

Reconstruction of Temporomandibular Joint With a Fibula Free Flap: A Case Report With a Histological Study

Rodrigo Fariña, DDS, MEd, *Pía Campos, DDS, †Javiera Beytía, DDS, ‡
and Benjamín Martínez, DDS§

Reconstruction of the temporomandibular joint (TMJ) for congenital or acquired deformities is a major challenge for maxillofacial surgeons. The alternatives for reconstructing the TMJ include free grafts (costochondral, iliac crest, clavicle, or metatarsus), free flaps (fibula), osteogenic distraction, and alloplastic grafts. The lack of biological knowledge of cartilaginous grafts and their reaction to the environment of the TMJ is largely responsible for the inability to predict growth. This report describes the use of a free flap for TMJ reconstruction.

© 2015 American Association of Oral and Maxillofacial Surgeons
J Oral Maxillofac Surg 73:2449.e1-2449.e5, 2015

Reconstruction of the temporomandibular joint (TMJ) for congenital or acquired deformities is a major challenge for maxillofacial surgeons.¹⁻³ Active proliferation of cartilage and endochondral ossification of the condylar skeletal unit (CSU) is necessary for the normal growth and development of the lower third of the face in the vertical, transverse, and horizontal directions.⁴ The absence of normal condylar growth has the consequence of progressive and severe facial disharmonies. Successful reconstruction of the TMJ must reproduce the structures that are involved to restore their form and function and allow normal mandibular growth.¹

Alternatives for reconstructing the TMJ include free grafts (costochondral, iliac crest, clavicle, or metatarsus), free flaps (fibula) when the defect is major, osteogenic distraction, and alloplastic grafts.⁵

The CSU can be reconstructed at a young age or once skeletal maturity has been achieved.⁶

The lack of biological knowledge of cartilaginous grafts and their reaction to the environment of the TMJ is responsible for the inability to predict

growth. It is not known whether the area of the TMJ provides an appropriate environment for the continuous growth of cartilaginous grafts or whether different types of cartilaginous grafts respond differently to the environment of the TMJ.⁶

Report of Case

A 17-year-old male patient presented with a high-flow arteriovenous malformation that compromised the chin area and his entire left hemimandible.

He received 7 coil onyx embolizations without a satisfactory response. He was admitted to the emergency service with profuse hemorrhage, hypovolemic shock, and a hematocrit level of 17%. A hemimandibulectomy was performed by disarticulating the TMJ (from the mandibular right permanent lateral incisor to the highest area of the left mandibular condyle) followed by immediate reconstruction using a fibular free flap. The articular disc was preserved. The graft was obtained according to the procedure described by Fernandes⁷ and Riaz and Warraich.⁸ At the first control, mandibular asymmetry with deviation of the chin

*Maxillofacial Surgeon, Hospital del Salvador; Maxillofacial Surgeon, Hospital San Borja Arriarán; Professor, Department of Oral and Maxillofacial Surgery, Dentistry School, Universidad de Chile, Santiago, Chile.

†Resident, Department of Oral and Maxillofacial Surgery, Dentistry School, Hospital San Borja Arriarán, Universidad de Chile, Santiago, Chile.

‡Resident, Department of Oral and Maxillofacial Surgery, Dentistry School, Hospital San Borja Arriarán, Universidad de Chile, Santiago, Chile.

§Professor of Oral Pathology at the Faculty of Odontology of The Mayor University, Avda Liber Bernardo O'Higgins, Santiago, Región Metropolitana, Chile.

Address correspondence and reprint requests to Dr Fariña: Providencia 2330, appt 23, Santiago, Chile; e-mail: rofari@gmail.com

Received May 29 2015

Accepted August 8 2015

© 2015 American Association of Oral and Maxillofacial Surgeons

0278-2391/15/01161-1

<http://dx.doi.org/10.1016/j.joms.2015.08.008>

toward the healthy side was observed owing to the free flap's excess length. A year after free flap reconstruction, the mandibular deviation remained exactly as it was initially. The authors decided to remove the excess at the most proximal segment of the graft (part of the condylar reconstruction; Figs 1, 2).

The clinical discovery was medullary canal obliteration. A biopsy examination was carried out. The histologic characteristics using hematoxylin and eosin stain and $\times 4$ magnification confirmed the presence of bone marrow, trabecular lamellar bone, and cartilage (Fig 3). Magnification at $\times 10$ showed lamellar bone tissue with osteocytes and hypertrophic hyaline cartilage with fibrocartilage (Fig 4). Magnification at $\times 20$ showed hypertrophic cartilage and fibrocartilage, numerous normal chondrocytes, lamellar bone with osteocytes, inactive osteoclasts, and bone marrow (Figs 5, 6).

