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# A COMPARATIVE ANALYSIS OF OPEN VERSUS CLOSED TREATMENT OF FRACTURES OF MANDIBULAR CONDYLAR PROCESS

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## ABSTRACT:

**Background:**Fractures of mandibular condyle represent 20% to 30% of all mandibular fractures. There are two principal therapeutic approaches to these fractures : conservative functional treatment and surgical. This study was conducted to compare the outcome of open and closed treatment of mandibular condylar process.

**Materials and methods:**This study was formulated to do comparison between the two treatment alternatives, open reduction with fixation and conservative functional treatment ( weekly mouth opening exercises for the periods of 4 weeks) of unilateral mandibular condylar fractures. Total 15 patients with trauma related unilateral fractures of mandibular condyle reporting to Department of Oral and Maxillofacial Surgery, Goverment Dental College, Thiruvananthapuram ,Kerala were selected for the study. 10 patients were in conservative functional group and 5 patients in surgical group (open reduction with fixation). Clinical examination was done for assessing mouth opening, deviation of mandible, occlusion, pain, chewing problems, clicking sound and radiographic ramus condylar height on orthopantomograph (OPG) at initial examination, 4 weeks, 3 months and 6 months follow ups.

**Results:**At the end of the study mean mouth opening in conservative functional group was 30 mm and 34 mm for surgical group. Deviation of mandible was 0.5 mm in conservative group and those in surgical group had no deviation. One patient in conservative group had deranged occlusion whereas it was normal in surgical group. Pain values were around 2 (assessed with visual analogue scale) in conservative group and 0 in surgical group. 2 patients in conservative group had difficulty in eating hard food while surgical cases had no difficulty in chewing. No clicking sound was observed in any of the patients in both the groups after treatment . There was reduction of condylar height by mean of 1.57 mm in conservative group but not after anatomic reduction and fixation condyle in surgical group.

**Conclusion:**Open reduction and fixation of mandibular condylar fractures gives better clinical and radiographical results as compared to conservative management.

**Key words:** condylar fractures, open reduction and fixation, closed reduction, occlusion.

## INTRODUCTION:

Road traffic accidents are responsible for majority of the patients reporting with maxillofacial trauma. Among mandibular fractures, condylar region is the most frequent site accounting for about 25-35%.[1] Injury to condylar region deserves special consideration apart from rest of the mandible because of anatomical differences and healing potential.[2] Condylar fractures are classified according to the anatomical location and degree of dislocation of articular head. There are two principle therapeutic approaches to these

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fractures: conservative functional treatmentand surgical. There has been considerable controversy regarding the treatment of condylar fractures whether to treat them conservatively or surgically. There are complications associated with both treatment modalities. Some authors prefer open reduction as there is early recovery of function , less incidence of malocclusion and adequate mouth opening than those treated by closed reduction.[3,4]

Thus this study was formulated to evaluate the comparative benefits of condylar open reduction for unilateral displaced and dislocated condylar fractures over conservative functional therapy.

**Aims and objective:**

Aim- To compare two treatment alternatives, open reduction with fixation and conservative functional treatment (non surgical treatment) of unilateral condylar fractures on the basis of clinical and radiographic analysis.

Objective- To compare effectiveness of open reduction and stabilization over the conservative functional treatment in the management of unilateral fractures of mandibular condyle.

## MATERIALS AND METHODS:

This study was formulated to do comparison between the two treatment alternatives, open reduction with fixation and conservative functional treatment ( weekly mouth opening exercises for the periods of 4 weeks) unilateral mandibular condylar fractures.

**Study population:** Total 15 patients with trauma related unilateral fractures of mandibular condyle reporting to Department of Oral and Maxillofacial Surgery, Goverment Dental College, Thiruvananathapuram, Kerala were selected for this study. 10 patients were in conservative functional group and 5 patients in surgical group (open reduction with fixation).

**Inclusion criteria**

1. Age group from 16 to 50 years were included in the study.
2. All the patients with trauma related fractures of mandibular condyle which were unilateral low subcondylar fractures.

**Exclusion criteria**

1. Patients reported after a period of 2 weeks following trauma.
2. Uncontrolled systemic illness.
3. Patients with condylar fractures involving condylar head or intracapsular fractures.
4. Bilateral condylar fractures.
5. Patients with condylar malformation or congenital condylar defects.

