Original Research Article

To compare the submandibular, preauricular and the transparotid approaches to the condylar fracture

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Received: 07-09-2020 / Revised: 19-11-2020 / Accepted: 25-11-2020

Abstract

Aims: The purpose of this study was to compare the submandibular, preauricular and the transparotid approaches to the condyle with respect to these parameters and correlated them with the specific features of condylar fractures.

Material and methods:A Retrospective study was conducted in the Department of Maxillofacial surgery, Narayan Medical College and Hospital ,Sasaram,Bihar,India for 1 year. 150 Patients with condylar fracture that required open reduction and internal fixation were include in this study. All patients were classified based on Spiessl and Schroll classification of condylar fractures, using radiological examination, into three groups- preauricular group (type VI), submandibular group (type II and type IV), and the transparotid group (type IIIb, type IIIc, and type V). Parameters like post-op IMF, palsy of facial nerve, scar, wound infection, malocclusion and plate retrieval were noted.**Results:**Out of 150 30(20%) of them were women where as120 (80%) were men with a p value of 0.33. RTA was the major etiology of injury(80%) in all the three groups followed by self- fall and assault. P-value was found to be significant (p-0.01). 8% of case in the submandibular group was bilateral, which was managed by closed reduction on one side. 60% of the cases in pre-auricular and trans-parotid and 56% of cases in the submandibular group were on the right side. (p-value 0.88). 90% of fractures in the pre-auricular group, 80% of fractures in the sub-mandibular group and 50% of the fractures in the trans-parotid group were associated with other fractures of the facial skeleton. A p-value of 0.018 was obtained which was found to be significant. Post-op IMF was present in 14% of preauricular group when compared 0% in the other two groups with a p-value of 0.10facial nerve palsy was seen in 8% of preauricular cases, 24% of submandibular group and 18% of trans-parotid group with a p-value of 0.41.

Conclusion: The inferior neck fractures seem to benefit from ORIF via submandibular approach, high neck fractures via the transparotid fractures and the condylar head fractures via the pre auricular approach with a low rate of complications.

Keywords: Condylar fractures, Open reduction,Pre-auricular, Sub-mandibular ,Transparotid.

Introduction

Condylar fractures account for 25–35% of the mandibular fractures and deserves a special consideration apart from the rest of the mandible due to their anatomical differences and their healing potential.[1] There can be few aspects of the maxillofacial trauma management that generate more controversy than the fracture involving the condylar process of the mandible.[2]

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The major controversy has been between conservative and surgical management. Traditionally condylar fractures were managed by conservative methods.

Surgeons who prefer closed treatment claim that equally good results were produced with reduced overall morbidity and lack of surgical complication.[3] The goals of treatment of condylar fractures are pain free mandibular motion, good occlusion, and symmetry and have said that as long as these goals can be achieved, it is prudent that the easiest and the least invasive treatment method should be selected.[4] But the severity of condylar injuries is often underestimated and the clinical outcome can be suboptimal particularly with regard to occlusion following conservative treatment. Also there is reduced incisal opening,

deviation of the mandible, impaired mastication, ankylosis, and internal derangement. Consequently the pendulum has swung towards accurate anatomical reduction in the hope that this will improve the outcome.

There are various approaches to the condyle as explained in the literature. When choosing between them the simplest approach among them, should be the treatment of choice provided all else is equal. Six types of condylar fractures were identified by Spiessl and Schroll which included displacement and dislocation of the fracture fragments. Two main treatment modalities are advised for the treatment of condylar fractures, one being closed reduction and the other open reduction with internal fixation. Open reduction can be performed by various approaches. To assess the most appropriate surgical approach for condylar fractures aesthetic and the functional outcomes should be considered. Hence in our study we have compared the submandibular, preauricular and the transparotid approaches to the condyle with respect to these parameters and correlated them with the specific features of condylar fractures.

