Journal of Plastic, Reconstructive & Aesthetic Surgery (2010) 63, 970—975

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Hypopharyngeal reconstruction with an anterolateral thigh flap after laryngopharyngeal resection: Results of a retrospective study on 20 patients

Belsam Sagar [a], Henri A.M. Marres [b], Ed H.M. Hartman [a,*]

[a] *Department of Plastic Surgery, Radboud University Nijmegen Medical Centre, The Netherlands*
[b] *Department of Oto-Rhino-Laryngology and Head and Neck Surgery, Radboud University Nijmegen Medical Centre, The Netherlands*

Received 10 September 2008; accepted 16 April 2009

KEYWORDS
Hypopharyngeal carcinoma;
Laryngopharyngectomy;
Anterolateral thigh flap;
Post-surgical complications;
Post-surgical quality of life;
Head and neck surgery

Summary The aim of this retrospective study is to evaluate short- and long-term postoperative morbidity and mortality of hypopharyngeal resection and reconstruction. Patients with laryngopharyngeal malignancies were treated with laryngopharyngectomy and the resulting defect was reconstructed with an anterolateral thigh flap. The study group consisted of 20 patients with one or more primary hypopharyngeal carcinomas or a relapse of this tumour.

All patients were diagnosed and operated in the University Medical Center between February 2000 and July 2007. Data were collected from the clinical medical files of the departments of plastic surgery and oto-rhino-laryngology. The dietetic and speech therapy files were used as well. To study the quality of life, the Dutch version of the University of Washington Quality of Life questionnaire was sent to all surviving patients.

The microsurgical reconstructions were 100% successful. Fifteen patients (75.0%) died during the follow-up period; the 5-year overall survival was 20%. Complications such as post-surgical fistulas and strictures requiring surgical intervention were found in five (25.0%) and six patients (30.0%), respectively. Other post-surgical complications such as wound dehiscence were seen in two patients (10.0%). The incidence of donor-site complications at the thigh was very low. No significant relationship was found among preoperative patients' characteristics like age, gender, preoperative radiotherapy, the TNM (tumour, node, metastasis) classification of the tumour and the risk of post-surgical complications. The number and/or the severity of the complications were not significantly associated with the duration of surgery or ischaemia time.

In our view, surgery is a good option in the treatment of these patients. Although curative treatment is the best outcome, a satisfactory palliation in itself can be a justification for this

* Corresponding author. Current address: Department of Plastic Surgery, Onze Lieve Vrouwe Gasthuis, Oosterpark 9, 1091 AC, Amsterdam, The Netherlands. Tel.: +31 20 599 2543.
E-mail address: hartman@nvpc.nl (E.H.M. Hartman).

1748-6815/$ - see front matter
doi:10.1016/j.bjps.2009.04.019

type of surgery. Although only seven patients were able to answer the QOL questionnaire, the positive judgements of these patients support this view point.

Hypopharyngeal tumours occur most often in patients aged between 50 and 70 years. Besides well-known risk factors such as smoking and alcohol abuse, other factors predispose these patients to pharyngeal tumours as well, such as human papilloma virus and individual predisposition to specific carcinogens caused by genetic factors.[1]

The choice of treatment in hypopharyngeal cancer depends on a number of factors that influence the quality of life, including preserving the functions of the upper airway and the passage of food. The treatment of choice is aimed at organ preservation, in most patients resulting in (chemo-)radiotherapy. In extensive disease or after failure of primary (chemo-)radiotherapy, surgical therapy is indicated. The surgically created defect has to be reconstructed immediately. Several reconstructive methods have been developed and evaluated.[2]

In spite of recent developments in reconstructive techniques, in particular the great microsurgical revolution, laryngopharyngeal reconstruction remains a challenge to the plastic surgeon. The chosen method depends on the availability and suitability of the various reconstructive tissues, and on the experience of the plastic surgeon. An ideal reconstruction method should result in low morbidity and mortality, a minimal chance of developing fistulas and strictures and an early functional re-validation of swallowing and speaking.[3]

