Anterolateral thigh flap in facial reconstruction. A case report

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Background: The free anterolateral thigh (ALT) flap has established itself as a reliable and effective method in the practice of microsurgical reconstruction of oncological abnormalities in the head and neck region. The versatility of application on various tissues, long vascular pedicle, and controlled donor site morbidity have made the ALT flap an indispensable tool in the practice of contemporary reconstructive surgery. Facial restoration therefore has not only functional but also esthetic aims, which requires a flexible approach to reconstructive surgery. The anterolateral thigh flap has become a workhorse in the practice of reconstructive microsurgery with its unparalleled versatility, including a robust vascular pedicle, a large skin paddle, and the ability to generate chimeric flaps.

Keywords: Facial Reconstruction, Anterolateral thigh flap, Microsurgery, Head and Neck oncology.

Case Report

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Oncological excisions in the head and neck region result in complicated tissue losses not only affecting anatomical integrity but also essential activities such as swallowing, speaking, and facial appearance. In the USA, >66,000 new cases of oral cavity, pharyngeal, and laryngeal malignancies are diagnosed each year, many of which present at advanced local stages requiring aggressive surgical resection as part of a comprehensive treatment regimen. Head and neck squamous cell carcinoma (HNSCC) is a major public health problem worldwide, with over 890,000 new cases diagnosed annually and nearly 450,000 deaths. Primary cutaneous sarcomatoid squamous cell carcinoma (also called desmoplastic cell squamous cell carcinoma) is a rare variant of squamous cell carcinoma (SCC) that has distinctive histomorphologic features. They are most common in the visceral organs and well documented in that area. Primary tumors of the skin are rare. It is typically restricted to sun-exposed skin and may be associated with areas previously irradiated. These tumors are difficult to find. Histopathologically, the tumor consists of deeply infiltrative spindle-shaped and pleomorphic cells in fascicles or cohesive clusters. Scanty or absent keratinization. However, the advent of microvascular reconstructive surgery with the transfer of well-vascularized autologous tissue in a single operative phase has changed the treatment of these patients. The ALT flap was first described by Song in 1984 and is the most common primary flap used for reconstruction of the head and neck. This particular combination of features—a broad vascular pedicle of adequate diameter, the possibility to incorporate several pieces of tissue, and relatively few problems at the donor site—is making this procedure increasingly popular.

Sarcomatoid squamous cell carcinoma (SSCC) is a rare and aggressive biphasic tumor that constitutes a small proportion of squamous cell carcinoma of the upper aerodigestive tract (especially larynx), oral cavity, cervix, esophagus and skin. It is very male-associated. It is associated with HPV16. Site specific symptoms are seen in patients presenting with hoarseness, dysphagia or airway obstruction, fungating masses in the head and neck, abnormal vaginal bleeding with cervical involvement, progressive dysphagia and weight loss with esophageal involvement and exophytic skin lesions. A large proportion of incidents occur in previously irradiated fields. The histomorphology of SSCC can be deceptive and may be mistaken for benign reactive conditions such as granulation tissue or inflammatory polyps or malignant mesenchymal tumors like sarcomas. Biopsies may show only malignant spindle and pleomorphic cells in fascicular, storiform or palisading patterns with marked nuclear pleomorphism.

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Figure 1. Sarcomatoid Squamous Cell Carcinoma on the left side of the face.

Immunophenotypic plasticity is characteristic of SSCC, showing heterogeneous and sometimes absent or weak positivity for epithelial markers such as pan-cytokeratin, CK5/6 and p63/p40, but usually co-expresses mesenchymal markers such as vimentin and smooth muscle actin. Malignancy is favored by abnormal SATB2 and p53 expression (diffuse positivity or null phenotype). The most common genetic abnormalities include TP53 mutations, receptor tyrosine kinases, PI3K pathway mutations,



Figure 2. RNM , 6 cm lesion.



Figure 3. Surgical defect following oncological excision.

elevated PD-L1 expression at tumor invasive front, and epithelial-mesenchymal transition markers suggesting a potential role for immune checkpoint suppression .

