Original Article

Comparative aesthetic evaluation of retro mandibular and pre- auricular approaches in condylar fracture fixation

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Abstract

Background: Mandibular condylar fractures are common maxillofacial injuries and often require open reduction and internal fixation when displacement is significant. Among the extraoral approaches, the retromandibular and pre-auricular routes are widely used. Each approach offers specific advantages in terms of access, visibility, fixation, and scar placement. However, comparative evaluation of their aesthetic outcome remains limited. The current study was undertaken to compare the aesthetic outcome of retromandibular and pre-auricular approaches in the surgical fixation of mandibular condylar fractures.

Materials and Methods: This prospective comparative clinical study included 30 patients with unilateral displaced mandibular condylar fractures requiring open reduction and internal fixation. Patients were divided into two groups of 15 each. Group I underwent fracture fixation through the retromandibular approach, while Group II was treated through the pre-auricular approach. The evaluated parameters included operating time, observer scar score, patient scar score, scar visibility, patient satisfaction, facial symmetry, maximal mouth opening, facial nerve weakness, wound complications, and overall aesthetic outcome.

Results: The mean operating time was significantly lower in the retromandibular group compared with the pre-auricular group. Scar-related scores and visibility were slightly better in the pre-auricular group, but the difference was not statistically significant. Facial symmetry, maximal mouth opening, and patient satisfaction were comparable between the two groups. Postoperative complications were minimal in both groups, and all cases of transient facial nerve weakness recovered completely by 6 months.

Conclusion: Both the retromandibular and pre-auricular approaches were effective for condylar fracture fixation with satisfactory cosmetic healing. The retromandibular approach offered the advantage of shorter operating time, while the pre-auricular approach showed a slight but non-significant aesthetic advantage. Functional recovery was comparable in both groups. Both approaches can therefore be considered reliable, with selection depending on fracture location and surgeon preference.

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INTRODUCTION:

Fractures of the mandibular condyle are among the most common mandibular fractures and continue to present a treatment challenge for oral and maxillofacial surgeons. Their management is important because inadequate reduction may lead to malocclusion, restricted mouth opening, deviation on opening, pain, loss of ramus height, and facial asymmetry. In displaced condylar fractures, open reduction and internal fixation is often preferred because it allows direct visualization of the fracture, anatomical reduction, and stable fixation with early functional recovery. However, even when open treatment is indicated, the choice of surgical approach remains a matter of debate. [1-3]

Among the extraoral approaches, the preauricular and retromandibular approaches are widely used. The preauricular approach provides good access to high condylar and condylar head or neck fractures, especially when the fractured segment is displaced anteromedially. In contrast, the retromandibular approach offers a shorter and more direct route to the condylar neck and subcondylar region, and many authors have reported easier reduction and plate fixation through this incision. Both techniques are clinically effective, but each has its own limitations related to access, working distance, facial nerve handling, and parotid dissection. [3-6]

In condylar fracture surgery, success is judged not only by fracture reduction and postoperative function but also by the aesthetic result. Because these incisions are placed on the face and parotid region, scar visibility, contour changes, and facial nerve weakness can strongly influence patient satisfaction. Previous studies have evaluated surgical morbidity and complications of both approaches, and systematic reviews have shown that facial nerve injury and scar-related concerns remain important considerations when selecting an incision. [5-8]

Despite this, fewer studies have focused specifically on **aesthetic comparison** between the retromandibular and preauricular approaches. Therefore, a comparative aesthetic evaluation of these two approaches in condylar fracture fixation is clinically relevant and may help in selecting the most suitable approach for achieving both functional and cosmetic success. [4-8]

MATERIALS AND METHODS:

This prospective comparative clinical study was conducted in the Department of Oral and Maxillofacial Surgery on patients diagnosed with unilateral mandibular condylar fractures requiring open reduction and internal fixation. Adult patients aged 18 to 55 years with displaced condylar neck or subcondylar fractures presenting within 2 weeks of trauma were included in the study. Patients with bilateral condylar fractures, comminuted mandibular fractures, previous facial scars in the operative area, pre-existing facial nerve weakness, infected fractures, severe systemic illness, or those unwilling to attend follow-up were excluded. Open treatment of condylar fractures through extraoral approaches has commonly been evaluated using parameters such as operating time, scar formation, facial nerve weakness, and postoperative function, which formed the basis of the present protocol.

A total of 30 patients were enrolled and divided into two groups of 15 each. Group I underwent fracture fixation through the retromandibular approach, and Group II underwent fixation through the pre-auricular approach. Preoperative evaluation included history taking, clinical examination, occlusal assessment, maximal mouth opening, facial asymmetry assessment, and radiographic confirmation using orthopantomogram and computed tomography wherever required. Fracture level, side, and degree of displacement were recorded before surgery.

