

A Comparative Evaluation of Surgical vs Conservative Modalities in Treatment of Condylar Fractures

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Conflict of interest: Nil

Abstract:

Background: The present study was conducted for comparatively evaluating surgical and conservative modalities in treatment of condylar fractures.

Materials & Methods: The current research included evaluation of 40 subjects which reported with condylar fractures. All the patients were randomly allocated into two study groups as follows: Group A: Patients undergoing surgical treatment, and Group B: Patients undergoing conservative treatment. Subjects of group A underwent surgery under general anesthesia with endotracheal intubation using retromandibular approach. Among patients of group B, Arch bar splinting of the maxilla and mandible and intermaxillary fixation was done with teeth in occlusion with the help of guiding elastics. Patients were systematically followed up. Clinical and radiological parameters were evaluated during the follow-up visits. The pain was measured using the visual analog scale (VAS). All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: Significantly better improvement was seen among patients of group A in comparison to patients of group B in terms of interincisal opening. Occlusion was significantly better stable among patients of group A at 2 weeks post-treatment. While comparing the height of ascending ramus at different time intervals, non-significant results were obtained. Also, no significant difference was observed while comparing the VAS at different time intervals in between the two study groups.

Conclusion: Although conservative procedures can be considered for the management of condylar fractures, our study demonstrated better results with surgical treatment.

Keywords: Surgical, Condylar, Fracture.

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Introduction

Beyond dispute, fractures of the mandibular condylar process are considered to be most frequent among the different fracture locations of the mandible, with incidences reported between 17.5 and 50%. [1] Basically, for the clinician, a condylar process fracture is defined as any fracture which is located above the mandibular foramen and runs from within or above the angle of the mandible into the sigmoid notch or the condylar head. [2, 3]

Condylar fracture is associated with pain, reduced mouth opening, and deviation of the mandible. With suboptimal treatment, temporomandibular joint (TMJ) ankylosis, and internal derangement may occur. The most commonly used incisions to expose the condyle are as follows: intraoral, coronal, preauricular, postauricular, endaural, endoscopic,

rhytidectomy, transparotid, submandibular, and retromandibular approach. [4,5] Hence; the present study was conducted for comparatively evaluating surgical and conservative modalities in treatment of condylar fractures.

Materials & Methods

The present study was conducted for comparatively evaluating surgical and conservative modalities in treatment of condylar fractures. The current research included evaluation of 40 subjects which reported with condylar fractures. Complete demographic and clinical details of all the patients was obtained. Patients with presence of another any temporomandibular joint disorder were excluded from the present study. All the patients were

randomly allocated into two study groups as follows:

Group A: Patients undergoing surgical treatment, and

Group B: Patients undergoing conservative treatment

Detailed case history and previous surgical procedures, if any, were recorded. Physical and clinical examination of all the patients was carried. This was followed by hematological and biochemical evaluation of all the patients. Subjects of group A underwent surgery under general anesthesia with endotracheal intubation using retromandibular approach. Among patients of group B, Arch bar splinting of the maxilla and mandible and intermaxillary fixation was done with teeth in occlusion with the help of guiding elastics. Patients were systematically followed up. Clinical and radiological parameters were evaluated during the follow-up visits. The pain was measured using the visual analog scale (VAS). All the results were

recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results

Mean age of the patients of group A and group B was 43.2 years and 41.9 years respectively. Majority proportion of patients of both the study groups were males. Mean interincisal opening among patients of group A at baseline, 2 weeks post-treatment and 5 weeks post-treatment was 9.12 mm, 20.78 mm and 26.27 mm respectively. Mean interincisal opening among patients of group B at baseline, 2 weeks post-treatment and 5 weeks post-treatment was 8.85 mm, 17.32 mm and 23.79 mm respectively. Significantly better improvement was seen among patients of group A in comparison to patients of group B in terms of interincisal opening. Occlusion was significantly better stable among patients of group A at 2 weeks post-treatment. While comparing the height of ascending ramus at different time intervals, non-significant results were obtained. Also, no significant difference was observed while comparing the VAS at different time intervals in between the two study groups.

