

## HOW DO PATIENTS ASSESS OUTCOMES OF TREATMENT OF PROGNATHISM?

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**The aim of the study** was to analyze the results of patients' subjective self-assessment of surgical treatment of prognathism.

**Materials and methods.** The study included 35 patients who underwent extraoral vertical ramus osteotomy. Each patient responded to 12 questions contained in the questionnaire created by the authors.

**Results.** All respondents positively assessed their appearance after surgery. In most cases they pointed out the positive impact of treatment on their self-confidence (82.9% of responses). The vast majority of respondents felt improvement in biting off food (91.4%).

**Conclusions.** Patients positively evaluate the outcome of surgical treatment with extraoral vertical ramus osteotomy. The subjective improvement of the facial appearance, as well as chewing and articulation functions took place after the treatment.

**Key words:** prognathism, surgical treatment, results, subjective self-assessment, quality of life

Prognathism (morphological mandibular prognathism) belongs to morphological defects. It is characterized by excessive anterior growth of the mandible with respect to the frontal plane. Anterior-posterior maxillary-occlusal disparity markedly affects appearance of the face, in particular its profile but also its anterior aspect. Facial profile demonstrates marked anterior displacement of the mandible and the lower lip outside contours of the maxilla and the upper lip, which disturbs harmony of the face. Occasionally collapse of the subnasal region can be observed. The "en face" appearance demonstrates reduction of the labiomental crease and prolongation of the maxillary portion in relation to normal, usually equal nasal and frontal segments (1, 2).

Morphological mandibular prognathism is a facial-maxillary-occlusal defect, resulting in changes in the facial proportion. This disorder negatively affects patient's mental status and makes the patient unsatisfied with his/her

appearance. Multispecialist care of the patient requires cooperation of multiple doctors specialists: a psychiatrist, orthodontist and maxillary surgeon (3, 4, 5). The patients undergo a complex orthodontic and surgical therapy. Orthodontic therapy should be started before the surgical treatment and it should be continued after the surgical procedure. In the clinical setting 2 methods of surgical treatment of prognathism are used: extraoral vertical ramus osteotomy and intraoral sagittal ramus osteotomy

The aim of the study was to analyze the results of patients' subjective self-assessment of surgical treatment of prognathism.

### MATERIAL AND METHODS

This survey study included 35 patients treated for prognathism at the Craniomaxillofacial and Oncological Surgery Clinic between

2002 and 2014. The study enrolled only patients who underwent surgical extraoral vertical ramus osteotomy. The study group included 22 women and 13 men. Age of the study subjects ranged from 18 to 42 years (average age was 26 years); for males it ranged from 19 to 42 years (average age was 25 years). The questionnaire prepared specifically for the study included 12 questions related to satisfaction of the patients with outcomes of the surgical therapy. Aesthetic aspects were analyzed – appearance and subjective assessment of function of the stomatognathic system after the surgical procedure was performed. An aspect of potential effect of the defect correction on contacts with other persons, self-confidence, promotion at work and effect of the modification of appearance on acceptance by the closest persons were also analyzed.

#### Statistical analysis

To analyze relations between age and responses to individual questions included in the questionnaire, non-parametric tests were used – Mann-Whitney test for two compared groups and Kruskal-Wallis for three compared groups. The decision to use non-parametric tests was based on the fact that the number of subjects in the study groups was small. Chi-square tests were used in the other comparisons.  $p < 0.05$  was considered as a statistically significant level.

## RESULTS

All study subjects provided positive assessment of their appearance after the surgical treatment; majority of them indicated that the surgical procedure had positive effect on their self-confidence (82.9% of responses). However, responses to the question concerning easier creation of interpersonal contacts after the surgical procedure were less conclusive.

None of the respondents encountered negative assessment of their appearance after the surgical treatment (80% assessments were positive, in 20% of cases there were no such assessments), while almost half of the respondents (48.6%) declared that they did not care about society noticing changes in their appearance.

The obtained responses indicate that the respondents did not notice any effect of the surgical procedure on improvement of their professional status.

The vast majority of respondents felt improvement in biting off food (91.4%), while effect of the procedure on improved articulation was inconclusive.

Only 5 of the respondents (14.3%) felt discomfort caused by the postoperative scar; the others were not disturbed by the scar (fig. 1 and 2).

