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Short communication

Postoperative neck pain associated with an implantable microvascular ultrasonic Doppler: a case report

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Abstract

Microvascular reconstruction in the head and neck has enabled the transfer of large amounts of tissue, and has improved functional and cosmetic outcomes for patients. Its success is primarily dependent on adequate perfusion, and though many methods have been used to monitor the circulation of flaps, the Cook-Swartz implantable Doppler has gained favour with surgeons and nursing staff. We present the unusual case of a patient who had developed recurrent infection and pain that was associated with its use.

Keywords: head and neck reconstruction; Cook-Swartz; implantable Doppler

Introduction

The incidence of cancers in the head and neck is on the rise.[1] Despite advances in chemoradiotherapy, operation remains a chief strategy of management. The primary complication associated with reconstruction using microvascular free flaps is thrombotic occlusion of the vessels, which is reported to account for failure in 10% of cases.[2] As most flaps fail within the first 48 hours, prompt identification facilitates early salvage and improved outcomes.[3] Monitoring perfusion is both demanding and technique sensitive,[4] and the challenge is compounded when the flap is buried, which makes assessment difficult.

Many studies have reinforced the role of the Cook-Swartz Doppler in improving outcomes after free flaps, and to our knowledge, no adverse complications have been published to date.[5]

Case report

A 52-year-old woman with an unremarkable medical history was referred with a six-month history of ulceration of the right lateral tongue. A diagnosis of T2N0M0 squamous cell carcinoma was confirmed, and management consisted of right hemiglossectomy, right neck dissection, and reconstruction with a radial free forearm flap. A Cook-Swartz implantable Doppler was placed using a ligature clip to secure the cuff around the pedicle of the cephalic vein. She progressed well and after an uneventful recovery had a course of adjuvant radiotherapy to the tumour bed in the right lateral tongue (60 Gy) that finished three months postoperatively.

During follow up she complained of occasional low-grade discomfort that was confined to the right neck and was attributed to adaptation of the tissues. At six months postoperatively, she was referred back to us urgently by her general practitioner after the discovery of a painful lump in her right neck. Clinical examination showed that there had been no recurrence intraorally, and no definitive node was detected on palpation. Treatment with antibiotics relieved the swelling

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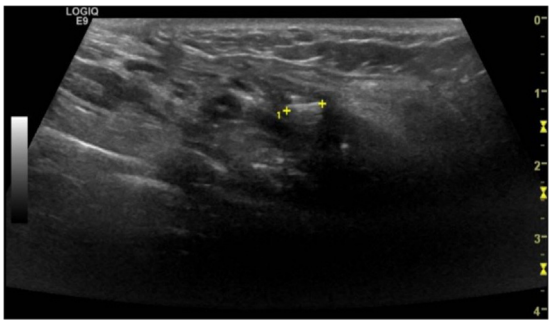

Fig. 1. Ultrasound of the neck showing the presence of a foreign body.

Fig. 2. Doppler cuff that was retrieved from the site of operation.

and discomfort transiently, but the pain returned and persisted. An ultrasound scan showed the presence of a small foreign body 6 mm in diameter in the right submandibular region (Fig. 1) with no evidence of nodal recurrence.

In light of the persistent discomfort, we removed the Doppler probe cuff and its attaching ligature clips, and found that it was surrounded by reactionary granulomatous tissue (Fig. 2). At subsequent review appointments, the previous discomfort had resolved and did not return.

Discussion

Since the implantable Doppler was introduced by Swartz et al in 1988, the design and materials have not changed much.[6] The unit consists of a 20 Mhz ultrasonic crystal probe that is mounted on an expanded polytetrafluoroethylene (GORE-TEX; WL Gore & Associates) cuff that is sutured, microclipped, or bonded conventionally to the vasculature of the pedicle.

A removable cable is used to connect the crystal probe to the transportable audiovisual monitor for live recording. Once monitoring is completed the probe and cable are removed, and the cuff left in situ. In this instance, the probe was removed at seven days by a senior team member, which was in keeping with the manufacturer's instructions. Controlled pressure was applied to the cable, and it detached without incident.

Although expanded polytetrafluoroethylene (ePTFE) is used extensively in biomedical applications because of its favourable mechanical properties and biochemical inertness, infection and inflammation have been reported as serious complications in up to 3.7% of recipients.[7] Current theory suggests that the immune cells of the host are unable to clear pathogenic bacteria, which inhabit the microsized pores on the surface and induce a foreign body reaction.[8]

The largest study to date to assess the efficacy of the Cook-Schwartz Doppler in the head and neck included a series of 351 consecutively-treated patients, in whom no such complication was documented.[9] Overall success rates in flaps of 98.1% have been reported, with a salvage rate of 92%, though such favourable results have been challenged by other authors.[10]

The remaining ePTFE cuff was ascertained to be the source of infection in this case, which resolved swiftly after its removal. We think that it is important to highlight the potential risk of infection associated with this device, and we encourage colleagues who have experienced such complications to contact us to help investigate potential risks further.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patient's permission

Ethics approval not required. The patient gave permission for the images to be published.

References

1. Louie KS, Mehanna H, Sasieni P. Trends in head and neck cancers in England from 1995 to 2011 and projections up to 2025. *Oral Oncol* 2015;**51**:341–8.
2. Meier JK, Prantl L, Müller S, et al. Simple, fast and reliable perfusion monitoring of microvascular flaps. *Clin Hemorheol Microcirc* 2012;**50**:13–24.
3. Novakovic D, Patel RS, Goldstein DP, et al. Salvage of failed free flaps used in head and neck reconstruction. *Head Neck Oncol* 2009;**1**:33.
4. Whitaker IS, Oliver DW, Ganchi PA. Postoperative monitoring of microvascular free tissue transfers: current practice in the UK and Ireland. *Plast Reconstr Surg* 2003;**111**:2118–9.
5. Chang TY, Lee YC, Lin YC, et al. Implantable Doppler probes for postoperatively monitoring free flaps: efficacy: A systematic review and meta-analysis. *Plast Reconstr Surg Glob Open* 2016;**4**:e1099.
6. Swartz WM, Jones NF, Cherup L, et al. Direct monitoring of microvascular anastomoses with the 20-MHz ultrasonic Doppler probe:

an experimental and clinical study. *Plast Reconstr Surg* 1988;**81**: 149–61.
7. Jin YJ, Kang S, Park P, et al. Anti-inflammatory and antibacterial effects of covalently attached biomembrane-mimic polymer grafts on Gore-Tex implants. *ACS Appl Mater Interfaces* 2017;**9**:19161–75.
8. Jin HR, Lee JY, Yeon JY, et al. A multicenter evaluation of the safety of Gore-Tex as an implant in Asian rhinoplasty. *Am J Rhinol* 2006;**20**:615–9.
9. Guillemaud JP, Seikaly H, Cote D, et al. The implantable Cook-Swartz Doppler probe for postoperative monitoring in head and neck free flap reconstruction. *Arch Otolaryngol Head Neck Surg* 2008;**134**: 729–34.
10. Ho MW, Cassidy C, Brown JS, et al. Rationale for the use of the implantable Doppler probe based on 7 years' experience. *Br J Oral Maxillofac Surg* 2014;**52**:530–4.