

Retromandibular approach for subcondylar fractures: A prospective studyTripathi GM¹, Sharma D², Dixit S³, Bhat A⁴, Yadav LS⁵, Sharma RJ⁶

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ABSTRACT

Background: Condylar fractures accounts for 25-50% of all mandibular fractures. It can be extracapsular or intracapsular, nondisplaced, displaced, deviated, or dislocated from the disc.

Objective: To evaluate the retromandibular transparotid approach for open reduction & internal fixation of subcondylar fractures for post-operative occlusal status, stability of fixation & postoperative complications.

Material and Methods: The prospective study was performed on 24 patients (18 male and 8 females) sustaining 26 subcondylar fractures who were treated surgically utilizing retromandibular transparotid incision.

Results: The most common etiology of injury was road traffic accidents in 62.5% patients. Satisfactory anatomic reduction and occlusion was achieved in all patients. The incidence of transient facial nerve injury was 16.67%. The facial nerve returned to normal function in 3 months in all the 4 affected patients.

Conclusion: The incision provides easy visualization of the subcondylar region from the posterior edge of the ramus to the sigmoid notch, allows the perpendicular placement of screws to the fracture site, with minimal post operative complications and satisfactory esthetic results.

Keywords: subcondylar fractures, surgical approach, retromandibular transparotid approach

Introduction

Fractures of condyle accounts for 25-50% of all mandibular fractures.^[1-3] Condylar fractures can be extracapsular or intracapsular, nondisplaced, displaced, deviated, or dislocated from the disc. It is important for the oral and maxillofacial surgeons to reach a consensus about the best way of managing mandibular condylar fractures. These fractures may be treated through intermaxillary fixation followed by physiotherapy or by open reduction through intraoral or extraoral surgical incision.^[4] Closed reduction requires inter maxillary fixation for varying time intervals which may cause complications like subsequent joint pain or deviation on mandibular movement, internal derangement of the temporomandibular joint (TMJ), TMJ ankylosis

and inadequate restoration of the vertical height of the ramus.^[5]

Open surgical intervention is superior to closed-method treatments in terms of achieving the appropriate anatomic fixation of the fracture and early mobilization of the temporo mandibular joint.^[6] Approaches for Open reduction and internal fixation of subcondylar fracture include: the submandibular approach, the preauricular approach and the retromandibular approach.^[7] The submandibular approach is very low for access to subcondylar fractures, and conversely the preauricular approach is very high. The fixation of screws utilising a preauricular incision is difficult because perpendicular orientation of the screw to the

plate is impossible and the area of ramal exposure is less.^[8]

The retromandibular approach is a useful alternative for the treatment of subcondylar fractures because it allows access of the entire ramus of the mandible including the neck of the condyle. The study was prospectively conducted to evaluate the efficacy and safety of retromandibular transparotid approach in treating subcondylar fractures.

Materials and methods

The study was carried out on patients reporting to the Out Patient Department of department of Dentistry, Shyam Shah Medical College, Rewa and emergency unit of associated Sanjay Gandhi Memorial Hospital with subcondylar fractures from June 2013 to May 2016. The data analysed included the mode of injury, types of condylar fracture, associated fractures and the need for surgical intervention. Postoperative assessment was done for fracture stability, facial nerve function, ease of surgery and other post operative complications.

Routine haematological along with radiological investigation were done in all patients. The study was approved by ethical board of the institution and informed consent for participation in the study was obtained from each patient. All the patients were operated under general anaesthesia with naso-endotracheal intubation. Retromandibular transparotid approach was used for fracture reduction of the subcondylar fractures. (Fig.1,2) The incision for the retromandibular approach begins 5mm below the ear lobe and continues 3 to 3.5cm inferiorly. It was placed in a similar manner just behind the posterior border of the mandible.



Fig. 1 3 D CT face revealing right subcondylar fracture

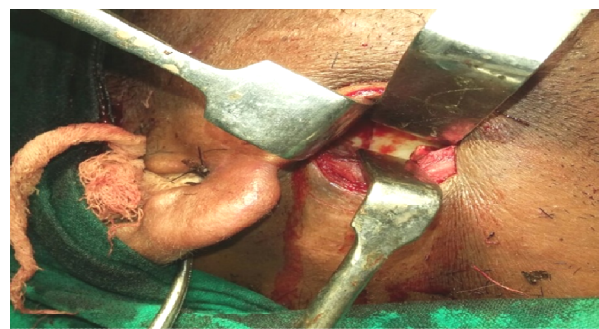


Fig.2 Right subcondylar fracture exposed through retromandibular transparotid incision.

Initial incision was carried through skin and subcutaneous tissues to the level of the scant platysma muscle which was sharply incised in the same plane as the skin incision. At this point the superficial musculo-aponeurotic layer (SMAS) and the parotid capsule were incised and blunt dissection was performed within the gland in an anteromedial direction towards the posterior border of the mandible. A hemostat was repeatedly inserted and spread open, parallel to the anticipated direction of the facial nerve branches. Blunt dissection through the parotid gland was performed between the marginal and buccal branches of the facial nerve. Dissection is continued until the only tissue remaining on the posterior border of the mandible was the periosteum of pterygomassetric sling. The pterygomassetric sling was sharply incised with scalpel. The fracture site was exposed and reduced. The fracture segments were fixed with titanium miniplates in some cases and stainless steel miniplates in other. Wound was closed in layers using 3-0 vicryl and 3-0 nylon sutures. The data were presented as counts and percentages. Data was also represented in the form of a pie chart revealing the etiology of injury.

