DO WE NEED MULTIPLE SURGICAL APPROACHES FOR MANAGEMENT OF CONDYLAR FRACTURES? - A RETROSPECTIVE STUDY OF TEN YEARS EXPERIENCE

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Abstract: Condylar fractures account for 20% to 62% of all mandibular fractures but occupies a unique and a very debatable place in the realm of Oral & Maxillofacial Surgery. The primary goal of treatment is re-establishment of normal occlusion and mastication. The ideal surgical technique to achieve these goals is variable and based on uniqueness of the injury after weighing the risk versus benefit ratio of surgery. This is a retrospective analytical study of ten years data obtained regarding all types of mandibular condylar fractures reported and managed in the Department of Oral & Maxillofacial Surgery, Armed Forces Medical College, Pune.

A database search of records from the departmental archiving of patients who were treated for condylar fractures in the Department of Oral & Maxillofacial Surgery of Armed Forces Medical College, Pune by various maxillofacial surgery teams during the period from 2007 to 2017 was carried out. The database revealed a total number of 181 cases of mandibular condylar fracture of all types. Among these 143 are male and 38 are female patients age ranging from 6 years to 71 years with a mean age of 38.5 years. Out of the 181 patients with 219 condylar fractures, unilateral subcondylar fractures were 121 (66.9%); bilateral subcondylar fractures were 38 (21%); fractures of the condylar head/intra capsular fractures were 12 (6.6%); residual deformity were 04 (2.2%); and 06 (3.3%) cases of condylar fractures were with minimal or no displacement. Surgical management with open reduction and internal fixation (ORIF) was done in 165 cases (91.16%) and condylectomy was done in 08 (4.4%) cases. The surgical approaches included retromandibular transparotid in 65 sides (30.8%) of 51 patients, retromandibular anterior parotid transmassetric in 146 sides (69.2%) of 122 patients. No intra oral approach was documented. In 30 cases (18.2%) neuromotor deficit of facial nerve injury was documented either affecting buccal or zygomatic branches or both. Postoperative salivary fistulae developed in 12 cases (6.9%). The complications related to the surgical approaches were analyzed using Pearsons' chi-square-test and Spearman correlations showed a high statistical significance in regards to facial nerve injury/deficit and salivary fistulae with a p-value less than 0.05.

In this retrospective study, we conclude that surgical treatment of condylar process fractures are superior to the results of conservative treatment. Retromandibular anterior parotid transmassteric approach yields excellent results providing adequate access to the fracture site, allowing proper anatomic reduction and fixation with lesser incidence of complications in comparison to transparotid approach and are statistically significant.

Key Words: **Subcondylar fractures, Transmassetric, Transparotid, Anterior Parotid**

I. INTRODUCTION

Condylar fractures account for 20% to 62% of all mandibular fractures but occupies a unique and a very debatable place in the realm of Oral & Maxillofacial Surgery(1). This is very much due to the fact that almost all condylar fractures are successfully manageable with both open reduction & closed treatment though there exist few exceptions. However, what matters the most is a rationalized approach towards the management of these fractures. By gone are those times of discussing and debating about the need for open reduction or closed treatment, various studies in the present era are focused mainly on when and what options should be executed in a rationalized manner. Most of the authors advocate closed management as the most appropriate modality. However, ongoing researches in the dynamics of maxillofacial surgery, better understanding of associated sequelae and advent of newer equipment has led most of the surgeons worldwide to opt for surgical reduction of the fracture(1).

The primary goal of treatment is re-establishment of normal occlusion and mastication. Considerations for jaw mechanics and overall aesthetics though important, occupy a secondary place. The ideal surgical technique to achieve these goals is variable and based on uniqueness of the injury after weighing the risk versus benefit ratio of surgery.

Ellis et al recommends open treatment in edentulous patients and patients with edentulous posterior mandible where closed reduction and loss of posterior facial height issues are impossible to be addressed(2). This loss of height leads to altered jaw

mechanics with significant deviation toward the ipsilateral side and open bite deformity in case of bilateral condylar fractures leading to discrepancy in occlusion that are difficult to correct on a later stage. There are two schools of thought being debated extensively. Some authors argue that severe dislocation of the fractured condyle is an indication for open reduction and internal fixation(1) and in other cases condylar remodeling will re-establish appropriate occlusion despite the visible alteration in jaw mechanics(3).

