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ORIGINAL ARTICLE

Study of Facial Nerve Function Following Retromandibular Open Reduction of Mandibular Condylar Fracture

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ABSTRACT

At least 1/3rd (26–40%) of all mandibular fractures occur in the condylar region, making it one of the most common fracture sites. They can further lead to morphological & functional damage when undetected or poorly managed. Condylar fractures that are misdiagnosed or improperly treated can cause substantial functional impairment, such as malocclusion, decreased mouth opening due to jaw deviation, and restricted lateral mandibular motions.

Objectives: The aim of the study was to examine facial nerve function following retromandibular trans parotid ORIF for mandibular sub-condylar fractures.

Methodology: After receiving the necessary ethical approval, 50 patients who presented with unilateral condylar fractures, sub condylar fractures (36), & neck fractures (14) (Ellis classification)[5] were chosen. All of the research participants, who underwent open reduction using a retromandibular technique, provided informed consent.

Results: All 50 patients were assessed and no patients were excluded. The healing went well, and no one experienced significant scarring or hardware infection. 7 (14%) individuals experienced transient buccal branch weakness, while 2 (4%) experienced transient zygomatic branch dimness

Keywords: Condylar fracture, Open reduction, Retromandibular approach, Anatomical reduction

INTRODUCTION

At least 1/3rd (26–40%) of all mandibular fractures occur in the condylar region, making it one of the most common fracture sites.[1] They can further lead to morphological & functional damage when undetected or poorly managed.[2] Condylar fractures that are misdiagnosed or improperly treated can cause substantial functional impairment, such as malocclusion, decreased mouth opening due to jaw deviation, and restricted lateral mandibular motions.[1] A commonly acknowledged form of therapy for mandibular condylar fractures is internal fixation & open reduction of the broken mandibular condyle, which routinely results in positive efficient results. The protection of the facial nerve is of the utmost significance & has been the subject of discussions for all of the time, which has impacted the selection of therapy (Open vs Closed).[3] We chose the retromandibular trans-parotid approach because it provides an uninterrupted & straightforward approach to the mandibular sub-condylar area. Other approaches to condylar fracture have included those that are preauricular, submandibular, rhytidectomy & even more recently, the transmassetric anterior parotid approach. Hinds and Girotti[4] published the first report on this strategy in 1967. The location of the incision also produces a hardly noticeable scar and has the extra benefit of providing enough exposure to the fractured site. Deprived of the requirement for inter maxillary fixation, rigid fixation & open reduction enable adequate anatomic repositioning, repair of the ramal length, averting of long-term sequelae such as clicking & late arthritic alterations, and a quicker return to daily function.

The aim of the study was to examine facial nerve function following retromandibular trans parotid ORIF for mandibular sub-condylar fractures.

METHODOLOGY

After receiving the necessary ethical approval, 50 patients who presented with unilateral condylar fractures, sub condylar fractures (36), & neck fractures (14) (Ellis classification)[5] were chosen. All of the research participants, who underwent open reduction using a retromandibular technique, provided informed consent.

Condylar neck and sub condylar area fractures in adult patients were considered. Bilateral instances were disregarded. A functional evaluation was conducted using the rule below (Table 1). No subject had any pre-existing circumstances that would have affected the facial nerve, and all patients' facial nerve pre-op statuses were normal.

Table 1: Tests requested by the patient

Expression/Movement	Branch measured
Raise and crinkle your forehead	Temporal branch
Puff cheeks, whistle, blow cheeks	Buccal branch
Closure of eyes	Zygomatic branch
Everted lower lip, move lower lip	Marginal mandibularis

One surgeon performed the surgeries on each and every patient. After palpating the ear lobe, a vertical incision was made about 0.5 cm below it, parallel to the mandibular posterior boundary. To assist in closure and to make retraction easier, skin and subcutaneous tissue were compromised (Figure 1). With the use of bipolar cautery, scant platysma was incised to reveal the parotid fascia. To help in the closure, the parotid fascia was meticulously incised & both culminations of this layer were marked with vicryl 4-0. The posterior margin of the mandible was again established by palpation before the pterygomassetric sling was incised (Figure 2) after the parotid gland was anteriorly divided to reveal it. Subperiosteal dissection was performed after the sling had been neatly dissected up to the bone to reveal the fractured location (Figure 3). One alternative was to insert a screw at the angle to help divert the mandible inferiorly.

A titanium 2.0 mm 4-hole plate with 2 mm screws was used to stabilize fractures, and all of the layers were painstakingly closed with 4-0 vicryl. To avoid sialocele, extra care was taken to ensure a watertight cessation of the parotid fascia. 5-0 Prolene was used to seal the skin.

RESULTS

All 50 patients were assessed and no patients were excluded. The healing went well, and no one experienced significant scarring or hardware infection. 7 (14%) individuals experienced transient buccal branch weakness, while 2 (4%) experienced transient zygomatic branch dimness.

