ORIGINAL RESEARCH PAPER

Volume-8 | Issue-3 | March-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# THE RETROMANDIBULAR TRANSPAROTID APPROACH FOR CONDYLAR FRACTURES: A PROSPECTIVE STUDY

**Oral And Maxillofacial Surgery**

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## ABSTRACT

We evaluated the safety, efficacy, and morbidity associated with the treatment of displaced mandibular condylar fractures using a retromandibular transparotid approach. The study group consisted of 9 patients who underwent surgery for 10 condylar process fractures analysed prospectively and were evaluated in terms of functional results, Stability of fixation, Scar formation, and Post operative complications. The approach offered good accessibility for fracture reduction and fixation. The recorded complications were minimal and transient. Functional occlusion was similar to preoperative condition .In conclusion, this prospective clinical investigation showed that retromandibular transparotid approach is ideal for displaced condylar neck fractures of mandible in terms of good skeletal reduction and internal fixation with miniplates and screws, also the surgical procedure provides reliable safe clinical results, immediate function, low morbidity and good aesthetics.

## KEYWORDS

Retromandibular approach, Condylar fractures, facial nerve, complications.

## INTRODUCTION:

Literature suggests that out of all mandibular fractures, condylar fractures account for 25-35%.(1)(2) These fractures can occur as unilateral or bilateral condylar fractures.

Hinds and Girotti in 1967 first described retromandibular approach. (3) Later Koberg and Momma in 1978 modified the procedure.(4) Ellis and Dean reported that retromandibular Transparotid approach has various advantages like distance from facial skin incision to condyle is shorter , access to posterior border of mandible to sigmoid notch is quicker and better, scar will be less conspicuous and the surgical procedure is easy for reduction and fixation.(5)(6) also include advantages like good exposure and pleasing aesthetic results as it does not involve supplemental incision and the reduction is easy.(7)

**PATIENTS AND METHODS:** This prospective study was conducted between December 2014 to December 2016. Nine consecutive patients with displaced condylar fractures were included in the study. They consisted of 8 males and one female patient, ranging in age from 18- 30 years, all of whom responded to a follow up call at least 6 months after surgery.

### Types of fractures

We analysed Patient profiles, fracture side, deviation of condylar segment according to the MacLennan classification, additional mandibular and midfacial fractures, also cause of trauma was reported. Out of nine patients two patients had bilateral dislocated fractures associated with symphysis fracture, one patient had unilateral dislocated fracture and six patients had unilateral displaced fracture. Consent was taken before treatment.

Patients with the following presentations were included in the study: Impossibility of obtaining adequate occlusion by closed reduction, displaced/dislocated condylar fractures, shortening of ramal height associated with other fractures.

Patients were reviewed at 1 week, 1 month, 3 month and 6th month. Surgical access was by the retromandibular transparotid approach in all cases and were reduced and fixed using single miniplate. Medically compromised patients who could not undergo general anaesthesia and the patients with undisplaced condylar fractures were excluded from the study.

**SURGICAL PROCEDURE:** Standard protocol and technique was followed in all cases. Access to the fracture site is with Retromandibular transparotid approach with incision given 0.5 cm below the earlobe posterior to the posterior border of the ramus of the mandible, dissection was carried out in sub dermal fat plane.

Platysma muscle was incised after skin and subcutaneous incision to obtain visibility of parotid capsule. Capsule was incised to gain entry to parotid gland. Blunt dissection in the gland was made in an antero medial direction towards posterior border of mandible. Procedure is done by inserting a curved haemostat and spreading it open parallel to the expected direction of the branches of the facial nerve, taking precautions to avoid injury to them.

Fracture site was exposed subperiosteally to expose bone so that a suitable retractor could be placed to expose the site as high as possible. Identification and reduction of fractured condylar segments were done. Condylar fracture fixation was done using miniplates. Occlusion was confirmed before wound closure. Wound was irrigated and checked for haemostasis before water tight closure of parotid capsule. Incisions were closed in layers with resorbable sutures and the skin with non resorbable sutures.

