

# Evaluation of Esthetic, Functional, and Quality-of-Life Outcome in Adult Cleft Lip and Palate Patients

KLAUS SINKO, D.M.D.

REINHOLD JAGSCH, PH.D.

VERENA PRECHTL

FRANZ WATZINGER, M.D., D.M.D., PH.D.

KARL HOLLMANN, M.D., PH.D.

ARNULF BAUMANN, M.D., D.M.D., PH.D.

**Objective:** Evaluation of esthetic, functional, and health-related quality-of-life (HRQoL) outcomes in adult patients with a repaired cleft lip and palate. The treatment for all patients was based on the so-called Vienna concept.

**Patients/Design:** Seventy adult patients with a repaired complete cleft lip and palate, ranging in age from 18 to 30 years, were included in the study. Esthetic and functional outcomes were assessed by the patients themselves and by five experts using a visual analog scale. Patients also completed the MOS Short-Form 36 questionnaire to evaluate health-related quality of life.

**Results:** Patients rated their esthetic outcome significantly worse than the experts did. No significant differences were observed in the ratings for function. Female patients, especially, were dissatisfied with their esthetic outcomes. In a personal interview, nearly 63% of them asked for further treatment, particularly for upper-lip and nose corrections. The health-related quality-of-life questionnaire revealed low scores for only two subscales, namely social functioning and emotional role. In most subscales of health-related quality of life, patients who desired further treatment had significantly lower scores than did patients who desired no further treatment.

**Conclusion:** Surgery of the lip and nose appears to be of prime importance for patients with a cleft lip and palate. Cleft patients who do not request secondary treatment are not always satisfied with the treatment. Patients with realistic expectations in regard to further treatment should be treated by specialists, whereas those with unrealistic expectations should be referred to a clinical psychologist.

KEY WORDS: *adult, cleft lip palate, facial appearance, quality of life, satisfaction with treatment outcome*

Cleft lip and palate is the most frequent congenital craniofacial deformity, with a mean prevalence of between 1:500 and 1:700 in Europe (Peterka et al., 2000). Cleft lip and palate irregularities vary greatly in terms of width of the cleft and other characteristics. Treatment modalities also differ, depending on the date of surgery and the technique of reconstruction. For obvious reasons, the region where this deformity occurs

(i.e., the face) is a very sensitive region of the body. In the long term, the treatment of cleft lip and palate should provide good esthetic and functional (speech, occlusion) results (Jeffery and Boormann, 2001; Marcusson et al., 2002). One of the major problems in the treatment of cleft lip and palate patients is that the definitive results of treatment are not visible until two decades after primary surgery. Because the patient's physical development and level of cooperation may vary, the final outcome cannot be predicted when the treatment is started. In fact, the final result can be assessed only when the patient is about 20 years old.

Esthetics in general, and facial esthetics in particular, appears to be a very important aspect of the individual's general perception of life, especially between the ages of 18 and 30 years (Jacobson, 1984; Harris and Carr, 2001). In the public health sector, a large amount of money has been invested in physical appearance during the last decade of the 20th century. Nose correction and the treatment of wrinkles are now popular

---

Dr. Sinko, Ms. Precht, Dr. Watzinger, and Dr. Baumann are at the University Hospital of Cranio-Maxillofacial and Oral Surgery, Medical University of Vienna, Vienna, Austria. Dr. Jagsch is at the Institute of Psychology, Department of Clinical and Health Psychology, University of Vienna, Vienna, Austria. Dr. Hollmann was an Associate Professor. Deceased October 2004.

Parts of this paper were presented as a poster at the 60th Meeting of the American Cleft Palate-Craniofacial Association; April 9–13, 2003; Asheville, North Carolina.

Submitted October 2003; Accepted July 2004.

Address correspondence to: Dr. Klaus Sinko, University Hospital of Cranio-Maxillofacial and Oral Surgery, Medical University, Waehringer Guertel 18–20, A-1090 Vienna, Austria. E-mail klaus.sinko@meduniwien.ac.at.

treatment options in plastic surgery. Dental rehabilitation also has been improved by the routine application of fixed orthodontic appliances and nonmetallic crowns and bridgework. Modern “tissue engineering” procedures such as distraction in combination with dental implants, allow nearly perfect rehabilitation of missing teeth.

One of the most relevant measures of the success of treatment for a cleft lip and palate is the individual’s facial appearance (Asher-McDade et al., 1991). The latter is judged by the patient’s satisfaction, as well as by the verdict of independent experts and laymen. In addition to the complexity of the deformity, various parts of the face may be involved. The patient may have a scar in the lip, a nasal deformity, a missing tooth, poor occlusion in a retruded maxilla, a nasal voice, or a combination of these phenomena. All of these must be considered in the final evaluation.

