Original Article

# Evaluation Of Temporomandibular Disorders Before And After Orthognathic Surgery

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## Abstract

**Background:** To evaluate temporomandibular disorders before and after orthognathic surgeries.

**Materials & methods:** A total of 40 patients were enrolled. Assessment of temporomandibular status was performed using the RDC/TMD criteria at T0 (prior to orthodontic therapy), T1 (3 months after the surgery), and T2 post-therapeutic cycle (6 to 12 months postoperatively). Result was analysed using SPSS software.

**Results:** At T1, 3 months after the orthognathic surgery, TMJ pain changed from 45% to 5%, headaches improved from 40% to 7.5% and disc dislocation from 52.5% to 20%. The most significant results can be seen from the comparison between T0 and T2 period.

**Conclusion:** Pain levels related to TMDs can be significantly improved with a multi-disciplinary approach

**Keywords:** orthognathic surgery, temporomandibular disorders, deformities.

## Introduction

Previously, patients with dentoskeletal malformations and head and neck tumors, who were scheduled for orthognathic surgery (OGS), routinely underwent diagnostic evaluation to assess the functionality of temporomandibular joint (TMJ) and masticatory muscles. [1,2] The therapy for patients with dentoskeletal malformations and temporomandibular disorders (TMDs) may be a demanding challenge for clinicians; it is not only important to correct skeletal malformation, but also to reduce arthralgia, muscular pain, and TMJ dysfunctions. [3,4] Tempromandibular joint disorders include any clinical conditions associated with masticatory musculature, temporomandibular joint, surrounding bony and soft tissue components, and any combinations of these structures. The symptoms of TMD manifest as a limited range of motion of mandible, pain in masticatory muscles and TMJ, Joint noise (clicking, popping, or crepitus), myofascial pain, and other functional limitations. [5] The positional changes of mandible, maxilla, or both jaws during OGS, can affect TMJ, masticatory musculature, its surrounding soft tissue, and TMD symptoms. Therefore, maxillofacial surgeons must carefully evaluate patients for presence of any TMJ symptoms preoperatively, and formulate treatment plans accordingly to prevent worsening of TMD symptoms.

Many dentofacial deformity (DFD) patients desire to improve stomatognathic function and esthetics, as well as TMJ symptoms. [6] However, current literatures on the relationship between OGS and TMJ complications are still

debatable. [7] Some authors claim that TMJ dysfunction can be improved after OGS, yet others claim deleterious effects on TMJ can occur after OGS. [8,9] Routine OGS procedure involves surgical movement of upper jaw via LeFort I osteotomy and lower jaw via ramus osteotomy. LeFort I osteotomy is not associated with direct trauma to TMJ or masticatory musculature, thus there are only minimal effects on TMJ dysfunction or mandibular movement. [10] Hence, this study was conducted to evaluate temporomandibular disorders before and after orthognathic surgeries.

## Materials & methods

A total of 40 patients were enrolled. Assessment of temporomandibular status was performed using the RDC/TMD criteria at T0 (prior to orthodontic therapy), T1 (3 months after the surgery), and T2 post-therapeutic cycle (6 to 12 months postoperatively). Complete history was taken. Datwa was collected and student-t test was done. Segmentation analysis was done. Result was analysed using SPSS software.

## Results

At T1, 3 months after the orthognathic surgery, TMJ pain changed from 45% to 5%, headaches improved from 40% to 7.5% and disc dislocation from 52.5% to 20%. The most significant results can be seen from the comparison between T0 and T2 period.

Table1: symptoms time progress

| | T0 (%) | T1(%) | T2 (%) |
|---|---|---|---|
| Pain | 45 | 5 | 0 |
| Headaches | 40 | 7.5 | 5 |
| Click | 52.5 | 20 | 15 |
| Tinnitus | 2.5 | 0 | 0 |
| Clenching | 27.5 | 7.5 | 10 |

Table2 : segmentation analysis

| | |
|---|---|
| Patient healed | 65% |
| Patient improved | 25% |
| Stable | 0% |
| Worsening condition | 10% |

In patients with and without TMDs, segmentation analysis highlighted the improvement caused about by the therapy; 26 (65%) patients were considered to be recovered, 10 (25%) improved, no subjects were considered stable, whereas 4 patients (10%) demonstrated worsening of the condition.