**Materials**

Clinical and radiographic details of the patient over a period of six months. A proforma was formulated to record the following findings in both groups-Mouth opening (mm), deviation of mandible (mm), occlusion (normal /abnormal), pain ( visual analogue scale 1 to 10),

chewing problems (yes/no), clicking sound ( yes/no).

Radiographic evaluation with orthopantomograph (OPG) was done for assessing condylar ramal length (from gonial notch to highest point on condyle).

**Statistical analysis:** Data collected was analysed using SPSS software version 16.0. using the normal probability plot , it was found that the clinical parameters followed the distribution normality. Statistical significance was declared if the "p-value" was found ≤ 0.05. Therefore the parametric test used to compare the mean difference was paired "t" Test and median was also calculated**.**

## RESULTS:

Total sample size was 15 patients, 10 patients in conservative functional group and 5 in surgical group.

Mouth opening- mean mouth opening on initial examination were 20 mm. Mean mouth opening at 3 months in 1st group ( conservative functional) was 28.5 mm and 35 mm for 2nd group ( surgical). (Figure 1)

Deviation of mandible on maximum mouth opening- initial examination showed mean deviation of 3 mm and 4 mm in group 1 and 2 respectively but after 4 weeks, 3 months, 6 months group 1 showed 1 mm,1 mm and 0.5 mm deviation but no deviation in group 2.( Figure 2)

Occlusion - initial examination showed 4 patients in group 1 and all 5 patients in group 2 had deranged occlusion but after 4 weeks,3 months and 6 months, group 1 patients had deranged occlusion (3 patients,1 patient, 1 patient respectively) and all patients in group 2 had normal occlusion. ( Figure 3)

Pain around temporomandibular joint region on mandibular movements-

Pain value ( measured with visual analogue scale) was same in both groups initially which was 8. In group 1 it reduced to 6, 2 and 2 at 4 weeks ,3 months and 6 months respectively whereas pain was absent in group 2 after 3 months and 6 months. (Figure 4)

Chewing problem-

After 6 months 2 patients in group 1 and no patient in group 2 had mild to moderate pain while chewing hard food. ( Figure 5)

Clicking sound-

No patient in both groups had clicking sound in temporomandibular joint in mandibular movements.

Radiographic ramal condylar height-

Ramal condylar height loss was 1.57 mm in group 1 after 4 weeks, 3 months and 6 months but no loss was seen in group 2. (Figure 6)

## DISCUSSION:

Factures of mandibular condyle and joint represent 20-30% of all Mandibular

fractures and are thus among the most common facial fractures. They clearly differ from other mandibular fractures as they are difficult to diagnose clinically and radiographically. Mandibual condylar fractures are difficult to manage because on one hand difficult anatomical access to the condylar and joint region and the fact that the condylar region is a growth region [5].

In the past conservative functional treatment measures ( intermaxillary fixation and weakly active mouth opening exercises for a period of 4 weeks) were recommended exclusively for the mandibular condylar fractures, even for greatly displaced and dislocated fractures.

Indications for surgical treatment of condylar fractures are still centre of debate today. With modified surgical access and development of special instruments for repositioning of condyle and introduction of functionally stable osteosynthesis with use of miniplates and lag screws.[6,7]

Based on these observations this study was undertaken to evaluate the comparative benefits of condylar open reduction and fixation for unilateral displaced and dislocated condylar fractures over conservative fuctional therapy.

The results obtained in this study were similar to clinical studies of Wildmark G [8] and Takenoshita [9], where the authors have got the satisfactory post-operative function and occlusion in both surgical and conservative groups.

Vitomirs S. Knstantinovic [10] compared functional recovery after open and closed reduction of 80 unilateral condylar fractures of which 26 were surgically and 54 conservatively treated. There was no statistical difference in functional recovery between both groups. But radiographic examination showed better position of surgically reduced condyle.

Schneider M et al [3], in their study found that difference in average mouth opening was 12 mm between both groups. The average pain level was 25 ( visual analogue scale from 0-100) after conservative management and 1 after open reduction and fixation.

Gerbino G et al [4] found that surgical treatment of condylar fractures promotes recovery of function, occlusion and facial symmetry with few complications.

Alexander [12] in his study suggested that displaced low subcondylar fractures should be treated with open reduction as there were no malocclusion, wound infection and neurosensory defecit. Edward Ellis [13] had greater incidence of malocclusion (27.3%) of malocclusion and Thoren H [14] observed that 39% of patients had deviation of jaw on mouth opening in patients treated were treated closed reduction.