Besides these visual aspects, psychological factors play a major role (Endriga and Kapp-Simon, 1999). Psychological deficits, particularly in self-concept, were observed especially in women (Kapp, 1979; Leonard et al., 1991).

Many adult patients with a repaired cleft lip and palate are satisfied with their facial appearance and dental function (Clifford et al., 1972; Noar, 1991; Ramstad et al., 1995; Marcusson et al., 2002). Clifford et al. (1972) reported that most of their patients (95%) were satisfied with their appearance after the completion of treatment. In 1991, Noar mentioned that 85.7% of patients were satisfied with the treatment, although 54% of patients were unhappy with some features of their faces. According to Ramstad et al. (1995), 35% of patients stated that they would like to have some form of additional treatment (mainly surgery). However, Marcusson et al. (2002) reported that only 50% to 70% of adult patients were satisfied with their facial appearance, yet 58% of patients desired further treatment.

The present study in adult cleft lip and palate patients was performed for two reasons: a) differing results have been reported in the published literature, and b) patients’ expectations concerning the treatment of cleft lip and palate have increased greatly in the last few decades.

The patients’ self-rated satisfaction with the esthetic and functional outcome of the treatment was compared with the ratings of so-called experts in the treatment of cleft lip and palate. A further aim of the study was to determine the patients’ desire for additional treatment and the type of treatment they desired. We also wanted to know whether psychological aspects influence the health-related quality of life (HRQoL) of adult patients with a repaired cleft lip and palate.

## MATERIAL AND METHODS

### Patients

One hundred sixty-five patients with a repaired complete unilateral or bilateral cleft lip and palate were invited by mail for a follow-up examination. The patients ranged in age from 18 to 30 years and had been operated on at the Department of

Oral and Maxillofacial Surgery, Medical University of Vienna. The sample consisted of 106 men (64.2%) and 59 women (35.8%). None of these individuals had other associated diseases. The patients were treated according to the Vienna concept (Hollmann, 1980). Lip adhesion was performed when, as newborns, the patients had reached their birth weight; the soft palate was closed when the patients were between the ages of 6 months and 1 year. At the age of 4 years, the upper lip and the nose were corrected, if necessary. The hard palate was closed before the child started going to school at 6 years of age. Until that time, the hard palate had been closed with an acrylic plate. The plate was evaluated and adjusted every 4 to 6 weeks, depending on the child’s growth and dental development, as described by Hotz (1969).

### Procedure

Patients were requested to assess their esthetic and functional outcome separately on visual analog scales (VAS). VAS were given preference over Likert scales because the former employs a 100-mm scale with a broad range of distinctive possibilities, whereas the latter uses ratings from 1 to 5 or from 1 to 10 (Johnson, n.d.). According to Jaeschke et al. (1990), both methods of presenting response options show the same level of construct validity and responsiveness. The procedure was explained to the patients by a psychologist. Facial appearance was judged by the patient’s degree of satisfaction with the lip, nose, and lower face. Patients rated their functional outcome with regard to biting, chewing, swallowing, and the comprehensibility of their speech for others. Complete dissatisfaction was marked at the left end and complete satisfaction at the right end of the 100-mm scale (Aitken, 1969). Every patient was interviewed individually and his/her esthetic and functional outcome rated by a psychologist (C.H.). The patient’s desire for further treatment (yes/no) and the preferred type of treatment were noted by the psychologist. In addition, a maxillofacial surgeon (A.B.), an orthodontist (K.S.), a dental assistant (K.P.-S.), and a speech therapist (V.P.) rated the patients on the VAS during the clinical examination. None of these examiners was involved in the primary treatment; all of them have worked on the cleft team for the last 10 years (except the psychologist who was engaged for the study). All measurements concerning the visual analog scales were done by one of the coauthors (R.J.) using a ruler. The clinical examination included an assessment of occlusion, inspection of the velopharynx, clicking and pain in the temporomandibular joint (TMJ), and cephalometric X-rays. The presence of palatal fistula and the need for orthodontic or prosthodontic therapy were also evaluated.

The patients’ well-being and HRQoL were assessed using the MOS Short-Form 36 (SF-36; Bullinger and Kirchberger, 1998). HRQoL is gaining increasing importance as an outcome variable to evaluate procedures in medicine. The SF-36 was chosen because it is widely used to assess HRQoL, and because normative data for stratified groups (for genders and different age groups) are available. It was designed for use in

**TABLE 1** Percentage of Men and Women With Stable Sexual Relationships; Proportions of Patients With Primary and Secondary Education

	Stable Relationship (%)	Primary Education (%)	Secondary Education (%)
Men, n = 46	32.6	63	37
Women, n = 24	66.7	75	25

clinical practice and research, as well as for general population surveys. The questionnaire takes about 5 to 10 minutes to complete and comprises 36 items in different formats, spanning two to six categories. The questionnaire investigates eight health concepts: physical functioning, role limitations due to physical health problems, bodily pain, general health perceptions, vitality/fatigue, social functioning, role limitations due to emotional problems, and general mental health. One additional item provides information about perceived change in health. Concerning psychometric properties, considerable evidence was found for the reliability of SF-36 (Cronbach's alpha  $>.85$ ; reliability coefficient  $>.75$  for all dimensions except social functioning) in a study performed by Brazier et al. (1992), and also for criterion validity. Jenkinson et al. (1994) observed statistically significant trends for decreasing SF-36 scores in patients with worsening self-rated general health. The HRQoL data of our patients were compared with normative data from a healthy population. In a second analysis, patients who expressed a desire for further treatment were compared with those who did not.