Though controversies still exist with regards to the approach for management of condylar fractures, advanced surgical techniques and innovative concepts have led to reduced perioperative challenges. Concurrently, there is an increased tendency for surgeons to perform open reduction of the displaced condylar fracture.

This is a retrospective analytical study based on the data obtained regarding all types of mandibular condylar fractures reported and managed by various oral & maxillofacial surgical teams in the Department of Oral & Maxillofacial Surgery, Armed Forces Medical College, Pune during the period between 2007 and 2017.

II. MATERIALS AND METHOD

A database search of records from the departmental archiving of patients who were treated for condylar fractures in the Department of Oral & Maxillofacial Surgery of Armed Forces Medical College, Pune by various maxillofacial surgery teams during the period from 2007 to 2017 was carried out.

A systematically obtained data, included total number of patients diagnosed with various condylar fractures, name, age, sex, mode of injury, nature and types of fracture, involved side, concomitant injuries, associated head injury, preoperative photographs and radiographs, mouth opening and all excursions of mandible, deviation of mouth on opening/closing, occlusal status, open bite, concomitant injury, informed consent for surgery, management modalities, difficulties encountered, surgical approaches and modifications, intraoperative and postoperative photographs and radiographs, postoperative pain and edema, postoperative maximum mouth opening, lateral excursion on the fractured and the opposite sides, deviation on opening the mouth, protrusive movement and occlusion, postoperative complications and its management such as pain, edema, wound infection, postoperative facial nerve function assessed using the House–Brackman Grading Scale, scar assessment made using the Patient and Observer Assessment Scale, salivary fistula and auricular paresthesia.

The obtained data was analyzed and studied to derive inferences regarding the rationale of contemplating surgical management as treatment modality for condylar fractures, compare the advantages and limitations of the various surgical approach, ease of access to fracture site, techniques of fixation, to find out the incidence of postoperative complications in respect of various surgical approaches and its management and to suggest it as a valuable protocol and nevertheless, the importance of maintaining database and archiving of patient records.

III. RESULTS

The database revealed a total number of 181 cases of mandibular condylar fracture of all types. Among these 143 are male and 38 are female patients age ranging from 6 years to 71 years with a mean age of 38.5 years (TABLE-1).

The most common mode of injury was road traffic accident (RTA) attributing to 129 cases (71.3%) followed by fall due to various reasons in 26 cases (14.4%), sports injury in 12 cases (6.6%), domestic violence and assault in 8 cases (4.4%), and occupational injury in 6 cases (3.3%) (TABLE-2).

Out of the 181 patients with condylar fractures, 177 (97.8%) patients had satisfactory dentition and 04 (2.2%) patients were completely edentulous. Four cases were pediatric with age ranging from 6 to 10 years with an average age of 8 years. Number of unilateral subcondylar fractures were 121 (66.9%); bilateral subcondylar fractures were 38 (21%); fractures of the condylar head/intra capsular fractures were 12 (6.6%); residual deformity were 04 (2.2%); and 06 (3.3%) cases of condylar fractures were with minimal or no displacement. Therefore, the total number condylar fractures managed was 219 (TABLE -3).

Analysis on the concomitant injuries in the involved mandible showed fracture of the parasymphysis on either of the side in 49 cases (27%); fracture of the angle on either of the side in 06 cases (3.3%); fracture of the symphysis and body were in 12 (6.6%) and 04 (2.2%) cases respectively. The other concomitant injuries were panfacial trauma in 15 cases (8.3%); association with fracture of zygomatic complex in 05 cases (2.8%); with midface trauma at various levels of Le Fort in 11 cases (6%) (TABLE-4).

All patients were subjected to radiological imaging which included orthopantomogram (OPG), Reverse Towne's view, CT scan for evaluation and assessment of fracture pattern, level and type of fracture, degree and displacement in order to contemplate management. All patients underwent maxillomandibular fixation with Erich arch bar and elastics pre-operatively.

The surgical approach depended on the anatomical site of the fracture, type of the fracture, preference of the various surgeons. Concomitant fractures of the mandibular body were treated by open reduction and osteosynthesis. Conservative management was done in 08 cases (4.4%). The closed treatment included intermaxillary fixation, period of observation and physiotherapy in the form of active mouth opening exercises. Surgical management with open reduction and internal fixation (ORIF) was done in 165 cases

(91.16%) and condylectomy was done in 08 (4.4%) cases (TABLE – 5). All surgical patients were operated under general anaesthesia, intubated via nasotracheal in 158 cases (91.3%) and transmylohoid route in 15 cases (8.7%). The surgical approaches included retromandibular transparotid in 65 sides (30.8%) of 51 patients, retromandibular anterior parotid transmassetric in 146 sides (69.2%) of 122 patients. No intra oral approach was documented (TABLE – 6).