Table 1: Comparison of interincisal opening

Mean interincisal opening (mm)	Group A	Group B	p-value
Baseline	9.12	8.85	0.270
2 weeks post-treatment	20.78	17.32	0.001*
5 weeks post-treatment	26.27	23.79	0.002*

*: Significant

Table 2: Comparison of Stability of occlusion

Stability of occlusion		Group A	Group B	p-value
Baseline	Normal	4	3	0.168
	Deranged	15	14	
	Satisfactory	1	3	
2 weeks post-treatment	Normal	18	12	0.000*
	Deranged	0	2	
	Satisfactory	2	6	
5 weeks post-treatment	Normal	20	20	0.118
	Deranged	0	0	
	Satisfactory	0	0	

*: Significant

Table 3: Comparison of height of ascending ramus (mm)

Height of ascending ramus (mm)	Group A	Group B	p-value
Baseline	64.12	64.85	0.883
2 weeks post-treatment	65.86	64.98	0.401
5 weeks post-treatment	66.27	66.16	0.397

*: Significant



Figure 1: Pre-Op OPG for Subcondylar Fracture.



Figure 2: 3D CT Face Left Parasymphysis fracture with Left Subcondylar Fracture

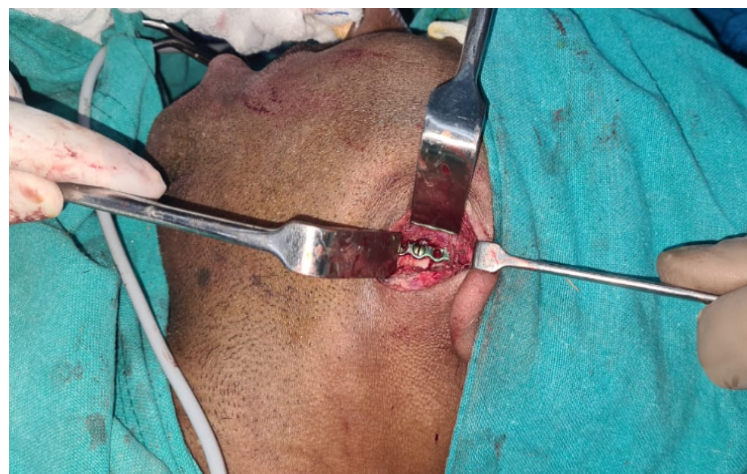


Figure 3: Subcondylar Fracture fixation using straight 2mm plate



Figure 4: Subcondylar Fracture fixation using 2mm delta plate

Discussion

Mandibular condylar fractures are the most common that account for nearly 20%–62% of all the mandibular fractures. The main causes of condylar fractures include road traffic accidents (approximately 50%), falls (30%), and interpersonal violence (20%). [6,7] Mandibular condyle fracture occurs so frequently that they account for approximately 30% to 40% of all mandibular fracture cases, and patients between 25 and 34 years old who have a busy social life account for one third of all the cases. Furthermore, about 40% of child injury patients have mandibular condylar fracture. The mandibular condyle is a region that plays a key role in the opening and closing of the mouth, and because it causes functional and aesthetic problems such as facial asymmetry, it is very important to perform accurate reduction. [8- 10]

In the present study, mean age of the patients of group A and group B was 43.2 years and 41.9 years respectively. Majority proportion of patients of both the study groups were males. Mean interincisal opening among patients of group A at baseline, 2 weeks post-treatment and 5 weeks post-treatment was 9.12 mm, 20.78 mm and 26.27 mm respectively. Mean interincisal opening among patients of group B at baseline, 2 weeks post-treatment and 5 weeks post-treatment was 8.85 mm, 17.32 mm and 23.79 mm respectively. Significantly better improvement was seen among patients of group A in comparison to patients of group B in terms of interincisal opening. Durmuş Kocaaslan N et al, in a previous study, compared conservative techniques in the mandibular condyle fractures. The length between the most protruding point of the condyle and the mandible was measured and the length difference was only 5.94 mm in patients who were treated by