### Statistical Analysis

SPSS 10.0 for Windows (SPSS Inc., Chicago, IL) was employed for statistical analysis. The experts' scores were compared with the patients' own scores using *t* tests for paired samples. The data of male and female patients were compared with *t* tests for independent samples. One-sample *t* tests were used to compare quality-of-life means with norm data.

Bivariate correlational relationships were assessed by means of Pearson correlations; comparison of frequencies was done using chi-square tests. Patients desiring further correction and those who did not were compared using parametric tools such as *t* tests for independent samples or univariate analysis of variance (ANOVA) with *post hoc* Scheffé tests. In case of failed prerequisites (heterogeneous variances, missing normal distribution of data), nonparametric tests like the Kruskal-Wallis test were employed, followed by Mann-Whitney *U* tests with Bonferroni adjustment. Data reduction was achieved by factor analyses using principal components analysis as the extraction method, eigenvalue solution, and varimax with Kaiser normalization as the rotation method. Significant results refer to a 5% level; results lower than 10% were interpreted as a trend toward significance. Additional information concerning power is given in case of statistically significant differences in mean scores.

**TABLE 2** Ratings\* for Function and Esthetics by Experts and Patients

	Function	Esthetics
Experts	77.44 ± 19.05	81.44 ± 14.00
Patients	78.05 ± 23.51	64.68 ± 24.70

\* On a visual analog scale from 0 to 100.

## RESULTS

The follow-up investigation included 70 patients (42.4%) of whom 46 were men (of 106) and 24 were women (of 59). The male-female ratio of 65.7%:34.3% was representative of the total population invited to participate in the study. The subjects' mean age was 23.9 years (SD = 4.1; range, 18 to 30 years). Data concerning education and marital status are summarized in Table 1. Based on the Austrian census of 2001, we found no significant difference in the educational level of patients and controls.

Of the remaining patients, 21 had moved, 2 had died, and 7 called to say they did not wish to attend the examination. The remaining 65 patients were contacted by mail a second time. Of these, 24 patients (17 men and 7 women) returned an enclosed simple questionnaire in which the subjects had been asked to indicate their satisfaction with the outcome of treatment (fully satisfied, moderately satisfied, or dissatisfied) and their desire for further treatment (yes/no).

Sixteen of 24 patients (66.7%) were fully satisfied, whereas 8 (33.3%) were moderately satisfied. No patient was dissatisfied with the treatment. Four of the fully satisfied and five of the moderately satisfied patients desired further treatment. In other words, 38% of this group wanted further treatment, although they were quite satisfied with the outcome. This percentage is nearly the same as that registered in patients who consented to the examination and were studied (44.3%; Table 4).

### Clinical Data

Forty-nine patients (70%) had a unilateral and 21 (30%) had a bilateral cleft lip and palate. Seventeen (24.3%) of these 70 patients had a persistent palatal fistula. Forty-one (58.6%) patients had received osteoplasty at a mean age of 15.8 years (range, 7–28 years). Because osteoplasty has been used routinely since 1990, older patients received a tertiary osteoplasty, which explains the relatively high mean age of this group. Thirteen patients (18.6%) had undergone orthognathic surgery to correct occlusal discrepancies.

Twenty-four men (52.2%) and 14 women (58.3%) underwent secondary operations, such as upper-lip and nose correction, whereas 15 patients had symptoms in the TMJ (only one patient reported pain). The experts recommended functional treatment such as orthodontics or prosthodontics in 12 patients, speech therapy in 23 patients, and upper-lip and nose correction in 19 patients. The experts believed that 6 patients could

