

Clinical Paper
Craniofacial Implants

Aesthetic and functional outcomes in patients with a nasal prosthesis

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Abstract. The aim was to evaluate the aesthetic and functional outcomes in patients with a nasal prosthesis after radical tumour resection. A questionnaire with 15 domains was created to evaluate the satisfaction of patients with their nasal prosthesis. Correlations with the results of the University of Washington Quality of Life (UWQOL) questionnaire, which was also completed by the patients, were analyzed. Forty-three patients with a partial or total nasal prosthesis completed the questionnaire. Twenty-seven patients were male and 16 were female; their median age was 62 years. The median follow-up time after tumour resection was 33 months. The best result was obtained for overall function (85.5) and the worst result for nasal crusts (58.5). The average daily duration of prosthesis use was 17.4 h. There were sex-dependent and age-dependent differences in the domain ‘self-confidence’, age-dependent differences in the domain ‘stability during sporting activities’, and differences in the domain ‘nose bleed’ depending on the time since tumour resection. All patients would recommend this rehabilitation after rhinectomy. ‘Satisfaction with function’ had the most influence on UWQOL domains. The nasal prosthesis is a well-accepted rehabilitation after rhinectomy. The results for appearance are comparable to those obtained for nasal reconstruction, and high scores were found for the functional domains.

Key words: quality of life; nasal cancer; nasal prosthesis; outcome; function; facial prosthesis; reconstruction.

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Malignancies of the nasal cavity, especially squamous cell carcinoma, tend to show local aggressive growth. A sufficient tumour excision – if necessary with partial or total resection of the exterior nose – is crucial, but may result in devastating changes to the outward appearance and psychosocial sequelae¹.

There are basically two possibilities for rehabilitation after total rhinectomy: a nasal prosthesis or operative reconstruction.

Although ‘artificial’, there are some obvious advantages to a nasal prosthesis: early rehabilitation, a shortened duration of surgery and hospitalization time, low initial costs, and particularly the ease of inspection of the former tumour region to ensure reliable treatment control^{2,3}.

On reviewing the literature, it appears that patient satisfaction with nasal prostheses has usually been studied in a cohort including other facial or auricular prostheses.

As a result, the aesthetic and functional outcomes of this particular type of rehabilitation have yet to be evaluated specifically.

Materials and methods

The study was performed in accordance with the guidelines of the Declaration of Helsinki of 1975, as revised in 1983, and the study protocol was approved by the

local institutional review board (Ethics Committee of the Albert-Ludwigs University of Freiburg). Written consent was obtained from the patients.

There is no standardized, validated questionnaire available to assess the aesthetic and functional outcomes for patients with a nasal prosthesis. The Nasal Appearance and Function Evaluation Questionnaire (NAFEQ) presented by Moolenburgh et al. was therefore used⁴. The NAFEQ scale is a valid and reliable method to evaluate outcomes in patients who have undergone surgical nasal reconstruction. Questions that were not relevant for patients with a nasal prosthesis were removed, in particular questions concerning the appearance of the aesthetic subunits of the reconstructed nose. The developers of the NAFEQ scale were approached and permission was obtained to use the instrument.

Questions concerning the everyday use of the nasal prosthesis and its influence on self-confidence and the subject's professional career were added. The domain selection was a result of discussion with affected persons rather than the result of a 'trialled' evaluation. The questionnaire included 15 domain questions. Questions 1–8 and 10 were scored on a five-point Likert scale from 0 (worst score) to 100 (best score). Question 9 assessed the stability of the nasal prosthesis in certain situations,

with a score from 1 (best score) to 6 (worst score). Patients received the German version of the questionnaire; Table 1 shows the English/translated version. Additionally, patients were able to report specific problems in a free text section, e.g. problems with care of the implant.

The study patients also completed the University of Washington Quality of Life (UWQOL) questionnaire, as presented in a previous study⁵. This was first introduced by Hassan and Weymuller and is now in its fourth iteration^{6,7}. Correlations between the results of the UWQOL and the aesthetic and functional outcomes questionnaire were assessed.