## CONCLUSION:

Considering the findings of this study , it can be concluded that open reduction and fixation of condylar fractures give better results both clinically and radiographically compared to conservative functional method. It can also be stated that for displaced and dislocated condylar fractures surgical treatment is the best option. But a more comprehensive randomized control large scale study is required with more number of cases in both the groups.

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## FIGURES:

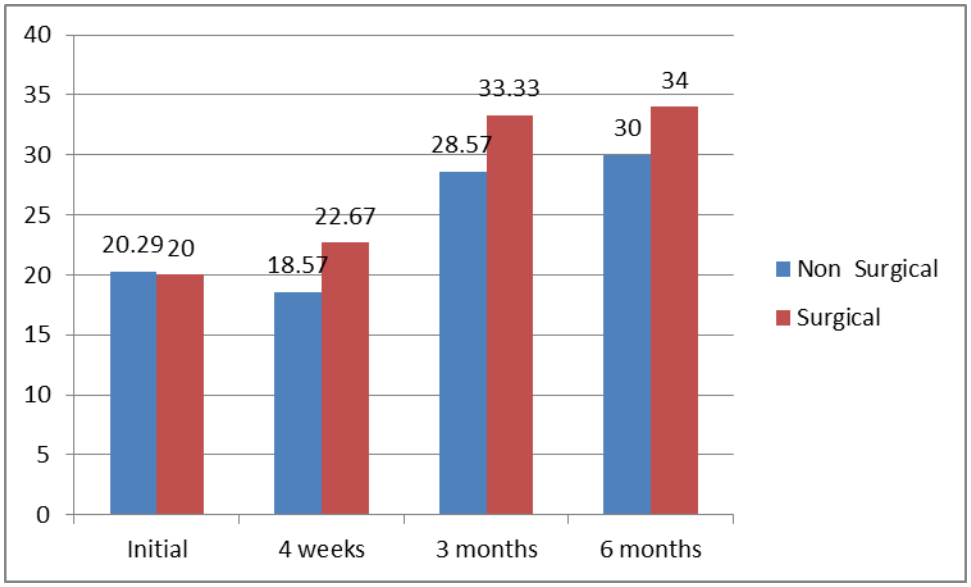


Figure 1. Mouth Opening (mm.). Initially there was reduction in mouth opening in both treatment groups. On 6 months follow up, mouth opening restriction was more in patients treated with conservative functional reduction.

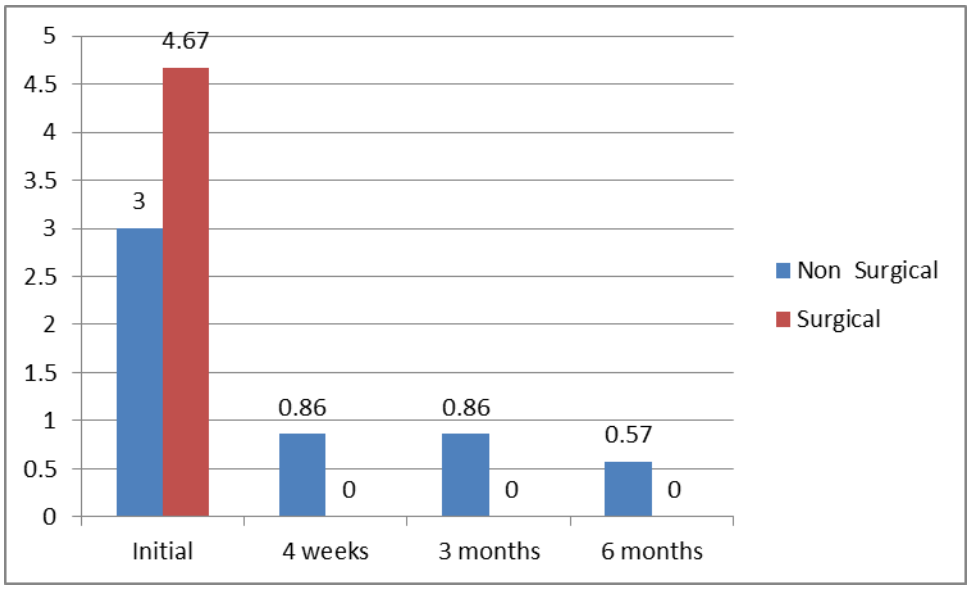


Figure 2. Deviation of Mandible on Maximum Mouth Opening (mm.). There was no deviation of mandible on further follow ups after open reduction and fixation.

