DOI: https://doi.org/10.53350/pjmhs020231712159

ORIGINAL ARTICLE

Impact of Unilateral Condyle Fractures on Facial Esthetics Treated by Closed Reduction

FAREED-UD-DIN AHMAD CHISHTI[1], SAADIA MANZAR[2], ALI ABU BAKAR[3], MUHAMMAD MINAM QURESHI[4], HAFIZ MUHAMMAD JAWAAD MANZOOR[5], SADIA GULL[6]

[1]Assistant Professor, [6]Demonstrator, Department of Oral & Maxillofacial Surgery, Lahore Medical & Dental College, Lahore, Pakistan
[2]Associate Professor/Head, [4]Assistant Professor, Department of Oral & Maxillofacial Surgery, Rashid Latif Dental College/Rashid Latif Khan University, Lahore
[3]Consultant, Department of Oral & Maxillofacial Surgery, Doctor's Hospital & Medical Centre, Lahore, Pakistan
[5]Assistant Professor, Department of Oral & Maxillofacial Surgery, Institute of Dentistry, CMH Lahore Medical College, Lahore
Correspondence to: Dr. Fareed-Ud-Din Ahmad Chishti, E-mail: fareed19182@gmail.com Cell: 0321-7294004

ABSTRACT

Background: Open reduction and internal fixation is gold standard treatment of displaced condylar fractures, yet closed reduction for moderately displaced condylar fractures is used under certain circumstances. Thus, there is possibility that closed reduction may not yield ideal esthetics after treatment.

Objective: To measure the mean shortening of ramus length after closed reduction in unilateral condyle fractures.

Methodology: This retrospective interventional cohort study was conducted at tertiary care medical facility from August 2013 to November 2018. A total number of 76 participants were enrolled and divided in two groups of 38 patients. Group A were treated by dynamic elastic therapy, whereas, group B patients were treated by maxillomandibular fixation.

Results: The average ramus length of group A was 5.75±1.29 mm and group B was 5.76±1.29 mm, thus, there was no significant statistical difference between the two groups (p>0.05).

Conclusion: Patients were highly satisfied with their esthetic appearance irrespective of treatment by the two techniques of closed reduction.

Keywords: Fractures, Facial asymmetry, Esthetics, Maxillomandibular fixation, Visual Analog Scale.

INTRODUCTION

The most common traumatic injuries to maxillofacial area are associated with mandible fractures accounting for 36%-70% of all facial trauma.[1] Fracture of mandibular condyle with incidence of 10-40% of maxillofacial complex, not only halts the function of masticatory system but also effects facial esthetics.[2] Facial asymmetry after unilateral condylar fracture occurs as a result loss of posterior ramus height[2], which in turn causes deviation of mandible on mouth opening.[3] Deviation may be either due to compensatory movements of contralateral joint due to loss of ramus height (LRH) on fractured side[3-5] or it is because translatory capacity of affected condyle is reduced due to intracapsular fracture.[6]

Treatment of condylar fracture has been a subject of controversy sincedecades,[7] distinctively related to moderately displaced condylar fractures with pre-operative (LRH) ≤7mm and condylar deviation ≤35 degrees.[8] Both ORIF and CR have been used by surgeons for treatment of moderately displaced condylar fractures, but depicted no substantial difference in outcomes of two techniques.[9-11] The cost of surgical treatment is a financial burden for many people of developing countries.[12] Therefore, we addressed moderately displaced unilateral condylar fractures using two distinct methods of CR and compared various functional outcomes as well as LRH. The post-operative results at 6th month charting revealed adequate functional rehabilitation, but did exhibit some LRH and slight opening deviation by both techniques of CR. The impact of these post-operative outcomes on esthetic discrepancies was subjectively assessed in this study. This would give us insight that whether CR techniques yield esthetic satisfaction among patients or some facial rejuvenating procedure is required later.

MATERIALS AND METHODS

This study is a retrospective interventional cohort piloted at tertiary care hospital environment, it presents data obtained from the treatment of slightly displaced condyle fractures on one side between August 2013 to November 2018, for facial aesthetic satisfaction among patients. This is the second segment to assess the functional outcomes after treatment by CR whereas, in this study aesthetic assessment was done over same sample size with same inclusion and exclusion criteria.[13]

Received on 19-06-2023
Accepted on 05-11-2023

The patients which conformed to the inclusion criteria were divided in two groups of 38 patients each. Group A patients were treated by dynamic elastic therapy, whereas group B patients were addressed by maxillomandibular fixation. The data was entered and analyzed through SPSS-25. Mean along with standard deviation were estimated for two groups. 't' test was applied, P<0.05 was considered as significant.