In most cases (71.4%) the respondents made the decision to undergo the surgical treatment by themselves. Only one woman (at the age of 28 years) said that she would not decide to



Fig. 1. A patient after extraoral vertical ramus osteotomy (EVRO). A linear, red, hypertrophic scar, well visible as a result of high contrast with the skin



Fig. 2. Atrophic, linear scar in the submandibular region after extraoral vertical ramus osteotomy – smooth, almost invisible

undergo the surgical therapy once again. This person positively assessed outcomes of the procedure – she indicated that she assessed her appearance well, the procedure had positive effect on the self-confidence and clearly facilitated her contact with other persons. Despite the fact that she cared about the society noticing changes in her appearance, obviously her friends did not assess her appearance. Furthermore, after the procedure this woman noticed improvement of her professional status, improvement in biting off food as well as she declared that the postoperative scar did not have negative aesthetic effect. Table 1 presents general summary of provided responses.

Subsequently relationship between the provided responses and patients' sex was analyzed. Essentially, no significant association was found between assessment of outcomes of the surgical treatment and sex. Only with responses to questions concerning improvement in articulation, women were more prone to provide extreme responses (yes or no). Forty per cent of the woman responded "yes" or "rather yes" to the question concerning improvement in speech after the procedure, while 60% responded "no" or "rather no". Among men, 61.5% subjects responded "rather yes" and 38.5% "rather no" to this question.

The respondents who assessed their appearance after the procedure as very good, more

Table 1. General summary of provided responses

|   |    |       |
|---|----|-------|
| 1. How do you assess your appearance after the procedure?                               |    |       |
| very good   | 16 | 45,7% |
| good  | 19 | 54,3% |
| moderate  |    |       |
| poor  |    |       |
| 2. Did the surgical procedure affect your self-confidence, and if yes, to what degree?  |    |       |
| yes 100%  | 8  | 22,9% |
| rather yes 70%  | 21 | 60%   |
| rather no 40%   | 1  | 2,9%  |
| no effect at all 0%   | 5  | 14,3% |
| 3. Do you find contacts with other persons easier after the surgical procedure?         |    |       |
| definitely yes  | 4  | 11,4% |
| rather yes  | 15 | 42,9% |
| rather no   | 4  | 11,4% |
| the procedure had no effect at all  | 12 | 34,3% |
| 4. Did your friends assess positively your appearance?                                  |    |       |
| yes   | 20 | 57,1% |
| rather yes  | 8  | 22,9% |
| rather no   |    |       |
| they did not assess my appearance   | 7  | 20%   |
| 5. Did you care about society noticing changes in your appearance after the procedure?  |    |       |
| definitely yes  | 6  | 17,1% |
| rather yes  | 12 | 34,3% |
| rather no   | 15 | 42,9% |
| definitely no   | 2  | 5,7%  |
| 6. Did your professional status improve after the surgical procedure?                   |    |       |
| yes   | 3  | 8,6%  |
| no  | 2  | 5,7%  |
| it did not change   | 30 | 85,7% |
| 7. Was your promotion at work related to the surgical procedure that you had undergone? |    |       |
| yes   | 2  | 5,7%  |
| no  | 33 | 94,3% |
| 8. Did your biting off and chewing food improve after the surgical procedure?           |    |       |
| yes   | 29 | 82,9% |
| rather yes  | 3  | 8,6%  |
| rather no   | 1  | 2,9%  |

|   |    |       |
|---|----|-------|
| the procedure had no effect at all  | 2  | 5,7%  |
| 9. Did your articulation improve after the surgical procedure?            |    |       |
| yes   | 5  | 14,3% |
| rather yes  | 14 | 40%   |
| rather no   | 12 | 34,3% |
| no  | 4  | 11,4% |
| 10. To what degree does your postoperative scar on your face disturb you? |    |       |
| very much   |    |       |
| moderately  | 5  | 14,3% |
| it does not disturb me  | 28 | 80%   |
| there is no scar  | 2  | 5,7%  |
| 11. Would you undergo surgical treatment of prognathism once again?       |    |       |
| yes   | 34 | 97,1% |
| no  | 1  | 2,9%  |
| 12. What did make you undergo the surgical treatment?                     |    |       |
| my family   | 6  | 17,1% |
| my friends  | 1  | 2,9%  |
| it was my own decision  | 25 | 71,4% |
| I consulted with my family doctor   | 3  | 8,6%  |

commonly claimed that the procedure markedly affected their self confidence (fig. 3).

The respondents who cared about society noticing changes after the procedure, heard positive opinions more commonly, while respondents for whom such opinion was not important, more commonly did not hear such opinion (fig. 4).