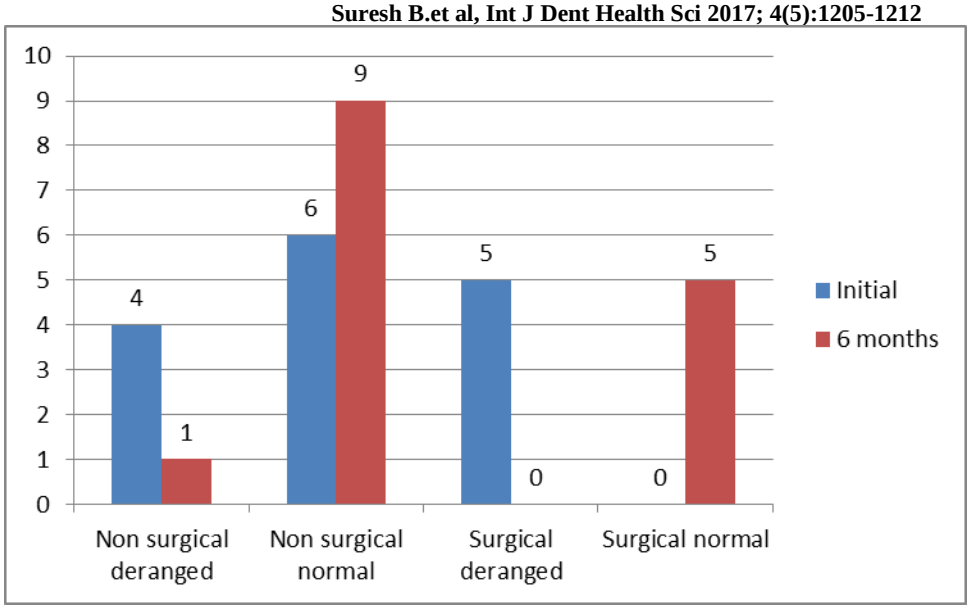


Figure 3. Occlusion. In conservative functional group 4 patients showed deranged occlusion one patient had deranged occlusion even after 6 months. In surgical group, all 5 patients had normal occlusion after surgery.

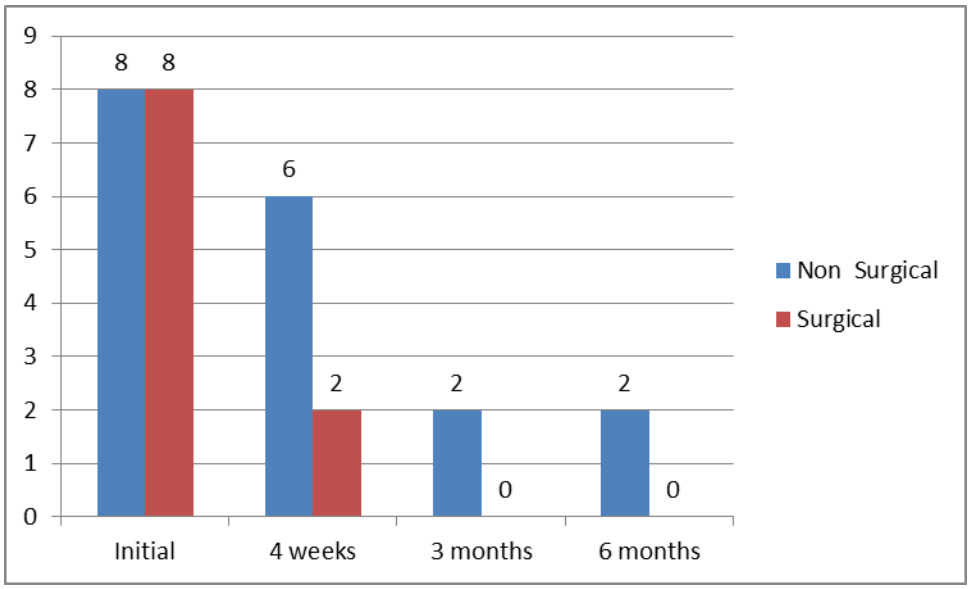


Figure 4. Pain around temporomandibular region. Median pain values in both groups was 8( visual analogue scale taken from 1 to 10). At 6 months follow up pain was commonly present in conservative functional group than surgical group.