**Fig. No. 1 Placement of Incision**

**Fig.No.2 – Exposure of the Fractured site**

Fig.No.3 – Plate Fixation

Fig.No.4 – Closure

**RESULTS:** The clinical efficacy of the transparotid approach for the treatment of condylar and subcondylar fractures was evaluated in terms of;

A. Accessibility and visibility of exposure.
B. Exposure time.
C. Intra operative complications.
D. Post operative complications.
E. Aesthetic results.

**This study revealed following observations:**
The average time taken for procedure was 65.5 min. Adequate Exposure was obtained in all cases for fracture reduction except in one case where condyle was dislocated medially. However the vertical height of the mandible was maintained. (Table I) There was transient facial nerve weakness in 2 patients but all resolved within 1 month (Buccal and Marginal Mandibular nerve). No permanent facial palsy was reported. Facial nerve injury was assessed using House –Brackman facial nerve grading system. No profuse bleeding was encountered during the operation, which could have occurred due to injury to the internal maxillary artery or the Retromandibular vein. No hematoma, infection, Frey's syndrome, chronic pain in the fracture site, hypoesthesia of the ear, was observed in any patients.

Results showed that Functional occlusion was identical to the preoperative condition and correct anatomical reduction of the condylar segments in centric occlusion. At 6 month follow up, all patients had satisfactory range of TMJ motion, without deviation and had stable individual centric occlusion. No clinically problematic TMJ pain was observed in any patient. Radiographs depicted proper anatomically correct reduction with rigid internal fixation. Bone healing was good and had no complications, such as mobility, non-union, resorption of condylar segments, plate or screw breakage or loosening, at the final 6 months follow-up.

Except in one patient Skin scarring was minimal, incision was concealed in all cases and gave satisfying aesthetic results. Two patients reported with salivary fistula one week after surgery, and were managed with pressure and antibiotic dressings. They resolved within one month.

**RADIOGRAPH OF THE PATIENT**

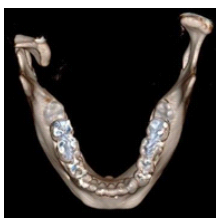
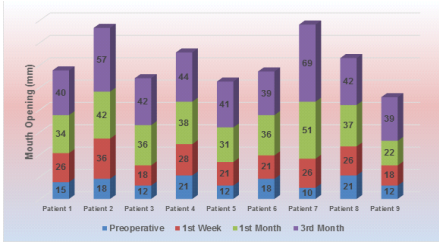


Fig.No.5 - PRE OPERATIVE Fig.No.6 - POST OPERATIVE

**TABLE – 1: AGE/GENDER, DURATION OF SURGERY, LENGTH OF INCISION, ACCESSIBILITY AND VISIBILITY**

| SERIAL NUMBER. | AGE/SEX OF THE PATIENT. | LENGTH OF INCISION | DURATION OF SURGERY. | ACCESSIBILITY AND VISIBILITY. |
|---|---|---|---|---|
| 1 | 21/M | 3.8 CM. | 62 min. | Excellent |
| 2 | 24/M | 6 CM. | 80 min. | Adequate |
| 3 | 22/M | 3.5 CM on Rt. 4 CM on left. | 40min for left and 55 min for right. | Adequate |
| 4 | 18/M | 3.4 CM | 120 min. | Adequate |
| 5 | 30/M | 3.6 CM | 50 min. | Adequate |
| 6 | 20/M | 3.8 CM | 110 min. | Inadequate |
| 7 | 21/M | 4.8 CM | 45 min. | Excellent |
| 8 | 22/F | 2.5CM | 47 min. | Adequate |
| 9 | 27/M | 3.5 CM | 48 min. | Adequate |




**GRAPH: 1 - MAXIMUM MOUTH OPENING**

**DISCUSSION**
The efficacy of retromandibular transparotid approach was evaluated in the present study. Reduction of medially displaced fracture was difficult compared to laterally displaced fracture. For medially displaced fractures ipsilateral molar region was pushed down to create space so that medially displaced fracture can be raised to convert it into a laterally displaced fracture. Maxillo-mandibular fixation was done before internal fixation and fractures were fixed with titanium miniplates.