Analysis of relationship between age of the respondents and assessment of the procedure

was also performed. Table 2 presents results of this analysis. Respondents who associated improvement of their professional status with outcome of the procedure, were on average older than the respondents who did not see such association. Furthermore, an average age of respondents who felt discomfort due to postoperative scar was higher than age of the respondents for whom the scar did not have a negative effect.

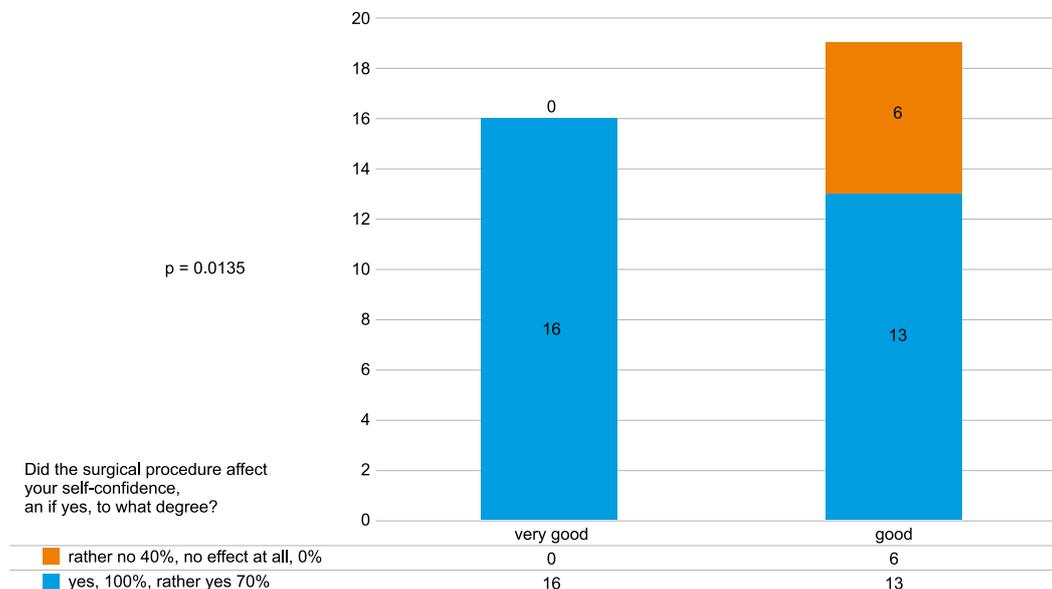


Fig. 3. How do you assess your appearance after the procedure?

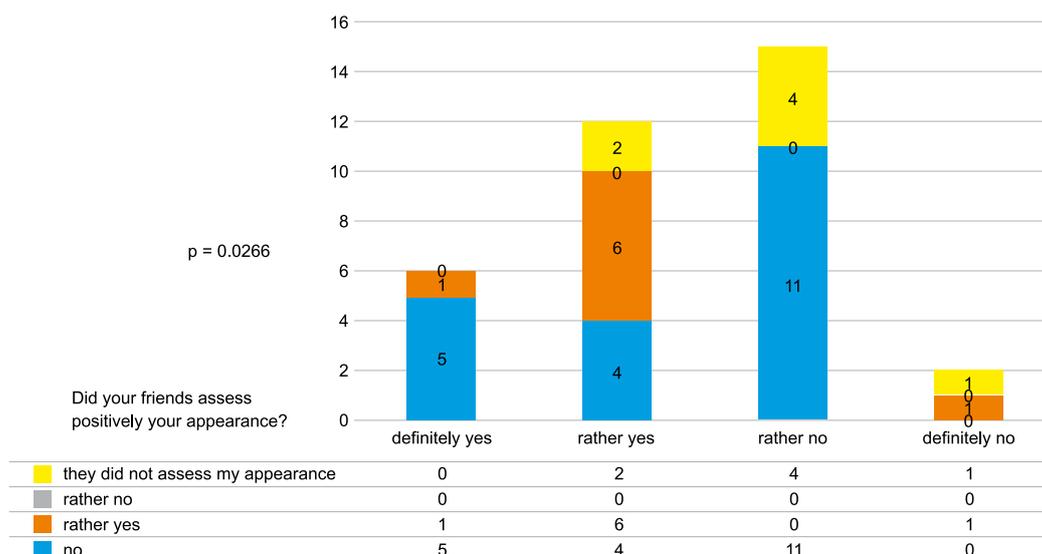


Fig. 4. Did you care about society noticing changes in your appearance after the procedure?