RESULTS

There were 23 (60.5%) males and 15 (39.5%) females in group A while in group B, 25 (65.7%) males and 13 (34.3%) females with mean ages of the groups were 30.42±9.73 and 33.87±9.08 years respectively (Table 2).

According to the ramus length of non-fractured side, the means were 51.28±2.27 mm & 52.84±1.95 mm, ramus length of fractured side were 45.52±2.78 mm & 46.96±2.18 mm and shortening of ramus length were 5.76±1.29 mm & 5.76±1.29 mm in Group A and group B respectively. There was statistically no significant (P>0.05) difference between the two groups (Table 2).

Table 1: Demographic information of the patients (n=76)

Variable	Dynamic elastic therapy		Maxillomandibular fixation	
	No.	%	No.	%
Age (years)				
16 – 35	27	71.1	22	57.8
36 – 50	11	28.9	16	42.2
Gender				
Male	23	60.5	25	65.7
Female	15	39.5	13	34.3

Table 2: Comparison of ramus lengths in dynamic elastic therapy and maxillomandibular fixation groups

Variable	Dynamic elastic therapy	Maxillomandibular fixation	P value
Ramus length of non-fractured side	51.28±2.27	52.84±1.95	0.155
Ramus length of fractured side	45.52±2.78	46.96±2.18	0.088
Shortening of ramus length	5.76±1.29	5.76±1.29	0.172

DISCUSSION

There is very limited data in literature that subjectively analyses the esthetic outcome after treatment of unilateral condylar fractures by closed reduction. A systematic review about CR treatment for

unilateral condylar fracture in adults narrates that most frequently used outcome measures were occlusion, maximum mouth opening (MMO), range of motion of the mandible (ROM), pain, temporomandibular joint (TMJ) sounds and function, deviation on mouth opening and facial deformity.[14]

Results of this study depict that patients were very satisfied with facial esthetic profile, as mean ramus length of group A was 5.76±1.29mm and group B was 5.76±1.29mm. There is no data in available in literature to compare these findings in patients of unilateral moderately displaced extracapsular condylar fracture treated by closed reduction. However, reason of esthetic satisfaction of patients despite LRH (4.6±0.87 mm) in both groups could be fluctuating asymmetry. It is a measure of developmental variability noise and sturdiness at population level.[15-18] It is determined mainly by environmental and genetic factors but also arise as a result of developmental course. Thus, fluctuating asymmetry is a random alteration of feature that is usually flawlessly symmetrical. It reflects the variability of contrast between left and right sides.[19] According to Choi et al[20], the human eye cannot identify a facial asymmetry <2mm but can surely detect asymmetry >5mm Lum et al[21] proposed through three-dimensional assessment of facial asymmetry that more than 50% of the overall facial surface area has an asymmetry greater than 2 mm in normal population samples. Thus, in this study, the impact of mean LRH of 4.6±0.87 mm on facial profile was not esthetically displeasing to study participants. Oh et al[22] states that the consequence of differences between right and left ramus length and condylar neck length is menton deviation. The mean deviation of mandible in this study was 1±0.77mm. Many researchers state that deviation from mid-sagittal plane or facial midline can only be identified as asymmetry by common people if its >4mm.[23].Boel et al[24] characterized menton deviation from mid-sagittal plane as asymmetric, if its value is >3mm. Thus, this derangement did create any negative perception among participants regarding facial symmetry.

CONCLUSION

Closed reduction technique provides acceptable esthetic results of treatment for moderately displaced unilateral extracapsular condylar fractures.

