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TMJ Total Joint Prosthesis for Condylar Fracture Malunion

Prótesis Articular Total de ATM para Malunión de Fractura Condilar

Paulo Hemerson de Moraes[*]; Leandro Pozzer[*]; Sergio Olate[**]; Fábio Ricardo Loureiro Sato[*] & Roger William Fernandes Moreira[*]

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ABSTRACT: In the international literatura exist some information related to temporomandibular joint (TMJ) involvement in condylar fracture malunion; the treatment is variated being executed with a bone reconstruction, ramus vertical osteotomy or condilar plate. This case demonstrates that TMJ replacement with prosthetic joint is technically possible and appropriate in the case of malunion of condylar fracture.

KEY WORDS: condylar fracture, malunion bone, TMJ prostheses.

INTRODUCTION

Malunion is "bony union" and the fractured bone ends are united by bony image in normal radiograph. However, the normal anatomic structure is not restored because of the unsatisfactory reduction and position (Li *et al.*, 2006). This case report shows the use of TMJ prosthesis in a condylar fracture malunion.

CASE REPORT

A 54-year-old man with history of condylar fracture 16 months ago was referred with limitation of mouth openning and pain. Intraoral examinations showed a patient with a severely periodontal disease and treatment with implants and dental prosthesis related to infection and implant mobility (Fig. 1). The patient had less than 15 mm interincisal distance in open mouth and showed pain related to mandibular fracture treated previously.

Fig. 1. Pre operative panoramic radiographic showing previous dental implant treatment with deficient conditions, periodontal disease and deficiencies in condylar position.

[*] División de Cirugía Oral y Maxilofacial, Facultad de Odontología de Piracicaba, Universidad Estadual de Campinas, Campinas, Brazil.
[**] Unidad de Cirugía Oral y Maxilofacial, Facultad de Odontología, Universidad de La Frontera, Temuco, Chile.

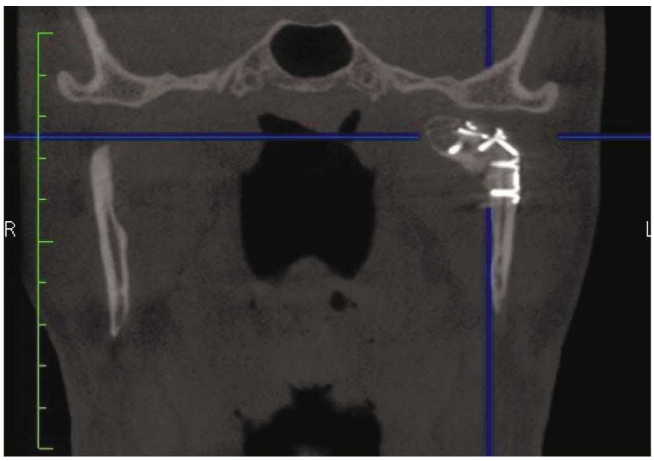

Fig. 2. Preoperative view of temporomandibular joint (coronal computed tomogram), with a malunionn of left condile.

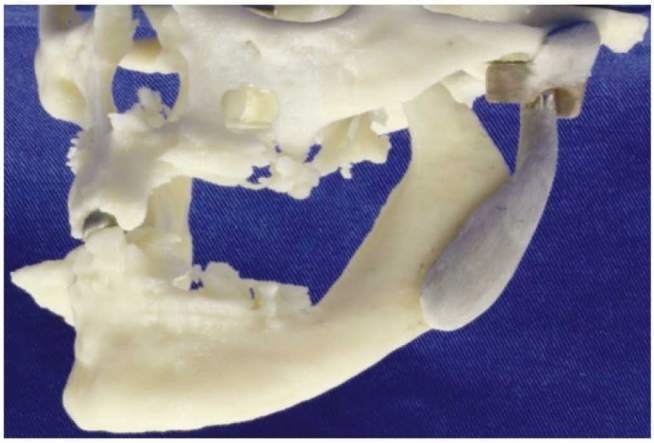

Fig. 3. Stereolithographic model used for confection of TMJ prosthesis.

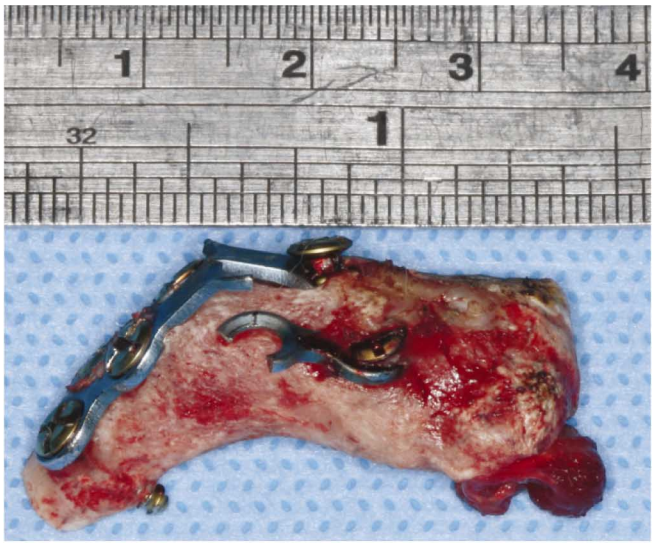

Fig. 4. Condyle removed showing malunion by failure of the internal fixation.