The study was designed as a cross-sectional investigation. First, patients in the department received the questionnaire (12 patients). To increase the significance of the results, two prosthesis manufacturers were asked for support. These companies forwarded the questionnaire to patients who were initially treated at other hospitals, resulting in 31 additional patients for inclusion in this study.

Data from the returned questionnaires were analyzed using IBM SPSS Statistics version 20.0 software (IBM Corp., Armonk, NY, USA). The Mann–Whitney test was used to test for significance, and Spearman's test was used for the correlation analysis. Probabilities of less than 0.05 were accepted as statistically significant.

Results

This study included 43 patients who had undergone a partial (n = 2) or total (n = 41) resection of the exterior nose and who had been rehabilitated with a nasal prosthesis. All patients had undergone surgery for advanced cancer of the nose/nasal cavity. Twenty-seven patients (62.8%) were male and 16 (37.2%) were female. The survey was sent to patients by mail. All patients had a bone-anchored or implant-retained prosthesis with a grouped implant system (mostly Epiplating; Medicon eG, Tuttlingen, Germany). The placement of the implant system usually follows tumour resection in the same surgery. The first prosthesis adjustment is usually done at 4–6 weeks after surgery and should not be delayed by radiotherapy. The median patient age was 61 years (mean 62.4 years, range 37–87 years). The median interval between tumour resection and inclusion in the study was 33 months (mean 45.3 months, range 6–163 months).

The results of the aesthetic and functional outcomes questionnaire (questions 1–8 and 10) are presented in Table 2. Figure 1 shows the results for question 9 concerning the stability of the prosthesis in different everyday situations.

The average daily duration of prosthesis use was 17.4 h (standard deviation 6.1 h). No patient was a member of a support

Table 1. English/translated version of the aesthetic and functional outcomes questionnaire.

| Question | Always | Mostly | Every now and then | Hardly ever | Never |
|--|-------------------|--------------|----------------------|-------------|----------------|
| 1 How often do you have trouble breathing through your nose? | 0 | 25 | 50 | 75 | 100 |
| 2 How often can you smell odors? | 100 | 75 | 50 | 25 | 0 |
| 3 How often do you have trouble with nasal crusts? | 0 | 25 | 50 | 75 | 100 |
| 4 How often do you have a nose bleed? | 0 | 25 | 50 | 75 | 100 |
| | Very poor | Poor | Moderate | Good | Very good |
| 5 How would you assess your quality of speech? | 0 | 25 | 50 | 75 | 100 |
| | Very dissatisfied | Dissatisfied | Moderately satisfied | Satisfied | Very satisfied |
| 6 How satisfied are you with the function of your prosthesis? | 0 | 25 | 50 | 75 | 100 |
| 7 How satisfied are you with the appearance of your prosthesis? | 0 | 25 | 50 | 75 | 100 |
| 8 How satisfied are you with the stability of your prosthesis? | 0 | 25 | 50 | 75 | 100 |
| 9 Assess the stability in the following situations (1 = very good to 6 = insufficient) | | | | | |
| a Housekeeping | | | | | |
| b Eating | | | | | |
| c Sports activities | | | | | |
| d Sweating | | | | | |
| e Coughing/sneezing | | | | | |
| | Very poor | Poor | Moderate | Good | Very good |
| 10 How does your prosthesis fit? | 0 | 25 | 50 | 75 | 100 |
| 11 Are you member of a support group? (Yes or no) | | | | | |
| 12 How many hours per day do you use your prosthesis? | | | | | |
| 13 Does the public use of the nasal prosthesis reduce your self-confidence? (Yes or no) | | | | | |
| 14 Did you have changes in your professional career after the therapy (surgery and subsequent prosthetic rehabilitation), for example retraining or part-time job? If yes, please specify: | | | | | |
| 15 Would you recommend this kind of therapy (surgery and subsequent prosthetic rehabilitation) to other patients with malignant diseases of the nose? (Yes or no) | | | | | |

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