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Anaplastology in times of facial transplantation: Still a reasonable treatment option?



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ABSTRACT

Optimum functional and aesthetic facial reconstruction is still a challenge in patients who suffer from inborn or acquired facial deformity. It is known that functional and aesthetic impairment can result in significant psychosocial strain, leading to the social isolation of patients who are affected by major facial deformities. Microvascular techniques and increasing experience in facial transplantation certainly contribute to better restorative outcomes. However, these technologies also have some drawbacks, limitations and unsolved problems. Extensive facial defects which include several aesthetic units and dentition can be restored by combining dental prostheses and anaplastology, thus providing an adequate functional and aesthetic outcome in selected patients without the drawbacks of major surgical procedures.

Referring to some representative patient cases, it is shown how extreme facial disfigurement after oncological surgery can be palliated by combining intraoral dentures with extraoral facial prostheses using individualized treatment and without the need for major reconstructive surgery.

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1. Introduction

Patients affected by severe facial deformity due to trauma or tumour often suffer from a profound degree of functional impairment and psychosocial strain, with an obvious impact on quality of life (Bronheim et al., 1991; Bonanno et al., 2010). Despite recent advances in human facial allotransplantation, appropriate reconstruction is still a challenge as the surgical reconstruction of some aesthetic subunits is nearly impossible or may require multi-step procedures, increasing the burden of care for patients affected by severe facial defects. Rehabilitation of patients with extensive craniomaxillofacial defects by means of anaplastology is still a viable option as artificial facial prostheses create excellent cosmetic results by providing good symmetry, colour and anatomical details (Sinn et al., 2011). For many years, extraoral implants for retaining

craniofacial prostheses have proved to be reliable (Branemark et al., 1982; Tjellstrom et al., 1994) and can be combined with intraoral dentures to improve functional rehabilitation (Engelen et al., 2014). In oncology patients, clinical monitoring for recurrence is facilitated by removable dentures and facial prostheses without the need for additional imaging. However, with advances in facial transplantation there may be discussion as to whether or not anaplastology still represents a reasonable treatment option for the rehabilitation of extensive craniofacial defects.

We describe the interdisciplinary management of three representative patient cases affected by extensive facial defects after ablative surgery. For adequate functional and aesthetic rehabilitation of the facial disfigurement in each patient, a combination of intraoral dentures and facial prostheses was required.

2. Materials and methods

In three patients (all female, >60 years old, with different comorbidities) orofacial rehabilitation was required after ablative

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surgery due to recurrent malignancies. In these patients, the surgery resulted in extensive facial defects involving both, intra- as well as extraoral subunits. In all three patients, nasal, labio-maxillary and buccal regions were affected; in two of the patients additional orbital involvement resulted in considerable functional and aesthetic impairment. There was no history of local irradiation.

Appropriate rehabilitation consequently required the combination of dentures and facial prostheses; these were manufactured according to the individual's needs. Anchorage of the craniofacial prosthesis was provided by osseointegrated craniofacial implants (EO System, Straumann, Switzerland) or plate-like systems for anaplastology (Ti-Epiplating, Medicon, Germany; Epitec, Stryker Leibinger, Freiburg im Breisgau, Germany). The interlinking between craniofacial implants, dentures and facial prostheses was mediated by corresponding magnetic abutments (X-Line, T-Line, K-Line, Z-Line, Steco, Hamburg, Germany). Manufacturing of the artificial parts, and care and support was provided by the anaplastology team of the department when radical oncological resection was documented by final histology. The anaplastology workflow was initiated as soon as the wound had healed. Time for the manufacturing of the individual 'hybrid device' varied according to the extent of the defect and was typically within the time-frame of three to six months for osseointegration of the craniofacial implants. To bridge this period, either surgical dressings or less sophisticated, glue-fixed facial prostheses without dentures were provided. Adjustments were made to the facial and dental prostheses until the patient indicated satisfaction with the functional results.

