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CASE REPORT

The Facial Nerve Injury After Temporomandibular Joint Surgery after Endaural Approach with Sharp Dissection

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Abstract Several authors have extensively modified approaches to temporomandibular joint surgery throughout history to improve access, improve aesthetics, and decrease the risk of nerve damage. However, This is why this retrospective cross-sectional is carried out to show the rate of facial nerve injury after the endaural approach with sharp dissection for the temporomandibular joint with a low rate of facial nerve paresis our case series.

Keywords Temporomandibular joint · Facial nerve · Paresis

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Introduction

Complications in temporomandibular joint surgery are rare but not irrelevant, being the most common facial nerve injury [1]. The facial nerve is the most critical nerve that the surgeon must consider when performing a surgical approach to the temporomandibular joint, which is the temporal branch the most vulnerable of the facial nerve branches [2]. For these reasons, multiples surgical approaches have been modified to improve the results in increasing aesthetic and decreasing complications such a facial nerve injury. There is a variable incidence for different approaches, from 1 to 55%, that change in various articles and surgeons [3]. However, there is no consensus about the best way to perform temporomandibular joint surgery, and several approaches to temporomandibular joint surgery have been described.

Nonetheless, on the other hand, the House and Brackmann facial nerve grading system is a standard clinical method for evaluating facial nerve injury introduced in 1983. This method includes several items as the periorbital and perioral musculature and appearance of the frontal. Approved by various academies worldwide as the universal standard for reporting facial nerve injury [3].

At this moment, there is not enough evidence of studies that evaluate the outcomes of facial nerve injury with this surgical approach and sharp dissection. For this reason, this cross-sectional retrospective study aims to show the number of patients who present paresis of the facial nerve in the immediate postoperative period of temporomandibular joint surgery using the endaural approach with sharp dissection.

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Table 1 The number of surgical procedures with outcome of facial nerve injury

Procedure	No	Facial nerve injury
Arthrotomy, arthroplasty meniscopexy	205	3
Arthrotomy, arthroplasty menisectomy	4	0
Arthrotomy, arthroplasty condilectomy	47	0

Material and Methods

The patient sample consisted of 256 historical records of patients undergoing temporomandibular joint surgery consisting of meniscopexy, meniscectomy, or condylectomy with a diagnosis of Wilkes IV (Table 1). The average age of patients was 37.03 years old, ranging between 14 and 71 years old. The study only includes the procedures carried out in the Hospital Universitario Fundación Santa Fe de Bogotá between 2011 and 2018. The procedures were performed by only two maxillofacial surgeons using an endaural approach with sharp dissection (Figs. 1, 2). For this study, patients excluded were those who have received a total temporomandibular joint replacement or condylar fractures. A House–Brackmann facial nerve alteration classification was used to determine facial nerve injury before and after surgery (Fig. 3).

Results

The patients' average age was 37.03 years, ranging between 14 and 71 years, being 87% female patients and 23% in male patients. Of the procedures performed, 205 were meniscopexies in which there were no lesions to the facial nerve; on the other hand, 4 were meniscectomies without injury cases to the facial nerve. Finally, in the case of condylectomies, 43 cases were performed with three patients who had nerve injury in their temporal branch, 2

