Impact of orthosurgical treatment phases on oral health–related quality of life

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Introduction: In this cross-sectional study, we investigated the impact of the orthosurgical treatment phases on the oral health–related and condition-specific quality of life (QoL) of patients with dentofacial deformities. **Methods:** Two hundred fifty-four orthognathic patients were allocated into 4 groups according to treatment phase: initial (not yet treated), presurgical orthodontics, postsurgical orthodontics, and retention. Data were collected using the Oral Health Impact Profile to evaluate the oral health–related QoL, the Orthognathic QoL Questionnaire to analyze the condition-specific QoL, and the Index of Orthodontic Treatment Need to assess malocclusion severity and esthetic impairment. Specific malocclusion characteristics were also documented. **Results:** A negative binomial regression analysis showed that the initial group had a more negative oral health–related QoL than did the postsurgical, presurgical, and retention groups (relative risks, 1, 0.79, 0.74 and 0.25, respectively). The initial group had a more negative condition-specific QoL than did the presurgical, postsurgical, and retention groups (relative risks, 1, 0.77, 0.38 and 0.15, respectively) regardless of age, income, or education; women reported greater negative impacts than men. Certain occlusal traits were related to higher Orthognathic QoL Questionnaire scores (*P* <0.01). **Conclusions:** Patients who completed their orthosurgical treatment had a significantly better oral health–related QoL and a more positive esthetic self-perception than did those undergoing treatment and those who were untreated. Crowding, crossbite, open bite, concave profile, edge-to-edge overjet, or Class III malocclusion negatively affected oral health–related QoL. (Am J Orthod Dentofacial Orthop 2016;149:171-81)

Dentofacial deformities are skeletal discrepancies associated with severe malocclusions that negatively affect esthetics, oral function, personality, and social behavior.[1] Because the face is the primary source of personal identity, facial attractiveness influences personal and professional interactions throughout life. Facial features affect several personality ratings, including intelligence, friendliness, and popularity.[2–6] Therefore, subjects with dentofacial deformities are at a disadvantage in society and may have low self-esteem, which negatively impacts mental health and quality of life (QoL).[7–9]

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Orthognathic surgery in conjunction with orthodontic treatment is the ideal management of dentofacial deformities.[1,3,5] The traditional method involves the following phases: (1) initial, when the person seeks treatment and planning is performed; (2) presurgical orthodontics, when dental alignment and leveling are performed; (3) orthognathic surgery, when the jaws are repositioned to create a more harmonious facial skeleton; (4) postsurgical orthodontics, when the final occlusion is refined; and (5) retention, when the fixed appliances have been removed, and the health gain has been fully realized.

Because orthosurgical treatment dramatically affects appearance, function, and the psyche over a short period of time, it is crucial to analyze patient-centered outcomes, such as oral health–related QoL, in addition to the normative results observed by the involved professionals. Oral health–related QoL has been defined as "the absence of negative impacts of oral conditions on social life and a positive sense of dentofacial self-confidence."[10] In 2013, a systematic review indicated that patients had positive responses to orthognathic surgery, with significant improvements in QoL and psychological status.[11] However, the review also reported significant variations in study designs and highlighted 3 standardized and validated questionnaires that have helped

achieve consistent results: the Short-Form Health Survey (SF-36),[12-14] the Oral Health Impact Profile-Short Form (OHIP-14),[15,16] and the Orthognathic Quality of Life Questionnaire (OQLQ).[17,18]

The SF-36 evaluates the impact of a condition on a subject's perception of general health and has predominantly been used in medical studies to compare different populations. However, this generic questionnaire has limited use in dentistry because it is not sensitive to oral health changes and it has a limited ability to capture the effects of specific interventions.[19]

The OHIP-14 assesses the impact of oral disorders and treatment modalities on oral health–related QoL regarding functional limitations; physical pain; psychological discomfort; physical, psychological, and social disabilities; and handicaps. This tool has been adopted by all dental specialties to capture the effects or side effects of interventions that could remain undetected by specific instruments.[15,16]