IV. RETROMANDIBULAR TRANSPAROTID APPROACH

In all retromandibular transparotid approach, incision of 3–5 cm in length, parallel and posterior to the posterior border of the mandible was made starting 0.5 cm below the ear lobe (Fig. 1). The parotid capsule was identified after dissection through skin, subcutaneous fat and platysma. The parotid capsule was incised and blunt dissection performed to expose the masseter muscle. Facial nerve branches, if encountered, were carefully dissected and retracted either superiorly or inferiorly. The pterygomassetric sling at the posterior border of the mandible was incised for approximately 6–8 cm. Dissection was further carried out subperiosteally after incising the periosteum at the posterior border of the mandible and the fracture site was exposed. The fracture was subsequently reduced and fixed as per Meyer's modification (4) using two 2 mm four-holed titanium miniplate and titanium mini screws with 2mm diameter and 6mm or 8 mm in length (Fig. 2). Maxillomandibular fixation was released at the end of the procedure. Closed circuit drain was used in some cases (11 patients) and watertight closure of the pterygomassetric and parotid capsule was done with resorbable sutures and the skin was closed with non-resorbable sutures.

V. RETROMANDIBULAR ANTERIOR PAROTID TRANSMASSTERIC APPROACH

In Retromandibular Anterior Parotid Transmassteric Approach, 3-4 cm length incision was placed 0.5 cm below the earlobe, parallel to the posterior border of the mandible. Dissection was carried out to expose the parotid capsule and the anterior parotid margin identified and retracted posteriorly (Fig. 3). The fibers of the masseter are identified and incised. The condyle and posterior border of the ramus are exposed by subperiosteal dissection in a posterolateral direction. Fracture was reduced and intermaxillary fixation was done to achieve maximum cusp to fossa relationship. Fixation and surgical wound closure was done in the similar manner as described earlier in the transparotid approach (Fig. 4). However, in 04 cases (1.8%) fixation was done with extra-corporeal method via anterior parotid approach. No transcutaneous trochar or endoscope were used in any of the cases.

In all cases, irrespective of the surgical approach, arch bars was kept in situ for a period of 3 to 5 days in order to place the patient on intermaxillary fixation with elastics to correct postoperative occlusal discrepancy, if any. All patients were advised to have a soft and semisolid diet for two weeks. Physiotherapy in the form of active mouth opening exercises was started as early as from the first post op day. Patients were usually discharged 3–5 days postoperatively. Suture removal was done on the seventh post-operative day. All patients are were followed up for a minimum period of 01 year post treatment at various intervals. Evaluation of facial symmetry, maximum mouth opening, static and functional occlusion, lateral excursion of mandible to the operated side, temporomandibular joint health, neurological impairments, scarring and aesthetic outcomes were evaluated, documented for all patients and archived.

The average delay between the date of injury and the surgery was 5 days with range of 3 to 7 days. Out of the 177 (97.8%) dentate patients, 08 (4.5%) were managed with closed treatment and 08 (4.5%) underwent condylectomy. In out of this 08 cases who underwent closed treatment 05 (62.5%) cases showed occlusal discrepancy and out of 08 cases of condlyectomy 05 cases (62.5%) showed occlusal discrepancy. All 4 edentulous patients were taken up for ORIF adding up to a total of 165 patients who underwent ORIF.

Out of 219 condylar fractures in 181 patients, 203 (92.7%) fractures in 165 patients underwent ORIF. Out of 161 dentate patients who underwent ORIF, pre-injury occlusion, both static and functional status was restored 149 (92.5%) patients which was assessed by clinical examination of first molar relationship and subjective signs from the patients respectively. In 12 (7.5%) patients, who had multiple and concomitant fractures, mild occlusal discrepancy with open bite was noticed in the immediate postoperative phase which eventually settled in 07 to 10 days with guiding elastics. Therefore, out of 177 dentate patients who underwent management of condylar fractures with both conservative and surgical, a total of 22 (12.5%) patients had occlusal discrepancies. Maximal postoperative mouth opening ranged from 32 to 44 mm with an average of 38 mm. All patients were pain free at rest, however mild pain on chewing and mild crepitus on palpation were noticed in 14 (6.6%) temporomandibular joints of 12 patients. Documented evidence shows none of these patients had persistent symptoms and signs with a follow up of one year.