All patients were operated under general anesthesia. In the retromandibular group, a skin incision was placed just below the earlobe parallel to the posterior border of the mandible. In the pre-auricular group, the incision was placed in the natural pre-auricular crease. After exposure and reduction of the fracture, internal fixation was performed using miniplates and screws according to fracture pattern. Standard postoperative antibiotics, analgesics, and physiotherapy were given in both groups.

Patients were followed at 1 week, 1 month, 3 months, and 6 months. The primary outcome was aesthetic evaluation of the surgical scar using observer scar score, patient scar score, and scar visibility score. Secondary outcomes included operating time, patient satisfaction, facial symmetry, mouth opening, transient facial nerve weakness, salivary fistula, wound infection, and hypertrophic scar formation.

RESULTS:

A total of 30 patients with unilateral mandibular condylar fractures were included in the study, with 15 patients each in the retromandibular and pre-auricular approach groups, and their baseline, intraoperative, aesthetic, and postoperative outcomes were compared.

Table 1 shows that both study groups were comparable at baseline with respect to age, sex, side and type of fracture, time from injury to surgery, and preoperative mouth opening. No statistically significant difference was observed in any of these variables, indicating that the two groups were well matched before surgery.

Table 1. Baseline demographic and fracture characteristics of the study groups

Variable	Retromandibular approach (n=15)	Pre-auricular approach (n=15)	Test value	p value
Age (years), Mean ± SD	29.87 ± 6.14	31.13 ± 5.78	t = 0.58	0.567
Male, n (%)	11 (73.3)	10 (66.7)	χ^2 = 0.16	0.694
Female, n (%)	4 (26.7)	5 (33.3)		
Right-sided fracture, n (%)	8 (53.3)	7 (46.7)	χ^2 = 0.13	0.721
Left-sided fracture, n (%)	7 (46.7)	8 (53.3)		
Condylar neck fracture, n (%)	9 (60.0)	10 (66.7)	χ^2 = 0.14	0.705
Subcondylar fracture, n (%)	6 (40.0)	5 (33.3)		
Time from injury to surgery (days), Mean ± SD	4.87 ± 1.41	5.13 ± 1.60	t = 0.47	0.644
Preoperative maximal mouth opening (mm), Mean ± SD	21.27 ± 3.12	20.93 ± 3.45	t = 0.28	0.784

Table 2 shows that the mean operating time was significantly lower in the retromandibular group, suggesting that it provided a more direct and efficient surgical approach. Scar-related scores, scar visibility, patient satisfaction, facial symmetry, and postoperative mouth opening were comparable between the two groups, with no statistically significant difference.

Table 2. Intraoperative and aesthetic outcomes in the study groups

Variable	Retromandibular approach (n=15)	Pre-auricular approach (n=15)	Test value	p value
Operating time (minutes), Mean ± SD	54.60 ± 8.74	71.27 ± 10.33	t = 4.77	<0.001*
Final observer scar score at 6 months, Mean ± SD	13.20 ± 2.39	11.67 ± 2.19	t = 1.82	0.079
Final patient scar score at 6 months, Mean ± SD	13.73 ± 2.63	12.27 ± 2.28	t = 1.63	0.114
Scar visibility score (0–10), Mean ± SD	2.40 ± 1.18	1.73 ± 0.96	t = 1.71	0.098
Patient satisfaction with scar (0–10), Mean ± SD	8.13 ± 0.92	8.53 ± 0.74	t = 1.31	0.201
Facial symmetry score at 6 months (0–10), Mean ± SD	8.60 ± 0.74	8.47 ± 0.83	t = 0.47	0.643
Maximal mouth opening at 6 months (mm), Mean ± SD	38.87 ± 3.11	37.93 ± 3.36	t = 0.79	0.437

*Significant

Table 3 shows that postoperative morbidity was low in both groups, with only a few cases of transient facial nerve weakness, wound infection, salivary leak, or hypertrophic scar. All patients had normal facial nerve function by 6 months, and satisfactory aesthetic outcome was achieved in the majority of cases in both groups.

Table 3. Postoperative morbidity and scar-related complications

Variable	Retromandibular approach (n=15)	Pre-auricular approach (n=15)	Test value	p value
Transient facial nerve weakness, n (%)	1 (6.7)	3 (20.0)	Fisher exact	0.598
Salivary fistula/parotid leak, n (%)	1 (6.7)	0 (0.0)	Fisher exact	1.000
Wound infection, n (%)	1 (6.7)	1 (6.7)	Fisher exact	1.000
Hypertrophic scar, n (%)	1 (6.7)	0 (0.0)	Fisher exact	1.000
Clearly noticeable scar at 6 months, n (%)	2 (13.3)	1 (6.7)	Fisher exact	1.000
Normal facial nerve function at 6 months, n (%)	15 (100.0)	15 (100.0)	—	—
Satisfactory aesthetic outcome, n (%)	13 (86.7)	14 (93.3)	Fisher exact	1.000

DISCUSSION:

