

Craniofacial Reconstructions with Bone-anchored Epithesis in Head and Neck Cancer Patients – A Valid Way Back to Self-perception and Social Reintegration

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Abstract. *Background: Patients with advanced head and neck cancer often require radical and mutilating surgery resulting in severe impairment of their aesthetic self-perception and social life. Cosmetically satisfying results associated with high aesthetic self-perception and social reintegration are possible with bone-anchored epithesis representing a serious alternative to craniofacial reconstructive techniques using regional and free tissue transfer. Patients and Methods: Five head and neck cancer patients treated in our Ear, Nose and Throat Department in the years 2003-2004 were evaluated after epithesial reconstruction. Results: Three out of the five patients scored self-perception after epithesial reconstruction as “very good”, while social integration was scored as “very good” by three and as “satisfactory” by two patients. Daily getting along was scored as “very good” by four and as satisfactory by one patient. One patient had a very good acceptance of the epithesis as a part of the body and for four patients it was satisfactory. Conclusion: For the first time, the high degree of satisfaction in head and neck cancer patients receiving epithesial reconstruction in the maxillofacial region is demonstrated.*

Patients with advanced head and neck cancer often require radical and mutilating surgery which results in severe impairment of their aesthetic self-perception because of the exposed character of the head and neck region (1). Beyond the main goal of controlling the malignant disease a

satisfying cosmetic result is as important as the functional outcome (2). Modern plastic surgery offers various kinds of locoregional techniques for reconstructing craniofacial defects. But in a huge number of patients, the cosmetic results remain poor due to the complexity of the head and neck organs such as the ear, nose and orbit.

Patients with a worse prognosis and other severe maladies, such as diabetes associated with difficult wound healing, and, in particular, elderly people in a reduced general condition could profit from bone anchored epithesis as a substitute for the resected tissue in the craniofacial region. In the early 1950s, Branemark began his bone-anchoring studies resulting in the first auricle epithesis in 1977 (3, 4). Scientific and technical progress in surgical skills, implantation techniques and epithesis materials have renewed interest in bone-anchored epithesis. A complex loss of facial tissue in head and neck cancer patients is the best indicator for epithesis-based restoration of orbitopalpebral, auricular and nasal defects (5), which facilitates a solution tailored to each individual patient. The usage of titanium-based fixtures enables the solid anchorage of soft silicone facial epithesis to replace antiquated solid epithesis in the head and neck (6).

Having a satisfactory cosmetic impact, the epithesial reconstruction of complex facial tissue encourages social acceptance and improves social reintegration of head and neck cancer patients. The aim of this paper was to show the advantages of epithesial reconstruction in head and neck cancer patients.

Patients and Methods

Five patients who underwent craniofacial tumor surgery in the Ear, Nose and Throat Department, University Hospital Frankfurt/Main, Germany in the years 2003/2004 resulting in extended tissue deficiency were included in this study. Table I gives an overview of the patient characteristics.

Patient selection and preliminary ENT examination is extremely important and was performed by an experienced otorhinolaryngologist specialising in plastic reconstructive surgery.

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Table I. Patient characteristics.

Patient	Age (years)	Gender	Etiology and localisation	Staging	Kind of epithesis
1	68	female	SCCHN frontal nose	T2 N0 M0	Nose
2	68	male	SCCHN auricular	T4 N0 M0	Ear
3	68	male	SCCHN auricular	T4 N0 M0	Ear
4	73	male	SCCHN nose cavity	T3 N0 M0	Nose
5	78	female	SCCHN frontal nose	T3 N0 M0	Nose

SCCHN, squamous cell carcinoma of the head and neck.

In preparation for tumor surgery followed by bone-anchored epithelial reconstruction, each patient received complete tumor staging including cranial-facial CT scan, a panendoscopy to exclude a second malignancy in the ENT region and for histological sampling, an X-ray examination of the thorax and an abdominal sonography. The preoperative evaluation was completed by professional photographic documentation.