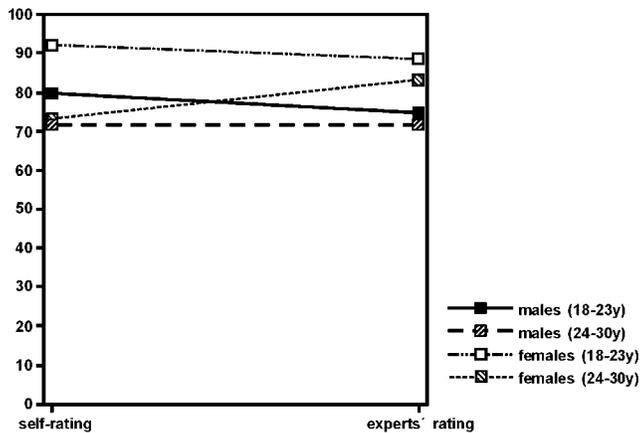


FIGURE 1 Ratings for function

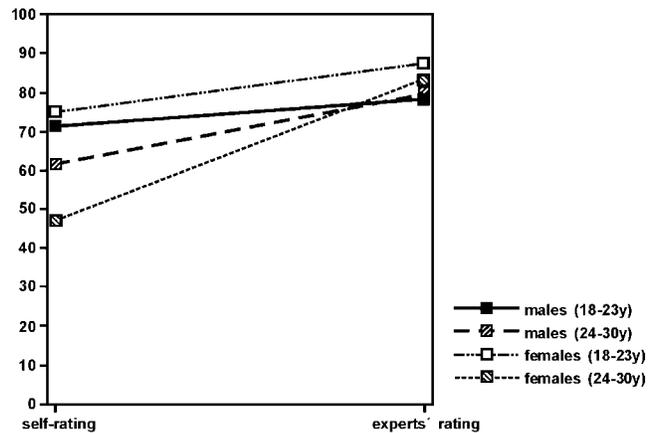


FIGURE 2 Ratings for esthetics

benefit from an osteotomy, and deemed further treatment unnecessary in 25 patients.

**Results of the VAS**

The ratings of experts and patients in respect to esthetics and function were compared. In order to determine differences based on sociodemographic variables, patients were divided into four subgroups according to median age and gender. Thus, the subjects were divided into women or men aged 18 to 23 years, and women or men aged 24 to 30 years.

With regard to function, no differences were found between the ratings of experts and those of patients—neither for the whole sample ( $t = -.162$ ;  $df = 69$ ;  $p = .872$ ) nor for the four subsamples divided by gender and age group ( $p > .05$ , Table 2 and Fig. 1). In contrast, the ratings of patients and experts in respect of esthetics differed: the experts' ratings were significantly better than those of patients ( $t = 5.613$ ;  $df = 69$ ;  $p < .001$ ;  $1 - \beta = 1.00$  [statistical power], Table 2). These differences were also registered at the level of the subsamples ( $p < .05$ ), except in males aged 18 to 23 years, in whom the difference did not achieve a level of significance ( $p = .148$ , Fig. 2).

Comparing male and female patients, the experts rated function significantly better in women than in men ( $t = -3.434$ ;  $df = 67.846$ ;  $p = .001$ ;  $1 - \beta = .94$ ); besides, a trend in favor of women was found for esthetics ( $t = -1.925$ ;  $df = 68$ ;  $p = .058$ ;  $1 - \beta = .72$ ). Comparing the self-ratings of the four subgroups of patients, no significant differences in function were observed ( $p > .05$ , Fig. 1). In contrast, ANOVA was significant for the comparison of the four subgroups in

respect of esthetics ( $F = 3.627$ ;  $df = 3$ ;  $p = .017$ ). Women aged 24 to 30 years expressed poorer ratings, compared with the two subsamples of younger patients (Fig. 2).

The correlations between the five experts revealed a high degree of concordance. A smaller range on the scale was observed for function ( $r$  between .562 and .807;  $p < .001$  for all dyads) than for esthetics ( $r$  between .476 and .815;  $p < .001$  for all dyads, Table 3 shows all ratings in detail). A factor analysis (eigenvalue solution) of all judgments of all experts (principal component analysis with varimax rotation and Kaiser normalization, variance explained 74.78%) confirmed the two-factor structure of the data: esthetic ratings scored high on factor 1 (explained variance, 41.23%), whereas ratings concerning function scored high on factor 2 (explained variance, 33.55%; for a visual description see Fig. 3). There was no significant difference between the ratings of male and female experts, or between the ratings of medical staff and nonmedical staff.

**Further Treatment**

Women expressed a desire for further treatment twice as often as men (62.5% versus 34.8%) (Table 4). Nearly one half of the men and two thirds of the women desired further treatment for correction of the upper lip and nose (Table 4). Considering the entire sample, a large number of women aged 24 to 30 years (81.8%) expressed a desire for further treatment.

The esthetic ratings of patients who desired further treatment were significantly lower than the ratings of those who desired no further treatment; however, the experts' ratings of esthetics did not differ for the two groups (Fig. 4).