Medially displaced condylar neck fractures were the cause of all seven occurrences of buccal branch weakening. With the exception of these cases with a medially evacuated condylar neck

fracture, which led to buccal branch weakening, the average duration from skin incision to closure after reduction & plating was one hour in all cases. During 8 weeks, five cases of buccal branch weakness were fully recovered, while two patients recovered after 11 weeks.

We found zygomatic branch weakening in 2 patients. It involved sub condylar fractures. All of these instances made a full recovery in 7 weeks.

After surgery, all subjects exhibited stable occlusion & normal mouth opening. Sialocele developed in 4 instances, and they all responded to local therapy. It took longer for the buccal branch of the facial nerve to heal than the zygomatic branch.

DISCUSSION

Maxillofacial surgeons frequently see condylar fractures since they are so prevalent (26–40%). The cornerstone in treating these fractures is open reduction & internal fixation. The facial nerve temporarily became paralyzed in 9 (18%) cases. Seven (14%) patients reported having buccal branch weakness. All of the medially displaced condylar neck fracture cases that led to buccal nerve palsy needed a significant amount of medial and superior retraction in order to grab the misplaced condylar fragment & subsequently realign it.

It's also crucial to remember that these fractures took a long time to heal. This contributed to the neuropraxia of the buccal branch, a condition marked by a protracted retraction of soft tissue. The narrow anatomical gap between the buccal & marginal mandibular branches is the foundation of the retromandibular approach.[6] This anatomic window is frequently quite narrow and frequently comes into contact with the buccal branch, which must be pulled back and kept safe from the surgical site. This increases the pressure on the nerve which causes weakness.

We found rapid bleeding in situations where the zygomatic branch was weak; this bleeding was most likely coming from the retromandibular vein or a branch of it, and it required to be clamped and ligated. As there was little ocular surface available to stop the bleeding, the significant retraction was necessary to successfully accomplish hemostasis.[7,8]

These maneuvers would have increased the nerve's transient palsy-causing retractive pressures. According to the literature, the transient facial nerve injury ranges from 12 to 25 percent [9-15], our 18% finding is in line with the same. In all of these cases of neurological damage, mecobalamin 1500mg was recommended for 3 weeks (once daily)[16] to help in rehabilitation.

The submandibular method and pre-auricular approach are two examples of extra oral methods to the mandibular condyle. Nevertheless, due to its closeness to the fracture site & direct contact, the retromandibular trans parotid technique provides the greatest access to subcondylar fractures and even neck fractures. The use of an endoscope to ease intraoral access has been recommended[17], but the expenses associated with obtaining such a costly setup outweigh any minimal benefits.

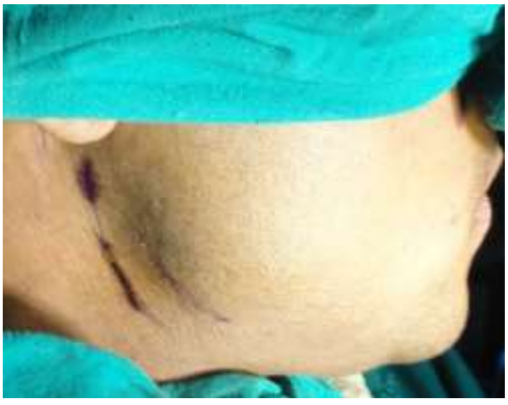

Fig 1:

It is abundantly obvious from our study into the application of the retromandibular tranparotid approach that this method is safe, provides adequate and prompt access to the mandibular condylar neck/sub condylar region, and most importantly, safeguards the facial nerve. It might just result in a brief palsy that goes away entirely without leaving a long-term neurological damage.

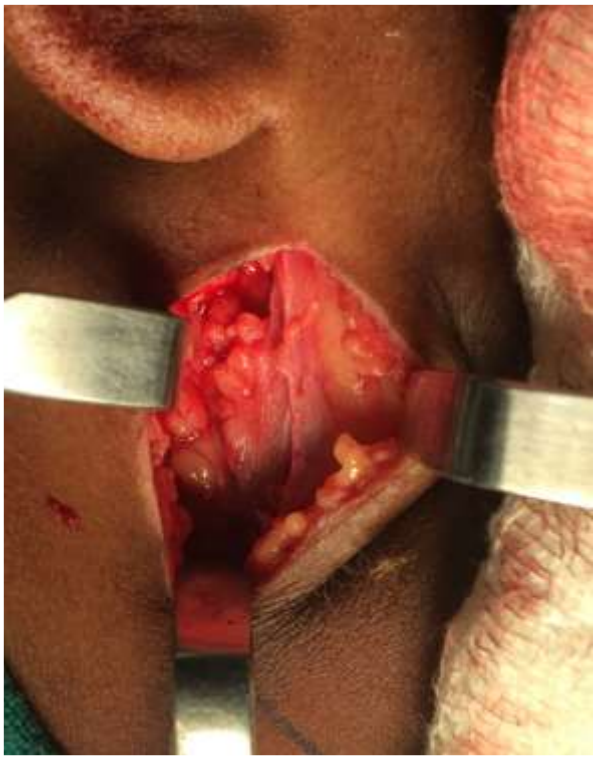

Fig 2:

