



The free scapular/parascapular flap as a reliable method of reconstruction in the head and neck region: A retrospective analysis of 130 reconstructions performed over a period of 5 years in a single Department



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SUMMARY

Background: The scapular/parascapular free flap was described by Saijo in 1978 and has since then been widely used in reconstructive procedures.

Materials and methods: This is a retrospective study, describing our experience with the use of free scapula/parascapular flap in 130 reconstructions over a period of 5 years in the Department of Oral and Maxillofacial Surgery of the University Hospital of Erlangen. Demographical data, data regarding the underlying pathology, flap raising details, microvascular anastomoses, early and late postoperative complications will be presented.

Results: The flap was raised without problems and the donor site was primarily closed in all cases. Sixteen flaps required revision. Five transplants were lost (failure rate of 3.85%). Loss of part of the flap was observed in 3 cases (2.3%).

Conclusion: The free scapula/parascapular flap is a versatile and reliable flap that can find many applications in the reconstruction of complex head and neck defects.

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1. Introduction

1.1. Historical perspective

Back in 1978 Saijo (1978), exploring potential flap donor sites of the dorsal trunk, identified the potential of raising a musculocutaneous flap-based on the circumflex scapular artery. Gilbert was the first to report the clinical use of such a flap in 1979 (Gilbert and Teot, 1982). The anatomy of the flap was extensively described in 1980 by dos Santos (dos Santos, 1980; dos Santos, 1984), while in 1982 Nassif et al. (1982) published the variation of the parascapular flap. Teot et al. (1981) recognized the possibility of incorporating a bony element in the flap. The potential of using the flap for mandibular and maxillary reconstruction was first presented by Swartz (Swartz et al., 1986; Sullivan et al., 1990a,b; Swartz, 2009).

1.2. Anatomy-flap raising technique

The scapular/parascapular flap system is based on the circumflex scapular artery (CSA), which is a branch of the subscapular artery. CSA is typically one of the two branches in which the subscapular artery divides, the other one being the thoracodorsal artery (Saijo, 1978; Teot et al., 1981; Mayou et al., 1982; Nassif et al., 1982; dos Santos, 1984; Rowsell et al., 1984, 1986; Sullivan et al., 1990a,b; Urken et al., 2001; Strauch and Yu, 2006). The cutaneous branches of the CSA are fairly consistent. The two most important of them are the transverse running scapular branch and the descending parascapular branch, which also provides numerous small branches that supply the lateral border of the scapula (Hwang et al., 2009). Interestingly, the blood supply of the angle of the scapula is provided by a consistent branch of the thoracodorsal artery, the angular artery, which can be incorporated to increase the length of the harvested bone (Coleman and Sultan, 1991; Sevin et al., 1993; Hallock, 1997; Seneviratne et al., 1999; Van Thienen, 2000; Sevin, 2001; Wagner and Bayles, 2008; Ch'ng and Clark,

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2011; Miles and Gilbert, 2011). CSA is typically accompanied by two venae comitantes (Imanishi et al., 2001a,b).

The flap is harvested by positioning the patient in the lateral decubitus position, with the respective upper extremity extended, so that the triangular space is easily identified. The dissection is performed in the subfascial plane. The flap can be based on either the scapular or the parascapular cutaneous branch of the CSA and is named respectively. The bony segment is harvested from the lateral scapular border and its vascular supply is maintained by preserving a muscular cuff attached to the bone (Teot et al., 1981; Hamilton and Morrison, 1982; Mayou et al., 1982; Nassif et al., 1982; dos Santos, 1984; Sullivan et al., 1989, 1990a,b; Hallock, 1997; Coleman et al., 2000; Sevin, 2001; Urken et al., 2001; Strauch and Yu, 2006, Miles and Gilbert, 2011).

2. Material and methods

This is a retrospective descriptive study, presenting the experience of our Department with the scapular/parascapular flap over a period of 5 years (2006–2010). Over this period 130 reconstructions with the use of scapula/parascapular flap were performed reaching a total number of 123 patients. Seven patients required a second reconstruction due to flap failure, tumour recurrence or development of osteoradionecrosis; the contra-lateral scapula was used for the second reconstruction attempt. Demographical data, data regarding the surgical procedure itself, the postoperative period as well as follow-up data will be presented and discussed.

3. Results

3.1. Patient demographics (Table 1)

The age spectrum of the patients ranged from 9 to 83 years, with a mean age of 58.1 years. Eighty-three patients were male (with a total of 88 flaps performed in male patients) while 40 were female (with a total of 42 flaps performed in female patients), with a respective mean age of 58.0 and 59.9 years. Another parameter to be mentioned is that in 46 out of the 130 cases (35.4%) the patient has been irradiated prior to reconstruction with the scapular flap.