TABLE 3 Ratings\* of Five Experts Taken Together and Ratings of Each Expert for Function and Esthetics in Men and Women

	All Together	Orthodontist	Surgeon	Dental Assistant	Speech Therapist	Psychologist
Function in men	73.86 ± 21.06	67.96 ± 26.83	77.10 ± 19.91	67.13 ± 24.92	79.96 ± 20.71	74.67 ± 26.15
Function in women	86.15 ± 10.34	84.98 ± 12.54	84.88 ± 14.51	81.17 ± 14.61	90.85 ± 10.62	88.90 ± 16.09
Esthetics in men	79.16 ± 15.35	78.84 ± 18.56	78.74 ± 18.29	76.65 ± 20.47	81.88 ± 16.60	80.51 ± 16.43
Esthetics in women	85.81 ± 9.83	82.71 ± 13.01	83.38 ± 13.30	87.48 ± 9.58	85.96 ± 15.46	89.54 ± 9.80

\* On a visual analog scale from 0 to 100.

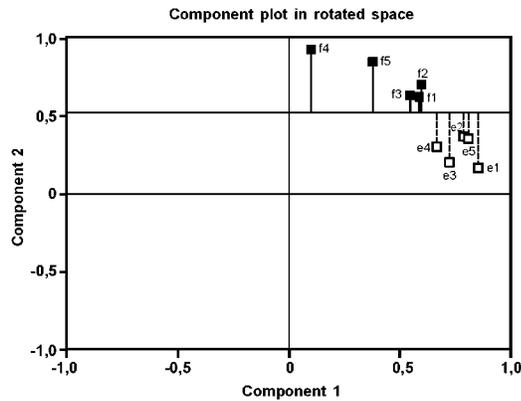


FIGURE 3 Two-dimensional component plot of all ratings of all five experts (f = function; e = esthetics; 1 = orthodontist; 2 = speech therapist; 3 = maxillofacial surgeon; 4 = dental assistant; 5 = psychologist).

### Comparison of the Patients' Desire for Further Treatment and the Experts' Evaluation of the Need for Further Treatment

The patients' desire for further treatment coincided with the experts' assessment of the need for such treatment in about three quarters of the men and two thirds of the women. Discrepancies among the women's scores were always because the patients desired treatment and the experts deemed further treatment unnecessary. Among men, however, only two thirds of the discrepancies were because of the patients' desire (for details see Table 5). It is interesting to note that one third of the discrepant scores for men were because the patients desired no further treatment, but the experts believed the patients would benefit from such treatment.

### Quality of Life

With regard to the HRQoL of adult patients with a repaired cleft lip and palate, the patients' scores were compared with normative data derived from a stratified population reported by Bullinger and Kirchberger (1998). Normative data of the age group 21 to 30 years were chosen because the average age of our patient group was 23.9 years. Only two subscales (i.e., social functioning [ $1 - \beta = .62$ ] and emotional role [ $1 - \beta = .67$ ]) revealed significantly lower scores ( $p < .05$ ) in pa-

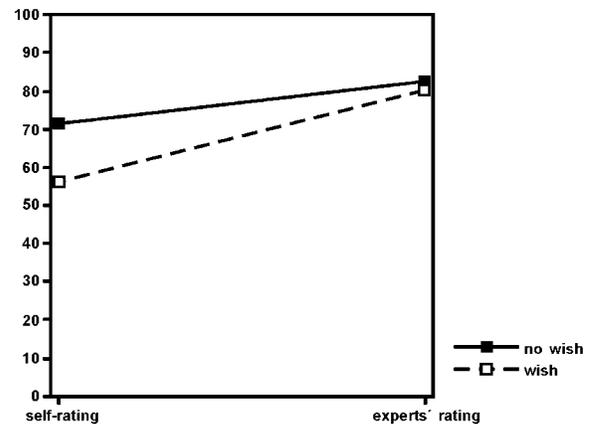


FIGURE 4 Esthetics: Experts' ratings and patients' self-ratings for those who desired further treatment and those who did not.

tients, whereas vitality showed a trend toward lower scores ( $p < .10$ ;  $1 - \beta = .63$ ). Differences in means never exceeded 9 points on a scale from 0 to 100, as shown in Figure 5.

Comparing patients who desired further treatment with those who did not, significant differences or trends toward significance were found for five of the eight subscales of SF-36 (Fig. 6): physical role ( $1 - \beta = .96$ ;  $p < .05$ ), vitality ( $1 - \beta = .89$ ;  $p < .05$ ), bodily pain ( $1 - \beta = .90$ ;  $p < .10$ ), social functioning ( $1 - \beta = .89$ ;  $p < .10$ ) and general mental health ( $1 - \beta = .90$ ;  $p < .10$ ).

### DISCUSSION

In contrast to data reported a few decades ago (Clifford et al., 1972), the findings suggest that facial esthetics is an important aspect of health-related quality of life in adults with a repaired cleft lip and palate. Women's ratings of their facial appearance were significantly poorer than those of experts; this discrepancy was especially marked in women aged 24 to 30 years. No significant differences were found between the functional ratings of patients and the ratings of examiners. Marcusson et al. (2002) found that 58% of adult patients who had undergone cleft lip palate repair wanted further treatment (mainly surgery). They also found that, in the cleft group, women's ratings of their mouth and profile on a five-point Likert scale were significantly poorer than those of men.

