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Case report

Delayed reconstruction of the upper digestive tract in a patient following total pharyngolaryngectomy with resection of the cervical oesophagus



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ABSTRACT

Carcinoma of the hypopharynx is an uncommon disease, with an annual incidence of approximately 1 in 100,000. Post-cricoid carcinoma is more common in women and is not usually associated with tobacco and alcohol abuse. Reconstruction of large pharyngeal defects following surgery for squamous cell carcinoma is complex and often requires microvascular free tissue transfer to achieve the best oncological and functional outcomes. The most common complications of such procedures include fistulas and strictures of the neopharynx. Here, we describe a case of a female patient admitted to the Head and Neck Department at our hospital to undergo delayed reconstruction following pharyngolaryngectomy and removal of the cervical oesophagus. Several complications occurred during post-operative care, including stricture and skin dehiscence. At present, the patient is able to swallow saliva and is currently being prepared to return to a normal diet.

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1. Introduction

The incidence of hypopharyngeal cancer is estimated at 1 in 100,000 and it accounts for 5% of all head and neck malignancies.¹ The pyriform sinus is involved in 70% of cases, the post-cricoid region in 20%, and the posterior wall of the pharynx in 10–15%.^{2,3} Post-cricoid cancer is most common in Northern Europe, North America, India and Japan.^{4,5} Unlike all

other head and neck tumours, which occur more frequently in men, post-cricoid cancer is more common in females and is not usually associated with tobacco and alcohol abuse.^{6,7} Regional metastases occur in 20–40% of cases.^{8,9}

Due to nonspecific symptoms, hypopharyngeal cancer is typically diagnosed at late stages, with invasion of surrounding anatomical structures and high risk of distant metastases. Early stage tumours are usually treated with radiochemotherapy.¹⁰ Advanced tumours that have invaded

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surrounding tissues and recurrent tumours both require extensive surgical procedures with one-step reconstruction. It is important to resect hypopharyngeal cancer with a 3 cm surgical margin; as a result, total pharyngolaryngectomy with cervical oesophagectomy is often necessary.¹¹

Reconstruction of the upper aerodigestive tract after oncological resection is one of the most challenging and difficult procedures in head and neck surgery. The options for hypopharyngeal reconstruction have evolved over time, starting from multistep reconstruction, which had a high failure rate, to one-step reconstructions in which the functional outcome is better. Several factors are crucial in successful hypopharynx reconstruction: easy access to donor tissue with minimal donor site morbidity, a low rate of fistulas and strictures of the neopharynx, and good tolerance to post-operative radiotherapy.¹²

To date, many hypopharyngeal reconstructive techniques have been introduced, including the use of different types of flaps (local, myocutaneous, free fasciocutaneous, and jejunal flaps), and gastric pull-up. Nevertheless, no consensus has been reached on which technique is most efficient in certain defects.

The pectoralis major myocutaneous flap is a reliable flap with excellent vascularisation; it has the added benefit of providing muscular covering for the carotid artery after neck dissection. However, the flap is too big to be rolled into a tube-like shape to cover the circumferential defect, especially in women and obese patients. Moreover, published data indicate that a high percentage of fistulas occur with this flap and females are sometimes unwilling to accept the donor site scarring that occurs.¹³ The main use of the pectoralis major flap is in salvage surgery after a free flap failure and in elderly patients with other comorbidities that preclude them from multi-hour procedures.¹⁴

The free jejunal flap is often used in circumferential defects of the hypopharynx and the rate of post-operative fistulas is low. In addition, due to segmental vascular supply, a 20 cm long flap on one vascular arcade is possible. On the other hand, patients often suffer from dysphagia after jejunal reconstruction due to uncontrolled peristalsis.¹⁵ Additionally, the reconstruction makes the patient's voice less powerful and "wet-sounding". Finally, jejunal flap grafting requires laparotomy, which is associated with additional donor site morbidity.¹²

Fasciocutaneous free flaps are thin and pliable, and can thus be shaped into a tubular form. When Spriano modification is used, the flap can be sutured to prevertebral fascia, thus providing additional lumen to the neopharynx. No donor site morbidities have been observed. Two team work shortens the total time needed to perform the surgery, and the long vascular pedicle facilitates reconstruction. Moreover, the flap's good vascular supply improves tolerance to ischaemia during vascular reconstruction. When using the radial forearm free flap, the Allen test must be performed to assess the deep palmar arterial arch.¹⁶ When anterolateral thigh flaps are used, ultrasound examination of the thigh must be performed to evaluate the vascular perforators.¹⁷ However, fasciocutaneous flaps present a greater risk of post-operative fistulas and strictures, especially in delayed procedures.¹⁸ Moreover, patients with previous neck dissection may have existing ligations of

the external carotid artery, its branches, and internal jugular vein, which limits vascular.¹⁹

2. Case presentation

A 39-year old female patient was admitted to the Head and Neck Department at our institution. Four months prior to admission to our centre, the patient had been diagnosed at another hospital with squamous cell carcinoma of the post-cricoid region, with circumferential infiltration to the hypopharynx and cervical oesophagus. The patient had undergone a pharyngolaryngectomy, with the resection of the cervical oesophagus and bilateral radical neck dissection at the other institution, with a final histopathological report of pT4bN0M0. Postoperative margins were free from tumour. The cephalic end of the patient's oesophagus had been transferred to the left supraclavicular region (Fig. 1). The patient had not been irradiated.

In order to determine if reconstruction was feasible, the patient underwent computed tomography and magnetic resonance imaging scans to assess the defect and to rule out any potential local and regional recurrence. The defect of the upper digestive tract was 7 cm. After thoroughly discussing the case with the patient, the decision was made to reconstruct the neopharynx with a radial forearm free flap (due to the lack of thigh vascular perforators).

After dissecting the hypopharyngeal oesophageal stumps, the radial forearm free flap was removed from the patient's left forearm, shaped into an inverted U-tube and sutured to the previously dissected prevertebral fascia, which created the posterior wall of the neopharynx (Figs. 2 and 3). The free flap was stabilised with a previously inserted Montgomery tube with a feeding probe inside it (Fig. 4). Next, vascular neck anastomosis was performed with the vascular pedicle sutured to facial vessels with 9.0 sutures. The skin was sutured in layers. No perioperative complications were observed.

Thirty days after surgery the Montgomery tube was removed and barium-swallow X-ray examination was performed (Fig. 5). The radiographic examination revealed that the neopharynx was sealed and the patient was allowed to swallow clear liquids. On day 40 after surgery a partial dehiscence



Fig. 1 – The cephalic end of the patient's oesophagus had been transferred to the left supraclavicular region.

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