Pattern of Pterygomaxillary Disarticulation Associated with Le Fort I Osteotomy: A Radiographic Analysis

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Introduction
Maxillary deformities are surgically managed by Le Fort I osteotomy. This osteotomy is widely used as it allows movement of the maxilla in three planes. During Le Fort I procedures, various techniques have been applied for pterygomaxillary disarticulation (PMD). In our unit Row's disimpaction forces are used for this purpose.

An unfavourable PMD may contribute to complications due to the close proximity of the pterygomaxillary junction to the pterygopalatine fossa and skull base (1).

Objectives

- Assessment of Le Fort I separation patterns.
- Evaluation of the maxillary anatomical variables and correlation to the Le Fort I separation patterns.
- Correlation of patient age with the Le Fort I separation patterns.

Methods
A retrospective study was conducted on preoperative and postoperative cone-beam computed tomography (CBCT) scans of 70 consecutive orthognathic patients who underwent Le Fort I osteotomy with maxillary disarticulation at Glasgow Dental Hospital and School between 2017 and 2020. Data were analysed using Pearson Correlation Coefficient; P < 0.05 was considered statistically significant. The inter- and intra-examiner reliability was evaluated.

Discussion
Previous studies state that the rate of complications in Le Fort I osteotomies is between 1.1% - 6.4%, and unfavourable PMD is considered the main reason for serious complications. Bilge et al. (2020) assessed the PMJ separation pattern using osteotomes and reported the most common pattern of separation was Type 1 (60%). However, their study assessed the PMJ separation at the level of the posterior nasal spine and only used axial CBCT slices. This would limit the view of the PMJ separation pattern (1). Our study, in contrast, shows that Type 1 was only 35% of the total cases. Several anatomical factors have been studied in the literature that may cause pterygoid plate fracture. Our study found only one variable, anteroposterior thickness, that had a significant correlation with the type of Le Fort I separation pattern seen, but it had a weak correlation. This result agrees with other studies that found a significant relation between PMJ thickness and PMD (2-3).

Conclusion
Unfavourable PMD is uncommon in Le Fort I osteotomies when disimpaction forces are used, and there is no significant correlation between the PMD pattern and the patients’ age or the local anatomy. Further prospective studies with a larger sample size may show a clear association between anatomical variables and PMD pattern.

References

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