TABLE 4 Absolute Numbers/Percentages of Patients Desiring Further Treatment and Type of Treatment Desired

	No Desire for Further Treatment (%)	Desire for Further Treatment (%)	Type of Desired Treatment			Various Aspects Would Need Improvement, But the Patients Were Unwilling to Undergo Further Treatment ("Fed Up") (%)
			Upper Lip and Nose (%)	Speech (%)	Occlusion (%)	
All patients n = 70	39 (55.7)	31 (44.3)	17 (54.9)	5 (16.1)	4 (12.9)	5 (16.1)
Men n = 46	30 (65.2)	16 (34.8)	7 (43.7)	3 (18.8)	2 (12.5)	4 (25.0)
Women n = 24	9 (37.5)	15 (62.5)	10 (66.7)	2 (13.3)	2 (13.3)	1 (6.7)

**TABLE 5** Concordance versus Discrepancy Between the Desire for (Patients), and the Deemed Necessity (Experts) of Further Treatment

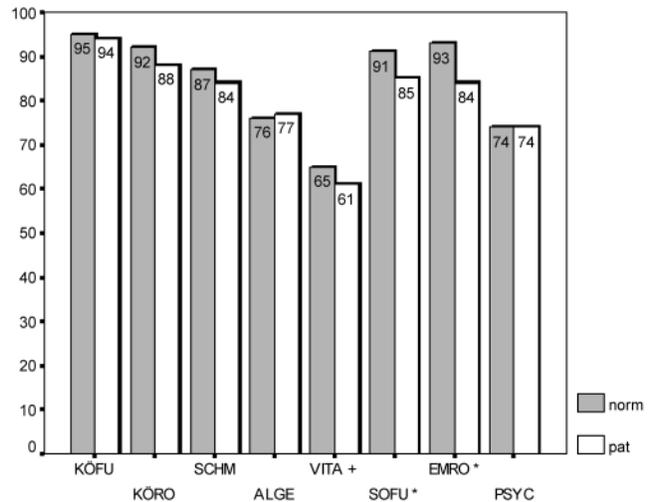
	Males n = 46 (%)	Females n = 24 (%)
Concordance	35 (76.1)	16 (66.7)
Discrepancy total	11 (23.9)	8 (33.3)
Discrepancy 1*	4 (36.4)	8 (100.0)
Discrepancy 2	7 (63.6)	0 (0.0)

\* Discrepancy 1 = patients desire treatment/experts deem further treatment unnecessary; Discrepancy 2 = patients desire no treatment/experts consider further treatment necessary.

According to Kapp (1979), girls may be more affected by the stigma of a repaired cleft because of the importance given to physical attractiveness in our society. Expectations concerning the treatment of cleft lip and palate have increased greatly in the last few decades, as information about plastic surgery has become accessible on a large scale in the mass media. According to Cunningham (1999), patients subconsciously adopt society’s concept of physical attractiveness and behave accordingly. In the general population, and especially in the age group of 18 to 30 years (which corresponds to one age group in our sample), 46% to 56% of men and 69% of women were concerned about at least one aspect of their appearance. One third of these women in a noncleft group had concerns about their noses, lips, mouths, and faces, including their chins (Harris and Carr, 2001). The nose is the most prominent facial feature, plain to everyone and impossible to cover or hide (Babuccu et al., 2003). A good-looking nose might encourage people to think one is more honest, trustful, successful, and loyal (Dion et al., 1972). And it is this sensitive region of the face where cleft patients have scars. Thus women, understandably, seek to improve their appearance after cleft lip repair. The deformity also may influence the ability to find a job, gain social credit, or find a spouse (Zapotoczky and Marlovits, 1993). This might explain the large number of patients who desired correction of the nose in our study, as well as in the study conducted by Marcusson et al. (2002). Patients’ expectations and satisfaction also may be influenced by the treatment schedule. Cunningham (1999) rightly states that patients should be urged to realize that other features of their personality are also important in social encounters, establishing relationships, and securing employment.

The differences between men and women in this study may be explained partly by the fact that men tend to identify themselves more with social status, money, and power. Therefore physical attractiveness has been less important for men than for women. Additionally, men have the possibility to hide scars or conceal a retruded maxilla with a moustache. However, in our study, more women had long-standing sexual relationships than men.