Important historical developments in pharyngeal reconstruction methods include the cervical random flap, the deltopectoral flap and the musculocutaneous pectoralis flap. Presently, free re-vascularised flaps have taken a crucial place in the reconstruction of the hypopharynx: the free rectus abdominis flap, the free jejunal flap, the radial forearm free flap and the anterolateral thigh (ALT) flap. The ALT flap was first introduced in 1984 by Song et al.[4] Since then, this flap has found worldwide application and evaluation.[5] In the absence of contraindications, such as severe peripheral vascular disease or a scar on the thigh,[6] the ALT flap is our first choice. Compared to the other flaps, it has several advantages including a long vascular pedicle with a suitable diameter of the vessels and a large skin flap that can be harvested with primary closure of the donor site.

Materials and methods

This retrospective case study was conducted in the University Hospital. All consecutive patients between February 2000 and July 2007 were included. Twenty patients were diagnosed and operated on for a primary or a recurrent hypopharyngeal carcinoma. Patients with other types of head and neck carcinoma were excluded. In addition, cases in which ALT flaps were used for a secondary reconstruction upon failure of another type were also excluded. All patients were seen by a multidisciplinary head and neck study group prior to deciding upon surgery.

Data were collected from the medical files of the Department of Plastic Surgery, the Department of Oto-Rhino-Laryngology and the Head and Neck surgery. Dietetic and speech therapy files were also studied. Both donor-site and acceptor-site complications are included in this analysis. This study focussed on surgery-associated risks in general and risks after a laryngopharyngectomy with an ALT flap in particular.

The patients were operated in a two-team approach: the head and neck surgeon initiated the laryngopharyngeal resection and the plastic surgeon simultaneously began with the dissection of the ALT flap. On account of the distant donor site of the ALT flap, the two teams could work simultaneously. Flap dissection was started with an incision in the midline of the upper leg. After identification of the perforator, the pedicle was completely dissected, but circulation was kept intact. Definitive flap dimensions were decided upon after creating the defect in the hypopharynx (Figure 1). In the distal part of the flap an extra skin triangle was included to prevent a circular scar at the distal anastomotic site. In this way, a stricture might be prevented. In addition, a skin island connected to the flap by a de-epithelialised skin area was included in the design for postoperative monitoring of the flap vascularisation. We have described this same technique in using the radial forearm flap in hypopharyngeal reconstructions.[7] The vascularisation of this skin monitor derives from the same blood vessels as the neo-pharynx, so in case of an

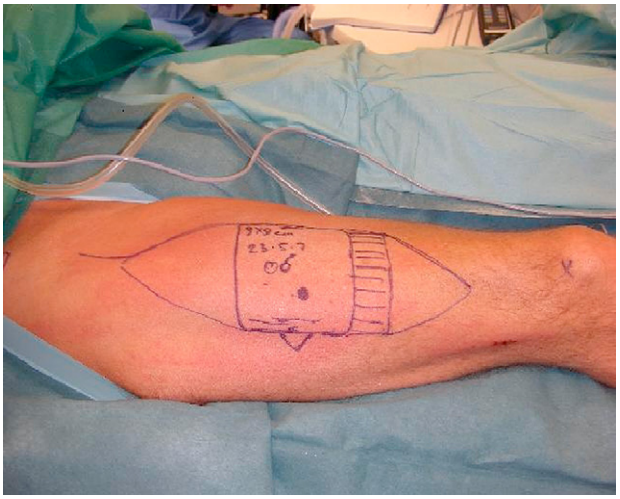

Figure 1 Design of the anterolateral thigh skin flap. A rectangular skin island is used for tubing. Note the triangular extension to prevent stricture at the distal anastomotic site. The monitor skin island is planned caudally from the de-epithelialized part of the flap. This skin island is then inset in the neck wound for post-operative monitoring on the ward.