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# A monolateral TMJ replacement under intraoral endoscopic assistance for jaw osteomielitis: a modified approach

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SUMMARY: A monolateral TMJ replacement under intraoral endoscopic assistance for jaw osteomielitis: a modified approach.

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Alloplastic replacement has become a valid treatment for TMJ endstage disease. The Alkayat and Bramley pre-auricular approach combined with the submandibular incision are the current surgical approaches for TMJ surgery. The present study shows a modified approach using intraoral endoscopic assistance. A female patient affected by jaw osteomielitis with condylar detachment was treated with total left TMJ alloplastic replacement combined with a right TMJ arthroplasty. No subamandibular incision was performed and, subsequently, the risks for permanent or temporary damage to the marginalis mandibulae nerve and surgical submandibular scar were avoided. Postoperative CT-Scan evidenced a good prosthesis position. No complications occurred after two years of follow-up.

KEY WORDS: TMJ replacement - Endoscopic - Jaw - Osteomielitis - Prosthesis.

# Introduction

The temporo-mandibular joint (TMJ) is one of the most complex articulation. Similarly, to other joints, the mainstay for treatment of end-stage disease is total alloplastic replacement. Thus, alloplastic TMJ prosthesis is indicated for several conditions as follows: ankylosis or reankylosis with severe anatomic abnormalities, avascular necrosis, neoplasms requiring extensive resection, failed autogenous grafts, formerly failed alloplastic reconstruction, severe inflammatory and degenerative joint disease (e.g. osteoarthritis, rheumatoid arthritis or psoriatic arthritis), and certain congenital disorders (e.g. hemifacialmicrosomia) (1, 2). These conditions result in anatomic and/or functional disorders of the TMJ. The

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relative contraindications for prosthetic joint replacement are as follows: allergy to prosthetic materials, chronic infection, systemic disease. A TMJ prosthesis should be comprised of biologically and functionally compatible materials; have low wear, flow, and fatigue coefficients when loaded; be easily fitted and affixed to anatomic structures; and be resistant to corrosion (3). Based on decades of experience with orthopedic joint replacement, the following goals for TMJ reconstruction were developed: 1. improvement in mandibular form and function; 2. reduction of further suffering and disability; 3. avoidance of excessive treatment and containment of costs; and 4. prevention of further morbidity (4, 5). Disadvantages include potential wear debris and associated tissue reaction, costs of the device, and the finite durability of the prosthesis, with potential need for replacement. Based on orthopedic experience, the expected lifetime should be at least 20 years (6). The Alkayat and Bramley pre-auricular approach combined with the submandibular incision are the current surgical approaches for TMJ replacement (7). We report a case that shows an innovating monolateral TMJ replacement in a patient with mandibular osteomielitis. The prosthesis of the glenoid fossa was applied by the traditional pre-tragic incision and the condyle prosthesis was applied by an intraoral incision under endoscopic assistance.

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Fig. 1 - a, b, c - a) Rx-Orthopantomogram that shows a decay in the dental element 3.8; b) Rx-Orthopantomogram that shows a total detachment of the left condylar process; c) CT scan in coronal projection shows an evident detachment of the left condylar process.

### **Case report**

We report the case of a 40 years old female patient affected by persistent masticatory difficulties, severe headache, TMJ pain and vertigo. Limited mouth opening (15mm), malocclusion, impossible left lateral mandibular movement and limited right movement were found. Anamnestic examination revealed that patient underwent molar decay one year before (Figure 1a). A left mandibular massive abscess occurred and she received antibiotic therapy, molar extraction and then transcutaneous drainage. She was treated with chronic opioid painkillers (morphine) for symptoms worsening. We decided to perform an X-ray orthopantomogram (Figure 1b), a CT-Scan (Figure 1c) and the TMJ RMI that evidenced the left condylar detachment from the mandibular ramus and a right meniscal dislocation. A total left TMJ replacement, associated to right TMJ arthroplasty was performed. A Biomet stock prosthesis was applied. We modified the classic approach for TMJ replacement using a pre-auricular incision extended to the temporal region. Therefore, the glenoid fossa and the condilo-meniscal complex were found. The osteomielitic condyle and debris were removed. The surgeon does not considered to remove the coronoid process. The glenoid fossa was prepared to allow positioning of the glenoid prosthesis and it was fixed with five screws. The application of the condylar prosthesis was applied under endoscopic assistance. An intraoral incision, like in orthognatic surgery was made and the mandibular angle and ramus were exposed. The condylar prosthesis was applied and fixed with five screws under endoscopic assistance using 0° and 30° optic fibers (Karl Storz, Germany) (Figure 2). The 30° optic fiber offers an excellent frontal and lateral view. Intermaxillary fixation to control occlusion was performed. A right TMJ arthroplasty was performed at the same time. The endoscopic assistance permitted to avoid the sub mandibular approach and the intraoral incision avoids permanent or temporary damage to the marginalis mandibulae nerve. No intraoperative complication oc-



Fig. 2 - Endoscopic fibers used during surgery.

curred. Antibiotic therapy was given for 10 days. Painkiller therapy was suspended seven days after surgery. An immediate post-surgical X-ray orthopantomogram evidenced a good prosthesis position (Figure 3a). The CT scan was performed after two years of follow up (Figure 3b and c).

## Results

No complications occurred in the early postoperative period. The symptoms regressed and the opioid therapy was suspended in seven days. No permanent or temporary injury of the facial nerve were presented (Figure 4a). The occlusion was stable (Figure 4b), mouth opening improved, passing form 15 mm preoperatively to 40 mm postoperatively (Figure 4c). The CT scan evidenced a satisfactory prosthesis position. Life quality improved and patient suspended chronic opiod therapy and no masticatory complications occurred. The subman-

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Fig. 3 a, b, c - a) Post surgical Rx-Orthopantomogram control; b) CT scan control shows a good positioning of the prosthesis; c) CT scan control in axial projection shows the condylar heat prosthesis in the glenoid cavity.



Fig. 4 a, b, c - a) Patient after surgery; no facial nerve issues occurred; b) Occlusion doesn't change after surgery and it remained stable; c) Patient after surgery. Mouth opening improvement; note no submandibular incision.

dibular incision was not performed and no surgical scars appeared.

# Discussion

Alloplastic materials have been successfully used for TMJ reconstruction. Nowadays, endospcopy is widely used in maxillofacial surgery. Success rate for total alloplastic TMJ replacement devices has been reported to be 84-91% (8, 9). The goal of any alloplastic joint replacement is the functional restoration whilst the pain reduction may be a secondary benefit (10, 11). Even this procedure is commonly used, the literature reports several complications. One of the most frequent is the facial nerve damage. The incidence of facial nerve issues after TMJ surgery is reported to be 18-30% (12). Using endoscopic assistance, the sub mandibular incision become superfluous,

# References

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# Conclusion

We think that endoscopy may be a valid help to total TMJ reconstruction with prosthesis. Advanced medications can be used for the intraoral site (15). Cold therapy should be applied in postoperative time; it decreases swallow and pain (16).

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