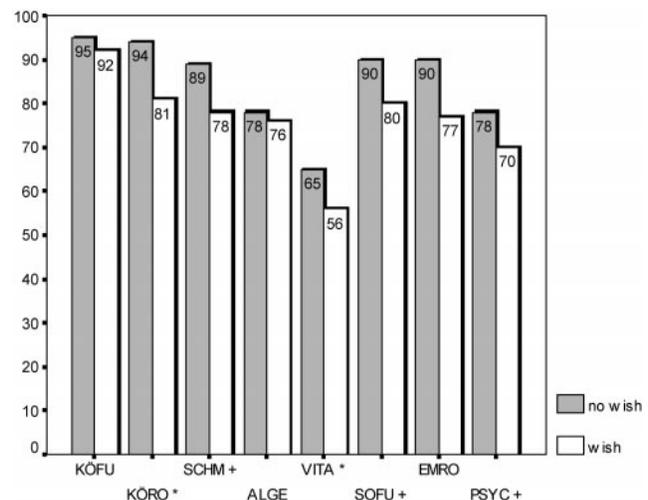
Interestingly, in a personal interview, 44.3% of all patients and 62.5% of women desired further treatment. This raises questions as to why dissatisfied patients do not seek further treatment and why some patients state they are very satisfied with the outcome of the treatment, yet desire further treatment.



**FIGURE 5** Comparison of quality of life between cleft lip and palate patients, and healthy norms (norm = healthy norms; pat = cleft lip and palate patients; KÖFU = physical functioning; KÖRO = physical role; SCHM = bodily pain; ALGE = general health; VITA = vitality; SOFU = social functioning; EMRO = emotional role; PSYC = mental health; \**p* < .05, + *p* < .10).

Many cleft lip and palate patients appear to be tired of seeking further treatment, although they are not entirely satisfied with the outcome of treatment. Sixteen percent of patients who requested correction stated that they desired several corrections but were disinclined to undergo any further treatment (Table 4). One explanation for this phenomenon might be the patients’ lifelong history of numerous surgical procedures, orthodontic treatment, and speech therapy.

With respect to function, a high level of agreement was observed between experts and patients (Table 2). Although experts believed that occlusion deserved to be corrected in some



**FIGURE 6** Comparison of quality of life between patients who desired further treatment and those who did not (KÖFU = physical functioning; KÖRO = physical role; SCHM = bodily pain; ALGE = general health; VITA = vitality; SOFU = social functioning; EMRO = emotional role; PSYC = mental health; \* *p* < .05, + *p* < .10).

cases, patients appeared to have no problems with respect to dental function.

Only two subscales of the questionnaire concerning HRQoL revealed significantly lower scores compared with a normal sample. Based on these data and several published reports (Bjornsson and Agustsdottir, 1987; Marcusson et al., 2001; Person et al., 2002), it could be concluded that the cleft lip palate patients participating in this study were psychologically well adjusted. However, in contrast to the above mentioned reports, major differences were observed between patients who desired further treatment and those who did not (Fig. 6): the former had a poorer quality of life than the latter (Fig. 5). Starr (1982) and Thomas et al. (1997) found a correlation between attractiveness and self-esteem in cleft lip and palate patients. Thus, a psychological aid may be useful in difficult cases (Richmann et al., 1985), especially in patients with unrealistic expectations with respect to further surgical treatment. Provided the patients' expectations are realistic, surgical correction may well improve quality of life.

One limitation of this study may be the fact that only 42.4% of the total sample was assessed. In order to reduce the possibility of incorrect conclusions based on a selected population, the 65 patients who declined the examination were asked by mail about their satisfaction with the outcome of treatment. Nearly the same percentage of these patients desired further treatment as did the assessed group (44.3% versus 38%). Thus, it appears that the assessed and nonassessed groups experienced the same degree of satisfaction and desire for further treatment. However, we were unable to obtain detailed information on the SF-36 and the VAS from 57.6% of the overall sample. Therefore, a documentation form was developed for our cleft lip and palate patients. The form allows both experts and patients to make a standardized detailed assessment of the outcome of treatment from the patient's birth to adulthood.

The results suggest that, provided the patient's expectations are realistic, surgery should be performed to improve quality of life. However, if the patient's desires cannot be fulfilled by surgery, he or she should be advised to consider psychological therapy.

*Acknowledgments.* The authors would like to thank Karin Pusch-Strasser (dental assistant) and Claudia Hausleitner (psychologist) for their assistance in conducting this study. This paper is dedicated to Rolf Ewers on the occasion of his 60th birthday.