In 30 cases (18.2%) neuromotor deficit of facial nerve injury was documented either affecting buccal or zygomatic branches or both. Out of these 30 cases, 22 underwent ORIF and 01 underwent condylectomy via transparotid surgical approach (total = 23 cases; 45.1%) and 07 cases (5.8%) underwent ORIF via anterior parotid approach. All cases of facial nerve injury resolved completely in 3–4 weeks without treatment except in 2 (0.9%) cases (1 case (1.5%) in transparotid and 1 case (0.7%) in anterior parotid) who had unresolved neuromotor deficit of zygomatic branch distribution at one year follow up. There were no cases of fracture of the miniplate documented.

Postoperative salivary fistulae developed in 12 cases (6.9%), and lasted for 1–3 weeks and managed conservatively with antibiotics, pressure dressings, and serial aspiration. Out of these 12 cases, 9 (13.9%) occurred in patients who underwent transparotid approach and 3 (2%) in anterior parotid approach (Fig. 5).

There was no case of greater auricular nerve anaesthesia/paraesthesia. Wound dehiscence was noticed in 11 (6.3%) cases with 6 (9.2%) occurring with transparotid and 5 (3.4%) in anterior parotid approach. None of the patients suffered from postoperative bone resorption or condylar necrosis. There was also no condylar shortening visible on postoperative radiographs (Fig – 6). None of the patients was observed to have gross facial asymmetry. Scar was very minimal to inconspicuous in all cases except in 9 (5.2%) cases who developed hypertrophic scar with 4 (6.2%) occurring in transparotid and 5 (3.4%) in anterior parotid approach (TABLE – 7). The details regarding average time taken for the procedure was not documented. The data collected was evaluated with the use of **IBM SPSS Statistics Version 21**. Significant differences between the various approaches and its complication were identified in using Pearsons' chi-square-test and Spearman correlations. A p-value less than 0.05 was regarded as statistically significant.

The evaluation of various complications which are related to the surgical approach showed a high statistical significance in regards to facial nerve injury/deficit and salivary fistulae (TABLE – 8). No statistically significant differences between the various approaches could be detected in any group regarding the wound dehiscence, occlusal discrepancy, TMJ complications or resultant scar (TABLE – 9).

VI. DISCUSSION

Mandibular condylar fractures are extremely frequent (20 to 62%) and it attracts maximum attention in maxillofacial trauma than any other site(5). Numerous studies have been published in this regard over the past two decades however still there exist controversies in regards to its most frequent etiology, pathophysiology, classification, appropriate management protocol, expected complications and its management. In this study, the male/female ratio was 3:1. This sex ratio is similar to other studies of Amaratunga, 1987; Ellis et al., 1985; Sawazaki et al., 2010; Silvennoinen et al., 1992; Villarreal et al., 2004; Zachariades et al., 2006; however, higher than that reported by Marker et al, 2000 as 2:1. The most common cause was observed to be RTA attributing to 71.3% followed by fall, assault, sports injury.

Historically, most of the condylar fractures were managed with closed treatment with various types of immobilization and intermaxillary fixation. Though the anatomic reduction of fractured segment were not actually achieved, favourable results of form and function are obtained that relies completely on patients' adaptation to an altered anatomy and condylar remodeling. Therefore, it remains as an appropriate treatment modality for a large number of condylar fractures, that includes intracapsular fractures, fractures with minimal or no displacement, pediatric condylar fractures and in patients whose medical or social conditions preclude other forms of treatment(6). However, closed techniques without direct reduction of the fractured fragments and functionally stable fixation may result in serious problems that include facial asymmetry, malocclusion and other oral dysfunction, obstructive sleep apnea, and nevertheless craniomandibular ankylosis. With advances in the understanding of surgical anatomy and osteosynthesis, to avoid such complications open reduction and internal fixation of condylar fractures has become more prevalent.