2.1. Case 1 (Fig. 1a and b)

An 81-year-old female patient, with a residual defect after resection of a microcystic carcinoma of the left paranasal region including parts of the nose, the upper lip and cheek (Fig. 1a). The patient was not willing to undergo major reconstructive surgery due to age and various relevant comorbidities. A facial prosthesis for the replacement of the lip, hemi-nose and left cheek was attached to a naso-zygomatic plate which was inserted four months after tumour resection. Functional loading was applied after another six months. Additional attachment for the facial prosthesis was provided by magnetic linking to an existing maxillary telescopic denture. Despite the well-known drawbacks of artificial lip replacement, the aesthetic and functional result was satisfactory for the patient, enabling almost unobtrusive speech and normal

nutrition without the need for a special diet (Fig. 1b). To bridge the ten months between tumour resection and integration of the device, the patient used a glue-fixed facial prosthesis. Follow up for the 'hybrid device' was 30 months.

2.2. Case 2 (Fig. 2a–c)

A 65-year-old female patient. Surgical therapy for recurrent squamous cell carcinoma of the left cheek resulted in subtotal midfacial resection including the orbit and zygomaticomaxillary region (Fig. 2a). Surgical reconstruction was not performed due to limited possibilities in reconstructing the orbit and further recurrences. A maxillary obturator was fitted with magnetic abutments for interlinking with the corresponding part of the facial prosthesis. The facial prosthetic replacement of the left orbit and cheek was attached to four extraoral implants with magnetic abutments (Fig. 2b).

The combination of intra- and extraoral artificial elements resulted in a functional and aesthetic situation which enabled the patient to live independently for several years (Fig. 2c). Despite some impairment of communication and nutrition (soft diet) this solution was acceptable for the patient. The total time taken to provide the patient with the 'hybrid device' was seven months after tumour resection, with insertion of the extraoral implants three months after ablative surgery plus another four months of healing time; follow-up time was 54 months. Several revisions of the prosthesis were performed during that time. The patient died due to the recurrent and spreading malignancy.

2.3. Case 3 (Fig. 3a–e)

A 60-year-old female patient, with severe comorbidities contraindicating major reconstructive surgery. This patient had a subtotal left facial defect after multiple operations due to recurrent squamous cell carcinoma of the cheek (Fig. 3a and b). Appropriate orofacial rehabilitation could be achieved by combining dental and facial prostheses. The larger removable facial part was attached to the residual skeleton by a combination of craniofacial implants and plates carrying a total of six magnetic abutments. The maxillary obturator which enabled chewing, swallowing and speaking was linked to the facial prosthesis by three additional magnetic abutments (Fig. 3c and d). Using this construction, an almost unremarkable facial appearance was realised which was the main therapeutic goal (Fig. 3e). A time period of 18 months after ablative

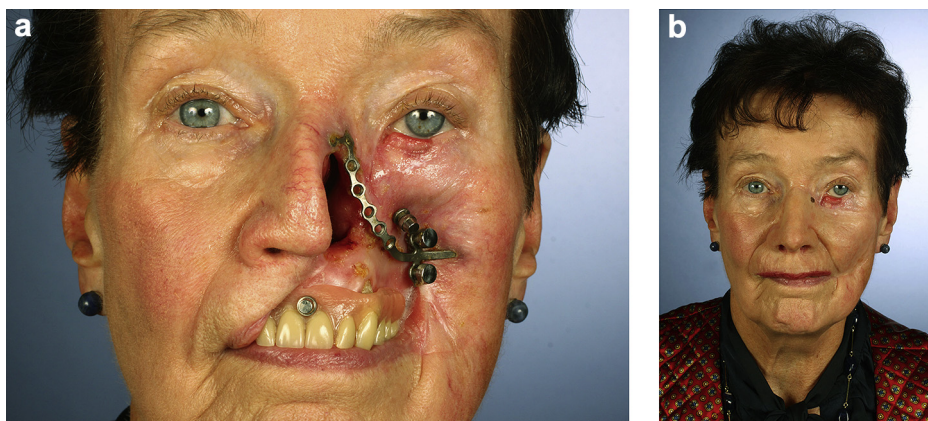


Fig. 1. (a) Clinical situation after resection of an adnexal carcinoma of the left upper lip causing obvious functional and aesthetic impairment. (b) Appropriate reconstruction of nasolabiobuccal subunits required advanced anaplastology. The combination of maxillary dentures and a facial prosthesis – attachment is provided by different magnetic abutments (steco K-, Z-, T-Line) mounted to a midfacial plate of the Ti-Epiplating system (Medicon).

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