

# Patient satisfaction and oral health-related quality of life 10–15 years after orthodontic-surgical treatment of mandibular prognathism

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*E. Schilbred Eriksen, K. Moen, P. J. Wisth, S. Løes, K. S. Klock: Patient satisfaction and oral health-related quality of life 10–15 years after orthodontic-surgical treatment of mandibular prognathism. Int. J. Oral Maxillofac. Surg. 2018; xxx: xxx–xxx. © 2018 International Association of Oral and Maxillofacial Surgeons. Published by Elsevier Ltd. All rights reserved.*

**Abstract.** This study investigated 36 patients at 10–15 years after they had undergone mandibular setback surgery by intraoral vertical ramus osteotomy (IVRO) and subsequent intermaxillary fixation for 6 weeks. The patients completed a 37-item structured questionnaire to evaluate patient satisfaction and possible long-term effects of the treatment. Visual analogue scales were used to measure self-perceived changes in seven items concerning oral function and appearance. Oral health-related quality of life was assessed using the Oral Impacts on Daily Performance (OIDP) index. The main reasons for seeking treatment were to improve chewing function and appearance. The treatment had resulted in significant improvements regarding chewing function, appearance, bullying, and self-confidence in social settings (all  $P < 0.05$ ). All patients were either very satisfied (61%) or reasonably satisfied (39%) with the treatment result. The mean OIDP frequency score was 8.49 on a scale from 8 to 40. Seventy-four percent of the patients reported no oral impacts on quality of life. In conclusion, 10–15 years after combined orthodontic and IVRO surgical treatment of mandibular prognathism, the patients were satisfied, and oral health-related quality of life was reported to be good.

**Key words:** orthognathic surgery; mandibular prognathism; intraoral vertical ramus osteotomy; IVRO; oral health-related quality of life; patient satisfaction.

Accepted for publication

Combined orthodontic and orthognathic surgical treatment is a well-established and accepted treatment option for patients with severe dentofacial anomalies. The

main pre-treatment concerns of patients reported in the literature are impaired chewing function and dissatisfaction with their facial appearance<sup>1–6</sup>. It has been

reported that people with facial deformities are often considered less intelligent, less attractive, less effective, less popular, and less employable<sup>7</sup>, and there is pressure

from society to fit the norm for facial attractiveness in the developed regions of the world<sup>8,9</sup>.

It is normally recommended that patients wait until growth has ceased before undergoing orthognathic surgery. Thus, these patients go through the critical years including puberty and the later teens with a deviating facial appearance and sub-optimal oral function. This has been shown to negatively affect body image, self-esteem, and quality of life<sup>10–12</sup>. Several studies have found that after orthognathic treatment, the patients are satisfied<sup>13–17</sup>, and their body image, facial body image, self-confidence, and oral health-related quality of life (OHRQoL) increase<sup>12,14,16,18–23</sup>.

In this study, strict inclusion criteria were established to collect information about patients with genuine mandibular prognathism treated with single-jaw surgery consisting of the intraoral vertical ramus osteotomy (IVRO) technique followed by 6 weeks of intermaxillary fixation (IMF). When evaluating a treatment procedure, one should include the patient's perception of the treatment procedure, satisfaction with the treatment result, and OHRQoL. The need for more long-term studies addressing patient satisfaction and quality of life after orthodontic-surgical treatment, including differentiation by type of deformity and type of surgical technique, has been emphasized by several authors<sup>14,20,21,23</sup>.

The main objectives of this study were to analyse the patients' self-perceived changes in seven items concerning oral function and appearance, and to report the patients' degree of satisfaction with the treatment outcome and their OHRQoL, all measured 10–15 years after surgery. Additional objectives were to report the patients' reasons for seeking orthodontic-surgical treatment and how they experienced the treatment they had received. Possible factors influencing patient satisfaction at 10–15 years after treatment were analysed.

## Materials and methods

During the period 1 January 1998 to 31 December 2002, a total of 84 patients with genuine mandibular prognathism underwent mandibular setback surgery by IVRO technique at Haukeland University Hospital in Bergen, Norway. All patients had IMF for 6 weeks after surgery. No additional maxillary surgery or genioplasty was performed. Pre- and postsurgical orthodontic treatment was conducted in all patients. No syndromic or medically

compromised patients were included in this cohort. Also, patients with skeletal asymmetry or a basal open bite were excluded.

In 2012, these 84 patients who had undergone previous orthognathic surgery were contacted by mail and invited to participate in a 10–15-year follow-up study. They were asked to complete a 37-item structured questionnaire. Thirty-six patients returned the questionnaire and attended a clinical examination. Written informed consent was collected from all participants. Among the non-responders, one subject attended the clinical examination but did not return the questionnaire, six subjects (two women and four men) could not attend within the scheduled timeframe for the collection of data, two subjects (one woman and one man) did not wish to participate in the study, and 39 subjects (19 women and 20 men) did not respond to the invitation.

## Questionnaire

The questionnaire included 30 closed-ended questions and seven questions requiring a response on a visual analogue scale (VAS). The participants also reported their level of education.

## Pre-treatment concerns and motivation

The participants were asked to report their reasons for seeking orthodontic-surgical treatment and to state who had advised them to seek treatment: their dentist, their family, or by own initiative. They were also asked how concerned they were about their facial appearance before surgery, if they had felt that their facial appearance differed negatively from others, and if they had often thought about the position of their lower jaw.

## Treatment and changes after surgery: 10–15 years in retrospect

The participants were asked about what they remembered as the most distressing part of the treatment: the orthodontic treatment or the healing after surgery including the 6 weeks of IMF. Concerning facial changes occurring after surgery, questions were included to determine whether they had noticed a change after surgery, and whether they had had any problems adapting to their new appearance. One question was included to measure whether they had experienced a change in self-confidence. Participants were also asked if they had experienced numbness in the lower lip or

jaw after surgery, and to report the eventual duration of any sensory disturbances.

## Self-perceived effects of treatment

A VAS was used to measure the patients' self-perceived improvement or deterioration in seven items concerning oral function and appearance from before the start of treatment to 10–15 years after surgery. The patients were provided with two VAS for each item. Each VAS was presented as a 10-cm line with clearly defined anchors at each end. The left end indicated severe problems and the right end indicated no problems. The items included were chewing, digestion, headache, speech, appearance, bullying, and self-confidence in social settings. On the first scale, the patients were asked to remember how much trouble the item had caused them before treatment. On the second scale, they reported the situation at 10–15 years after surgery for the same item. The change for each item was measured in centimetres as the difference between the marks on the second and the first line.

## Patient satisfaction 10–15 years after surgery

Respondents were asked to rank their satisfaction today with the treatment they had received 10–15 years earlier, and whether they would have asked for the same treatment again.

## Oral health-related quality of life at 10–15 years after surgery

The frequency score of the Oral Impacts on Daily Performance (OIDP) index was used to measure the patients' OHRQoL<sup>24</sup>. This index has previously been translated into Norwegian and has been tested in a representative sample of the Norwegian population (age 16–79 years). It was found to be a valid and reliable instrument for use in the adult population in Norway<sup>25</sup>.

The patients were asked if, during the past six months, they had been affected by any problems in their mouth or with their teeth in the following eight situations: eating and enjoying food, talking and expressing themselves clearly, cleaning their teeth, sleeping and relaxing, smiling and showing their teeth without being embarrassed, being emotionally stable and not being irritable, enjoying socializing with other people, and performing daily activities. The answers were rated on a 5-point scale: 1 = never or less than once a month, 2 = once or twice per month, 3 = once or twice per week,

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