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The effect of strabismus surgery on psychosocial and functional quality of life

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ABSTRACT

Aims: To evaluate the effect of strabismus surgery on psychosocial and functional quality of life.

Methods: 50 adult strabismus patients who presented to our outpatient clinic with the complaint of strabismus in one eye were included in the study. Routine ophthalmologic examinations and strabismus controls were performed. With the diagnosis of monocular fixed eso/exotropia, unilateral horizontal muscle retraction and resection surgery were planned, and preoperative adult strabismus score (AS-20), Rosenberg self-esteem, body perception, and social appearance anxiety questionnaires were applied. A postoperative PD of 10 or less was considered success, and the questionnaires were repeated at the 2nd postoperative month.

Results: The mean age of the patients was 21.54±3.95 (16-32) years. Twenty-two of the patients were female, and 28 were male. Pre-operative and post-operative strabismus AS-20 score, Rosenberg self-esteem, body perception, and social appearance anxiety scales showed statistically significant differences ($p<0.05$, $p<0.001$, $p<0.001$, $p<0.001$, $p<0.001$).

Conclusion: Strabismus is an important disease that can cause difficulties in social life both in childhood and adulthood. The aim of strabismus surgery is to restore normal facial appearance as well as functional correction. Our study results showed that successful strabismus surgery can improve the psychosocial and functional quality of life.

Keywords: Strabismus, AS-20 score, Rosenberg self-esteem, body perception, social appearance anxiety

INTRODUCTION

Strabismus is a disease that occurs when the visual axes of the eyes are not parallel in any direction of gaze.[1] It may cause physiopathologic changes, including diplopia, confusion, and amblyopia, and may also lead to psychosocial developmental disorders.[2,3] Surgical treatment has an important place in the treatment of strabismus. The aim of surgery is to correct the shift in the visual axes and restore both binocular vision and a normal facial appearance. Individuals with strabismus have social problems, such as finding a job and a spouse, because of their appearance in society. There are studies showing that self-confidence decreases in patients with strabismus.[4]

The aim of our study was to evaluate the effect of strabismus surgery on psychosocial and functional quality of life.

METHODS

The study was carried out with the permission of the Fırat University Hospital Scientific Researches Evaluation and Ethics Committee (Date: 27.07.2023, Decision No: 2023/10-20). We obtained an informed consent form from all patients for procedure. All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. 50 strabismus patients over 16 years of age who applied to our outpatient clinic with the complaint of inward or outward shift in one eye and underwent surgery were included in the study. Routine ophthalmologic examinations and strabismus controls were performed. Patients with deep amblyopia (VA:<0.2 snellen) and sensorial strabismus were excluded from the study. With the diagnosis of monocular fixed eso/exotropia, unilocular horizontal muscle retraction and resection surgery were planned, and preoperative adult strabismus score (AS-20), Rosenberg self-esteem, body perception, and social appearance anxiety questionnaires were applied. A postoperative 10 PD of deviataion or less was considered success, and the questionnaires were repeated at the 2nd postoperative month.

The Rosenberg Self-Esteem Scale was developed in 1963 and is a self-report scale consisting of 63 multiple-choice questions.[5] The scale consists of twelve subcategories. For the purpose of the study, the first "ten" items of the scale were used to measure self-esteem. Items 1, 2, 4, 6, and 7 question positive self-evaluation and are scored from 3 to 0. Items 3,

5, 8, 9, and 10 question negative self-evaluation, and those who score 0-1 in the "Self-Esteem" subtest are considered to have "high" self-esteem; those who score 2-4 are considered to have "moderate" self-esteem; and those who score 5-6 are considered to have "low" self-esteem.

The Social Appearance Anxiety Scale (SAAS) is a self-report scale developed to measure emotional, cognitive, and behavioral concerns about one's appearance and validated and reliably validated by Doğan et al.[6] in 2010. The validity and reliability studies of the scale were conducted on three different samples of university students. Exploratory factor analysis (EFA) was conducted with the data obtained from the first sample of 512 participants, and confirmatory factor analysis (CFA) was conducted with the data obtained from the second sample of 853 participants. With the data obtained from the third sample of 541 participants, convergent validity and test-retest reliability were calculated. The internal consistency coefficient of the scale was found to be .94, .95 and .94 for the three samples, respectively. The test-retest reliability coefficient obtained as a result of two applications one month apart was found to be .84. The scale contains 16 items and is related to how they feel about their appearance. The total score of the scale, which has scores ranging from 1 to 5 for each item and has response options such as "not at all appropriate," "not appropriate," "somewhat appropriate," "appropriate," and "completely appropriate," varies between 16 and 80, and a high score indicates a high level of appearance anxiety.[7]