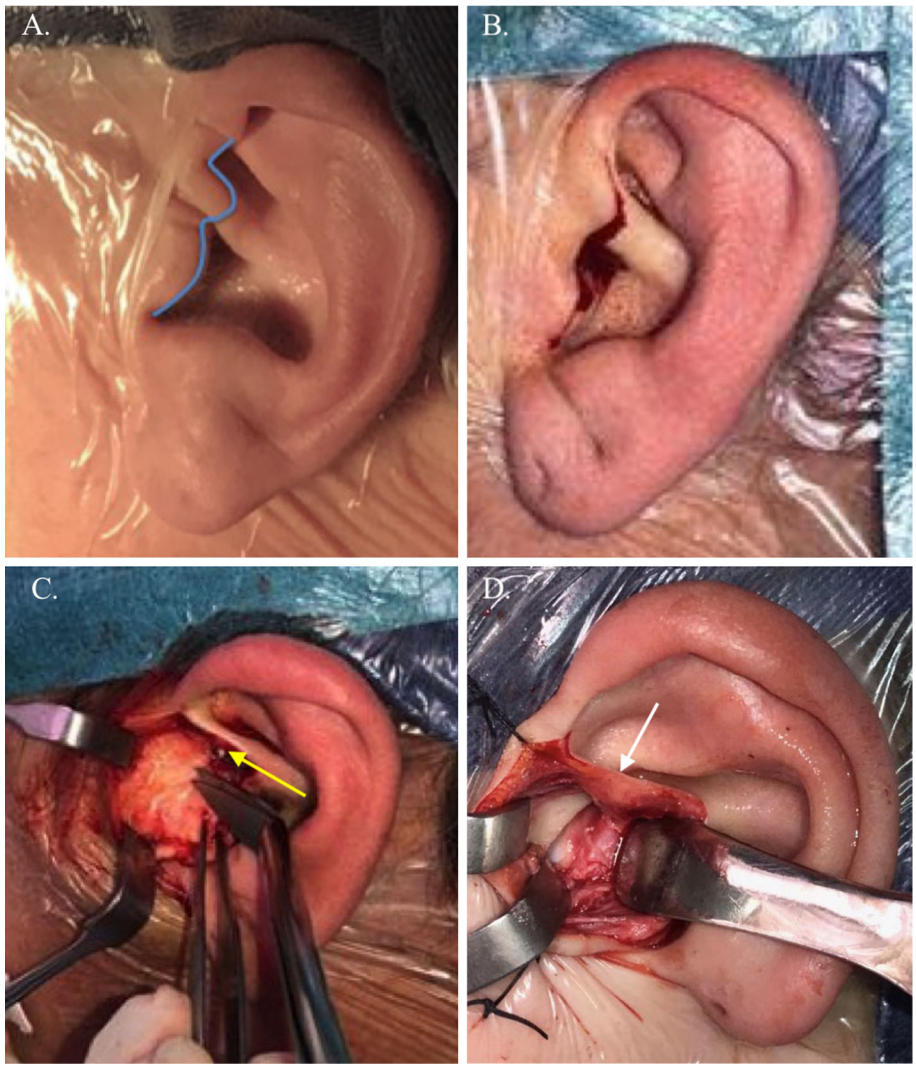

Fig. 1 **a** Approach design. **b** Incision. **c** Sharp dissection with endaural approach. **d** An excellent access to perform TMJ surgery

Fig. 2 The final step after surgery showing an excellent immediately postoperative

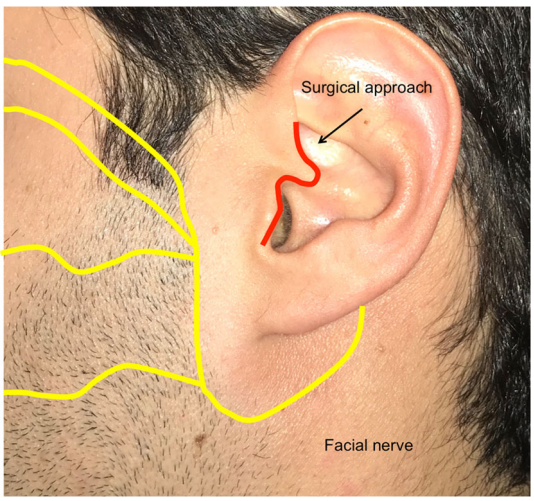

Fig. 4 Anatomical relationship between the facial nerve and the surgical approach

Fig. 3 Facial nerve evaluation after TMJ surgery

Table 2 The number of facial nerve injuries per side

Side	Amount	Facial nerve injury
Right	112	1
Left	101	2
Bilateral	43	0

cases were surgery on the left side, and 1 case on the right side. Facial nerve lesions were in female patients who resolved at the first control after five days. The total number of patients with a facial nerve injury in our study was 1.17%. There are no other complications (Table 2).

Discussion

Facial nerve paresis is occasionally found in TMJ surgical procedures. Over the years, various approaches have been found and modified to obtain excellent access to the surgical area. Also, it is essential to protect the facial nerve and other critical vascular structures. For this procedure, the main approaches are the retromandibular approach, the preauricular approach, and the endaural approach [5] (Fig. 4).

Another study reported facial nerve injury with the endaural approach between 12.5 and 32% being the temporal branch, the most commonly affected, followed by the zygomatic branch [1]. However, even if the procedure is carried up carefully, there is a risk of presenting paresis of the same nerve due to the fibrosis, heavy-handed retraction causing stretching the nerve, suture ligation, or the use of electrocautery in deep sites such as other factors that can be influencing the injury nerve independent of the surgical approach [3].

However, the postauricular surgical approach has good aesthetic results and provides excellent access to the retromandibular area and less risk of injury to the facial nerve. Nonetheless, this approach does not present good access to the anterior region of the temporomandibular joint. Other approaches, such as a preauricular or endaural approach, simplifies the procedure by avoiding sectioning the external auditory canal [5].

On the other hand, the endaural approach provides good access from the upper posterior part of the joint, improving the surgical field's visibility and moving away from essential structures such as blood vessels and branches of

the facial nerve [4]. With the completion of the endaural approach with sharp dissection and taking care of the factors that can influence the appearance of nerve injury and the approach, we found a decrease in facial nerve injury compared to the other reports in the literature. Therefore, the proper use of this previously reported approach with sharp dissection is recommended.

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Declarations

Conflict of interest This research was funded through Hospital Universitario Fundación Santa Fe de Bogotá, Colombia; and the authors have expressed none conflict of interests.

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Consent to participate Not applicable.

Consent for publication Not applicable.

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