



Use of Post-Auricular Approach to Removal Anchors after Discopexy – Clinical Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. Author AJLP wrote the manuscript. Author FRLS conducted the surgical procedure of the clinical case and data collect. Author MOCDL wrote the first draft of the manuscript. Author RGT managed the literature searches. Author CRPJ managed the literature searches, data collect. All Authors read and approved the final manuscript.

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Case Study

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ABSTRACT

The mandibular temporomandibular joint (TMJ) is two diarthrodial ginglymus joints joined by a single bone, the mandible. Multiple approaches to TMJ are described in the literature due to the complexity of their exposure without damaging the noble structures in the region (facial nerve, temporal artery, and parotid gland) and causing aesthetic damage. This article will present a case report of a 21-year-old female patient. The post-auricular approach removed loose anchors in the right TMJ due to a fistula in the pre-auricular approach region. The post-auricular approach efficiently exposed TMJ and the healing, presenting superior aesthetic results compared to other TMJ approaches.

Keywords: TMJ; TMJ disorders; temporomandibular joint disc displacement; mandibular condyle; post-auricular approach; mandibular movements; Axhausen.

1. INTRODUCTION

Displacements of the articular disc are included as arthrogenous TMD or internal derangement of temporomandibular joint (TMJ), whereas patients may complain of TMJ pain, joint sounds during mandibular function. Treatment of TMD patients (in particular, those who are symptomatic with disc displacement) aims to reduce pain and recover normal mandibular movements in order to improve quality of life [1]. Clinicians have recognized that a sequential strategy or stepwise management has been recommended considering the patients' progression from episodic signs and symptoms to refractory history of pain and dysfunction of TMJ in order to implement conservative treatment (patient education and psychological support, medication, occlusal splint, physiotherapy, and low-level laser therapy), minimally invasive procedures (intra-articular injection, arthrocentesis, arthroscopy), or invasive open surgery procedures (disc plication or discopexy, arthroplasty, and discectomy) [2]. The present case report aims to describe the use of the post-auricular approach to remove loose anchors in the right TMJ region due to an active fistula in the pre-auricular approach region.

2. PRESENTATION OF THE CASE

The anatomy of TMJ is very characteristic of the diarthrodial ginglymus type, divided into upper and lower compartments separated by the articular disc. Dense collagen fibers cover the articular surface, the mandibular condyle, and the glenoid cavity; the cavities are filled with synovial fluid. The articular disc is also a complex structure, with its central part comprising avascular collagen tissue and its posterior region comprising highly vascularized tissue [3].

The temporomandibular joint can be affected by several pathologies. [4] Multiple indications require surgical treatment of TMJ: internal derangement, arthritis, trauma, ankylosis, developmental disorders, and neoplasms [5]. Approach for TMJ surgical procedures can cause severe complications due to the present noble structures (facial nerve, temporal auricular nerve, superficial temporal artery and vein, and parotid gland). [6] Multiple approaches to TMJs are described in the literature due to the complexity of their exposure without damaging the present structures [7]. The most used surgical approaches are 1) pre-auricular, 2) endaural, 3) post-auricular, and 4) retromandibular. [5]

In the post-auricular approach, an incision is made behind the pinna to operate on an anteriorly located structure, TMJ. It was described by Axhausen in 1931 as a technique in which the incision is made in the posterior region of the ear, followed by anterior dissection with division of the cartilaginous ear canal. TMJ is exposed through the flap containing the entire auricle and the posterior part of the parotid gland spread anteriorly. The rectus auricularis technique is efficient, with predictability in joint exposure and postoperative healing; thus, minimizing possible complications [8]. In addition to preserving the lateral ligaments of TMJ during open intracapsular surgery [9].

The indications for the postauricular approach are replacement and osteosynthesis of condylar fractures, eminoplasty or eminectomy, and treatment of some ankyloses [9]. The risk of the technique is canalicular stenosis [10].

There are also several methods for the management of TMJ articular disc dislocation. A commonly used method to reestablish the relationship between the condyle and the glenoid

fossa is discopexy, which is repositioning of the articular disc by anchoring the disc to the condyle using mini anchors [11]. The present case report used the post-auricular approach to remove loose anchors in the right TMJ region due to an active fistula in the pre-auricular approach region.