The present study compared the aesthetic outcome of the retromandibular and pre-auricular approaches in patients undergoing open reduction and internal fixation for condylar fractures. The main findings were that the retromandibular approach required significantly less operating time, while both approaches produced comparable long-term aesthetic and functional outcomes. Although the pre-auricular group showed slightly lower scar scores and better scar visibility scores, the difference was not statistically significant. Postoperative morbidity was low in both groups, and all cases of facial nerve weakness recovered completely by 6 months. These findings suggest that both approaches are clinically acceptable, and the final choice may depend more on fracture level, surgeon familiarity, and the balance between surgical access and cosmetic preference. [9-16]

In the present study, the retromandibular approach showed a significantly shorter mean operating time than the pre-auricular approach. This finding is in agreement with previous reports describing the retromandibular route as a shorter and more direct pathway to the condylar neck and subcondylar region, allowing easier instrumentation and plate fixation. Clinical series on retromandibular transparotid access have repeatedly noted that the working distance is reduced and reduction can often be achieved more quickly when the fracture is located lower in the condylar region. This probably explains why the retromandibular group in our study demonstrated faster surgical access and fixation.[12-14]

The aesthetic results of our study were favorable in both groups. The final observer scar score, patient scar score, scar visibility score, and satisfaction with scar were slightly better in the pre-auricular group, but the difference was not statistically significant. This pattern is clinically understandable because the pre-auricular incision lies within a natural skin crease and may therefore become less conspicuous over time. At the same time, the retromandibular scar is usually short and placed in a relatively hidden area below the earlobe, which also contributes to acceptable cosmetic healing. Published series of both approaches have described good scar acceptance, and our findings support the view that, when meticulous closure is performed, both incisions can yield satisfactory aesthetic outcomes.[12-16]

Another important observation in the present study was that facial symmetry and maximal mouth opening at 6 months were similar in both groups. This indicates that both approaches permitted adequate reduction and stable fixation, with satisfactory restoration of mandibular function. Earlier reports on extraoral management of condylar fractures have also shown that, when the approach is selected appropriately for the fracture level, both pre-auricular and retromandibular access can provide good exposure and acceptable postoperative function. Therefore, the lack of a significant difference in long-term functional parameters in our study is consistent with the broader literature.[9,10,12,15,16]

Facial nerve weakness remains one of the main concerns when extraoral approaches are used for condylar fracture fixation. In the present study, transient facial nerve weakness was seen more often in the pre-auricular group than in the retromandibular group, although the difference was not statistically significant, and complete recovery occurred in all patients by 6 months. This result is comparable with modern evidence showing that most postoperative facial nerve deficits after open condylar fracture surgery are temporary rather than permanent. Systematic reviews have emphasized that nerve injury depends not only on the skin incision but also on the deeper dissection plane, the fracture level, and the extent of traction applied during exposure. Our findings therefore suggest that careful tissue handling can keep permanent

nerve morbidity low with either approach.[9-11,15,16]

Salivary complications were rare in the present study, but one case of salivary fistula or parotid leak occurred in the retromandibular group, while no such case was seen in the pre-auricular group. This finding is also understandable because retromandibular transparotid dissection may traverse parotid tissue more directly, which creates a recognized risk of salivary leakage or sialocele. Previous retromandibular series have described these complications as uncommon and usually self-limiting. The low frequency of wound infection and hypertrophic scar formation in both groups in our study further supports that both approaches are generally safe when performed with proper surgical technique.[13,14,16]

An important practical point from the present study is that the two approaches appeared to differ more in ease of access and scar concealment than in final treatment success. The retromandibular route seemed advantageous in terms of speed and direct access, particularly for lower condylar fractures, whereas the pre-auricular route appeared to provide a slightly more favorable visible scar profile and may be preferred in higher fractures. This interpretation is supported by the literature, which repeatedly recommends matching the approach to the fracture site rather than relying on a single approach for all condylar injuries. In this context, the results of the present study are clinically relevant because they show that aesthetic considerations can be integrated with surgical practicality when selecting the incision.[9,10,12,15,16]

The present study had some limitations. The sample size was modest, the follow-up period was limited to 6 months, and the study did not include subgroup analysis according to exact fracture height or degree of medial displacement. In addition, scar assessment, although structured, still contains a subjective component from both patient and observer. Nevertheless, the study provides useful comparative information because it focused specifically on aesthetic outcome while also documenting surgical and functional parameters. Within these limitations, the findings indicate that both retromandibular and pre-auricular approaches are effective for condylar fracture fixation, with the retromandibular approach offering shorter operating time and the pre-auricular approach showing a slight but non-significant cosmetic advantage.

CONCLUSION:

Both the retromandibular and pre-auricular approaches provided satisfactory aesthetic and functional outcomes in the fixation of mandibular condylar fractures. The retromandibular approach required significantly less operating time, making it a more direct and efficient surgical route. The pre-auricular approach showed slightly better scar-related aesthetic scores, although the difference was not statistically significant. Within the limits of this study, both approaches were effective, and the choice of approach should be guided by fracture level, surgical accessibility, and cosmetic considerations.

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