjects who received iliac crest grafts required an average of 5 days in the hospital postoperatively, compared with subjects with tibia grafts who stayed an average of 3 days postoperatively [7]. The longer duration of postoperative pain was reported after harvest iliac crest in 80% of patients for a week and 43% two weeks later.

A period of training for the surgeon with a clear regional anatomic concept is necessary. Using appropriate techniques, damage to the articulation of the knee can be avoided and postoperative gait disturbance can be decreased. In Kalaaji's [8] long-term experience, no operative, or early or late postoperative complications were reported (such as hematoma, tibia fracture, or shortening the limb). Marchena [9] reported only mild discomfort and a gait disturbance were present for an average of 9 to 10 days. Our patient was similar to the previous reports and she was walking on the first postoperative day. The technique for tibia bone grafts is less invasive and the whole operation can be done under general anaesthesia or local anaesthesia combined with intravenous sedation. Patients do not require hospitalization and this decreases the cost of surgery. Patients can start weight-bearing on the donor leg immediately and do not require equipment for ambulatory assistance.

Conclusion

The proximal tibia bone graft can provide patients with a shorten hospitalization, and is a more comfortable method to obtain the same quality and quantity of cancellous bone grafts as iliac crest grafts in reconstruction of secondary alveolar defects. Thus, the proximal tibia metaphysis is a useful site for obtaining cancellous bone graft and is an alternative bone graft donor site for maxillofacial reconstructive procedures.

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