Material and methods

The present Retrospective study was conducted in the Department of Maxillofacial surgery, Narayan Medical College and Hospital ,Sasaram,Bihar,India for one year.

Inclusion criteria

Patients with condylar fracture that required open reduction and internal fixation

Exclusion criteria

- Patients with pre-existing medical conditions
- Infected fracture site,
- Patients who were treated by closed reduction

Methodology

A total of 150 cases were included in the study. All patients were classified based on Spiessl and Schroll classification of condylar fractures, using radiological examination, into three groups- preauricular group (type VI), submandibular group (type II and type IV), and the transparotid group (type IIIb, type IIIc, and type V). In all the cases miniplates were used for internal fixation. Preauricular approach was preformed according to Eckelt. For submandibular approach the incision was given two fingers below the mandibleand for the transparotid approach incision was given 2-3 cm vertically below the lobule of the ear. All patients' records were followed up for 6 months. All data were evaluated using the patient's records including the radiological imaging. Parameters like post-op IMF, palsy of facial nerve, scar, wound infection, malocclusion and plate retrieval were noted.

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages and means. Test applied for the analysis was chi-square test. The level of confidence interval and p-value were set at 95% and 5%.

Results

150 cases of condylar fractures were included in this study. 30(20%) of them were women whereas120(80%) were men with a p value of 0.33 The mean age in the preauricular group was 36.45 years, 33.47 years in the submandibular group and 35.23 years in the transparotid group with a standard deviation of 11.26, 9.85, and 8.57 respectively. RTA was the major aetiology of injury(80%) in all the three groups followed by self- fall and assault. P-value was found to be significant (p- 0.01). 8% of case in the submandibular group was bilateral, which was managed by closed reduction on one side. 60% of the cases in pre-auricular and trans-parotid and 56% of cases in the submandibular group were on the right side. (p- value 0.88). 90% of fractures in the pre-auricular group, 80% of fractures in the sub-mandibular group and 50% of the fractures in the trans-parotid group were associated with other fractures of the facial skeleton. A p-value of 0.018 was obtained which was found to be significant.

Table 1: Demographic Profile of Patients

Gender	**N=150**	**%**
Male	120	80
Female	30	20
Age		
0-20	10	6.67
20-40	120	80
Above 40	20	13.33
RTA injury	120	80
Other	30	20

Post-op IMF was present in 14% of preauricular group when compared 0% in the other two groups with a p-value of 0.10facial nerve palsy was seen in 8% of preauricular cases, 24% of submandibular group and 18% of trans-parotid group with a p-value of 0.41. unfavorable scar formation was recorded in 12% of pre-auricular group, 34% of submandibular group and 36%trans-parotid group (p-value- 0.18). Wound infection was seen in 12% of preauricular group, 22% of submandibular group and 4% of transparotid group with a p-value of 0.15. Malocclusion was seen in 14% of preauricular cases, and none in the other two groups. (p- value- 0.10). 12% of cases in the preauricular group and 6% of cases in the transparotid group had to undergo plate retrieval with a p-value of 0.54.

Table 2:Comparison of three group

Parameters		Pre-auricular		Sub-mandibular		Transparotid		Chi-square value	P value
		Frequency	Percent	Frequency	Percent	Frequency	Percent		
Post op infection	No	43	86	50	100.0	50	100.0	3.98	0.10
	Yes	7	14	0	0	0	0		
Palsy of facial nerve	No	46	92	38	76	41	82	2.11	0.41
	Yes	4	8	12	24	9	18		
Scar	No	44	88	33	66	32	64	3.14	0.18
	Yes	6	12	17	34	18	36		
Wound infection	No	44	88	39	78	48	96	3.85	0.15
	Yes	6	12	11	22	2	4		
Malocclusion	No	43	86	50	100.0	50	100.0	4.26	0.10
	Yes	7	14	0	0	0	0		
Plate retrieval	No	44	88	50	100.0	47	94	2.35	0.54
	Yes	6	12	0	0	3	6		