After tumor resection the bone-anchored epithelial reconstruction was performed analogously as described elsewhere (6). The postoperative results showed good stability of the fixtures and no healing time delay. The patients were able to leave hospital 1 to 3 days after the bone-anchoring fixtures were inserted and then had several sessions with the epithelialist for constructing and fitting the epithesis. The epitheses were manufactured after forming a model based on patients' presurgery photographs.

In the first two years after the malignant disease had appeared, oncological aftercare was conducted every two months and the patients were questioned about their satisfaction with the epithesis.

Results

After osseo-integration in all five patients, the titanium fixtures were stable in the postoperative period and throughout the whole observation. There were no complications, such as inflammation or infections. Table II gives an overview of the patients' satisfaction with the epithesis. Figures 1 and 2 give an impression of the epithelial results.

Discussion

In the last few decades the epithetic options in ENT reconstructive surgery have rarely been discussed as a serious treatment option for enabling patients' social reintegration and improving patients' self-perception after mutilating cancer resection.

The maxillofacial bone-anchored epithesis and the esthetic results of autogenous reconstruction must be judged on their ability to free cancer patients from stigmatization. An excellent cosmetic result is the key to providing patients with the confidence that their reconstructive surgery will remain undetected (7).

Table II. Patient satisfaction with the epithesis.

Patient	Self-perception	Social integration	Daily getting along (cleaning, handling)	Acceptance of epithesis as of body part
1	3	3	3	3
2	3	3	3	2
3	3	3	3	2
4	2	2	2	2
5	2	2	3	2

Score: bad = 1; satisfactory = 2; very good = 3. Data were ascertained 6 months after epithesis was fitted. Questioned if the epithesis improved their life, all 5 patients answered "yes".

One of the most important requirements in planning reconstructive surgery is to provide the patient with adequate information about the different techniques available. This might be particularly helpful for those patients with an unclear prognosis who, for lack of information, might otherwise undergo fruitless attempts at autogenous reconstruction. Even though the criteria for reconstructive treatment selection between surgical and prosthetic approaches are well defined for example in ear reconstruction, the main concern is what the final result will really look like (8, 9).

Conventional plastic reconstruction are manifold. Problems of vascularisation of flaps and significant resorption of cartilage-based reconstructions often lead to tissue necrosis requiring reintervention (10). Autogenous reconstruction also often requires a large piece of rib cartilage, for example for ear or nose reconstruction, impairing rib and thorax structure and leaving a soft tissue deficit at the donor site. The visible long-lasting scars at the sampling points are likely to invite questioning, mostly during leisure or summertime activities. Moreover reconstruction techniques often need two or more operative sessions which may be critical, especially in older patients.

Another issue is the symmetry of the reconstructed organs especially in ear reconstruction. One of the great advantages of bone-anchored epithesis is the attainment of bilateral symmetry. Considering the co-morbidities of many head and neck cancer patients resulting from longtime alcohol and nicotine abuse combined with a lack of compliance, shorter surgery times as well as the easier management of the postoperative and oncological aftercare with the epithesis approach is another benefit. The simplicity of the epithesis procedure, its good results and the early physical and social rehabilitation attained, favor its use when suitably indicated (11).

People who suffer maxillofacial disfigurement as a result of head and neck cancer often experience profound psychological trauma (12). The present results show, for the