Previously to TMJ treatment all remaining teeth and implant were removed due to periodontal disease for further rehabilitation using a new dental implants installed in an adequately position with good bone support.

Computed tomography (CT) confirmed condylar fracture malunion by failure of the internal fixation (Fig. 2). A series of CT sections (1mm cuts) was used to reconstruct a stereolithographic model (Fig. 3). A mock operation was done on the model and sent to TMJ for fabrication of customized prosthesis. To maintain the occlusal vertical dimension (OVD), provisional dental prostheses were made and these values were used during the manufacture and installation of the TMJ. Surgical approach was through preauricular and submandibular incisions. The condyle was removed and fixation system (Fig. 4). The glenoid fossa implant was inserted followed by the condylar implant (Fig. 5) and into surgical room the patient presented an open mouth almost to 35 mm. After 12 months of follow-up, the TMJ showed good skeletal and occlusal stability (Fig. 6), mouth opening was 35 mm and no pain is present (Fig. 7).

DISCUSSION

A history of multiple previous failed operations is the most common criterion for inclusion for selection TMJ (Mercuri 1998; Wolford *et al.*, 2003a, 2003b; Guarda-Nardini *et al.,* 2008; Mercuri, 2006). The choice of non-bone grafts for TMJ reconstruction was performed by the knowledge of the biology autogenous tissues grafting that success require the host site have a rich vascular bed. Unfortunately, the scar tissue encountered in multiplex patients who have undergone surgeries does not provide an environment conducive to he predictable and occasionally success of free vascularized autogenous tissue grafts. The most important principle in TMJ alloplastic reconstruction is primary stability of the device components immediately after implantation (Mercuri, 2006). The most patients presenting with indications for total TMJ alloplastic reconstruction have distorted anatomy caused by either numerous failed prior surgical interventions/materials or primary or secundary joint disease compounds the stability problems in the TMJ area (Guarda-Nardi *et al.*; Mercuri, 1998). This finding makes it extremely

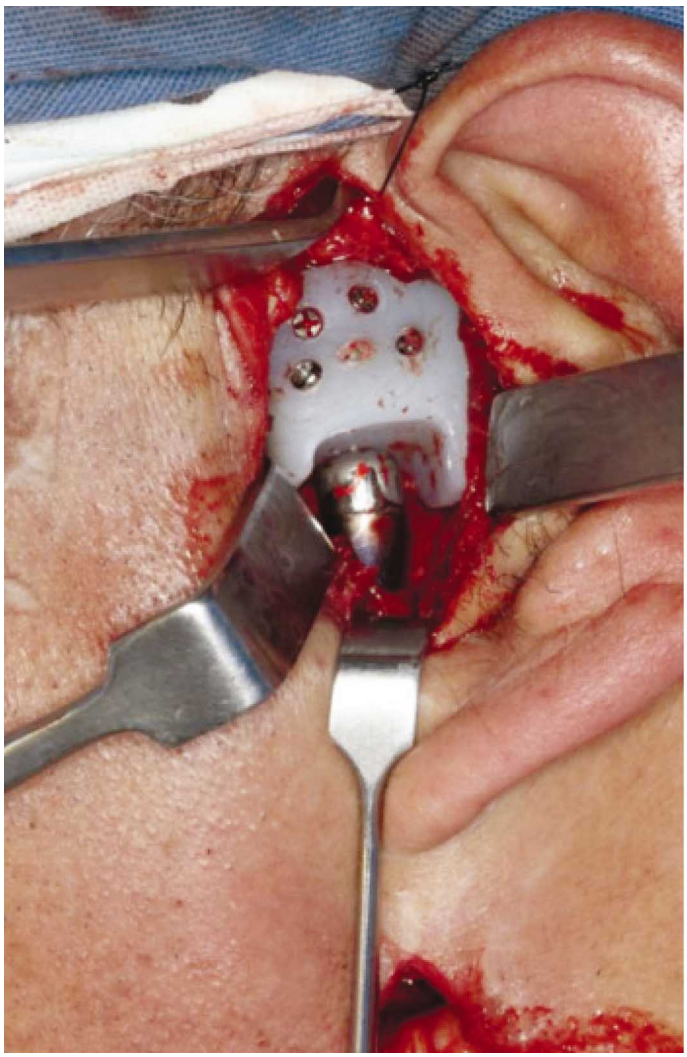

Fig. 5. Operative image with the glenoid and condylar component installed; a prearicular and submandibular approach was used.