## REFERENCES

- Aitken RC. Measurement of feelings using visual analogue scales. *Proc R Soc Med.* 1969;62:989–993.
- Asher-McDade C, Roberts C, Shaw WC, Gallagher C. Development of a method for rating nasolabial appearance in patients with clefts of the lip and palate. *Cleft Palate Craniofac J.* 1991;28:385–390.
- Babuccu O, Latifoglu O, Atabay K, Oral N, Cosan B. Sociological aspects of rhinoplasty. *Aesthetic Plast Surg.* 2003;27:44–49.
- Bjornsson A, Agustsdottir S. A psychosocial study of Icelandic individuals with cleft lip or cleft lip and palate. *Cleft Palate J.* 1987;24:152–157.
- Brazier JE, Harper R, Jones NM, O' Cathain A, Thomas KJ, Usherwood T, Westlake L. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ* 1992;305:160–164.
- Bullinger M, Kirchberger I. SF-36 Fragebogen zum Gesundheitszustand-Handanweisung. Göttingen: Hogrefe; 1998.
- Clifford E, Crocker EC, Pope BA. Psychological findings in the adulthood of 98 cleft lip-palate children. *Plast Reconstr Surg.* 1972;50:234–237.
- Cunningham SJ. The psychology of facial appearance. *Dent Update* 1999;26: 438–443.
- Dion K, Berscheid E, Walster E. What is beautiful is good. *J Pers Soc Psychol.* 1972;24:285–290.
- Endriga MC, Kapp-Simon KA. Psychological issues in craniofacial care: state of the art. *Cleft Palate Craniofac J.* 1999;36:3–11.
- Harris DL, Carr AT. Prevalence of concern about physical appearance in the general population. *Br J Plast Surg* 2001;54:223–226.
- Hollmann K. "Vienna concept" of treatment of cleft lip, jaw and/or palate. *Österr. Z. Stomatol.* 1980;77:249–252.
- Hotz MM. Pre- and early postoperative growth-guidance in cleft lip and palate cases by maxillary orthopedics (an alternative procedure to primary bone-grafting). *Cleft Palate J.* 1969;6:368–372.
- Jacobson A. Psychological aspects of dentofacial esthetics and orthognathic surgery. *Angle Orthod.* 1984;54:18–35.
- Jaeschke R, Singer J, Guyatt GH. A comparison of seven-point and visual analogue scales. *Control Clin Trials.* 1990;43–51.
- Jeffery SL, Boormann JG. Patient satisfaction with cleft lip and palate services in a regional centre. *Br J Plast Surg.* 2001;54:189–191.
- Jenkinson C, Wright L, Coulter A. Criterion validity and reliability of the SF-36 in a population sample. *Qual Life Res.* 1994;3:7–12.
- Johnson JM. Visual Analog scales: Part III. Available at: <http://www.bamc.amedd.army.mil/DCI/articles/dci07976.htm>. Accessed April 23, 2004.
- Kapp K. Self concept of the cleft lip and or palate child. *Cleft Palate J.* 1979; 16:171–176.
- Leonard BJ, Brust JD, Abrahams G, Sielaff B. Self-concept of children and adolescents with cleft lip and/or palate. *Cleft Palate Craniofac J.* 1991;28: 347–353.
- Marcusson A, Akerlind I, Paulin G. Quality of life in adults with repaired complete cleft lip and palate. *Cleft Palate Craniofac J.* 2001;38:379–385.
- Marcusson A, Paulin G, Östrup L. Facial appearance in adults who had cleft lip and palate treated in childhood. *Scand J Plast Reconstr Surg Hand Surg.* 2002;36:16–23.
- Noar JH. Questionnaire survey of attitudes and concerns of patients with cleft lip and palate and their parents. *Cleft Palate Craniofac J.* 1991;28:279–284.
- Persson M, Aniansson G, Becker M, Svensson H. Self-concept and introversion in adolescents with cleft lip and palate. *Scand J Plast Reconstr Surg Hand Surg.* 2002;36:24–27.
- Peterka M, Peterkova R, Tvrdek M, Kuderova J, Likovsky Z. Significant differences in the incidence of orofacial clefts in fifty-two Czech districts between 1983 and 1997. *Acta Chir Plast.* 2000;42:124–129.
- Ramstad T, Ottem E, Shaw WC. Psychosocial adjustment in Norwegian adults who had undergone standardised treatment of complete cleft lip and palate. II. Self-reported problems and concerns with appearance. *Scand J Plast Reconstr Surg Hand Surg.* 1995;29:329–336.
- Richman LC, Holmes CS, Eliason MJ. Adolescents with cleft lip and palate: self-perceptions of appearance and behavior related to personality adjustment. *Cleft Palate J.* 1985;22:93–96.
- Starr P. Physical attractiveness and self-esteem ratings of young adults with cleft lip and/or palate. *Psychol Rep.* 1982;50:467–470.
- Thomas PT, Turner SR, Rumsey N, Dowell T, Sandy JR. Satisfaction with facial appearance among subjects affected by a cleft. *Cleft Palate Craniofac J.* 1997;34:226–231.
- Zapotoczky WP, Marlovits S. Changes in the sociomedical situation of patients with cleft lip, jaw and palate in 1975 and 1990 in Vienna. *Z Stomatolol.* 1993;90:137–148.