Discussion

About one third of all mandibular fractures are of the mandibular condylar.[5] Treatment plan of these fractures are controversial, either to treat surgically (open reduction and internal fixation) or functionally (closed reduction).[6] In adult patients surgical treatment depends on the type and displacement of the fracture.[7] Based on the height and position of the fractured segment, various approaches to the condylar process are described. The only criterion for selection of the approach is done with the distance between the incision and level of fracture.[8] The choice of surgical approach to the condyle depends upon the individual maxillofacial surgeon and is based on their experience with technique and their personal beliefs. In this study Spiessl and schroll[9]classification of condylar fractures was used. Practically, all the fractures were divided into 3 groups, based on the type of fracture and the most suitable approach for it. Spiessl and schroll type I condylar fractures were not included in the study as they could be managed with closed reduction. The mean age for condylar fractures to occur was between 25-35 years in all the 3 groups when compared to a study by Newman et al where it ranged between 17-32 years.[10]In this study males constituted 80% of the total cases, indicating the fact that men constitute the main working force in our society. This supports the statistics of Wong and Badar and Syed where there was male predominance.[11,12] On the other hand, Zachariades et al., in a review study of 466 condylar fractures cases found no significant difference between males and females.[5] This can be attributed to the fact that more women work outdoors in some occupations which leads to more exposure to craniomaxillofacial fractures. RTA was the most common cause of condylar fracture with (80%). This data were similar to a study done by Sawazakiet al.[13]who mentioned that RTA was the most common cause of condylar fracture (55.33%). In our study, falls, assault and violence were of less frequency. 90% of fractures in the pre-auricular group, 80% of fractures in the sub-mandibular group and 50% of the fractures in the trans-parotid group were associated with other fractures of the facial skeleton. A p-value of 0.018 was obtained which was found to be significant. Zachariadeset al.[5] had mentioned that condylar fractures resulted from the transmission of force which is not fully absorbed in the area of its primary application. 8% of case in the submandibular group was bilateral. The presence of bilateral condylar fractures in isolation did not mandate an ORIF. This was in accordance with management of Kellman.[14] In contrast, Ellis believed that any unilateral condylar fracture could be treated with MMF only.[15] In addition, he did not believe that he could manage bilateral condylar fractures efficiently by MMF. The complication rates found in this study are within reported ranges. The incidence of facial nerve injury has ranged from 0-25%. It was seen more in the submandibular approach (24%). This could be attributed to the subcutaneous dissection which

traverses the marginal mandibular nerve deeply, in the submandibular approach when compared to the superficial traversing in the transparotid group.[16] The least was found to be in the pre-auricular approach (8%). Unfavorable scaring was recorded the most for submandibular and transparotid approaches in comparison to the preauricular group. Owing to the fact that the pre auricular incision lies in the pre auricular fold making it inconspicuous. Wound infection was more in the submandibular group (22%) when compared to 12% and 4% in the pre auricular and transparotid group respectively. It could be attributed to the fact that submandibular approach requires, long incision, more exposure, deep tunneling to reach the subcondylar area, due to its increased distance from the fracture line. Transient Malocclusion was seen in only in 14% of the case in the pre auricular group, which could be due to improper anatomic reduction and plate fixation of the fracture fragments, which is usually difficult using the preauricular approach. These cases were managed with post-op IMF for 4 weeks thereby setteling occlusion. Implant retrieval was done in 5 of the cases in pre auricular group and 2 case in the transparotid group due to the presence of continued infection.

Conclusion

Open reduction and internal fixation of condylar fractures have proven to provide better results. The preferred surgical approach should be the one that allows straightforward fracture management whilst minimizing the potential risks. The inferior neck fractures seem to benefit from ORIF via submandibular approach, high neck fractures via the transparotid fractures and the condylar head fractures via the pre auricular approach with a low rate of complications.

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Conflict of Interest: Nil
Source of support:Nil