Before wound closure all of the Maxillo-mandibular fixation materials were removed, except in 4 patients in whom the fracture sites were in both the midface and mandible, and in whom the contralateral condylar head fractures were not treated surgically and hence to attain pre traumatic occlusion those patients needed elastic control training post-operatively. Radiographs were taken to confirm reduction. Post operatively assessment of motor response of facial nerve branches was made. (Within 24hrs, 1stweek, 1stmonth, 3rd month and 6th month). Ease of access, duration of procedure, stability of fracture site, lateral excursion, and opening of mouth, occlusion, parotid fistulation, post operative infections, and aesthetic outcome of the procedure was monitored.

It is reported that transient damage to branches of facial nerve is 12-48% with retromandibular transparotid approach. (2)(5)(8-12).

As the access is between the branches of the parotid gland, retraction leads to transient neuropraxia. Medially overlapped and dislocated condylar fragments developed more transient palsies due to extra retraction. Blunt dissection of parotid capsule and parenchyma of parotid increases the incidence of parotid fistula and facial nerve damage. (7)

In the present study out of 9 Patients which includes 10 fractures, 2 patients had transient facial nerve palsy but all resolved within 1 month. Branches of the facial nerve that were involved were the buccal and marginal mandibular nerves.

Area of dissection is between buccal and marginal mandibular branches, medially overlapping condyles require more retraction for reduction and plating which can affect buccal branch. (10, 12)

Buccal nerve palsies can be reduced by dissecting the nerve and protecting it with a suitable instrument from retraction. In the study buccal nerve was retracted away if it is encountered and made no attempt to visualise the nerve.

In the study, one patient had bilateral medially dislocated condylar fracture and we encountered difficulty to locate and retrieve the fractured fragment and also required more retraction of soft tissue over a longer period and this probably resulted in facial nerve palsy which took longer time to recover.

Accessibility and visibility was good in subcondylar and laterally displaced fractures, regarding anatomical reduction excellent results were achieved in eight patients, except in one patient who had bilateral medially dislocated fracture with joint capsule ruptured and condylar head dislocated anteromedially. Anatomic reduction of fractured condyle was not achieved but the vertical height was restored, thus minimizing the chances of temporomandibular joint problems. There were no complaints from the patients regarding post operative facial asymmetry, nor asymmetry observed in any of them. Mouth opening was adequate in all patients. There was no evidence of complications such as mobility, non-union, mal-union, resorption of condylar segments, plate or screw breaking or loosening. Bone healing was good at the final six months followup.

One patient developed deviation on opening the mouth towards the fractured site during immediate post-operative period which resolved in one month. Pain was assessed subjectively by visual analogue scale; all patients were free from pain with no deflection or clicking upon opening or chewing. Hematoma, infection, Frey's syndrome, chronic pain in the fracture site, hypoesthesia of the ear was not observed in any patients.

The time from trauma to surgery was 3 to 10 days (mean 4.2 days), and had no influence on the overall outcome.

Retromandibular transparotid approach also had advantages like length of incision is shorter which usually is 3-4 cm and can be placed in a hidden location, this technique is ideal for procedures involving the area from condylar neck to ramus as the entire ramus is visible from behind. Other advantages are facial scarring will be less conspicuous, operating time is short, minimally invasive procedure, plate and screw fixation is easier in a close working space. (2)(13-15).

Strength of this study is common surgical technique combined with rigid internal fixation, consistency of clinical and radiographic data collection; all procedures were performed at standardized intervals, all patients underwent long term post operative follow up for six months. Relatively small case series and non randomised nature of patient selection are weaknesses of the study.