The patient, a 21-year-old female, attended the Trauma Surgery Service complaining of pain in the right TMJ region. The patient reported that she underwent a discopexy surgery, with a pre-auricular approach on the right side, to treat disc dislocation articulate. She reported that approximately 15 days after the first procedure, she felt severe pain when forcing her mouth open, followed by clicking noises. Clinical examination revealed the presence of a fistula scar in the region of the pre-auricular incision (right side), with a small purulent output upon manipulation. That fistula had been present for four months since the previous surgical procedure.

On the panoramic radiography, it was identified that the anchors on the right side were loose; therefore, it was decided to remove them. The approach of choice for this case was post-auricular to avoid that after the fistulectomy (performed in the same surgical procedure), there would be little soft tissue available for suturing, which would cause a local aesthetic defect and the risk of injury to the facial nerve.

Description of the surgical procedure:

1. Incision posterior to the auricular flexure extended to a point 5mm posterior to the most superior anterior insertion of the auricle, up to the mastoid process, without extension;
2. Dissection in the region anterior to the auditory cavity;
3. Channel transection;
4. Release of remaining tissue insertions to the canal and suture of the anterior surface of the canal, subsequently fixed to the mastoid fascia;
5. Dissection superior to the external auditory canal to expose the temporal fascia;
6. Incision of the temporalis fascia;
7. Dissection continues inferior to the arch;
8. Exposure of the capsular ligament;
9. Horizontal incision in the capsular ligament in the superior joint space;
10. The incision is extended to locate the loose anchors;
11. Removal of the loose anchors;
12. Suture of the joint capsule, remaining tissue, skin surface, and retro-auricular skin incision;
13. A fistulectomy was performed in the right pre-auricular region, washing with 0.9% saline, debridement, and suturing.



Fig. 1. Initial panoramic radiograph with loose anchors on the right side



Fig. 2. Demarcation for fistulectomy and post-auricular incision, without extension, and inflammatory fistula scar in the pre-auricular region

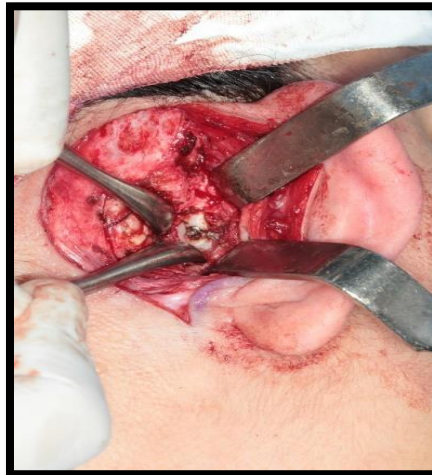


Fig. 3. Right side anchors lose



Fig. 4. Suture in the post-auricular incision region and in the fistula region (pre-auricular)

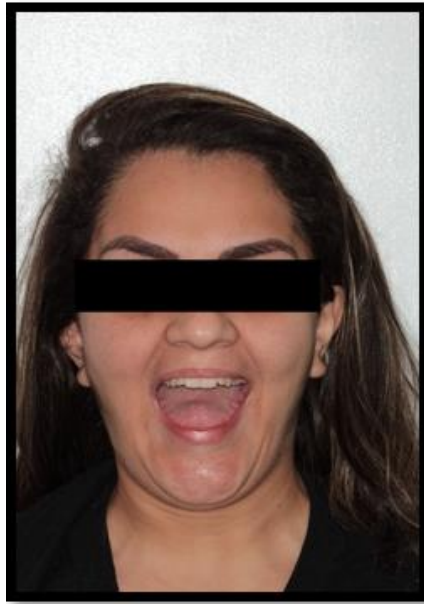


Fig. 5. Patient without limitation, with 45mm of mouth opening post-operative

3. DISCUSSION

Concern about the non-aesthetic position of the scar in an approach to TMJ (pre-auricular) is a constant in the academia and the surgeons' routine. Many approaches, such as the endaural approach, are recommended to provide an adequate surgical access and an acceptable cosmetic result for the surgical scar [12]. But even so, the surgical access can be quite extensive [13], and there is a high risk of accidents/complications due to the set of noble structures in the region (auriculotemporal nerve, superficial and middle temporal veins, parotid gland, facial nerve, transverse facial artery, and vein) [14], associated with pre-auricular and/or endaural approaches; on the other hand, an epidemiological study demonstrated that occurrence of possible permanent dysfunction of the facial nerve is low through endaural surgical access. [15] These adversities make the post-auricular approach an excellent alternative as it solves two problems: 1) it is in a non-aesthetic area, and 2) it does not directly affect any noble structures.