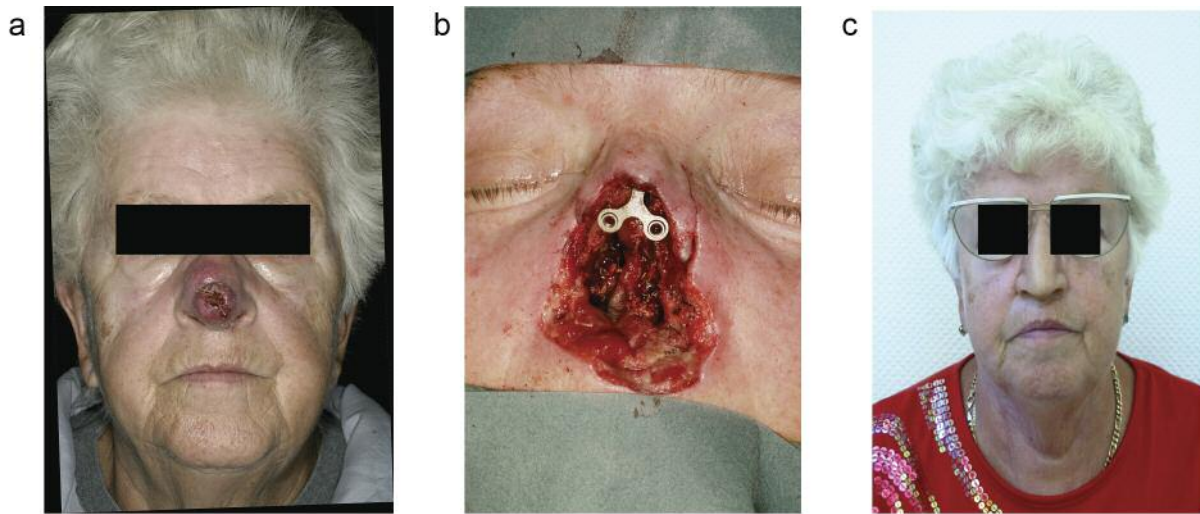


Figure 1. A 68-year-old female patient affected by an invasive squamous cell carcinoma of the frontal nose. No radiation therapy was applied. a) Before the ablatio nasi procedure. b) Intraoperative photodocumentation of the resected situs with fixtures. c) Result after epithelial reconstruction.

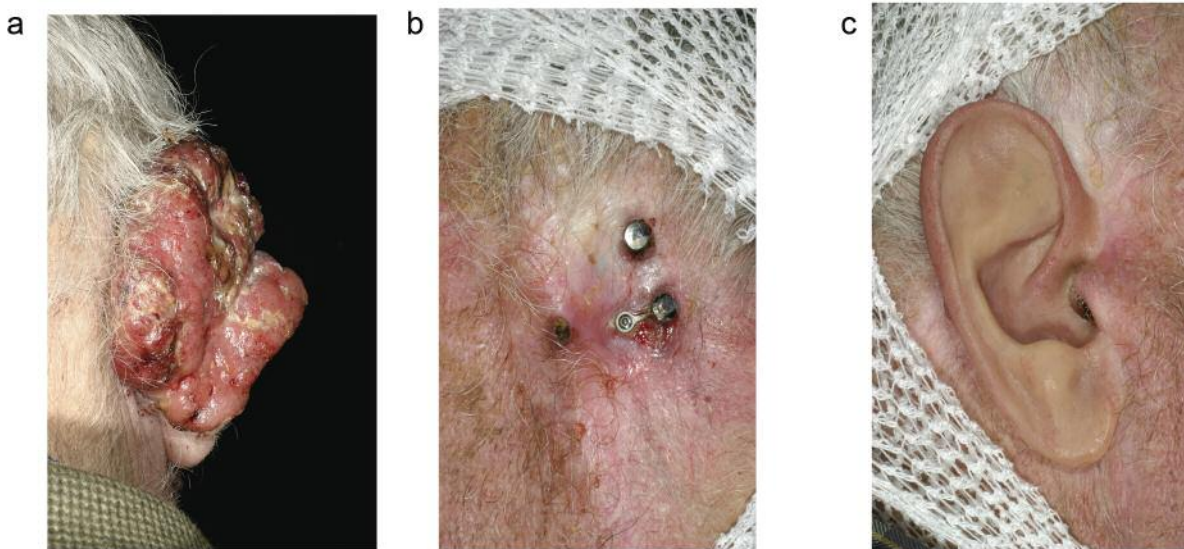


Figure 2. A 68-year-old male patient affected by an invasive squamous cell carcinoma of the auricle. No radiation therapy was applied. a) Before the ablatio auris procedure. b) Postoperative photography after tumor resection and anchoring of the fixture. c) Postoperative result after epithelial reconstruction.

first time, that head and neck cancer patients who have undergone epithelial reconstruction can overcome this psychological trauma resulting in a high degree of patient satisfaction with extraoral maxillofacial prostheses.

Conclusion

Our preliminary results indicate that bone-anchored epithesis represents a valid way back to self-perception and social reintegration for head and neck cancer patients.

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