This study was approved by ethical board of the Hospital del Salvador (Santiago, Chile).

Discussion

The costochondral graft is the most widely used autogenic technique for reconstructing the condyle. The advantages of this graft are its biological compatibility, malleability, functional adaptability, and low levels of morbidity in the donor region. The growth potential of costochondral grafts makes them an ideal option for children.⁵ However, excessive mandibular growth and cartilage fractures have been identified as potential complications of this graft.⁹

After costochondral grafts were installed in Marmoset monkeys (*Callithrix jacchus*; whose TMJ is very similar to the human one), clinical and radiographic evaluation showed a deviation of 0.5 to 2 mm from the lower midline toward the unoperated side in growing monkeys where grafts with long cartilage were used. This deviation became clear 3 to 4 months after surgery. The deviation gradually increased until 13 to 15 months of age. Adult and growing monkeys that received shorter cartilages showed no deviation from the lower midline.¹⁰

In growing monkeys with long cartilage reconstruction, measurements of the glenoid cavities showed that the cavity was located in a slightly more posterior and medial position on the operated side compared with the unoperated side. In addition, there was virtually no difference between the sagittal or transverse position of the glenoid cavity on the operated side and the unoperated side in growing monkeys reconstructed with grafts using shorter cartilages and in all adult monkeys.¹⁰ This is evidence of the cartilage's growth potential in separating tissues, causing midline dental deviation, and causing the glenoid cavity to be relocated farther back on the grafted side. With a larger amount of cartilage and therefore more germinative cells, the growth potential of the graft increases.^{11,12} This increased growth has an effect on the articular surface of the costochondral graft because in all monkeys the articular head was larger on the grafted side, which agrees with the study by Perrott et al.¹³

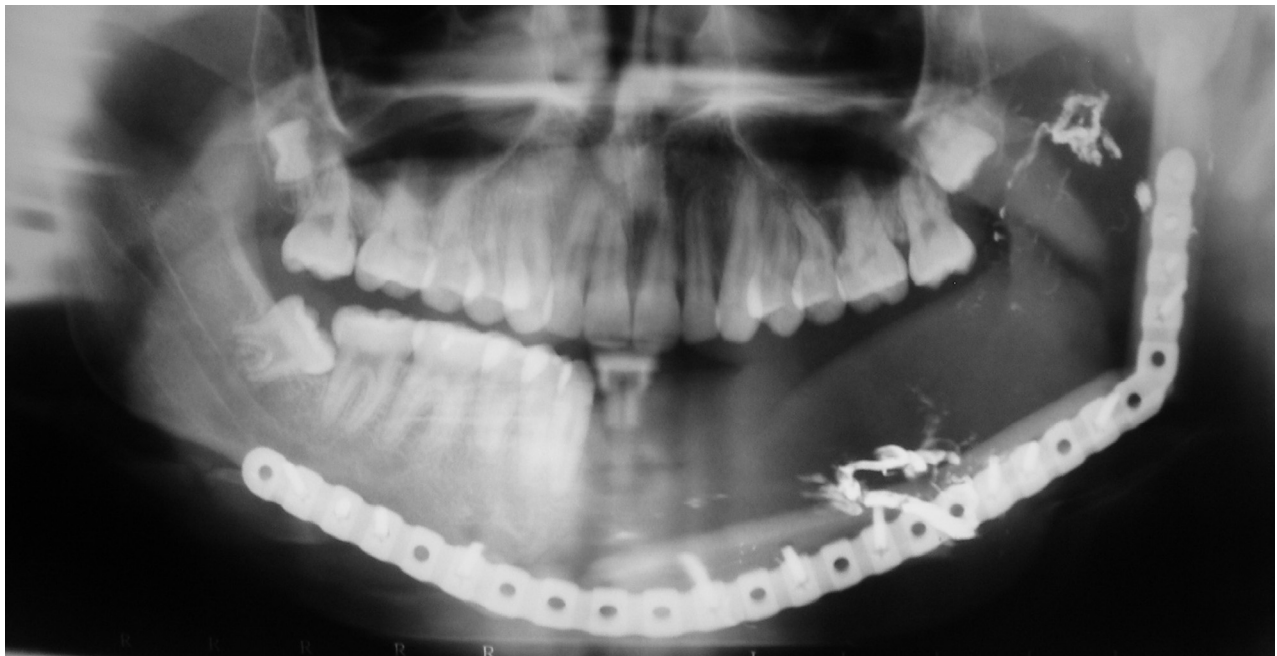


FIGURE 1. Panoramic radiograph 1 month after mandibular reconstruction.

Download English Version:

<https://daneshyari.com/en/article/3153021>

Download Persian Version:

<https://daneshyari.com/article/3153021>

[Daneshyari.com](https://daneshyari.com)