Transmeatal retro auricular approach is indicated in patients (1) with intracapsular fracture of the condyle head; (2) overweight patients with consequently excess soft tissue in the cheeks; (3) patients with genetic predisposition to develop hypertrophic keloids; (4) patients who preoperatively do not accept any possible nerve injuries or visible facial scars; (5) patients who

mentioned previous surgical procedures during the clinical examination, procedures in the pre-auricular region (facelift, parotid surgery) [16]; surgical indication, which coincides with the surgical recommendation of our case report, due to the previous surgery to place anchors with pre-auricular approach and persistent fistula in the scar.

The post-auricular approach is technically more complex than approaches, such as pre-auricular or endaural. However, this issue is overcome with the surgeon's experience [16], given that the pre-auricular approach is still preferred and used by many surgeons [6]. Furthermore, complications, such as bleeding or conduit stenosis are rare, with adequate surgical technique [17]. The post-auricular approach extended to the temporal region presents good condylar exposure, mainly in its posterior region, considering that the pre-auricular approach is more suitable for accessing the lateral region [16]. The post-auricular approach enables an excellent access to the retromandibular area [18], a better cosmetic result as the incision area is non-aesthetic, in addition to significantly reducing the occurrence of damage to the facial nerve. [19] However, the post-auricular approach can also present some disadvantages, such as hemorrhage, otitis, auricular canal stenosis, and temporary auricular anesthesia [20]. It can show more significant postoperative discomfort due to the increased operative field and more remarkable preservation of the V and VIII pairs of

cranial nerves, which prevents paresthesia, resulting in painful sensitivity in the postoperative period [9]. There is a report of temporary weakness of the frontal branch of the facial nerve in a sample of 14 patients who recovered normal function after a short period (1.6 months) [16]. In this case report, no immediate or late accidents/complications are associated with the postauricular approach. The three pre-auricular, endaural, and post-auricular incisions present an acceptable exposure of TMJ with satisfactory functional and cosmetic characteristics [3]. When choosing the approach route, the surgeon's experience and the aesthetic issue of the patient's healing must be considered [19].

4. CONCLUSION

The post-auricular approach efficiently removed the anchors in the said clinical case. It resulted in a scar in a non-aesthetic region (post-auricular) and closed the active fistula without further complications.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Marlière DA, Calori MJ, de Lima Medeiros Y, Santiago RC, Strujak G, Asprino L. Clinical outcomes of the discopexy using suture anchors for repositioning disc displacement in temporomandibular joints: Systematic review and meta-analysis. *Journal of Cranio-Maxillofacial Surgery*; 2023 . Available: <https://doi.org/10.1016/j.jcms.2023.06.007>
2. Al-Moraissi EA. Open versus arthroscopic surgery for the management of internal derangement of the temporomandibular joint: a meta-analysis of the literature. *International Journal of Oral*

- and *Maxillofacial Surgery*. 2015;44(6):763-70. Available: <https://doi.org/10.1016/j.ijom.2015.01.024>
3. Kreutziger KL. Surgery of the temporomandibular joint. I. Surgical anatomy and surgical incisions. *Oral Surgery, Oral Medicine, Oral Pathology*. 1984;58(6):637-46. Available: [https://doi.org/10.1016/0030-4220\(84\)90027-6](https://doi.org/10.1016/0030-4220(84)90027-6)
4. George Soares Santos, Lamis Meorin Nogueira, Celso Koogi Sonoda, Morais W. Using Endaural Approach for Temporomandibular Joint Access. *Journal of Craniofacial Surgery*. 2014;25(3):1142-3. Available: <https://doi.org/10.1097/SCS.0000000000000465>
5. Elsayed SA, Hassan S, Hakam M, Mekhemer S, Mobarak F. Effect of two fascial incision options for access to the temporomandibular joint on facial nerve function: objective investigation. *Int J Oral Maxillofac Surg Dez*; 2021. Available: <https://doi.org/10.1016/j.ijom.2021.12.010>
6. Qiu, Yating, et al. Can a Novel Surgical Approach to the Temporomandibular Joint Improve Access and Reduce Complications?. *Journal of Oral and Maxillofacial Surgery* .2016;74(7):1336-1342, Available: <https://doi.org/10.1016/j.joms.2016.01.039>.
7. Alexander R, James RB. Postauricular approach for surgery of the temporomandibular articulation. *PubMed*. 1975;33(5):346-50. Available: <https://pubmed.ncbi.nlm.nih.gov/1055190>
8. Kreutziger KL. Extended modified postauricular incision of the temporomandibular joint. *Oral Surgery, Oral Medicine, Oral Pathology*. 1987;63(1):2-8. Available: [https://doi.org/10.1016/0030-4220\(87\)90330-6](https://doi.org/10.1016/0030-4220(87)90330-6)
9. Sikora M, Chęciński M, Nowak Z, Chlubek D. Variants and modifications of the retroauricular approach using in temporomandibular Joint Surgery: a systematic review. *Journal of Clinical Medicine* .2021;10(10):2049. Available: <https://doi.org/10.3390/jcm10102049>