Condition-specific instruments can evaluate clinically important health changes resulting from a health care intervention. The OQLQ was specifically developed to evaluate patients with dentofacial deformities according to their age, condition, and needs in 4 domains: oral function, facial esthetics, awareness of deformity, and social aspects of deformity.[17,18] Although the OQLQ is the most precise and appropriate tool for assessing the impact of orthognathic surgery on condition-specific health-related QoL, only a few studies have reported its use (in the United Kingdom,[18] Germany,[19] China,[20-22] Jordan,[23,24] India,[25] and Ireland[26]). Most of these studies evaluated small samples (14-65 subjects, except for Khadka et al,[20] who included 110 Chinese orthosurgical patients), described the OQLQ translation and validation,[18,19,23] focused on comparing the oral health–related QoL results from a few weeks before to short periods after orthognathic surgery,[20,21,24-26] or evaluated only untreated subjects.[19,23] Only 2 studies (from the United Kingdom[18] and China[21]) used the OQLQ to evaluate patients at all treatment phases. Thus, there is a dearth of data on the perceived impact of orthosurgical treatment in larger cohorts across different cultures at all surgical-orthodontic treatment phases; a more thorough analysis of the distinct types of dentofacial deformities is also necessary.

In this cross-sectional study, we aimed to evaluate the changes in the oral health–related and condition-specific QoL of Brazilian patients with various dentofacial deformities at different orthosurgical treatment phases compared with untreated subjects. The influences of esthetic impairment, malocclusion severity, sociodemographic characteristics, and specific occlusal characteristics on oral health–related QoL were also examined.

MATERIAL AND METHODS

An adequate sample size was calculated using the equation and effect-size indexes described by Cohen[27] to enable a comparison of the quantitative data of the 4 groups having different interventions (4 treatment phases). It was estimated that a sample size of 45 patients in each group would be required to identify a medium-sized difference of 0.25: ie, a 25% reduction in the OQLQ and OHIP-14 scores at the 5% significance level, with a power of 80%.

The Brazil Platform Ethics Research Committee approved this study in September 2012. The participants were informed of the examination procedures and were assured of the confidentiality of the collected information and that it would not affect the treatment in any way. Only patients who signed a consent form were included in the study.

Subjects were recruited during routine appointments at 3 important public centers for surgical-orthodontic treatment from October 2012 to November 2013: the orthodontic clinic of the State University of Rio de Janeiro, the oral and maxillofacial surgery clinic of Pedro Ernesto University Hospital, and the craniomaxillofacial surgery department of the National Institute of Traumatology and Orthopedics. Patients who were totally edentulous or had clefts, syndromes, or a history of facial bone fractures were excluded.

The sample consisted of 254 consecutive patients (18-50 years old) with Angle Class I, Class II, or Class III malocclusions divided into 4 groups: (1) initial, untreated subjects with dentofacial deformities who had been referred for orthognathic surgery but had yet to undergo orthodontic bracket bonding; (2) presurgical orthodontics, patients undergoing dental alignment and leveling orthodontic treatment for orthognathic surgery planning with multibracket fixed appliances in both arches that began more than 6 months before the study; (3) postsurgical orthodontics, patients who had undergone orthognathic surgery more than 3 months before the study and were concluding orthodontic treatment with multibracket fixed appliances in both arches; and (4) retention, patients who had completed the surgical-orthodontic treatment and had their fixed orthodontic appliances removed more than 6 months before the study.

Data were collected by a trained orthodontic researcher (N.B.P.) in face-to-face interviews, with self-administered questionnaires completed in the clinic in the presence of the investigator, and also included oral examinations performed by a trained orthodontic researcher (N.B.P.). For the general and condition-specific oral health–related QoL assessments, all subjects were asked to complete the Brazilian versions of the OHIP-14[28] and the OQLQ,[29,30] which have demonstrated psychometric properties similar to the original instruments.