

# Retromandibular transparotid approach vs transmasseteric anteroparotid approach in treatment of mandibular condylar fractures- A literature review

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## Abstract

*Aim:* The aim of this review is to evaluate the retromandibular transparotid and transmasseteric anterior parotid in the management of mandibular subcondylar fracture.

*Methods:* A literature search was done using PubMed Medline, ScienceDirect and Google Scholar.

*Conclusions:* Both methods are effective for the mandibular subcondylar treatment with varying rates of surgeon preference depending on complications and case selection.

**Keywords :** condylar trauma, management, retromandibular, transparotid, transmasseteric,

## INTRODUCTION

The management of condylar trauma has remained a point of debate amongst oral and maxillofacial surgeons despite advances in radiographic imaging, use of biomaterials and various surgical modalities. The treatment plan is often determined by the surgeon's preference and experience.<sup>1</sup> Owing to the composite anatomical site, surgical approaches in this area should provide good visualization and allow the surgeon to precisely reduce the fracture and provide stable internal fixation.<sup>2</sup> Various approaches have been employed for this purpose in the past, each with its own specific benefits and drawbacks. This literature review discusses retromandibular transparotid approach vs anteroparotid approach in treatment of mandibular condylar fractures.

### Retromandibular approach: Transparotid vs Anteroparotid

In the past, condylar fractures were treated mostly using the closed reduction primarily due to risk of surgical infection in the pre-antibiotic era. There was also a notion that surgical approach may damage the facial nerve branches due to its close proximity. Closed reduction was also prone to other complications such as occlusal dearrangement and pain. Latest studies however provide evidences that surgically treated condylar fractures have the better results regarding occlusion, masticatory function, mouth opening and bone morphology.<sup>3</sup>

Open reduction and internal fixation of mandibular condylar fracture comes with various surgical approach including submandibular approach, retromandibular approach, preauricular approach etc. Each of these approaches has its own advantages and disadvantages.<sup>4,5</sup> The retromandibular transparotid approach is the most widely used one. It was first described in 1967 by Hinds and Girotti and modified in 1978 by Koberg and Momms.<sup>6,7</sup> Advantages reported in this approach include less facial nerve morbidity which can be identified and retracted under direct vision, minimal working distance from the incision to the fracture site, good exposure, aesthetically pleasing results from a less conspicuous scar and ease of

fracture reduction/fixation.<sup>8,9</sup> Types of retromandibular approach are retromandibular transparotid (through the parotid gland) and retromandibular trans-masseteric anterior parotid (bypassing the parotid gland) also called TMAP.

In retromandibular transparotid approach, incision is placed on parotid fascia and then blunt dissection is carried out in the surface of the parotid gland parallel along the expected course of facial nerve branches to reach the pterygomasseteric sling.<sup>10,11</sup> The transparotid approach requires dissection of the parotid capsule and parenchyma of the parotid to reach the fracture site. The TMAP approach described by Wilson, et al. in response to concerns about injury to the facial nerve and parotid-related complications resulting from the transparotid route.<sup>12</sup> It is easy technique to learn, provides adequate surgical exposure for open reduction internal fixation, and has minimal complications rates. In TMAP, management of sub condylar fracture is through preauricular incision extended in curvilinear fashion in cervico mastoid crease. The dissection is carried out superficial to the parotid capsule till the anterior portion of the gland, masseter muscle is identified and vertical incision is given in masseter muscle and dissection is carried out along the fibers of masseter muscle to reach the periosteum. The length of incision was longer in their approach and it leaves the scar in the preauricular region.<sup>13</sup>

## DISCUSSION

While retromandibular approaches have been known to reduce the risk of facial nerve palsy and make it much easier for managing a case of condylar fractures, the incidence of facial nerve palsy was found to be higher among patients undergoing the transparotid approach when compared to patients undergoing the anteroparotid approach. Parihar V S et al compared the complications associated with a retromandibular transparotid approach with TMAP approach for their management in thirty patients. The results did not show any significant difference in complications between the two approaches, but the retromandibular transparotid approach provided

straight-line access in fractures of the condylar neck, with fewer incidences of nerve injury. The anterior parotid approach, on the other hand, provided easier access for fractures that were medially dislocated or of the condylar base but had an increased incidence of facial nerve injuries.<sup>14</sup> Retromandibular anteroparotid approach provides good access, and was associated with minimal complications and is relatively useful for an inexperienced and novice surgeon as well. Ramaraj P N et al conducted a study on thirty condylar fracture in 26 patients.<sup>15</sup> Parotid fistula formation was present in 2 patients in retromandibular transparotid approach while none of the patient had parotid fistula in retromandibular anteroparotid approach. Three patients out of 15 had the transient facial nerve weakness in retromandibular transparotid approach which got resolved in 6 month while none of the patient had facial nerve weakness in TMAP.

Mandal J et al did a randomized controlled trial in patients with mandibular subcondylar fractures requiring operative intervention to compare the efficacy of 2 variants of the retromandibular approach-retromandibular transmasseteric anterior parotid (TMAP) and retromandibular transparotid (TP) with a 3 month follow up.<sup>16</sup> No facial nerve injury was seen in patients treated with the TMAP approach, whereas 3 (7.8%) patients in the TP group had transient facial nerve injury. They concluded that the TP approach provides quicker access to the condyle as compared with the TMAP approach. Except for reduced blood loss in the TP approach, all other parameters were comparable in both the approaches. Shaheen A et al evaluated mandibular condylar fracture with Open Reduction Internal Fixation (ORIF) in 26 patients who were divided into 2 groups of 13 each; one was managed using by means of a retromandibular transparotid approach while the other group was by means of a retromandibular retroparotid approach (RP).<sup>1</sup> Of the overall complications seen, the cases in the TP group had a higher incidence of infection (7.69%) and seroma (15.38%) while those in the RP group had more deviation on mouth opening (7.69%). After a 6 month follow-up, they found no significant disparity between the two approaches and stated that the primary determining factor for selection of either technique is surgeon preference and appropriate case selection.

A recent systematic review and meta-analysis concluded that the incidence of facial nerve palsy was higher among patients undergoing the transparotid approach when compared to patients undergoing the anteroparotid approach.<sup>17</sup> In total, 40 studies with 2,096 participants were assessed. The pooled incidence of facial nerve palsy following the transparotid approach was 13%, and 2% following the anteroparotid approach. The pooled incidence of sialocele following the transparotid approach was 2%, and 2% following the anteroparotid approach. The pooled incidence of postoperative infection following the transparotid approach was 1%, and 1% following the anteroparotid approach. Both the approaches result in little to no risk of complications that are common with other approaches for condylar fractures. The findings of the review highlight that the anteroparotid approach can be used for patients with limited risk of facial nerve palsy. Previous reviews examining the rate of complications

between the two approaches also reported similar findings in which the transparotid approach resulted in a higher incidence of facial nerve palsy compared to the anteroparotid approach.<sup>18, 19</sup>

## CONCLUSION

The current review provides baseline information on the two retromandibular approaches for mandibular condylar fractures. We found that very few studies that have investigated the comparative risk of both retromandibular approaches, especially in the form of randomised control trials. Further studies comparing the two approaches are required to identify the best approach, which will help surgeons to determine the surgical procedure with least complication rate and best success rate for their patients.

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