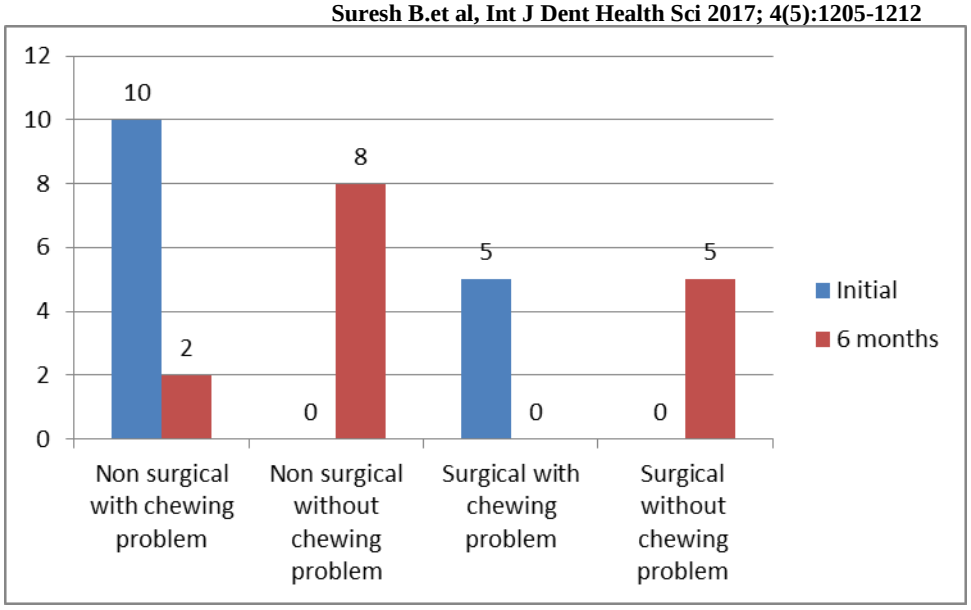


Figure 5. Problems in chewing. All the patients had chewing problem in both groups at initial examination. At 6 months follow up 2 patients had chewing problem as compared to none in surgical group.

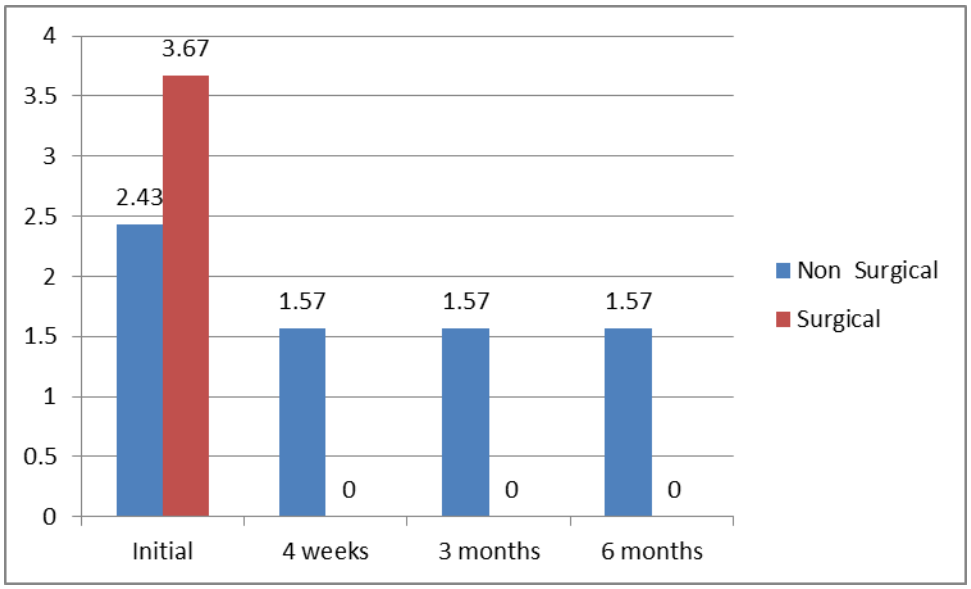


Figure 6. Radiographic ramal condylar height. Conservative functional treatment group at months follow up showed reduction in ramal condylar height by 1.57 mm. on average. Whereas in surgical group ramal condylar height was anatomically reduced during open reduction and fixation.