

Management of Condylar Fracture: Open versus Close Reduction- A Retrospective Analysis

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ABSTRACT

Aim: The aim of the study was to identify the difference in outcomes between Open Reduction and Internal Fixation (ORIF) and Closed Treatment (CT) for adult unilateral mandibular condylar fractures.

Material & Method: 20 patients who came under the inclusion criteria were reviewed at 1 month, 6 month and 1 year after treatment for examination of occlusion, mouth opening, scar perception, pain, motor and sensory nerve function. The patients were divided in two groups according to the treatment plan. The data obtained was analysed using an unpaired t-test ($p < 0.05$).

Results: No statistical differences were noted in both groups for occlusion, pain, motor and sensory nerve evaluation. Mouth opening was reduced initially in CT group but after 6 months no difference was noted in both the groups. Scar was visible in ORIF group. There were no significant long term major complications in both the groups.

Conclusion: Both ORIF and CT methods for mandibular unilateral condylar fracture had acceptable outcomes without any major complications within 1 year follow up.

Keywords: Condylar fracture, ORIF, Closed treatment.

INTRODUCTION

Following the facial trauma, mandible and particularly mandibular condyle is frequently injured bone and the rate is 19% to 67% of all mandibular fractures^{1, 2, 3}. Two treatment modalities are there to treat unilateral mandibular condyle, closed treatment (CT) and Open reduction and internal fixation (ORIF). According to ELLIS & THROCKMORTON⁴ the management of mandibular condylar fractures has created more discussion and controversy than any other topic in the field of trauma. 20 patients which came to Department of Oral & Maxillofacial Surgery, Vaidik Dental College and Research Centre were included in the study.

The aim and objective of the study is to assess the post-operative outcome of unilateral mandibular condyle fracture in CT group and ORIF group in terms of functional and aesthetic outcomes and making the treatment decision which provides good quality of life to the patient.

MATERIALS AND METHOD

Total 20 patients, 13 male and 7 female, coming in inclusion criteria were recalled and reviewed at one month, six months and one year post treatment to assess the treatment outcome. The patients included in the study were adults above 18 years of age, unilateral condylar fracture alone or associated with other mandibular fractures

Received: Aug. 11, 2016; Accepted: Oct. 3, 2016

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which are non-infected fractures. The patients had no other jaw fractures which was checked clinically or radiologically. Patients were excluded as: 1) Incomplete information about trauma, 2) Presence of ankylosis of TMJ after condylar injuries, 3) Previously treated condylar fracture surgically in other centre.

Patients with subcondylar fracture or disturbed occlusion were planned for open reduction and internal fixation (ORIF). In ORIF, standard pre auricular incision was given and fixation was done with monocortical screws and 4 holed straight titanium mini plates. Maxillomandibular fixation was not given in any patient post surgically. Patients with condylar head or neck fracture with normal occlusion was treated by closed treatment (CT). No surgical exploration was done and Maxillomandibular fixation was given for 2-3 weeks followed by physiotherapy and soft diet. The physiotherapy was given for 1 month post operatively.

Information was obtained from records and follow up visits. The data was collected including age, sex, type of condylar fracture and other associated fracture. Pre surgical data was collected using standard history proforma. The surgical and postsurgical data was collected using operative notes and follow up records. The patients were recalled on 1 month, 6 months and 1 year for review. At one month, six month and one year follow up, examination of patient was targeted at

Table 1: Occlusion in different group

Occlusion (Total 10 patients per group)	CT group: 1 month	CT group: 6 month	CT group: 1 year	ORIF group: 1 month	ORIF group: 6 month	ORIF group: 1 year
Same as to pretraumatic occlusion	10	9	9	10	8	8
Slight disturbance in occlusion	-	1	1	-	2	2
Malocclusion during mastication	-	-	-	-	-	-
Needed rehabilitation	-	-	-	-	-	-

Nine patients had no pain in CT group after one month and after six months. In ORIF group, two patients had slight pain in TMJ region while giving

assessing functional ability and limitations of Temporomandibular joint. Both the joints were assessed for various movements, pain and clicking sounds. Maximum mouth opening was recorded. Deviation from midline and occlusion was noted.

An assessment of occlusion and pain in the TMJ was noted using 5 unit scale where 1 indicates a good outcome and 5 indicates worst outcome. Motor and sensory nerve assessment and evaluation of post-operative scar were also documented.

RESULTS

A total of 20 patients who fulfilled the inclusion criteria were included in the study of which 13 were male patient and 7 were female patient. The mean age of the patient was 27 years. The etiological factor for the fracture was road traffic accidents in 100% cases. Out of 20 patients, 7 patients had isolated unilateral condyle fracture, and 13 patients had associated symphysis, parasymphysis, body or angle fracture. In which, 10 patients underwent ORIF and 10 patients underwent CT. The pretraumatic occlusion was achieved in all the patients in CT group at 1 month. After 6 months follow up, 1 patients had slight disturbance in occlusion which persists also after 1 year. In ORIF group, pretraumatic occlusion was achieved in all patients at 1 month and at one year review, two patients had occlusal disturbance (Table 1).

functional movement after one month review. After one year review, one patient had pain associated with TMJ (Table 2).

