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Case Series

Replacement of TMJ Reconstruction Plates with Condylar Head by TMJ Concepts Custom-Made Prosthesis

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Received: May 10, 2019; **Published:** June 19, 2019

Abstract

Inopportune substitution of prosthesis used for temporary temporo-mandibular joint (TMJ) reconstruction after removal of the mandibular condyle can cause undesirable consequences, such as mouth opening limitation, mandibular deviation and severe pain. The aim of the present study is to report the cases of 2 patients who received replacement of 3 reconstruction plates with condylar head by TMJ Concepts custom-made prostheses (TMJ Concepts, Ventura, CA).

Keywords: *Temporo-Mandibular Joint (TMJ); Condylar Head*

Introduction

Indications for TMJ reconstruction include degenerative joint disease, ankylosis, condylar fracture, neoplasia, or previously failed reconstruction. When the condylar component is replaced alone, terms as partial arthroplasty or condylar replacement seems to be more adequate than TMJ reconstruction [1]. Partial joint arthroplasties using plates with condylar head are recommended only for temporary use, until final reconstruction is done. Sometimes, timely replacement of those plates is not executed, causing severe damage to the joint. Lindqvist., *et al.* [2] documented a study of 19 patients who received 23 condylar prostheses, reporting heterotopic bone formation in 52% of the cases, glenoid fossa resorption in 43% and skull base erosion in one patient. Westermark., *et al.* [3] reported 2 cases of partial TMJ prostheses replacement by total ones and stated that to replace only the condyle is inadequate for TMJ reconstruction.

Case 1

In 2005, a 55-year-old female patient presented to the oral and maxillofacial surgery department at Hospital Universitario Clínica San Rafael, in Bogotá, Colombia, with the chief complaint of severe pain while chewing of 5 years' duration. She has previously had bilateral TMJ hemiarthroplasty using condylar reconstruction plates. Clinical findings included maximum interincisal opening (MIO) distance of 15 mm and bilateral pain over the masseteric regions. Imaging study showed two condylar prostheses located cephalically, relative to their desired position and heterotopic bone formation over the TMJ area, classified as Class IV according to Brooker [4] (Figure 1). The case was

managed by two-stage surgery using the modified endaural approach reported by the Ruiz and Guerrero [5] in 2001 in combination with the classic retromandibular approach. Removal of both prostheses after plentiful heterotopic bone removal was executed at first. Three months later, TMJ reconstruction using a custom-made prosthesis was performed (Figure 2). Adequate masticatory function, occlusal stability, MIO distance of 30 mm and significant decrease of the symptomatology has been documented over a 10-year observation period.

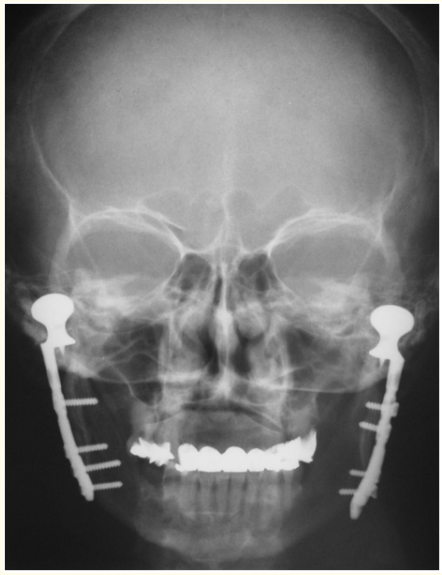

Figure 1: *Posterioanterior X-ray showing bilateral displaced condylar prostheses.*

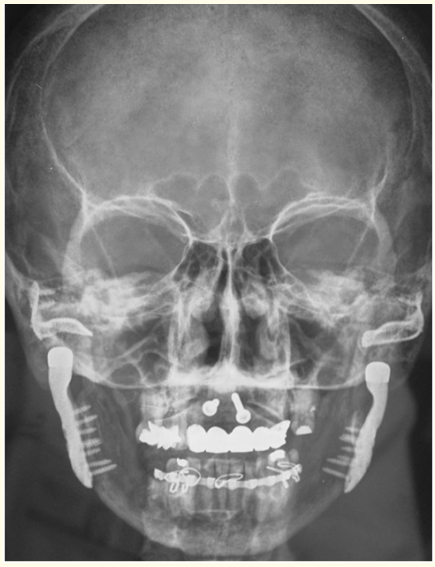

Figure 2: *Radiograph that shows the bilateral prosthetic replacements in adequate position.*

Case 2

In 2012, a 75-year-old female patient presented to the department with a 5-year history of severe left TMJ pain. Examination revealed MIO distance of 20 mm and mandibular deviation to the left. A CT scan demonstrated fracture of the reconstruction plate, dislocation of the condylar head in close proximity to the middle cranial fossa and bone deposition classified as Brooker's class III (Figure 3). A condylar plate inserted 14 years before was removed and immediate prosthetic replacement using TMJ Concepts prosthesis was performed. Surgical exposure of the joint revealed an undermined glenoid fossa and heterotopic bone formation around the old prosthesis. After the procedure, the patient referred paresthesia over the left half of the inferior lip, which resolved within a 6-month period and exhibited a 40 mm MIO distance. Radiographic verification of adequate condylar position was performed (Figure 4). Further erosion of the temporal bone was ruled out. The patient has been followed for three years and complete remission of the symptoms persists.

Figure 3: *CT scan showing the dislocated and broken condylar plate.*

Figure 4: *Adequate adjust of the prosthesis and protection of the middle cranial fossa can be observed in the control orthopantomogram.*

Discussion

Three different types of TMJ prostheses have been described in the literature: for fossa replacement, for condyle replacement and for fossa-condyle replacement. The senior author of this article previously documented the use of the latter type of prosthesis in 2 cases of mandibular reconstruction after hemimandibulectomy due to extensive multicystic ameloblastomas [6]. Hahn [7], Boyne [8] and Kent [9], developed different designs of condylar plates trying to decrease the excessive trauma over the fossa. When Schmoker., *et al.* [10] created the AO/ASIF TMJ prosthesis, they tried to neutralize the resorption of the fossa using a spherically oval-shaped prosthetic condylar head anchored to the medullary bone through a spike designed to gain retention.

Conclusion

We consider that in cases of single condylar replacement, the forces produced by the muscles are well tolerated within the interface between the plaque and the bone in the distal segment, but the proximal surfaces do not resist that well. We therefore recommend total TMJ replacement. In this paper, we present 2 cases of prosthetic TMJ replacement, which we considered to be successful, despite the chronic alterations suffered within the glenoid fossa caused by previous condylar replacements.

Conflict of Interest

We have no conflict of interest.

Ethics Statement/Confirmation of Patient's Permission

This research complies with the World Medical Association Declaration of Helsinki on medical protocols and ethics.

Acknowledgements

The authors want to thank Dr. Fernando Briceño for his support during the initial stages of our learning curve with the placement of alloplastic prostheses system.

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Volume 18 Issue 7 July 2019