Fig 3:

REFERENCES

1. Ayub T, Kumari B, Kumar R, Abro B, Hassan SG, Shams S. Comparison of Preauricular Versus Retromandibular Approach in the Management of Mandibular Condyle Fractures. Journal of Pharmaceutical Research International. 2022 Jan 15;34(2A):28-35.
2. Mohamed AA, Rao G, Mai L, Sakran KA, Al-Wesabi SN, Pan C, Lin Z. Is the retromandibular approach a suitable approach to anatomical reduction of unilateral subcondylar fracture? A non-randomized clinical trial. Head & Face Medicine. 2022 Dec;18(1):1-2.
3. Kumar A, Hussain F, Raza A, Zaidi SW, Ayub T, Shoaib M. Efficacy of Retromandibular Approach in The Management of Mandibular

Subcondyle Fractures: Retromandibular Approach in Mandibular Subcondyle Fractures. Pakistan Journal of Health Sciences. 2023 Jan 31:113-7.
4. Hinds EC, Girotti WJ. Vertical subcondylar osteotomy: a reappraisal. Oral surgery, oral medicine, oral pathology. 1967 Aug 1;24(2):164-70.
5. Ellis III E, McFadden D, Simon P, Throckmorton G. Surgical complications with open treatment of mandibular condylar process fractures. Journal of oral and maxillofacial surgery. 2000 Sep 1;58(9):950-8.
6. Mohamed AA, Qi H, Lin Z, Sakran KA, Pan C. Is the Retromandibular approach a suitable approach to anatomical reduction of unilateral condylar fracture? a prospective non-randomized cohort study.
7. Arcuri F, Ferri A, Bianchi B, Laganà F. Modified Preauricular Transparotid Approach for Treating Mandibular Condylar Fractures.
8. Özer C, Tamer Y, Bayram B, Pektaş ZÖ. Modified Blair Approach for the Treatment of Mandibular Condyle Fractures. Journal of Craniofacial Surgery. 2022 Oct 1;33(7):2231-4.
9. Ahmed MA, Islam MA. Outcome of Reduction of Subcondylar Fracture in Retromandibular Transparotid Approach. Mymensingh Medical Journal: MMJ. 2022 Oct 1;31(4):931-6.
10. Laganà F, Arcuri F, Spinzia A, Bianchi B. Analysis of the High Submandibular Approach: A Critical Reapprasail of a Transfacial Access to the Mandibular Skeleton. Journal of Craniofacial Surgery. 2023 Jan 30;34(1):e15-9.
11. Orvakonde S, Mutum B. Analysis of facial nerve function after open reduction of mandibular condylar fracture via a retromandibular approach. 2019 Oct 1;32(5):2121-4
12. Lee SJ, Chun YJ, Lee SJ, Jun SH, Song IS. Modified high-submandibular appraoch for open reduction and internal fixation of condylar fracture: case series report. Journal of the Korean Association of Oral and Maxillofacial Surgeons. 2022 Oct 31;48(5):267-76.
13. Slama NB, Crampon F, Maquet C, Derombise B, Duparc F, Trost O. Preauricular anteroparotid transmasseteric approach of the mandibular condyle: The natural evolution after cervical dissections? An anatomical feasibility study. Journal of Stomatology, Oral and Maxillofacial Surgery. 2022 Oct 1;123(5):e598-603.
14. Kumar P, Jeyaraman B, Rajiah D, Kamalakaran A, Thirunavukkarasu R, Palani T. Evaluation of Mini-Preauricular Incision in the Surgical Management of Condylar Fracture. Cureus. 2022 Nov 21;14(11).
15. Bhat SV, Krishna VK, Periasamy S, Kumar SP, Krishnan M. Modified Retromandibular Approach for the Management of Condylar Fractures of the Mandible. Cureus. 2022 Aug 5;14(8).
16. Paul R, Suvvada B, Polomarasetty P, kumar Thumu S, Santosh PV. Evaluation of efficacy 3Dimensional 4-hole trapezoid condyle plate for treatment of base of condyle fracture. National Journal of Maxillofacial Surgery. 2022 Sep 1;13(3):405.
17. Gilliland J, Ritto F, Tiwana P. Complications of the Transmasseteric Anteroparotid Approach for Subcondylar Fractures: A Retrospective Study. Craniomaxillofacial Trauma & Reconstruction. 2022 Mar;15(1):66-71.