Zide and Kent in 1983 first outlined the indications for open reduction of mandibular condylar fractures(7). Reha Kisnisci (2013), claims that significant improvements in diagnostic modalities, surgical modifications to provide adequate access have led to choose the surgical management over closed treatment even in complex and difficult fractures(8). The author had also outlined the expanded indications for surgical management in conditions which were previously believed to be inoperable. However, some reasons still exist for not completely abandoning closed management to justify surgical modalities, despite several developments, is the possible unavoidable surgical complications. Also, reduction and alignment of fractured bones by taking guidance and advantage from the dental occlusion is not completely reliable as in the fracture management of mandible with the fracture lines crossing or involving the teeth(9).

Various surgical approaches for better access and fixation of the condyle has been described by many authors and published in international literature. They all claim that surgical management allows anatomic reduction and earlier function of the condyle, reduces risk of ankylosis or reduced functional capabilities. However, there are some condylar fractures that continue to invite debate and dilemma among surgeons regarding the best course of management. Nevertheless, whatever may be the management, the starting point is a thorough understanding of the surgical anatomy and biomechanics of the fractured condyle.

Ellis and Throckmorton studied the neuromuscular adaptation and masticatory function of patients with condylar fractures and described how the masseteric activity increases on the non-fractured side, and decreases on the injured side that invariably transfers load away from the injured condyle(3). This neuromuscular compensation is less required if open reduction of fragments is undertaken. In closed treatment, the mandibular condyle on healing often reestablishes an articulation that is more anterior and lower on the eminence, which may reduce the translational component of mandibular opening. This skeletal compensation is avoided with open reduction of the fracture. Recent meta-analytical studies also report a statistically significant reduction in the incidence of malocclusion and lateral deviations on opening, improved protrusive and laterotrusive movements with surgical therapy compared with closed management. A lower incidence of infection was the only variable studied that favored closed management, whereas differences in maximum opening and pain were not significant(6).

Selection on a particular approach to access the fracture depends on the location of the fracture and the height, location and type of osteosynthesis being contemplated. There are many approach discussed by many authors and protocols that are followed in many institution worldwide which include intraoral, periangular, retromandibular, preauricular, and retroauricular. Approaches to the subcondylar base and neck should be distinguished from head fractures. Condylar head fractures can be accessed through the

preauricular or retroauricular approaches. Neck fractures can be accessed through intraoral, periangular, retromandibular and preauricular and postauricular incisions. Base fractures can be accessed through intraoral, periangular, and retromandibular incisions(10). However, these are just general guidelines only and are not sacrosanct. These approaches can actually differ from individual surgeon's choice, skill and experience.

Most authors suggest that the treatment of choice in adult patients should be made as per the specific anatomical site of the fracture and the grade of dislocation and/or displacement despite the ever ongoing debate. In this retrospective study, mixture of classifications that are often cited in literature were used by various surgeons at various point of time such as Spiessl and Schroll (1972), Eckelt (2000); Lauer et al., (2006); Klatt et al., (2010) Loukota et al.,(2005). This might be in part attributable to a lack of uniformity of classifications of the fractures of the mandibular condyle. In this retrospective study, it is noticed that all condylar fractures were managed with retromandibular incision with modification of either transparotid or anterior parotid transmassetric approach. ORIF was done in 165 cases (91.16%) and condylectomy was done in 08 (4.4%) cases with excellent results. No documentation or exact statistical data was available regarding how many cases were classified under a particular classification or level of the fracture. However, all surgical treatment were done via retromandibular approach successfully, proving it as a versatile surgical approach that can be used for addressing all condylar fractures irrespective of levels and types. The modifications and variations differed only in terms of postoperative complications.

The most common complication encountered was facial nerve dysfunction accounting to 18.2% involving either buccal or zygomatic branch. This is due to the fact of blunt dissection and to tissue traction during surgery. It is also observed that this incidence is more in transparotid approaches than anterior approach. This concurs with the results obtained by Antonio and co-workers in management of 25 consecutive condylar fractures via retromandibular transparotid approach where they found transient facial nerve palsy occur in 13% to 22% of cases(11). This opinion is also in accordance with the study by Hou et al. (2014), who compared the complications arising from retromandibular and transparotid approaches. The authors showed that in the group treated with the retromandibular approach the percentage of transient facial nerve paresis was not higher than 13% and this complication was absent in all patients treated with the transparotid approach (Hou et al., 2014). On the other hand, Croce et al. (2010), in their study on transparotid approach found a transient paresis of the facial nerve in 27% patients, whereas Ellis et al. (2000), on their examination in the 6th week after open reduction and fixed osteosynthesis of condylar fracture, observed this complication in 17.2% patients. A spontaneous recovery of the nerve function within 6 months postoperatively was observed in all the cases, supporting earlier findings by other authors (Croce et al., 2010; Hou et al., 2014; Ellis et al., 2000)(12). Cases have been described in other literature of paresthesia of the auriculotemporal nerve and paresthesia of the great auricular nerve or of other nerve trunks were observed in patients who underwent retromandibular approach. However no such complication was not observed in our retrospective study.