## Discussion

Adaptive developmental changes on mandibular condyles and post-developmental degenerative changes of mandibular condyles can create alteration on facial skeleton and occlusion. [11,12] Also, trauma or developmental deformity causing the changes in morphology and occlusion, can alter biomechanics of TMJ, consequently develop into TMJ internal derangement (TMD ID). [13] Hence, this study was conducted to evaluate temporomandibular disorders before and after orthognathic surgeries.

In the present study, at T1, 3 months after the orthognathic surgery, TMJ pain changed from 45% to 5%, headaches improved from 40% to 7.5% and disc dislocation from 52.5% to 20%. The most significant results can be seen from the comparison between T0 and T2 period. A study by di Paolo C et al, studied assessment of temporomandibular status with T0, T1 and T2. A total of 76 participants were included by them. Forty-seven

patients were affected by TMDs. At T0, 25 patients experienced TMJ pain, 27 had muscular pain, 31 suffered headaches, 42 had disc dislocation with reduction, and 5 were affected by disc dislocation without reduction. Thirty-five patients had occlusal signs of parafunctions, 8 reported tinnitus, and 7 dizziness. At T1, TMJ pain changed from 33.3% to 4.44%, muscular pain changed from 35.5% to 11.1%, headaches improved from 40% to 6.67%, and disc dislocation from 55.2% to 17.7%. Segmentation analysis highlighted improvement after therapy; 57 patients were considered recovered, 14 improved, none were considered stable, whereas 5 patients demonstrated some worsening, 3 of whom had not presented disc dislocation before surgery. At T2, 71 patients were considered completely recovered or improved. [14]

In the present study, patients with and without TMDs, segmentation analysis highlighted the improvement caused about by the therapy; 26 (65%) patients were considered to be recovered, 10 (25%) improved, no subjects were considered stable, whereas 4 patients (10%) demonstrated worsening of the condition. Another study by Aoyama S et al, compared temporomandibular joint dysfunction (TMD) symptoms before and after bilateral sagittal split ramus osteotomy, and identifies predictive factors for the postoperative TMD symptoms by assessing the adjusted odds ratio using multiple logistic regression analysis. A consecutive series of 37 cases treated only with bilateral sagittal split ramus osteotomy were evaluated. New postoperative TMD symptoms appeared in 9 cases, preoperative TMD symptoms disappeared in 6 cases, and TMD symptoms were unchanged in 5 cases. The median period until the interincisal opening range attained 40 mm was 5 months (range, from 2 to 15 months). In addition, the maximum value of the bilateral setback distance of more than 9 mm was a positive factor of 6.95 (95 percent confidence interval, from 1.06 to 45.42). [15]

Patients with bilateral TMJ ID tend to have a short ramus, clockwise rotation of mandible, and retrognathic mandible, [16] while patients with unilateral TMJ ID present lateral displacement of mandible and deviated occlusal and mandibular plane. [13] The severity of TMJ ID is also associated with amount of displacement of Antegonion and Menton [17,18] and the growth pattern can be altered in maxilla as well as mandible. Unilateral TMJ ID displays a deviation of mention to the affected side. [17-19] And reverse examination study also demonstrated positive correlations between short ramus and condyle as well as deviated mention being associated with TMJ disc displacement and derangement. [20] Thus, the severity of TMD and disc displacement can lead to mandibular hypoplasia or facial asymmetry. [12] Also, degenerative changes and resorption of manduibular condyle beyond growth completion can lead to changes in skeletal shape. [21]

## Conclusion

Pain levels related to TMDs can be significantly improved with a multi-disciplinary approach

## References


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