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Case Report

Pedicled supraclavicular flap reconstruction of a pharyngeal defect following laryngectomy

Dishan Samarathunge

Jeevan Rankothkumbura

National Hospital of Sri Lanka

Introduction

Supraclavicular pedicle flap (SCPF) is a fasciocutaneous island flap based on supraclavicular artery and vein. It has been used successfully to reconstruct pharyngeal, oesophageal, tracheotomy defects and skin defects following oncological resections of anterior neck[1,2]. Here we present the case of a patient who underwent SCPF reconstruction of a pharyngeal defect following laryngectomy for laryngeal carcinoma.

Clinical course

A 63-year-old patient diagnosed with laryngeal carcinoma who was initially treated with 6 cycles of radiotherapy, presented with recurrence of carcinoma involving bilateral arytenoids and bilateral piriform fossae. He underwent total laryngectomy along with thyroidectomy, thymectomy and bilaterally paratracheal lymph node dissection and tracheostomy with primary closure of pharynx and anterior neck soft tissue. Histology confirmed moderately differentiated squamous cell carcinoma. Six weeks after laryngectomy he developed a pharyngo-cutaneous fistula. Primary closure of pharyngeal and oesophageal defect over a nasogastric tube was attempted but failed. Ten weeks into laryngectomy he had an approximately 1x 2 cm oesophageal defect and an anterior neck fascio-cutaneous defect of 4 x 5 cm. A fasciocutaneous SCPF was planned to reconstruct the oesophageal and cutaneous defects.

Surgery

Wound debridement and preparation was done in the recipient site. Supraclavicular artery was located using hand held doppler. A 14cm x 5cm fusiform shaped flap was used which extended from proximally supraclavicular fossa (about 2.5 cm lateral to posterior border of sternocleidomastoid clavicular head) to proximal deltoid distally (Figure -2) Flap was raised sub facially from distal to proximal using sharp dissection.

The supraclavicular vascular pedicle was identified and dissected along up to about 3cm distal to its origin. Distal edge refashioning was done and viability confirmed. Flap was rotated and tunnel onto anterior neck. Oesophageal defect was closed separately using absorbable sutures and cutaneous defect was closed in two layers using absorbable sub-dermal and non absorbable skin sutures. Donor site was closed primarily. Total operative time was 105 minutes

Follow up

Initial wound inspection five days after surgery confirmed flap viability. Suture removal was done after two weeks. Patient was followed up for two months postoperatively with successful outcomes. Flap texture and colour matched the surrounding tissue and successfully covered the previous defects with no observable scarring. No complications were observed in donor or recipient sites.

Discussion

Reconstructing neck defects with a successful anatomical, aesthetic and functional outcome can be challenging. Achieving complete anatomical closure, skin texture and colour matching while preserving full range of neck function is important [3].

PCF is a common major complication following laryngectomy [1]. Primary repair or delayed secondary repair has been associated with higher complication and poor success rates with previous irradiation being an independent risk factor[4], hence reducing local flap options. Use of vascularized flaps has demonstrated successful outcomes [4]. Different flaps have been described in the closure of these including pectoralis major flaps (PMF) and radial forearm free flaps (RFF)[3]. Supraclavicular flap is one of these faciocutaneous flaps.

SCPF is a pedicled fasciocutaneous, rotational flap based on supraclavicular artery (SCA) and veins which can be used successfully in reconstruction of head and neck defects [1]. It is based on SCA, which is a branch of transverse cervical artery (TCA) arising from the thyrocervical trunk (TCT) which can be easily identified as a 1-1.5mm pedicle in the triangle bound by external jugular vein posterolaterally, posterior border of sternocleidomastoid anteromedially and the clavicle inferiorly [4]. Although commonly used dimensions are 6-8cm x 8-10 cm [1] , large flaps of 20 -25cm of length can be used[4]. Width is limited by the ability to close donor site primarily which is about 8cm. Pedicle can either be incorporated into the exterior neck or can be tunnelled after de-epithelialisation[4]. SCPF doesn't require post-operative monitoring except routine inspection.

No randomised trials comparing SCPF with other similar flaps could be found. However single-center reviews , retrospective reviews articles and case studies have denoted SCPF as a highly favourable option for head and neck reconstruction.
It's a thin, hairless flap with similar colour and texture to neck recipient site [2] providing better cosmetic outcome than PMF and RFF which are bulky and cause distortion in donor site[3]. It is easy to perform and operative time is short[4]. Additionally Emerick, Herr et al reports successful use of SCPF as a patch graft reconstruction of pharyngeal wall and pharyngeal interposition graft after oncological resections. SCPF pedicle is outside the surgical field of cervical lymphadenectomy and has shown favourable results in prior irradiated, vessel depleted necks recipient sites[1,4,5]It's simplicity, being a single surgery reconstruction and shorter operative time allow its use in anaesthetically complicated patients. Ability of primary closure of donor site is also an advantage.
Complications reported in SCPF are distal tip ischaemia, pharyngeal fistulas and leaks, referred shoulder pain during eating, wound dehiscence and scarring [2]. Rate of total flap loss is low (4%) [4]. Donor site scarring and serum formation are also reported[3]. Most studies report SCPF having similar or low complication rates compared to other alternatives[1,3,4].

Previous surgery involving TCT or TAC , irradiation over the donor site and prior extensive neck dissections are considered relative contra-indications for this procedure[1].

Learning points
SCPF is a pedicled rotational fasciocutaneous flap used in head and neck reconstructions. It's a simple procedure with a short operative time and can be used in previously irradiated recipient sites. It provides complete anatomical closure with cosmetically favourable outcomes and minimal complications.

Figure 2: Completely healed oesophageal and fasciocutaneous defect after two weeks

Declarations
None

ORCID
Dishan Samarathunge https://orcid.org/0000-0002-4407-7021
Jeevan Rankothkumbura https://orcid.org/0000-0003-0542-135X

Ethics approval and consent to participate
Not applicable

Consent for publication
Informed written consent for publication and accompanying images was obtained from the patients prior to collecting information.

Availability of data and material
All data generated or analyzed during this study are included in this published article.

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Figure 1: Oesophageal and fasciocutaneous defect and flap design before surgery.

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