

Case report: Oro-facial reconstruction in an arteriopath

Lottie Arnold¹, Mr Malcolm Cameron²

Abstract

Squamous cell carcinoma (SCC) of the head and neck represents 90% of head and neck neoplasms and 5% of all cancers in the UK[1]. The most common aetiological factors in oral cancer are tobacco and alcohol consumption[6]. Incidence of SCC is rising alongside the aging population and the median age of presentation of oral cancers is 62[1], consequently many patients suitable for treatment have significant comorbidities. We present the case of an 85-year old man with lower limb arteriopathy and a SCC of the oral cavity and discuss considerations for surgical management. Post-operative complications such as delirium and delayed healing, particularly relevant to elderly patients, are also considered.

¹University of Cambridge Clinical School Corresponding Author: ca445@cam.ac.uk ²Maxillofacial Department, Addenbrookes Hospital Cambridge

1. INTRODUCTION

In contemporary practice, orofacial reconstruction of a tumour arising from the body of the mandible would often consider use of an osteocutaneous free flap. Such a procedure requires sufficient blood supply to the donor flap. The osteocutaenous fibula free flap is frequently used but lower limb vascular compromise necessitates alternative solutions. With a growing number of SCCs being reported in the elderly population[2], and a higher likelihood of atherosclerosis with age, different options for reconstruction often need to be considered. Here we discuss a pectoralis major free flap reconstruction in an arteriopath who underwent a segmental mandibulectomy and examine postoperative complications of this surgery in the elderly.

2. CASE

2.1 Presentation

An 85-year-old gentleman was referred to Addenbrookes Oral and Maxillofacial Surgery unit with a six-week history of right sided facial swelling unresolved following a tooth extraction. He reported weight loss of several kilograms and previous smoking history. Otherwise the patient was fit and well with no relevant past medical history.

2.2 Examination

A 3cm firm facial swelling in the right buccal mucosa was palpable intra-orally. Sensation was intact in the inferior alveolar dental nerve region. There was no cervical lymphadenopathy. Between initial presentation and surgery, the tumour invaded the skin of the right cheek. The external appearance of the tumour on the day of surgery is shown in figure 1.

2.3 Imaging

Orthopantomogram showed bone destruction at the site of the tumour. Ultrasound guided core biopsy confirmed squamous cell carcinoma and CT imaging staged it as T4. As seen in figure 2, the tumour is seen arising from the right body of the mandible, at lower right pre-molar sockets and invading the right cheek through to the skin of the face. Arterial duplex scanning of the lower limbs showed significant arteriopathy bilaterally, at and beyond the trifurcation, notably in the anterior compartment (anterior tibial artery). A fibula free flap was therefore not appropriate.

2.4 Operation

An elective temporary tracheostomy was placed as the first procedure. A right sided segmental mandibulectomy and level 1–4 selective neck dissection was performed. The defect was repaired with a pedicled myocutaneous pectoralis major flap. This involves dissection to free the pectoralis major muscle (whilst maintaining its insertion point), and rotation of the muscle to cover the neck defect.

During dissection a range of anatomical structures were encountered (figure 4); in particular the greater auricular, lingual, hypoglossal and spinal accessory nerves were preserved to ensure a good functional outcome for the patient.



Figure 1. External appearance of tumour with cutaneous invasion.



Figure 2. CT head. Transverse section through lower mandible.

Notably the genial attachments were conserved, and the intermediate tendon of digastric muscle sutured to the insertion of genioglossus on the mandible. This functioned to reduce the risk of hyo-laryngeal suspension issues which may affect swallowing and speech. A skin graft from the anterolateral right thigh was used to cover the defect and is shown post-operatively in figure 5. During theatre frozen sections were reported clear of malignancy.



2.5 Post-operation

Post-operatively the patient was delirious for around 24 hours, attempting to remove his tracheostomy tube, wound drains and other cannulae. He was acutely managed with haloperidol and transferred to the ward. This functioned to orientate him, in a bed adjacent to a window and with his family present to talk to. The flap remained well perfused with a capillary refill time under 2 seconds. Two weeks post-operatively there was dehiscence of the skin graft to the cheek and some discharge was noted at the junction of the pectoralis major pedicled flap and skin. This orocutanous fistula originated from the anterior floor of the

mouth, adjacent to the pedicled flap. No concurrent signs of infection were present and the defect was subsequently repaired in theatre. During extubation there was ventilatory difficulty and the patient required replacement of the tracheostomy and transfer to critical care. Sadly, after acquiring repeated chest infections he sadly passed away 41 days later.