## CONCLUSION

This prospective study showed that retromandibular transparotid approach is ideal for subcondylar and laterally displaced fractures of the mandibular condyle which provides good skeletal reduction and fixation with miniplates and screws, also offers immediate function, reliable safe clinical results, good cosmetics and low morbidity. There is a role for preoperative and postoperative counselling of patients who opt for this approach about temporary facial nerve palsy, salivary fistula, scar, and other related complications.

## REFERENCES


1. Williams JLT. Rowe and Williams' maxillofacial injuries. 2nd ed. Churchill Living Stone; 1994-409.
2. L. Yang, P.M. Patil: The retromandibular transparotid approach to mandibular subcondylar fractures. Int. J. Oral Maxillofac. Surg. 2012; 41: 494-499.
3. Hinds ET, Girotti WJ. Vertical subcondylar osteotomy: a reappraisal. Oral Surg Oral Med Oral Pathol 1967:24:164-70.
4. Koberg WR, Momma W, Treatment of fractures of the mandibular process by functional stable osteosynthesis using miniaturized dynamic compression plates, Int J Oral Surg 1978: 7:256-62
5. Ellis III E, Dean J. Rigid fixation of mandibular condyle fractures. Oral Surg Oral med Oral Pathol 1993: 76: 6-15.
6. T. Kanno, S. Sukegawa, H. Tatsumi, Y. Nariai, H. Ishibashi, Y. Furuki, J. Sekine: The retromandibular transparotid approach for reduction and rigid internal fixation using two locking miniplates in mandibular condylar neck fractures. Int. J. Oral Maxillofac. Surg. 2014; 43: 177-184.
7. Ongkila Bhutia, Lalit Kumar, Anson Jose, Ajoy Roychoudhury, Anjan Trikha : Evaluation of facial nerve following open reduction and internal fixation of subcondylar fracture through retromandibular transparotid approach. British Journal of Oral and Maxillofacial Surgery 52 (2014) 236-240.
8. Edward Ellis III, David McFadden, Patricia Simon, Gaylord Throckmorton: Surgical Complications with Open Treatment of Mandibular Condylar Process Fractures. J Oral Maxillofac Surg 58:950-958, 2000.
9. J.J.Downie, M.F.Devlin, A.T.M. Carton, W.S. Hislop: Prospective study of morbidity associated with open reduction and internal fixation of the fractured condyle by the transparotid approach. British Journal of Oral and Maxillofacial Surgery 47 (2009) 370-373.
10. Vesnaver.A; Gorjanc M, Eberline A, et al. The preauricular transparotid approach for open reduction and internal fixation of condylar fractures. J.Craniomaxillofac Surg 2005:33:169-79.
11. Manisali M, Amin M, Aghabeigi B, et al. Retromandibular approach to the mandibular condyle: a clinical and cadaveric study, Int J Oral Maxillofac Surg 2003: 32:253-6.
12. Hyde N, Manisali M, Aghabeigi B, et al. The role of open reduction and internal fixation in unilateral fractures of the mandibular condyle, prospective study. Br J Oral Maxillofac Surg 2002; 40: 19-22.
13. Ellis III E, Zide MF. Retromandibular approach. In: Ellis EE, Zide MF, editors. Surgical approaches to facial skeleton. Baltimore: Williams & Wilkins: 2006. P. 169-84.
14. Nogami S. Takahashi T, Yamauchi K, Miyamoto L, Kaneuji T, Yamamoto N, et al. Clinical Comparision between the retromandibular approach for reduction and fixation and endo-scope- assisted open reduction and internal fixation for mandibular condyle fractures. J.Craniofac surg 2012: 23: 1815-8.
15. Narayanan V, Kannan R, Sreekumar K. Retromandibular approach forreduction and fixation of mandibular condylar fractures: a clinical experience. Int J Oral Maxillofac Surg 2009: 38: 835-9.