3.2. Underlying pathology – reason for reconstruction (Fig. 1)

The defect that was reconstructed was, in the majority of the cases, created by the resection of a squamous cell carcinoma of the maxillofacial region (88 cases). Tumour resection and reconstruction were performed simultaneously in the majority of these cases (86 cases), while in only 2 cases a secondary reconstruction post tumour resection was performed.

The predominant localization of the resected tumours was the mandibular alveolar mucosa with 46 tumours (52.3% of the tumour patient group), followed by the floor of the mouth (26 patients or 29.5% of our patients group), the maxillary alveolar mucosa (6 cases or 6.8% of the tumour patient group), the oropharynx (4 cases or 4.5% of the tumour patient group), the tongue and the buccal mucosa with 2 cases or 2.3% of our patients each, while two of our patients (2.3% of the group) had extensive tumour formations, involving the mandibular/maxillary/buccal area and the

Table 1
Brief presentation of the patients' demographics, as far as gender and age distribution are concerned.

	Number of patients	Number of flaps	Mean age
Male	83	88	58.0
Female	40	42	59.9
Total	123	130	58.1

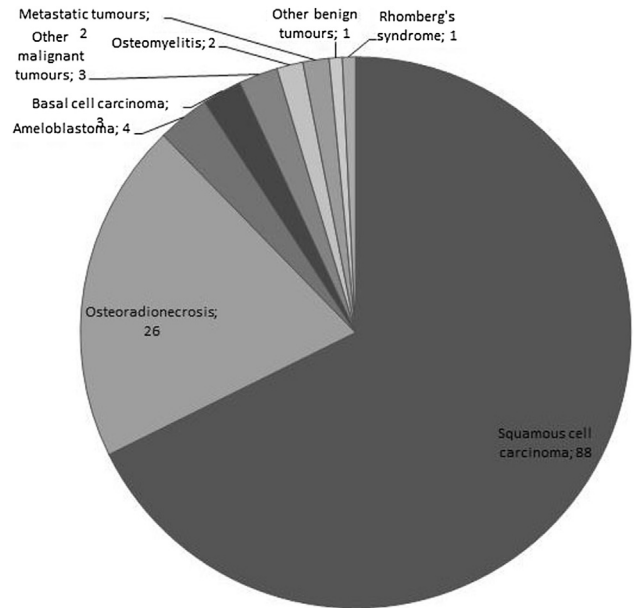


Fig. 1. Underlying pathology that necessitated reconstruction with free scapula/parascapular flap.

mandibular/maxillary/buccal area plus the skull base respectively (Fig. 2). As far as the tumour stage is concerned, 8 patients were classified at stage I, 12 patients at stage II, 6 patients at stage III and 62 patients at stage IV (according to TNM classification system).

Osteoradionecrosis of the mandible was the second most common diagnosis in our case series (26 patients). These patients were treated with either primary or adjuvant radiotherapy for tumours of the head and neck region (on average 60–70 Gy). Extensive mandibular necrosis dictated bone resection and microsurgical reconstruction in these cases.

Less frequently encountered were other malignant tumour types such as basal cell carcinomas (3 cases), leiomyoblastoma, mucoepidermoid carcinoma and adenoid cystic carcinoma (one case each). Resection of a tumour metastasis involving the

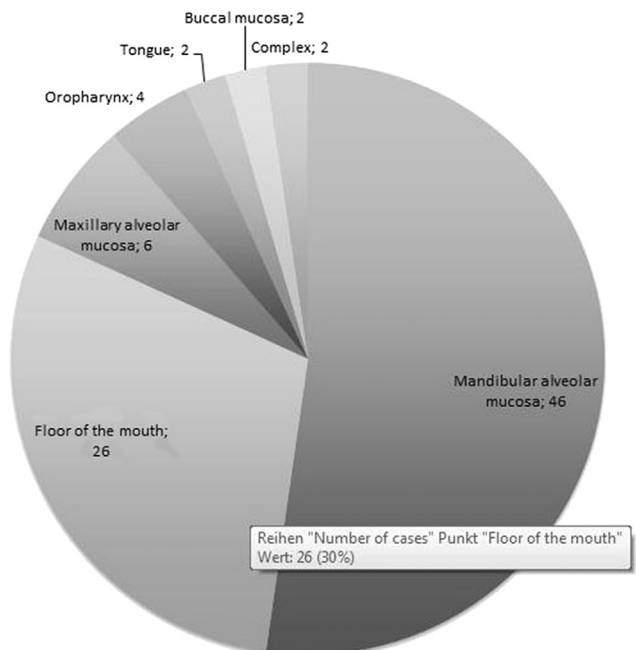


Fig. 2. Graphic representation of the localization of the resected tumour formations.

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