Case report

An 18-year-old male farmer referred from the dermatology department of our hospital presents with a lesion on the left side of his face that has been progressively enlarging, asymptomatic, and bleeds intermittently. An examination by the reconstructive surgery team revealed a 6 × 6 cm mass that was solid, non-painful, mobile, purple in color, and ulcerated. On specialized cervical examination, there was no lymphadenopathy on examination. An MRI was performed which excluded bone involvement but revealed an infiltrative lesion in the facial musculature. For this reason, we decided to manage the case



Figure 4. ALT Flap, final Surgical Outcome.

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together with the surgical oncology department with block resection and coverage through plastic and reconstructive surgery using a free microvascular anterolateral muscle flap and to obtain advantageous oncological, surgical and esthetic results.

The ALT flap is a septocutaneous or musculocutaneous perforator flap based on the descending branch of the lateral circumflex femoral artery (LCFA). The LCFA is usually a branch of the profunda femoris artery. Its descending branch is situated in the intermuscular septum between the rectus femoris and vastus lateralis muscles and gives off perforators to the superficial skin and fascia of the anterolateral part of the thigh. However, the anatomy of the perforators can be quite variable, with one or two dominant perforators that generally originate from the septum or traverse the musculature of the vastus lateralis to supply the skin paddle. Mean number of perforators per flap: 1.2. The vascular pedicle is long (8 to 12 cm) with a large diameter (2 to 3 mm). It is a suitable candidate for microvascular anastomosis in the craniofacial region. Preoperative assessment should be done carefully. Preoperative perforator discovery was done by hand-held Doppler. From the medial edge of the flap the dissection was carried down to the subfascial layer to identify the descending branch of the lateral circumflex femoral artery (LCFA) and its perforators. The perforators were carefully followed retrograde to their origin. If the perforator and the needs of the reconstruction were available, primary thinning was performed by dissecting the fatty tissue between the superficial fascia and the fascia lata with blunt-tip scissors, preserving the vascular network within the subdermal plexus and a cuff of fascia around the perforator. The microvascular anastomoses were done mainly in end-to-end or side-to-end mode, mostly with the facial artery and veins [9]. The donation site was mostly closed. Flap viability was followed up in the first 24 hours by standard clinical evaluation (ocular inspection and Doppler ultrasonography).

Discussion

Radical tumor ablations in the head and neck region can result in considerable functional and esthetic impairment and usually necessitate extensive rebuilding procedures. Previously, soft tissue covering was only possible with pedicled flaps. Traditional free flaps were either too thin, too thick, or had poor texture matching. The development of perforator-based flap harvest and the chimeric flap idea allows the surgeon to select a more precise single-stage restoration that can restore satisfactory function and produce an esthetically acceptable result in most patients. The ALT free flap was first described by Song et al. in 1984 and has become more common, sometimes referred to as the workhorse for repairing skin and soft tissue defects. Since then the application of the pedicled flap has increased. The flap is quite adaptable and can be tailored according to the defect to be reconstructed. The flap can be raised as an adipocutaneous, fasciocutaneous, or myocutaneous flap depending on the needs of the defect being rebuilt. When harvested as a myocutaneous flap, it is feasible to employ a section of the rectus femoris, vastus lateralis, or tensor facia lata muscle. The muscle used in the myocutaneous flap is based on the patient's specific anatomy and the demands of the recipient site. Free flaps are a viable alternative if there is enough coverage. However, they demand surgical expertise, more operative time than pedicled flaps, and deep recipient vessels in this region. The ALT flap is technically more demanding but allows for more variability in size and shape, better skin fit, and reduced bulkiness. A major advantage of the ALT flap is the comparatively minimal donor-site morbidity associated with even a large flap harvest. A larger size of cutaneous flap does not seem to be associated with a commensurate rise in donor site morbidity. The nerve to the vastus lateralis muscle should be meticulously dissected and preserved in the case of the cutaneous ALT flap to ensure maximum quadriceps function.

Conclusion

The ALT flap has emerged as a cornerstone of modern head and neck reconstruction, offering a distinctive combination of versatility, reliability, and minimal donor site morbidity that few other options can match. The ALT flap will surely remain an important tool in the reconstructive surgeon's armamentarium, improving functional as well as esthetic outcomes in patients undergoing oncologic excision of head and neck cancers.

Conflicts of interests

None declared by the authors

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