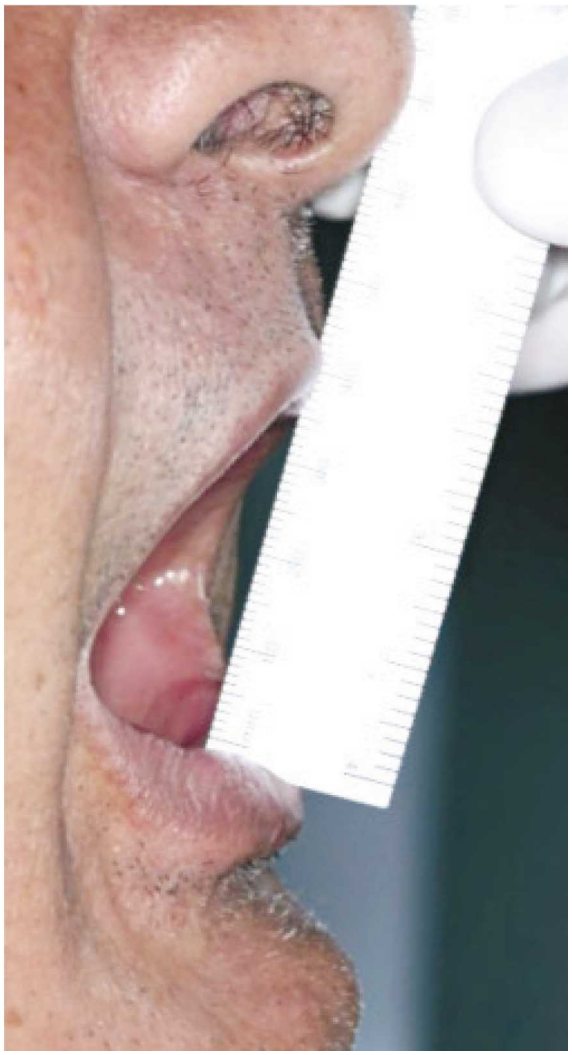

Fig. 7. One year follow-up showing 35mm open mouth and patient free of pain.

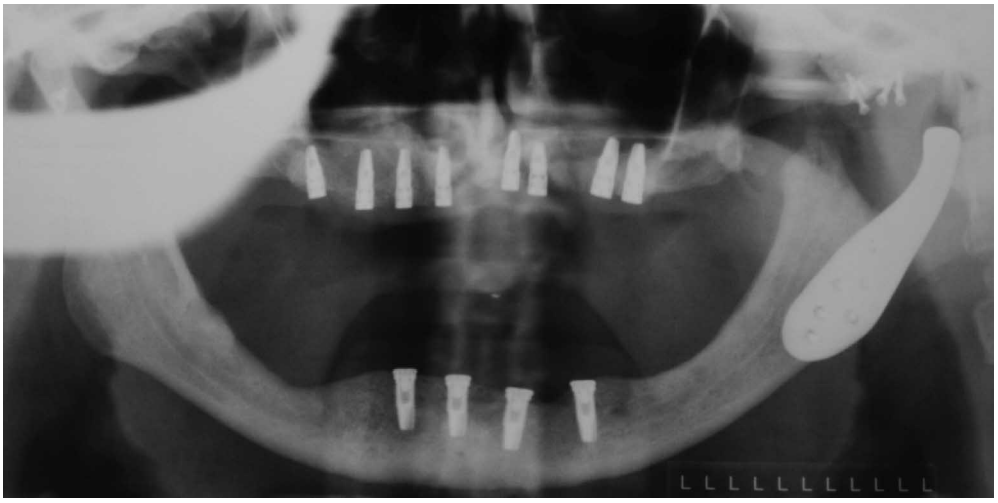

Fig. 6. Postoperative panoramic radiograph shoeing the TMJ prosthesis in adequate position and implant installed in the mandible and maxilla for fixed dental rehabilitation.

difficult to reconstruct these cases with an off-the-shelf or so-called "stock" device. Therefore, a patient-fitted or custom-made TMJ device may be most appropriate for complex cases (Wolford, 2003a). The present case showed a good functional restoration with no pain and stability.

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RESUMEN: La literatura internacional presenta información asociada a la mal unión de fracturas condilares de la articulación temporo mandibular; el tratamiento es variado siendo ejecutado con reconstrucciones óseas, osteotomía vertical de rama mandibular o instalación de placas con forma condilar. Este caso demuestra que el reemplazo de ATM con prótesis articular es técnicamente posible y apropiado en casos de malunion de fracturas condilares.

PALABRAS CLAVE: fractura condylar, malunion osea, protesis de ATM.

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Correspondence to:
Prof. Dr. Sergio Olate Morales
Division of Oral and Maxillofacial Surgery
School of Medicine
Universidad de La Frontera
Claro Solar No 115, Temuco – Chile
Phone: 56-45-325000

Email: solate@ufro.cl

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