10. Bansal V, Kumar S, Mowar A, Yadav A, Khare G. The post-auricular approach for gap arthroplasty – A clinical investigation. *Journal of Cranio-maxillofacial Surgery*; 2012; Available: <https://doi.org/10.1016/j.jcms.2011.08.009>
11. Thomas Z, Neelakandan RS, Ahamed MIT. Disc anchoring with an orthodontic mini-screw for chronic meniscocondylar dislocation of TMJ. *Journal of Maxillofacial and Oral Surgery*. 2014;14(3):735–44. Available: <https://doi.org/10.1007/s12663-014-0729-2>
12. Ruiz, Colomé, and José Suárez Guerrero. A new modified endaural approach for access to the temporomandibular joint. *British Journal of Oral & Maxillofacial Surgery*. 2001;39(5):371–373. Available: <https://doi.org/10.1054/bjom.2001.0662>.
13. Fandiño K, Andrés Gómez-Delgado, Juan Pablo López. Open reduction of condylar fracture through a modified endaural approach. *Journal of Maxillofacial and Oral Surgery*. 2022 ;21(3):936–8. Available: <https://doi.org/10.1007/s12663-022-01746-x>
14. Posnick JC, Goldstein JA, Clokie CML. Advantages of the postauricular coronal incision. *Annals of Plastic Surgery*; 1992. Available: <https://doi.org/10.1097/00000637-199208000-00003>
15. Liu F, Giannakopoulos H, Quinn PD, Granquist EJ. Retrospective study of facial nerve function following temporomandibular joint arthroplasty using the endaural approach. *Cranio-maxillofacial Trauma and Reconstruction*. 2015;8(2): 88–93. Available: <http://dx.doi.org/10.1055/s-0034-1393726>.
16. Benech A, Arcuri F, Baragiotta N, Nicolotti M, Brucoli M. Retroauricular transmeatal approach to manage mandibular condylar head fractures. *Journal of Craniofacial Surgery*. 2011;22(2):641–7. Available: <https://doi.org/10.1097/scs.0b013e318207f495>
17. Pauwels A, Lozano C, López JP. The facial nerve injury after temporomandibular joint surgery after endaural approach with sharp dissection. *Journal of Maxillofacial and Oral Surgery*. 2021; cc10.1007/s12663-021-01570-9 Available: <https://doi.org/10.1007/s12663-021-01570-9>
18. Polley JW, Cohen M. The retroauricular coronal incision. *Scandinavian Journal of Plastic and Reconstructive Surgery and Hand Surgery*. 1992;26(1):79–81. Available: <https://doi.org/10.3109/02844319209035187>
19. Walters PJ, Geist ET. Correction of temporomandibular joint internal derangements via the posterior auricular approach. *Journal of Oral and Maxillofacial Surgery*. 1983;41(9):616–8. Available: [https://doi.org/10.1016/0278-2391\(83\)90168-4](https://doi.org/10.1016/0278-2391(83)90168-4)
20. Krause M, Kamal M, Kruber D, Halama D, Hierl T, Lethaus B, et al. Improved access in minimally invasive temporomandibular joint surgery through a novel endaural template. *BMC Surgery*. 2021;21(1). Available: <https://doi.org/10.1186/s12893-021-01098-2>.

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