Table 2. Responses to the questions included in the questionnaire depending on respondents' age

|  | Age  |     | p      |
|--|------|-----|--------|
|  | mean | SD  |        |
| 1. How do you assess your appearance after the procedure?                              |      |     | 0,3498 |
| very good  | 27,9 | 8,1 |        |
| good   | 24,6 | 4,5 |        |
| 2. Did the surgical procedure affect your self-confidence, and if yes, to what degree? |      |     | 0,7490 |
| yes, 100%, rather yes 70%  | 26,1 | 6,8 |        |
| rather no 40%, no effect at all, 0%  | 26   | 5,5 |        |
| 3. Do you find contacts with other persons easier after the surgical procedure?        |      |     | 0,1332 |
| definitely yes, rather yes   | 23,9 | 4,1 |        |
| rather no, the procedure had no effect at all  | 28,6 | 8   |        |
| 4. Did your friends assess positively your appearance?                                 |      |     | 0,8560 |
| yes  | 26   | 6,2 |        |
| rather yes   | 25,4 | 6,8 |        |
| they did not assess my appearance  | 27,1 | 8,2 |        |
| 5. Did you care about society noticing changes in your appearance after the procedure? |      |     | 0,1528 |
| definitely yes, rather yes   | 24,7 | 6,2 |        |
| rather no, definitely no   | 27,5 | 6,8 |        |
| 6. Did your professional status improve after the surgical procedure?                  |      |     | 0,0449 |
| yes  | 34,3 | 7,1 |        |
| it did not change  | 25,3 | 6,1 |        |
| 8. Did your biting off and chewing food improve after the surgical procedure?          |      |     | 0,0532 |
| yes, rather yes  | 26,6 | 6,6 |        |
| rather no, the procedure had no effect at all  | 20,3 | 2,5 |        |
| 9. Did your articulation improve after the surgical procedure?                         |      |     | 0,3849 |
| yes, rather yes  | 27,4 | 7,6 |        |
| rather no, no  | 24,6 | 4,9 |        |
| 10. To what degree does your postoperative scar on your face disturb you?              |      |     | 0,0287 |
| moderately   | 21   | 1   |        |
| it does not disturb me, there is no scar   | 26,9 | 6,7 |        |
| 12. What did make you undergo the surgical treatment?                                  |      |     | 0,6795 |
| my family, my friends, consultation with a doctor                                      | 24,7 | 5,4 |        |
| it was my own decision   | 26,6 | 7   |        |

## DISCUSSION

Extraoral vertical ramus osteotomy is one of two procedures currently used in Poland as surgical correction of the prognathism (6). The literature indicates that majority of patients with facial-maxillary-occlusal defects, including mandibular prognathism, are satisfied with outcomes of corrective orthognathic surgical procedures. Furthermore, usually most of the subjects, noticing positive changes in their appearance as a result of the surgical treatment, would decide to undergo surgical treatment once again were they faced with such prospect (7-10).

Results of our study are compatible with data presented by other authors. Furthermore, the surgical procedure was shown to have positive effect on self-confidence of patients. Furthermore, the scar was found not to have negative effect on general assessment and satisfaction with outcomes of the surgical treatment. Subjects who felt discomfort related to the presence of postoperative scar were on average younger. Other authors, based on studies conducted in patients who had undergone vertical osteotomy, also indicate that presence of the scar had no effect on general positive assessment of outcomes of the treatment (9, 10).

Results of surveys available in the literature confirm that after surgical therapy patients declare improvement in biting off and chewing food as well as in articulation (8, 10,

11). In this study vast majority of respondents also noticed improvement in biting off food (92%). More than half of subjects also indicated that their speech was improved. Subjective improvement of articulation was also reflected by objective investigations of speech. Lewandowski observed that lisping and nasal speech, occurring in approximately half patients with class III skeletal defects, completely or partially resolve after the surgical procedure (11, 12).

Extraoral vertical ramus osteotomy changes the interrelations between the facial soft tissues, markedly affecting aesthetic aspects and attractiveness of the face. Improved function of the somatognathic organ involved in chewing and articulation was also important for the subjective assessment of the patients.

## CONCLUSIONS

1. Patients positively assessed outcomes of surgical treatment using vertical ramus osteotomy.
2. After the surgical treatment there is a subjective improvement of the appearance of the face as well as chewing and articulation function.
3. The postoperative scar has no negative effect on general, positive assessment of aesthetic postoperative outcome.

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