
How I Do It
A Targeted Problem and Its Solution

Monitoring of Partial Pharyngeal Reconstruction

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INTRODUCTION

The goal in pharyngeal surgery is to achieve surgical margins free of tumor. In some cases it is necessary to perform a wide pharyngectomy that is difficult to close without a reconstructive procedure. In our centers we use the radial forearm free flap when pharyngeal reconstruction is necessary. This is a pliable, thin flap with a large pedicle that makes the reconstruction and the microvascular anastomosis easy to perform.¹ In reconstruction of pharyngeal defects with free flaps, the location of the flap is inconvenient for visual monitoring. Usual monitoring techniques are direct visualization, Doppler ultrasound, laser Doppler, and fluorescein injections.² Clinical assessment of the flap is the method of choice, although this is not always possible.

For the monitoring of total pharyngectomy, we have been using the design of Urken et al.³ with a small segment to be monitored connected to the primary skin paddle by a fascial subcutaneous segment of tissue. This monitor segment is exteriorized in the neck to provide clinical monitoring of the flap. Because of the inconvenience of this segment, we tried to find a simpler method for monitoring cases in which we employed the radial forearm flap for pharyngeal reconstruction.

TECHNIQUE

The essential steps in harvesting the radial forearm flap are well described in many reports, so we describe only the changes we have made in our design.

We designed our flap to be 4 cm longer than the extension we need for the pharyngeal defect, usually 12 cm in length and 6 cm in width. After we have harvested

the flap, we de-epithelialize approximately 2 cm of the distal part of the flap, leaving 2 cm distally with the forearm skin intact (Fig. 1). The distal 2-cm portion is used for clinical assessment of the viability of the flap under direct view. When the flap is harvested, we suture the flap to the residual pharyngeal mucosa, leaving the 2-cm portion distal to the flap not sutured. When we finish suturing the pharyngeal mucosa, we perform the microvascular anastomosis. After the microvascular anastomosis we begin to close the cervical skin. When we arrive at the monitor segment of the forearm flap, we suture it to the posterior wall of the trachea and to the cervical skin (Fig. 2). The skin monitor segment is useful in monitoring the flap because it has the same vascular pedicle as the rest of the flap that is used for pharyngeal reconstruction. For individuals who are familiar with patients having reconstructive procedures, this skin paddle is easy to monitor.

PATIENTS AND METHODS

The present report includes four patients who underwent a partial pharyngeal reconstruction with the radial forearm free flap during 1999 at the University Clinic of Navarra (Pamplona, Spain) and Valle Hebrón Hospital (Barcelona, Spain). All primary lesions were squamous cell carcinomas of the pharyngeal wall that involved the larynx. One patient had been treated previously with chemotherapy, radiotherapy, and a total laryngectomy and had a pharyngeal stenosis. In the patients with no prior treatment a partial pharyngectomy with total laryngectomy was performed, and in the patient treated previously, because of pharyngeal stenosis, only a partial pharyngectomy was performed. Two patients had an unilateral cervical neck dissection (one radical and one functional neck dissection), and one patient had a bilateral neck dissection at the time of the surgery. The patient treated previously with a total laryngectomy had the neck dissection performed previously. The three patients with no prior treatment were given full-course radiotherapy 1 month after discharge from the hospital.

RESULTS

All four radial forearm flaps were successfully transferred. No patient required any additional surgical proce-

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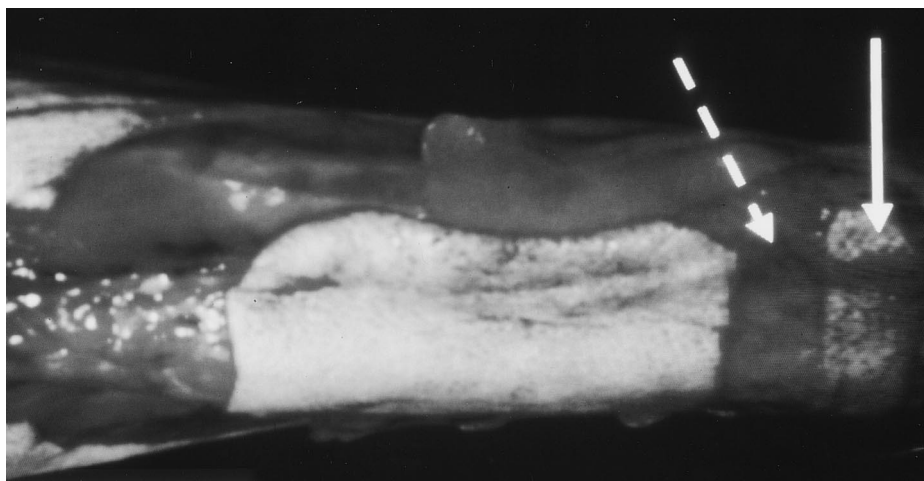


Fig. 1. Free radial forearm flap harvested. It is possible to view two islands, one for pharyngeal reconstruction and the other for monitoring.

dure. All the patients began oral soft food intake by the 14th day with no salivary fistula. The four patients were discharged from the hospital between the 13th and 15th day after the surgery.