The body perception scale (BPS) was developed by Secord and Jourand[8] in 1953, and its validity and reliability were tested in 1989. The reliability of the two halves of the scale was found to be 0.89. ($p<0.05$) This finding shows that the reliability of the scale is high. When Cronbach's alpha values were analyzed, it was found that the internal consistency coefficients of the two halves of the scale were 0.79 and 0.87, respectively. The internal consistency coefficient of the whole scale was 0.95.[9]

The scale contains 40 items, and each item is related to an organ or a part of the body (such as an arm, leg, or face) or a function (level of sexual activity). The total score of the scale ranges between 40 and 200, with scores ranging from 1 to 5 for each item and response options such as "I don't like it at all", "I don't like it", "I don't like it", "I am undecided", "I like it", "I like it" and "I like it very much", and a high total score indicates a high level of satisfaction. The cut-off score of the scale was 135, and those with a score below 135 were defined as the group with low body perception.[9]

The adult strabismus (AS-20) questionnaire, a strabismus-specific questionnaire developed by Hatt et al.[10] is used for the psychosocial and functional effects of strabismus in adults. The AS-20 scale consists of a total of 20 questions, including 10 questions about psychosocial status and 10 questions about functional status. Patients are asked to mark the appropriate option under each question in the form of a proposition. Scoring is done as never (100 points), rarely (75 points), sometimes (50 points), frequently (25 points), and always (0 points). The scores of the answers given to all questions are summed and divided by the number of questions answered, and a total score is obtained. The average of the first 10 questions related to psychosocial status is used to determine the psychosocial score, and the average of the second 10 questions related to functional status is used to determine the functional score. In addition, the total AS-20 score is obtained by considering all 20 questions.

Statistical Analysis

The study data were computerized and evaluated using "SPSS (Statistical Package for Social Sciences) for Windows 22.0 (SPSS Inc., Chicago, IL)". Descriptive statistics were presented as mean±standard deviation, median (25%-75%), frequency distribution, and percentage. Pearson's chi-square test was used to evaluate categorical variables. The conformity of the variables to a normal distribution was examined using visual (histogram and probability plots) and analytical methods (Kolmogorov-Smirnov test). Mann Whitney The U test was used as a statistical method for determining statistical significance between two independent groups for variables that were found not to conform to a normal distribution. The relationship between the variables was evaluated by the Spearman test. A statistical significance level of $p<0.05$ was accepted as significant.

RESULTS

The mean age of the patients was 21.54±3.95 (16-32) years. 22 of the patients were female (44%) and 28 were male (56%). Pre-operative and post-operative strabismus AS-20 score, Rosenberg self-esteem, body perception, and social appearance anxiety scales showed statistically significant differences ($p<0.05$, $p<0.001$, $p<0.001$, $p<0.001$, respectively) (**Table 1**, **2**, **3**, and **4**).

Table 1. Strabismus surgery and AS-20 scale

AS-20	Preoperative	Postoperative	P value
Psychosocial	48.71±16.02	65.40±15.10	P<0.012
Functional	45.03±13.88	59.40±14.81	P<0.033
Total score	46.40±13.45	62.56±15.21	P<0.028

AS-20: Adult strabismus-20

Table 2. Strabismus surgery and Rosenberg self-esteem scale

Self-esteem	Preoperative	Postoperative	P value
High	12 (40%)	27 (90%)	P<0.001
Mid-level	15 (50%)	3 (10%)	
Low	3 (10%)	0	

Table 3. Strabismus surgery and body perception scale

Body image	Preoperative	Postoperative	P value
High	7 (23.3%)	26 (86.6%)	P<0.001
Low	23 (76.6%)	4 (13.4%)	

Table 4. Strabismus surgery and Social Appearance Anxiety Scale (SAAS)

Social appearance anxiety	Preoperative	Postoperative	P value
Mean	2.2	1.41	P<0.001
Standard deviation	0.43	0.36	

DISCUSSION

Strabismus is observed in 4% of the general population.[11] Strabismus surgery is primarily performed to correct the disease and provide visual rehabilitation. In addition, surgical correction has social and psychological effects. Strabismus also causes effects on patients' educational lives, social relationships, self-care, and work environments.[12-14] Patients with strabismus may engage in behaviors such as wearing glasses and covering their shifting eyes with their hair due to their hesitation to make direct eye contact in their social relationships.[15]

Patient-reported outcome measures are standardized and validated instruments to measure patients' perceptions of their health conditions according to specific parameters or

at specific time points. Patients self-assess their health status on these scales and can compare their pre-treatment and post-treatment status. The psychosocial impact of strabismus was first demonstrated in a study conducted in 1993.[12] Burke et al.[13] evaluated 31 strabismus patients postoperatively and reported that self-confidence, attractiveness, self-esteem, and communication with the opposite sex were positively affected after surgery. In a study by Jaskson et al.[15] 46 cases were prospectively analyzed, and it was reported that the anxiety levels of the patients decreased and the social anxiety score decreased after surgery. In a study conducted by Menon et al.[16] it was found that 95% of 40 patients had improved self-confidence and personal relationships after surgery.[16]