Table 2. Pain perception in different group

Pain (Total 10 patients per group)	CT group: 1 month	CT group: 6 month	CT group: 1 year	ORIF group: 1 month	ORIF group: 6 month	ORIF group: 1 year
No associated pain	9	9	10	8	9	9
Slight pain	1	1	0	2	1	1
Moderate pain	-	-	-	-	-	-
Pain limiting routine activity	-	-	-	-	-	-

In CT group, mouth opening was restricted in all patients which was below 30 mm but after one year follow up, all the patients had mouth opening more than 51 mm except one patient. In ORIF group, mouth opening was restricted below 20 mm

in one patient and rest of all had average type of mouth opening which was ranging from 41 mm to 50 mm. After one year review, all the patients had normal mouth opening except one patient (Table3).

Table 3. Mouth opening in different groups.

Mouth opening (Total 10 patients per group)	CT group: 1 month	CT group: 6 month	CT group: 1 year	ORIF group: 1 month	ORIF group: 6 month	ORIF group: 1 year
<20 mm	3	-	-	1	-	-
21 mm to 30 mm	7	2	-	-	2	-
31 mm to 40 mm	-	1	1	9	-	1
41 mm to 50 mm	-	7	-	-	8	-
>51 mm	-	-	9	-	-	9

None of the patients reviewed in our study had any motor or sensory nerve weakness regarding the facial nerve in CT group. In ORIF group, after one month two patients had paresthesia and in one patient it persists even after

one year (Table 4). The extra oral scar was perceivable in all patients in ORIF group but none was complaining about it. None of the patients had any other complication like plate fracture, sinus tract formation, sialoceles or screw loosening.

Table 4. Sensory and motor nerve function in different group

Sensory and motor nerve function (Total 10 patients per group)	CT group: 1 month	CT group: 6 month	CT group: 1 year	ORIF group: 1 month	ORIF group: 6 month	ORIF group: 1 year
Normal functioning	10	10	10	8	9	9
Sensory loss	-	-	-	2	1	1
Sensory and motor loss	-	-	-	-	-	-

DISCUSSION

For unilateral condylar fracture, Open Reduction and Internal Fixation is considered treatment of choice in many centres. Whereas for

moderately displaced fracture, ORIF is still under debate⁵⁻⁹.

In closed treatment group, basically angulation of fragment and shortening of ascending ramus

remained unchanged after six months. These two points are noticeably improved in ORIF group. The patients in ORIF also reported better treatment results in terms of mouth opening and less pain. Other retrospective studies demonstrated a good anatomical position of condyle after open reduction. Whereas there was no proper difference in functional outcomes in both groups ^{10, 11}.

Edward Ellis et al.¹² reported in literature that facial nerve weakness had seen in 17.2% of cases, salivary fistulae had seen in 2.3% of cases, visible scar was present in 50% of cases and hypertrophied surgical scar had seen in 2% of cases. In our study, we found 10% of cases having facial nerve weakness, a drawback for Open Reduction and Internal Fixation.

The approach for ORIF depends upon fracture site and degree of displacement of fracture segment. In routine practice, they perform pre auricular, post auricular, retromandibular, submandibular, transparotid or combine approach¹³. In our study, we used pre auricular approach for all cases in ORIF group.

Landes and Lipphardt¹⁴ reported a mean mouth opening of 38mm in CT group and 55mm in the ORIF group. In our study, there was no statistically significant difference in mouth opening between both groups after one year. Except one patient in both the groups, all the patient had more than 50 mm of mouth opening.

Edward Ellis III and Gaylord Throckmorton¹⁵ noticed no significant differences in occlusion in both the treatment groups. Studies by Luc M. H. Smets et al¹⁶ reported 92% of patients treated with ORIF with normal occlusion and 2% of the patients treated under CT had malocclusion. In our study, we found 20% of cases with slight occlusal disturbance after one year follow up in ORIF group.

According to Hyde. N et al¹⁷, 6% of patients treated with the closed reduction (CT) were left with chronic pain. Giacomo De Riu et al¹⁸ found the absence of pain in both the groups. Matthias Schneider et al¹⁹ reported that in their closed reduction group the level of pain had decreased with increase in the level of the fracture. In our study, 1% of cases had pain after six months follow

up in CT group and 1% of cases had chronic pain after one year in ORIF group.

CONCLUSION

After this study we concluded that there was no significant difference in postoperative measures like pain, mouth opening and occlusion. However, the patients treated with ORIF had visible scar and mild weakness of facial nerve. There was no any significant postoperative complication in any group.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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