The skin segment to be monitored was a reliable and easy clinical monitor of the circulation to the flap in all cases. The nurses at the intensive care unit monitored the flap every 4 hours within the first 48 hours; then, at the patient's room, both the ENT physician and the nurse performed the monitoring every 12 hours for 3 more days.

The aesthetic result was good, and the skin monitor segment was usually covered by the tracheal canula.

There were no major complications, and only minor complications occurred at the donor site in two patients with a partial tendon exposure that resolved within 1 month.

DISCUSSION

We have been using the radial forearm flap for hypopharyngeal reconstruction since 1994 because it offers

advantages over other reconstructive methods.¹ Although the radial forearm free flap is highly reliable in all cases, with its use in pharyngeal reconstruction, clinical monitoring is inconvenient because of the location of the flap. Although the design of Urken et al.³ is useful, it has the disadvantage that sometimes a much longer pedicle must be obtained than is needed. Also, it is necessary to adapt the monitor island to the cervical skin by making a hole in the skin surface and suturing the island.

With our design, the adaptation of the skin monitor segment is much easier because we suture it to the superior part of the tracheostomy and the inferior border of the superior cervical flap. It has the advantage that the blood supply to the monitor island is the same as to the rest of the flap, with no need to obtain excessive fascial-subcutaneous tissue to maintain vascularization to the island.

The only complication that occurred in our patients was a tendon exposure in two cases, and we do not think that this was a result of the design itself. There were no

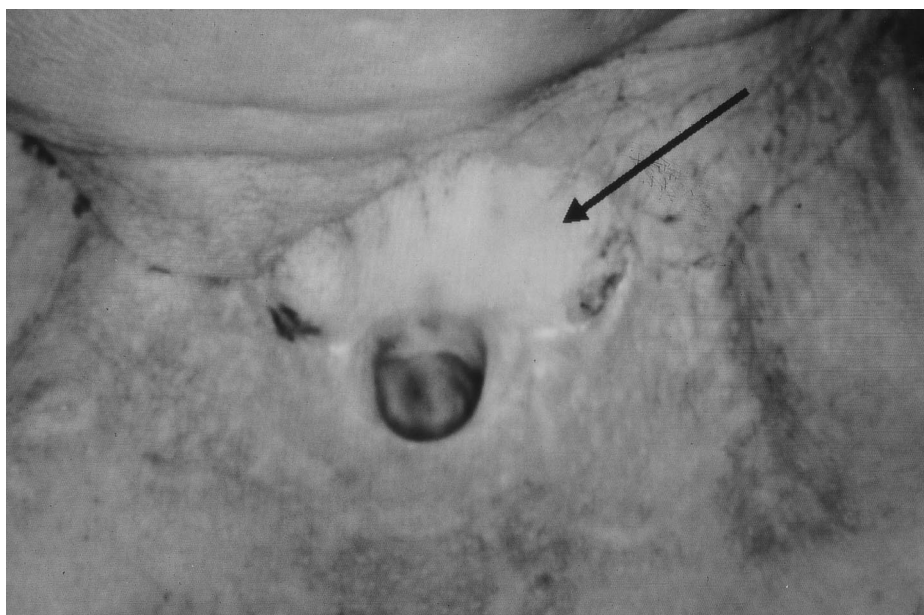


Fig. 2. Monitoring island between the tracheostomy and the superior cervical skin.

additional complications because of the greater amount of tissue that we harvested for monitoring, and our complication rate was quite good,⁴ although this may be attributable to the small number of cases in our series.

BIBLIOGRAPHY

1. Kelly KE, Anthony JP, Singer M. Pharyngoesophageal reconstruction using the radial forearm fasciocutaneous free flap: preliminary results. *Otolaryngol Head Neck Surg* 1994;111:16–24.
2. Disa JJ, Hu QY, Hidalgo DA. Retrospective review of 400 consecutive free flap reconstruction for oncologic surgical defects. *Ann Surg Oncol* 1997;4:663–669.
3. Urken ML, Furtran N, Moscoso JF, Biller HF. A modified design of the buried radial forearm free flap for use in oral cavity and pharyngeal reconstruction. *Arch Otolaryngol Head Neck Surg* 1994;120:1233–1239.
4. Evans GR, Schusterman MA, Stephen SK, et al. The radial forearm flap for head and neck reconstruction: a review. *Am J Surg* 1994;118:446–450.

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