In this study, postoperative occlusal disturbances was documented in 16 cases (15.7%), which eventually settled in 07 to 10 days with guiding elastics. Maximal postoperative mouth opening ranged from 32 to 44 mm with an average of 38 mm. Postoperative salivary fistulae developed in 12 cases (8%). Mild pain on chewing and mild crepitus on palpation were noticed in 14 (6.6%) temporomandibular joints of 12 patients. Similar results was shown by Yang and Patil (2012), in a study focused on the use of transparotid approach in the treatment of condylar base fractures on 42 patients with occlusal disturbances in 3 cases (7%), post-operation haematoma in 2 cases (4.8%), a salivary fistula in 3 cases (7%) and transient paresis of the facial nerve in 8 patients (19%). Temporomandibular disorders in terms of acoustic phenomena were found in 5 patients (12%). Mean maximum opening was 44 mm and post-operative scars were acceptable for all patients(12).

In another study by Wilson and co-worker on Transmasseteric antero-parotid approach for open reduction and internal fixation of condylar fractures claimed that the most feared complication common to all approaches is injury to the facial nerve and they observed to be temporary in 30—48% and permanent in1%. They also claimed that marginal mandibular branch is most often injured in the submandibular and retromandibular approaches, whereas the preauricular approach often causes injury to the temporal and zygomatic branches(13).

In our study, we found that standard two plate fixation on the compression tension lines, one on the posterior border and another parallel and below the sigmoid notch as explained by Meyer et al (Fig – 4) was followed in all cases(4). Both transparotid and anterior parotid approach allowed proper fracture reduction and osteosynthesis with good aesthetic results. Salgarelli et al in 2013, conducted a retrospective study in 13 patients and suggested certain modification on how to improve retromandibular transmasseteric anteroparotid approach for mandibular condylar fractures. They also discussed the merits of anterior parotid approach in comparison with other surgical approaches. Accordingly, they claimed that the retromandibular approach offers excellent access to the ramus–condyle unit and reduces the risk of facial nerve damage. This approach directly exposes the condyle and fracture, enabling good visualization and reduction, as well as proper fixation. Postoperative scarring was also minimal (14).

VII. CONCLUSION

Within the intrinsic limits of this retrospective study and review of literature, it is evident that management of condylar neck fractures seem to benefit from ORIF, irrespective of the surgical approach. However, the complications may be minimized by adhering to a proper protocol and mastering a particular approach. In this retrospective study, we conclude that surgical treatment of condylar process fractures are superior to the results of conservative treatment. Retromandibular anterior parotid transmassteric

approach yields excellent results providing adequate access to the fracture site, allowing proper anatomic reduction and fixation with lesser incidence of complications in comparison to transparotid approach and are statistically significant. However, the value and advantages of the endoscopic assisted intraoral approach are not discussed in this paper.

VIII. FIGURES

Fig – 1: Retromandibular Transparotid approach

Fig – 2: Fracture reduced and fixed using two 2 mm four-holed titanium miniplate and titanium mini screws

Fig – 3: Dissection carried out to expose the anterior parotid margin identified and retracted posteriorly

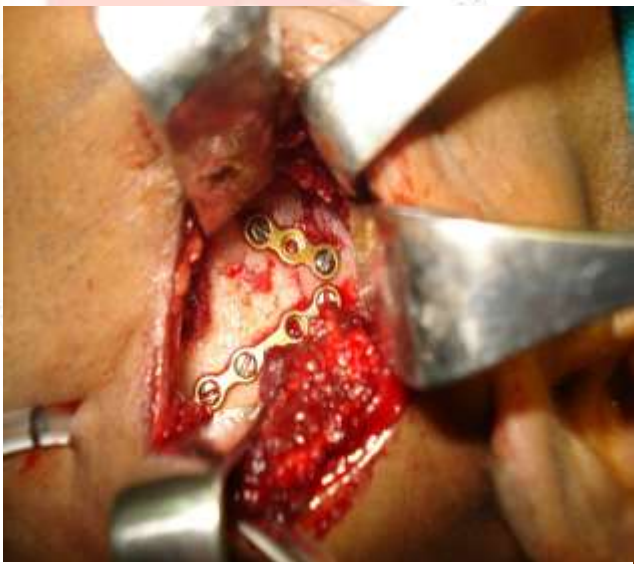

Fig – 4: Fixation done as per Meyer's modification through anterior parotid transmassetric approach