Results

A total of 63 patients reported with fractured condyle from June 2013 to May 2016. Only 24 patients (42.85%) had subcondylar fractures which were treated by transparotid retromandibular approach. Of these 18 were males (59.25%) and 8 were females (29.62%). The most common modes of injury were road traffic accidents (62.5%), interpersonal assault

(16.66%), sports injury (8.33%) and other miscellaneous reasons (12.5%). (Fig. 3)

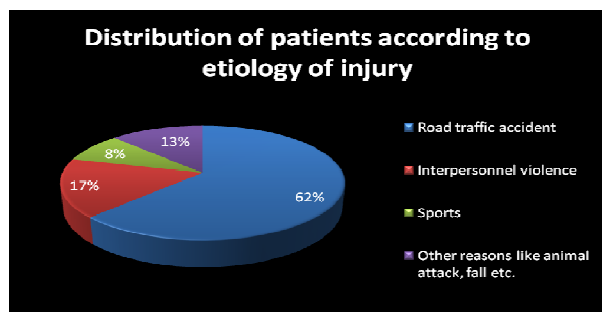


Fig.3 Distribution of patients according to etiology of injury

Isolated subcondylar fractures were seen in only 7 patients (29.17%) and the rest 17 patients (70.83%) had some associated facial fracture. Associated fracture of mandibular symphysis/parasymphysis was seen in 9 patients (37.5%), body of mandible in 3 patients (12.5%), mandibular angle fracture in 2 patients (8.33%), and ipsilateral zygomatico maxillary complex fracture in 3 patients (12.5%). (Table 1) The associated fractures were treated by open

reduction and internal fixation according to Champy's principles of osteosynthesis. Unilateral condylar fracture was seen in 22 patients (91.66%) while 2 patients sustained bilateral condylar fractures (8.33%). Out of a total of 26 subcondylar fractures, 20 were displaced (76.92%), 4 were deviated (15.38%) and 2 were dislocated (7.69%). (Table 2) The average duration of surgery was 40 min (range: 25-55min) for satisfactory exposure and reduction of each condylar fracture through transparotid retromandibular approach. The anatomic reduction and fixation of the fractured segments was satisfactory in all the cases. Occlusion was restored satisfactorily in all patients. The fracture stability was satisfactory in all the cases (100%). All patients were allowed to start soft diet within 1st day of the surgical procedure. All the patients had regular follow-up checks at 1, 3 and 12 months postoperatively. All patients had returned to their normal diet within 45 days of the surgical procedure.

Table 1: Distribution of patients with multiple fractures according to occurrence of associated facial fracture (N=17)

Site of associated fracture				
	Parasymphysis/symphysis	Body of mandible	Angle of mandible	ZMC fracture
No. Of Patients	9	3	2	3

Table 2: Distribution of patients according to the type of condylar fracture.

Unilateral	Bilateral	Displaced	Deviated	Dislocated
22	2	20	4	2

Table 3: Distribution of patients according to the incidence of post operative complications

Permanent Facial nerve injury	Salivary fistula	Fractured miniplates
0	2(8.34%)	1(4.17%)

In post-operative complications, transient facial nerve injury was seen in 4 patients (16.67%)

which returned to normal function in 3 months, none of patients (0%) reported with any

permanent facial nerve injury, 2 (8.34%) cases reported with salivary fistula which responded to conservative management (pressure dressings and medications to reduce salivary secretion), 1 (4.17%) patient reported with fractured miniplate which was managed by additional surgical intervention. (Table 3) The postoperative scar was imperceptible and considered satisfactory by all the patients (100%). Postoperatively none of the patients complained regarding occlusion, maximum interincisal opening, and other range of mandibular movements.

Discussion

For surgical exposure of subcondylar fracture, the focus is laid on obtaining an optimal view of the fracture site while minimizing the risk of injury to the facial nerve. Preauricular approach being too high provides a compromised access to subcondylar fractures whereas the submandibular approach appears to be very low. The retromandibular approach was first described by Hinds and Girotti^[9] in 1967 and modified in by Koberg and Momma.^[10]

The retromandibular transparotid approach offers the advantage of shorter working distance from the skin incisions to the condyle, good access and visualization to the posterior border of the mandible and sigmoid notch favoring the fracture manipulation and reduction.^[11] The angulation of screw placement is perpendicular to the ramus of the mandible making the fracture fixation easy. The window between the buccal and marginal mandibular branches of the facial nerve is the preferred area of dissection for the transparotid retromandibular incision. The minimal working distance from the incision to the fracture site minimizes the risk of damage to the facial nerve since it can be identified and retracted under direct vision. The incidence of transient damage to branches of the facial nerve with the use of retromandibular transparotid approach has been reported to be between 12% and 48% by Bhutia O et al,^[12] 18% by Shi D et al,^[10] and 17.2% by Ellis et al.^[13] Transient facial nerve paresis was seen in 16.67% patients in this study which recovered over period of time. The

retromandibular transparotid approach for treatment of mandibular subcondylar fractures provides anatomic as well as functional rehabilitation of the temporomandibular joint (TMJ) utilizing short surgical exposure time and minimal cosmetic impairment.

Tansparotid retromandibular approach renders good exposure to the subcondylar fractures of the mandible for open reduction and internal fixation. The anatomical and functional outcomes achieved were satisfactory with minimal risk of damage to the facial nerve and inconspicuous incision marks.

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