IMF. None of the patients developed ankylosis, open mouth, limitation of mouth opening, facial asymmetry, laterognathia, and retrognathia. The occlusion of the patients who were not known to have pre-trauma occlusions were directed, repositioned and provided an appropriate occlusion. The use of IMF with an occlusal splint is a more conservative and acceptable treatment modality than open reduction in selected cases. [11]

In the present study, occlusion was significantly better stable among patients of group A at 2 weeks post-treatment. While comparing the height of ascending ramus at different time intervals, non-significant results were obtained. Also, no significant difference was observed while comparing the VAS at different time intervals in between the two study groups. Moritz M et al compared the clinical and radiographic long-term results of patients with condylar fractures treated. 51 patients were treated in a conservative functional way. Rigid internal fixation was performed in 25 patients using an intraoral approach, according to a technique described by Steinhäuser in 1964. The results of their retrospective analysis indicate that in fractures of the condylar head a conservative functional treatment is the therapy of choice. Fractures of the subcondylar region and also--in selected clinical circumstances--fractures of the condylar neck represent indications for a carefully executed rigid internal fixation. The intraoral approach has been proved to cause minimal morbidity and complications. [12]

Conclusion

Although conservative procedures can be considered for the management of condylar fractures, our study demonstrated better results with surgical treatment.

References

1. Zachariades N, Mezitis M, Mourouzis C. et al. Fractures of the mandibular condyle: a review of 466 cases. Literature review, reflections on treatment and proposals. *J Craniomaxillofac Surg.* 2006;34(7):421–432.
2. Cornelius C P, Audigé L, Kunz C. et al. The comprehensive AOCMF classification system: mandible fractures - level 2 tutorial. *Cranio-maxillofac Trauma Reconstr.* 2014;701: S15–S30.
3. Eckelt U. Fractures of the mandibular condyle [in German] *Mund Kiefer Gesichtschir.* 2000;4 01: S110–S117.
4. Villarreal PM, Monje F, Junquera LM, Mateo J, Morillo AJ, González C, et al. Mandibular condyle fractures: Determinants of treatment and outcome. *J Oral Maxillofac Surg.* 2004; 62:155–63.
5. Klatt J, Pohlenz P, Blessmann M, Blake F, Eichhorn W, Schmelzle R, et al. Clinical follow-up examination of surgically treated fractures of the condylar process using the transparotid approach. *J Oral Maxillofac Surg.* 2010; 68:611–7.
6. Choi BH, Kim KN, Kim HJ, et al. Evaluation of condylar neck fracture plating techniques. *J Craniomaxillofac Surg.* 1999; 27:109–112.
7. Throckmorton GS, Dechow PC. In vitro strain measurements in the condylar process of the human mandible. *Arch Oral Biol.* 1994;39: 85 3–867.
8. Haug RH, Peterson GP, Goltz M. A biomechanical evaluation of mandibular condyle fracture plating techniques. *J Oral Maxillofac Surg.* 2002; 60:73–80.
9. Danda AK, Muthusekhar MR, Narayanan V, Baig MF, Siddareddi A. Open versus closed treatment of unilateral subcondylar and condylar neck fractures: A prospective, randomized clinical study. *J Oral Maxillofac Surg.* 2010; 68:1238–41.
10. Sawazaki R, Lima Júnior SM, Asprino L, Moreira RW, de Moraes M. Incidence and patterns of mandibular condyle fractures. *J Oral Maxillofac Surg.* 2010; 68:1252–9.
11. Durmuş Kocaaslan N, Karadede Ünal B, Çavuş Özkan M, Karadede B, Çelebiler Ö. Comparison of different treatment techniques in the mandibular condyle fracture. *Ulus Travma Acil Cerrahi Derg.* 2022 Jan;28(1):99-106.
12. Moritz M, Niederdellmann H, Dammer R. Fractures condyliennes mandibulaires: traitement conservateur versus traitement chirurgical [Mandibular condyle fractures: conservative treatment versus surgical treatment]. *Rev Stomatol Chir Maxillofac.* 1994;95 (4): 268-73. French.