Fig – 5: Postoperative salivary fistulae managed with drain and serial aspiration

Fig – 6: Postoperative radiograph showing no condylar shortening

IX. TABLES

Table – 1
Age and sex distribution of patients

Male	143
Female	38
No. of Pediatric patients	4
No. of Adult patients	177
Average age in years	38.5

Table – 2
Distribution of fractures according to etiology

Mode of injury	No. of cases
Road Traffic Accident (RTA)	129
Fall	26
Sports injury	12
Domestic violence/assault	8
Occupational injury	6
Total	181

Table - 3 Distribution of condylar fractures

Total Number of patients	Total Number of condylar fractures	Number of unilateral condylar fractures	Number of bilateral condylar fractures	Number of intracapsular/ condylar head fractures	Number of Residual deformity	Number of fractures with minimal or no displacement
181	219	121 (66.9%)	38 (21%)	12 (6.6%)	4 (2.2%)	6 (3.3%)

Table - 4
Associated mandibular and facial fractures

Concomitant involved sites in maxillofacial region	
Symphysis	12 (5.5%)
Contralateral parasymphysis	45 (20.5%)
Ipsilateral parasymphysis	4 (1.8%)
Midface	15 (6.8%)
Ipsilateral angle	1 (0.5%)
Contralateral angle	5 (2.3%)
Contralateral body	12 (5.5%)
Total	95 (43.4%)

Table - 5
Management of condylar fractures

Type of management	No. of patients
No. of conservative management with IMF	08 (4.4%)
No. of surgical management	173 (95.6%)
ORIF	165 (91.16%)
Condylectomy	08 (4.4%)

Table - 6
Surgical approach and type of management

Surgical approaches	No. of sides	No. of ORIF	No. of condylectomy
Retromandibular Transparotid	65 (30.8%)	62 (95.3%)	5 (4.7%)
Retromandibular Anterior parotid Transmassetric	146 (69.2)	141 (96.6%)	3 (3.4%)
Total	211	203 (96.2%)	8 (3.8%)

Table - 7 **Postoperative complications attributed to the type of surgical approach**

Approaches	Total no. of patients	Total no. of sides	Complications						TMJ dysfunction (No. of joints)	Hypertrophic scar
			Temporary Neuromotor deficit of facial nerve (Zygomatic/ buccal branch)	Permanent Neuromotor deficit of facial nerve (Zygomatic/ buccal branch)	Wound dehiscence	Salivary fistulae of parotid gland	Occlusal discrepancy post ORIF	Occlusal discrepancy post condylectomy		
Retromandibular Transparotid	61 (35.3%)	65 (30.8%)	23 (45.1%)	1 (1.5%)	6 (9.2%)	9 (13.9%)	4 (6.2%)	3 (4.6%)	5 (7.7%)	4 (6.2%)
Retromandibular Anterior parotid Transmassetric	112 (64.7%)	146 (69.2)	07 (5.8%)	1 (1.5%)	5 (3.4%)	3 (2%)	2 (1.4%)	2 (1.4%)	9 (6.2%)	5 (3.4%)
Total	173	211	30 (17.3%)	2 (1.2%)	11 (6.3%)	12 (6.9%)	6 (3.5%)	5 (2.9%)	14 (8%)	9 (5.2%)

TABLE – 8

Surgical Approach * Salivary fistula of parotid gland

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	12.493[a]	1	.000		
Continuity Correction	10.302	1	.001		
Likelihood Ratio	11.178	1	.001		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	12.436	1	.000		
N of Valid Cases	219				

a. 1 cells (25.0%) have expected count less than 5. The minimum expected count is 3.56.

b. Computed only for a 2x2 table

TABLE – 9

Surgical Approach * Facial Nerve Injury with temporary neuromotor deficit

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	36.771[a]	1	.000		
Continuity Correction	34.208	1	.000		
Likelihood Ratio	33.536	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	36.603	1	.000		
N of Valid Cases	219				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.90.

b. Computed only for a 2x2 table

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