



# Reliable Option for Circumferential Pharyngeal Reconstruction with Deltopectoral Flap: a Case Report

Anant Chouhan<sup>1</sup> · Bindu Rani<sup>2</sup> · Mohit Sharma<sup>3</sup> · Mahesh Patel<sup>3</sup>

Received: 10 June 2019 / Accepted: 7 August 2019 / Published online: 17 August 2019  
© Indian Association of Surgical Oncology 2019

## Introduction

The poor prognosis of hypopharyngeal cancers compels the surgeon to choose a technique which allows wide surgical resection associated with a reconstruction procedure resulting in prompt restoration of physiological functions, low morbidity, and a short period of hospitalization. Total circular pharyngolaryngectomy has certainly made some impact on the prognosis, but above all on the quality of life of these patients [1]. The surgical options for circumferential reconstruction of the hypopharynx include the free flaps, myocutaneous/fasciocutaneous pedicled flaps, and visceral transpositions [2]. In our observation, we have noticed that deltopectoral flap is thin and pliable so the tube formation is easy; it is very reliable with good vascularity. Technically, also the procedure is very easy and it does not need any microvascular expertise [3]. Its versatility and reliability and minimum donor-site morbidity ascertain its role as an important reconstructive tool in well-selected patients [4].

## Case Report

A 54-year-old man presented with progressive difficulty during swallowing, change in voice, and breathing difficulty.

---

Study conducted in Gujarat Cancer & Research Institute, Ahmedabad, Gujarat, India

---

✉ Anant Chouhan  
dr.apschouhan@gmail.com

<sup>1</sup> Department of ENT and Head & Neck Surgery, Apex Hospital, 9, Adarsh Model Town, Malviya Nagar, Jaipur, Rajasthan 302017, India

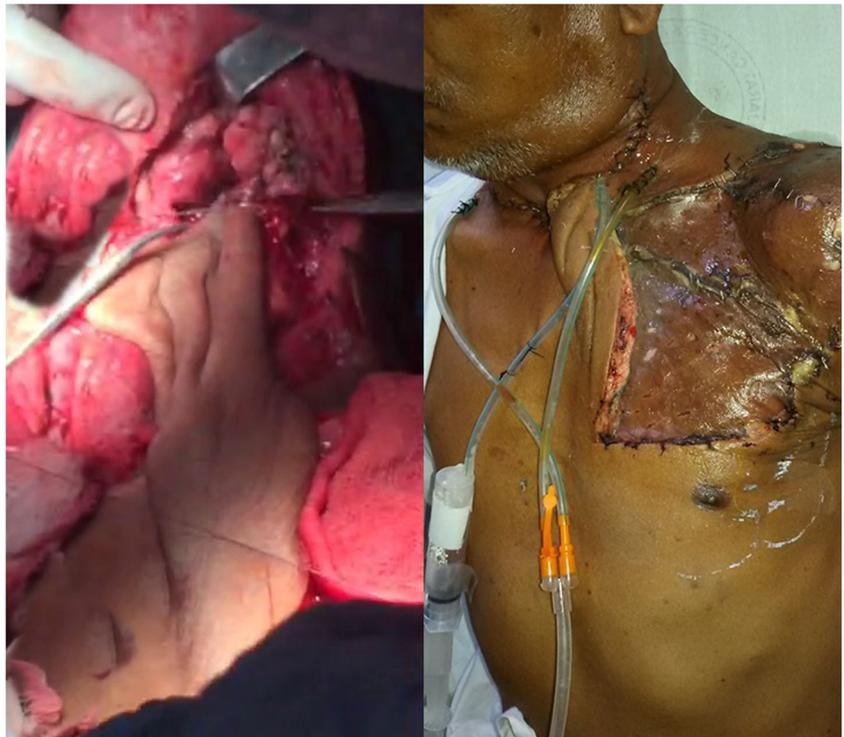
<sup>2</sup> Department of General Medicine, NIMS Hospital, Jaipur, Rajasthan, India

<sup>3</sup> Department of Surgical Oncology, GCRI, Ahmedabad, Gujarat, India

Patient was admitted and all routine investigations were done. Assessments were done by both CECT, direct laryngoscopy and biopsy. Biopsy report was well-differentiated squamous cell carcinoma of hypopharynx and TNM stage was T4N0M0. Patient was hypertensive that was managed preoperatively by physician consultation. He underwent total laryngopharyngectomy and bilateral selective neck dissection.

For reconstruction of circumferential pharyngeal defect, two staged deltopectoral flap was chosen. Medially based deltopectoral flap was designed which incorporated first to third perforators. Cut was made through the skin, subcutaneous fat, and the deltopectoral fascia onto the muscle. Scalpel (not diathermy) was used to elevate the pectoral fascia off the muscle in order to protect the suprafascial vascular network. Flap was raised lateral to medial just deep to the deltopectoral fascia. We stopped elevating the flap about 2 cm lateral to the sternum so as not to injure the perforators. The skin medial to the deltopectoral groove is reliably nourished by the internal perforators, but the skin lateral to the deltopectoral groove is usually nourished by musculocutaneous perforators arising from the deltoid muscles. The extended portion of deltopectoral flap beyond the deltopectoral groove is therefore a random pattern flap. We routinely incorporate the deltopectoral fascia into the flap and perform the dissection in a subfascial plane. The point of rotation of the deltopectoral flap was located closer to the upper side of the base of the flap due to the more lax skin along the inferior border of the flap and along the anterior axillary fold. An 18 number Ryle's tube was inserted and the tube was formed by deltopectoral flap with the skin surface inside. Interrupted three "O" vicryl sutures were used with a knot placed in the lumens. Distal portion of skin tube was attached to the proximal healthy portion of the hypopharynx, and the proximal end of the skin tube was patent. A suction catheter as a salivary stent was placed coming through the patent end of the tube to avoid salivary fistulas and to reduce retraction of scar tissue which was fixed on chest with sutures. Donor site was covered with a split thickness skin graft. Neck drains were put and incision closed in

**Fig. 1** Intraoperative and postoperative pictures showing deltopectoral flap



layers (Fig. 1). Patient tolerated the procedure well and was discharged on the fifth day after neck drain removal.