Strabismus surgery has also important psychosocial consequences.[17,18] Previous studies have shown that strabismus surgery reduces social anxiety.[19] However, strabismus patients may have functional visual problems that may lead to diplopia, depth perception problems, ligament pain, dizziness, and loss of balance.[20] It has also been reported that strabismus patients have more vision-specific mental health problems compared to other ophthalmologic diseases such as glaucoma and cataract. Correction of strabismus should not only consist of restoring the eyes to their normal positions. Strabismus surgery also improves head position, stereopsis, visual field enlargement, correction of diplopia, and psychomotor development.[21-26]

The adult strabismus-20 (AS-20) questionnaire is designed to assess health-related quality of life and functional vision in strabismus patients. The AS-20 score assesses both the physiologic and functional consequences of strabismus. It has been shown to be superior to existing assessment tools with high retest reliability.[27-29] In their study, Hatt et al.[30] compared strabismus patients with the AS-20 score with the normal population and patients with other ophthalmologic pathologies other than strabismus in one eye. The AS-20 score was found to be 98 in the normal population, 88 in patients with ophthalmologic pathology other than strabismus in one eye, and 56 in strabismus patients. In our study, the preoperative AS-20 score was 46.40±13.45 in strabismus patients. Postoperative AS-20 score increased to 62.56±15.21. There was a statistically significant difference between preoperative and postoperative AS-20 scores (P<0.028).

In our study, when the preoperative and postoperative results of the patients were evaluated with self-esteem, social appearance anxiety, and body image scales, we found that the scores of the patients changed statistically significantly after surgery (p<0.001, p<0.001, p<0.001, p<0.001). The present findings suggest that the postoperative psychosocial status of the patients improved. The data we obtained in the AS-20 score and the data we obtained in the self-esteem, social appearance anxiety, and body image scales seem to be compatible with each other.

The AS-20 score may be low in some postoperative patients. However, no postoperative decrease in the AS-20 score was detected in our study. Postoperative diplopia, a predisposition to depression, and accompanying facial anomalies were detected in patients with low postoperative AS-20 scores. Therefore, a comprehensive postoperative evaluation of the patients is important. In the Jackson et al.[31] series, postoperative diplopia persisted in 11 of 18 patients with preoperative diplopia, and this result was reported to negatively affect the AS-20 score. Hatt et al.[32] also showed that 80 of 106 patients with a low AS-20 score postoperatively had diplopia. In our study, we did not detect postoperative diplopia; therefore, we did not find a postoperatively low AS-20 score. Beauchamp et al.[33] reported in a retrospective study of 101 cases that patients' postoperative uncorrected misalignments did not cause an increase in quality-of-life scores, including specific health, social communication, and daily activities. Dickman et al.[34] also discovered that the success of strabismus surgery had an impact on the postoperative score and that poor surgical outcomes were associated with poor quality of life scores. Hatt et al.[32] divided the postoperative results as successful (orthophoric or <10 PD, no diplopia), partially successful (10-20 PD, mild symptomatic), and unsuccessful (>20 PD), but they did not find significant results in the AS-20 score in the postoperative results. They explained this with the placebo effect of strabismus surgery. In our study, our postoperative results were <10 PD in patients without diplopia. Therefore, we did not detect any decrease in the AS-20 score. However, patients should be evaluated in detail before surgery, and postoperative conditions should be explained in detail. This is important for postoperative patient satisfaction.

In their study, Hatt et al.[35] found the AS-20 score to be 78 at the 6th postoperative week, continued to follow up with the patients, and reported that the score increased to 86 at the end of 1 year. This shows that the postoperative improvement in the AS-20 score is not limited to the early postoperative period but continues even in the long term in patients' social and work lives. In our study, the AS-20 scores at the 2nd postoperative month were significantly higher than the preoperative period but relatively lower than the literature. The reason for this is that the preoperative AS-20 score was lower than the literature, and the test was repeated at postoperative month 2, as mentioned before. We think that in longer-term follow-ups, the AS-20 score will increase as the patients' satisfaction in social life increases.

Limitations

Among the shortcomings of our study are that our relatively small number of cases. It is important to support the findings in studies with larger patient participation and including postoperative complicated cases.

CONCLUSION

Strabismus is an important disease that can cause difficulties in social life both in childhood and adulthood. The aim of strabismus surgery is to restore normal facial appearance as well as functional correction. Our study results showed that successful strabismus surgery can improve the psychosocial and functional quality of life.

ETHICAL DECLARATIONS

Ethics Committee Approval

The study was carried out with the permission of Fırat University Hospital Scientific Researches Evaluation and Ethics Committee (Date: 27.07.2023, Decision No: 2023/10-20).

Informed Consent

All patients signed and free and informed consent form.

Referee Evaluation Process

Externally peer-reviewed.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Financial Disclosure

The authors declared that this study has received no financial support.

Author Contributions

All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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