REFERENCES

1. Hsieh TY, Funamura JL, Dedhia R, Durbin-Johnson B, Dunbar C, Tollefson TT. Risk factors associated with complications after treatment of mandible fractures. JAMA Facial Plast Surg 2019; 21(3):213–20.
2. García-Guerrero I, Ramírez JM, Gómez de Diego R, Martínez-González JM, Poblador MS, Lancho JL. Complications in the treatment of mandibular condylar fractures: Surgical versus conservative treatment. Ann Anatomy Anatomischer Anzeiger 2018;216: 60-8.
3. Eckelt U, Schneider M, Erasmus F, Gerlach KL, Kuhlisch E, Loukota R, et al. Open versus closed treatment of fractures of the mandibular condylar process – a prospective randomized multi-centre study. J Craniomaxillofac Surg 2006;34(5):306–14.
4. Smets LMH, Van Damme PA, Stoelinga PJW. Non-surgical treatment of condylar fractures in adults: a retrospective analysis. J Craniomaxillofac Surg 2003;31(3):162-7.
5. Zachariades N, Mezitis M, Mourouzis C, Papadakis D, Spanou A. Fractures of the mandibular condyle: A review of 466 cases. Literature review, reflections on treatment and proposals. J Craniomaxillofac Surg 2006;34(7): 421-32.
6. Niezen ET, Bos RRM, de Bont LGM, Stegenga B, Dijkstra PU. Complaints related to mandibular function impairment after closed treatment of fractures of the mandibular condyle. Int J Oral Maxillofac Surg 2010;39(7):660-5.
7. Rozeboom A, Dubois L, Bos R, Spijker R, de Lange J. Open treatment of unilateral mandibular condyle fractures in adults: a systematic review. Int J Oral Maxillofac Surg 2017;46(10):1257-66.
8. Vincent AG, Ducic Y, Kellman R. Fractures of the Mandibular Condyle. Facial Plast Surg 2019;35(06):623-6.
9. Rastogi S, Sharma S, Kumar S, Reddy MP, Niranjanaprasad Indra B. Fracture of mandibular condyle - to open or not to open: an attempt to settle the controversy. Oral Surg Oral Med Oral Pathol Oral Radiol 2015;119(6):608-13.
10. 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(6): 1238-41.
11. Rozeboom AVJ, Klumpert LT, Koutris M, Dubois L, Speksnijder CM, Lobbezoo F, et al. Clinical outcomes in the treatment of unilateral condylar fractures: a cross-sectional study. Int J Oral Maxillofac Surg 2018;47(9):1132-7.
12. Luciana L, Oggy BAR, Wiargitha IK, Irawan H. Management of maxillofacial fracture: experience of emergency and trauma acute care surgery Department of Sanglah General Hospital Denpasar Bali. J Med Sci 2019; 7(19): 3245-8.
13. Sohail A, Chishti FUDA, Manzar S, Zahid N, Ahmad F, Rafiq T. Can dynamic elastic therapy be established as the standard protocol of closed reduction for moderately displaced extracapsular condylar fractures? Oral Maxillofac Surg 2023; 13: 14-9.
14. Rozeboom AVJ, Dubois L, Bos RRM, Spijker R, de Lange J. Closed treatment of unilateral mandibular condyle fractures in adults: a systematic review. Int J Oral Maxillofac Surg 2017;46(4):456-64.
15. Mather K. Genetical control of stability in development. Heredity 1953;7(3):297-336.
16. Gateño J, Jones TL, Shen SGF, Chen KC, Jajoo A, Kuang T, et al. Fluctuating asymmetry of the normal facial skeleton. Int J Oral Maxillofac Surg 2018;47(4):534-40.
17. Dongen SV. Fluctuating asymmetry and developmental instability in evolutionary biology: past, present and future. J Evolution Biol 2006; 19(6):1727-43.
18. Graham JH, Raz S, Hel-Or H, Nevo E. Fluctuating asymmetry: methods, theory, and applications. Symmetry 2010;2(2):466-540.
19. Graham J, Özener B. Fluctuating asymmetry of human populations: a review. Symmetry 2016; 8(12): 154.
20. Choi KY.Analysis of facial asymmetry. Arch Craniofac Surg 2015;16(1):1.
21. Lum V, Goonewardene MS, Mian A, Eastwood P. Three-dimensional assessment of facial asymmetry using dense correspondence, symmetry, and midline analysis. Am J Orthodont Dentofac Orthop 2020; 158(1): 134-46.
22. Oh MH, Cho JH. The three-dimensional morphology of mandible and glenoid fossa as contributing factors to menton deviation in facial asymmetry - retrospective study. Prog Orthod 2020;21(1):33.
23. Hosseinzadeh Nik T, Gholamrezaei E, Keshvad MA. Facial asymmetry correction: From conventional orthognathic treatment to surgery-first approach. J Dent Res Dent Clin Dent Prospects 2019;13(4):311-20.
24. Boel T, Sofyanti E, Sufarnap E. Analyzing menton deviation in posteroanterior cephalogram in early detection of temporomandibular disorder. Int J Dent 2017; 2017: 1-5.

This article may be cited as: Chishti FUDA, Manzar S, Bakar AA, Qureshi MM, Manzoor HMJ, Gull S: Impact of Unilateral Condyle Fractures on Facial Esthetics Treated by Closed Reduction. Pak J Med Health Sci, 2023; 17(12): 159-160.