Second-stage operation was planned after 3 weeks of the first stage and the base of the flap was cut and attached to the distal healthy end of the esophagus. A corrugated drain was put in the neck to identify any leak (Fig. 2). Ryle's tube feeding was continued from the first operation. On the first week after the second-stage operation, sips of water were allowed keeping the Ryle's tube in situ. Ryle's tube was withdrawn after 3 days and corrugated drain was removed as there was

no leakage. Liquid diet was allowed followed by solid food. Swallowing function was acceptable.

## Discussion

Squamous cell carcinoma of the hypopharynx accounts for about 5% of all head and neck cancers and includes primary hypopharyngeal tumors and advanced tumors from other sites, mostly from the larynx [5]. In case of extension of the

**Fig. 2** A corrugated drain was put in patient's neck to identify any leak



retrocricoid region or the posterior wall with involvement of both pyriform sinuses surgical treatment generally requiring a circumferential pharyngolaryngectomy followed by a reconstruction of the removed segment of the upper digestive tract. Historically, many techniques have been used in order to achieve a safe and functional reconstruction [6]. Despite the high success rate of initial free jejunal transfer, once vascular thrombosis occurs, the salvage of failing flap with reanastomosis is quite difficult [7]. As far as concerns the free flaps, the fasciocutaneous ones (forearm or lateral thigh) have the advantage of avoiding abdominal surgery. However, in order to tubulize the forearm flap, a big dimension of volar surface is needed, causing poor aesthetic results. The lateral thigh is not a first-choice flap because of small vascular pedicles with a high thrombosis risk. In addition both flaps are prone to fistula formation because of the difficult adaptability of the mucous-cutaneous sutures [8, 9]. Besides the free flaps, the myocutaneous flaps have the disadvantage of being prone to local complications such as a high rate of salivary fistulae and dysphagia because of the thickness of the flap. Visceral transpositions have higher perioperative morbidity and mortality [10]. Despite the technical advancements in microvascular surgery and introduction of various new flaps, deltopectoral flap still possesses multiple unique advantages (technical simplicity, reliable axial blood supply, large size, thinness, versatility, and pliability) that few other reconstructive options can provide [4].

This case study described deltopectoral flap a two-step technique for the reconstruction of the pharynx and can be tried in patients having contraindication of free flaps and technical difficulties in other described reconstructive options.

## Conclusion

Our experience confirms that this kind of reconstruction is simple and safe with shorter operative time and has shorter length of intensive care unit stay, decreased hospital charges, and good results in improving oncologic controls, thus offering the patient fast rehabilitation and a reasonable quality of

survival. This is a cost-effective method specially in developing countries and can be done even in a district hospital.

## Compliance with Ethical Standards

This article does not contain any studies with animals performed by any of the authors.

Informed consent was obtained from all individual participants included in the study.

**Conflict of Interest** The authors declare that they have no conflict of interest.

## References

1. Rénier S, Decroocq F, Simon C (1996) Our experience in pharyngeal reconstruction with free flaps after total circular pharyngolaryngectomy. *J Fr ORL* 45:21–27
2. Fabian RL (1988) Pectoralis major myocutaneous flap reconstruction of the laryngopharynx and cervical oesophagus. *Laryngoscope*. 98:1277
3. Goutam Guha S, Gupta S, Chakraborty S (2005) Indian J Otolaryngol Head Neck Surg 57(3):229–234
4. Chan RCL, Chan JYW (2014) Deltopectoral flap in the era of microsurgery. *Surg Res Pract* 2014:420892, 5 pages
5. Patel R, Goldstein D, Brown D, Irish J, Gullane PJ, Gilbert RW (2010) Circumferential pharyngeal reconstruction: history, critical analysis of techniques, and current therapeutic recommendations. *Head Neck* 32:109–120
6. Stepnick DW, Hayden RE (1994) Options for reconstruction of the pharyngoesophageal defect. *Otolaryngol Clin N Am* 27:1151–1158
7. Hikida S, Takeuchi M, Hata H, Yamana H, Fujita H, Shirouzu K, Matsuno K, Tanaka T, Kawaguchi C, Akiyoshi K, Tsuru T, Tanaka Y, Mizote H (1998) Free jejunal graft autotransplantation should be revascularized within 3 hours. *Transplant Proc* 30:3446–3448
8. Hayden RE (1989) Lateral cutaneous thigh flap. In: *Microvascular reconstruction of the head and neck*. Churchill Livingstone, New York, pp. 211–228
9. Guler M, Isik S, Sezgin M (1998) Pharyngoesophageal reconstruction with the tubed radial forearm free flap. *Eur Arch Otorhinolaryngol* 255:24–26
10. Marks SC, Steiger Z (1997) Combined pectoralis flap and gastric pull-up for pharyngeal reconstruction. *Head Neck* 19:134–136

**Publisher's Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.