3. DISCUSSION

Firstly this case highlights important features of oral cancer to be aware of: a firm, localised mouth swelling, alongside



Figure 4. Intraoperative appearance post tumour excision.

weight loss and a history of smoking. Other concerning features in patients with oral cancer include unexplained ulceration for longer than 3 weeks, or red and white patches on the oral mucosa. Both of these features would necessitate a 2 week wait referral to a Maxillofacial clinic.

Ordinarily, a case such as this would be treated with an osteocutaneous fibular free flap. However, as our patient had significant arteriopathy, a pectoralis major myocutaneous flap was considered an acceptable alternative option; not only does it contain a robust blood supply via the pectoral branch of thoracoacromial artery, but its large size allows it to reach the oral cavity. Additionally, the muscle bulk would restore some symmetry to the sides of the face. Notably a pedicled flap is not associated with worse outcome in comparison to free flaps which are more commonly used in the UK and may even be conducive to shorter stays in ITU and on the ward[5], which is preferable for elderly patients.

Another important consideration would be maintaining

function of the oral cavity when removing such a large tumour. For this reason, the genial attachments to the mandible were maintained. Without such attachments speech and swallowing may have been impacted significantly, the latter in particular posing a threat in elderly susceptible to aspiration[3].

This patient developed an oro-cutaneous fistula, a reported complication of pedicled flap reconstructions. Common causes are infection, trauma, inflammation or malignancy[4]. Also, the patient was hypoalbuminaemic, a complication of surgery and increased nutritional needs (he was fed via NGT post-surgery). This too could contribute to poor wound healing and lead to fistula formation. This complication was managed intra-operatively 3 weeks after the initial surgery and further biopsies were taken to confirm tumour clearance.

Lastly, this case also raises the issue of a higher risk of operative complications in the elderly, who are more susceptible to delirium and post-operative pulmonary complications[7].



Figure 5. Skin graft covering defect post-operatively.

We have discussed several approaches to treat delirium in elderly patients including re-orientation on the ward and involvement of family, with sedation as a last resort. This emphasises the need for pre-operative anaesthetic assessment, in order to avoid these complications as much as possible.

4. CONCLUSION

We present the case of an advanced squamous cell carcinoma fungating through the skin. The arteriopathic comorbidity in our patient demonstrates the need for alternative options to free flaps in treatment of large head and neck cancers, especially in the elderly. Additionally, we consider the complications that may arise in this kind of reconstruction, including anaesthetic risks in an elderly population and failure of wound repair. Clearly early identification and treatment of oral SCC is preferable in this population, to avoid risks of major surgery.

References

- ^[1] Sanderson RJ, Ironside JA. Squamous cell carcinomas of the head and neck. Bmj. 2002;325(7368):822–7.
- ^[2] Ohkoshi A, Ogawa T, Sagai S, Nakanome A, Higashi K, Ishii R, et al. Simple laryngeal suspension procedure by suturing the digastric muscle to the periosteum of the mandible in neck dissection for tongue cancer. Am J Otolaryngol. 2018;39(2):77–81.

- ^[3] Balakrishnan C, Narasimhan K, Gursel T, Jackson O, Schaffner A. Closure of orocutanous fistula using a pedicled expanded deltopectoral flap. Can J Plast Surg. 162008. p. 178–80.
- [4] Mahieu R, Colletti G, Bonomo P, Parrinello G, Iavarone A, Dolivet G, et al. Head and neck reconstruction with pedicled flaps in the free flap eraRicostruzioni del distretto testa collo con lembi peduncolati nell'era dei lembi liberi. Acta Otorhinolaryngol Ital. 2016;36(6):459–68.
- [5] McCrory AL, Magnuson JS. Free tissue transfer versus pedicled flap in head and neck reconstruction. Laryngoscope. 2002;112(12):2161–5.
- [6] van Zyl AW, Marnewick JC. Aetiology of oral cancer. Sadj. 2012;67(10):554–6.
- [7] Damian D, Esquenazi J, Duvvuri U, Johnson JT, Sakai T. Incidence, outcome, and risk factors for postoperative pulmonary complications in head and neck cancer surgery patients with free flap reconstructions. J Clin Anesth. 2016;28:12–8.