Orthodontic Consideration of Class III Skeletal Deformities

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Skeletal Class III malocclusion is the most common dentofacial deformities in Taiwan. The process of surgical-orthodontic treatment planning should be based on the problem lists of the skeletal and dentoalveolar components in both midface and lower jaw. The transverse dental arch discrepancy and the asymmetry in the roll and yaw dimension should also be integrated into overall consideration. Surgery-first approach (SFA) provides an efficient and effective treatment modalities in surgical orthodontics. The case selection, range of tooth movement and methods to setup the dental occlusion rely on the orthontists' design and responsibility to complete the overall treatment on the patients. Computer aided surgical simulation which enhance the surgical outcome by integrating the treatable malocclusion in SFA and the overall facial esthetics is an essential tool for the quality of treatment.

General skeletal morphologic features of skeletal Class III deformities are maxillary hypoplasia and mandibular prognathism, more than 60% with mandible deviation and asymmetry. Therefore bimaxillary surgical correction is favored for a better total face correction. The clockwise rotation of maxilla-mandibular complex by maxillary posterior impaction is a common strategy for a typical skeletal Class III correction; it provides solutions for both skeletal and some dentoalveolar problems, such as 1) forward augmentation of midface, 2) more backward rotation of mandible, 3) straighten the maxillary incisor inclination, 4) improve the smiling arc, 5) better control of lower facial height. Thus, the amount of mandible setback is mainly governed by the face esthetics rather than dental overjet correction.

Segmental osteotomies are safe procedures in surgical orthodontics. The anterior maxillary segmental osteotomy could upright upper front teeth for a better dental decompensation, flatten the compensating curve in cases of skeletal anterior open bite. The 3-pieces maxillary osteotomy adjusts the maxillary transverse width by expansion or constriction. The anterior mandibular segmental osteotomy facilitate flattening of accentuated lower curve of Spee by lower front teeth intrusion and proclination; it ensure the post-surgical stability of mandible, reduce the amount of visible lower incisor show, and provide a better chin contour. With proper designs, overall treatment duration can be reduced, the outcome of good occlusion can be ensured.

Questionnaire Survey for Patient's Satisfaction in Orthognathic Surgery

The motivations of patients to receive orthodontic treatment and orthognathic surgery are oral health improvement, functional demands and dentofacial esthetics. The scientific assessment of treatment outcomes can be objectively evaluated by the measurements of craniofacial images, jaw motion analysis, electromyography and various dentofacial esthetic scales. In the recent years, patient reported outcome assessment has been on the rise and emphasized more nowadays.

QoL was defined in 1993 by the WHO as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. Oral health-related quality of life (OHRQOL) was recognized

by the WHO in 2003 as an important part of the Global Oral Health Program. Malocclusion itself and its treatment both affect the OHRQOL.

General questionnaires can be used as a survey of intercultural, cultural, and disease, but be short of measurement of specific health-related quality of life. On the contrary, specific questionnaires are short of in comprehensive and holistic QoL. The most common questionnaires used to evaluate outcome of orthognathic surgeries (OGS) are the Short Form Health Survey (SF-36), the Short Form Oral Health Impact Profile (OHIP-14) and Orthognathic Quality of Life Questionnaire (OQLQ). The SF-36 surveys the generic health for medical outcomes. The components include physical health and mental health. The OHIP-14 is a comprehensive measure of self-reported dysfunction, discomfort and disability attributed to oral health. It is conceptualized as adverse outcomes to measure the "burden of illness". The OQLQ is a condition-specific tool to investigate the impact of dentofacial deformities and the benefits of orthognathic treatment on patient's QoL. In recent years, FACE-Q was developed as a reliable instruments to analyze perceptions of aesthetics and QoL outcomes following OGS and/or genioplasty. The issues and topics related to OHRQOL and OGS were reviewed in this presentation.

Hemifacial Microsomia: Long-term Facial Growth

The orthodontic and surgical decision for hemifacial microsomia (HFM) is influenced by the severity of facial skeletal involvement as well as the functional and psychological needs of the patients; from camouflage orthodontic treatment or functional appliance to costochondral graft or free flap treatments. A comprehensive literature review provided no evidence for the long-term effectiveness of early distraction osteogenesis (DO) in patients with HFM who were followed up from 1 to 5 years.

This retrospective cohort study examined 20 consecutive adults with unilateral HFM who received definitive orthodontic/orthognathic treatments between 2012 and 2015 in the Chang Gung Craniofacial Center. The indication for early surgical correction were: 1) patients' concern about obvious face asymmetry, 2) occlusal and functional demand, 3) requirements for psychological support. These patients were grouped according to their previous treatment into the DO group, comprising patients with early mandible DO (n = 9), and the NDO group, comprising those without early mandible DO (n = 11).

For patients with early DO, longitudinal facial growth was evaluated by panoramic and lateral cephalometric radiographs. Adult 3D craniofacial morphology of both groups was compared by measurements on cone-beam computed tomography (CBCT) obtained before definitive treatment. The mandible was segmentalized for 3D form analysis.

The patients with early DO presented 8–9-mm forward and downward maxillary growth and 4.57-mm limited forward and 17.25-mm substantial downward mandibular growth. The ramus length ratio (affected/nonaffected) was 90.84% at DO completion and decreased to 69.46% at growth completion during 13 years of follow-up. 3D craniofacial images were constructed; the positions of craniofacial landmarks relative to 3 standard orthogonal planes were compared between the DO and NDO groups. Both groups showed obvious craniofacial asymmetry, as indicated by occlusal plane canting, chin deviation, transverse and vertical condyle positions, and mandibular contours.

Early mandible DO could not alter the inherent facial growth pattern in patients with grade II HFM. Limited benefits are derived for definitive facial correction with early DO. Additional definitive surgical corrections were still required after early DO because of lower growth on the affected side.