

Case Report

Hypopharyngeal defect reconstruction, following extended total laryngectomy, using a myocutaneous sternocleidomastoid flap

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REZUMAT

Reconstrucția defectului hipofaringian, după laringectomie totală extinsă, utilizând un lambou musculocutanat din sternocleidomastoidian

Introducere: Lipsa simptomatologiei specifice determină prezentarea tardivă la medic, în stadii local-avansate de boală (T3-T4), a pacienților cu tumori maligne hipofaringiene. Acest lucru determină o restrângere a opțiunilor chirurgicale la laringectomie totală cu faringectomie parțială sau laringectomie totală cu faringectomie circulară. În majoritatea acestor cazuri este necesară reconstrucția faringiană cu lambouri.

Material și metodă: Prezentăm cazul unui bărbat în vârstă de 61 de ani care a suferit o intervenție chirurgicală pentru o tumoră malignă localizată în sinusul piriform drept, extinsă la baza de limbă și amigdala palatină dreaptă. S-a practicat laringectomie totală extinsă la baza limbii și amigdala palatină dreaptă și faringectomie parțială. Reconstrucția peretelui faringian lateral a fost realizată utilizând un lambou musculocutanat pediculat din sternocleidomastoidian.

Rezultate: Sonda nazogastrică a fost suprimate după 21 de zile. Nu s-a înregistrat apariția fistulei faringocutanate. Controalele postoperatorii la 3, 6 și 9 luni nu au evidențiat recidivă tumorală.

Discuții: În opinia noastră lamboul musculocutanat din sternocleidomastoidian reprezintă o resursă valoroasă în reconstrucția defectelor peretelui lateral faringian.

Cuvinte cheie: defect hipofaringian, reconstrucție, sternocleidomastoidian, lambou

ABSTRACT

Background: The lack of specific symptoms causes late presentation for patients with advanced T-stage malignant tumors (T3-T4) of the hypopharynx. This fact restricts surgical options to total laryngectomy with partial pharyngectomy or total laryngectomy with circular pharyngectomy. In most of these cases pharyngeal reconstruction, using flaps, is mandatory.

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Method: We present the case of a 61 years old male who underwent surgery for a malignant tumor of the right pyriform sinus extended to the base of the tongue and right tonsil. A total laryngectomy associated with partial pharyngectomy, partial resection of the base of tongue and right tonsillectomy were performed. The reconstruction of the lateral pharyngeal wall was achieved using a myocutaneous pediculated sternocleidomastoid flap.

Results: The nasogastric tube was removed after 21 days. No pharyngocutaneous fistula was recorded. The follow up at 3, 6, and 9 months showed no signs of recurrence.

Discussions: We consider that the sternocleidomastoid myocutaneous flap represents a valuable resource in the reconstruction of the lateral pharyngeal wall defects.

Key words: hypopharyngeal defect, reconstruction, sternocleidomastoid, flap

BACKGROUND

Hypopharyngeal cancer represents approximately 7% of all head and neck malignancies, occurring more frequently in men (male / female ratio 3:1) with a maximum incidence in the 6th and 7th decades (1, 2). The lack of specific symptoms causes late presentation with advanced T-stage disease (T3-T4) which restricts surgical options to total laryngectomy with partial pharyngectomy or total laryngectomy with circular pharyngectomy, associated, in most cases, with bilateral neck dissection (1, 3). Submucosal extension of the tumor is what compels the surgeon to practice an extended resection in order to meet the criteria of oncological resection (4, 5). In order to achieve a primary suture of the pharynx is imperative that the width of the remaining mucosa is at least 2.5-3 cm (2, 6). If this goal is not achieved then the resectional stage is mandatory followed by a reconstructive one, in order to prevent pharyngocutaneous fistula occurrence, pharyngeal stenosis or poor vocal rehabilitation. For lateral pharyngeal wall defects, reconstruction can be performed using regional flaps (myocutaneous pectoralis major flap, lateral island trapezius, deltopectoral flap, latissimus myocutaneous flap, submental island flap) or free flaps (radial forearm fasciocutaneous free flap, lateral arm free flap) (1,2,3,5,6). If a circumferential resection has been performed the optimal reconstruction is the one that re-creates a lumen that can allow normal deglutition so, jejunal free flaps, ileocolic free flaps, radial arm free flaps, anterolateral thigh flap, peroneal flap, gastro-omental free flap, gastric transposition and many other methods were successfully used (3, 5, 6, 7, 8, 9). The reconstructive procedure performed by us used a pediculated, myocutaneous sternocleidomastoid flap harvested from the same side as the lesion and it was addressed to a lateral hypo-

pharyngeal wall defect.

The sternocleidomastoid muscle has multiple arterial sources in each portion: the upper third is irrigated by branches of the occipital artery, the middle by branches of superior thyroid artery, by external carotid artery or by both of them and the lower part by branches of the suprascapular artery, the transverse cervical artery, the thyrocervical or the superficial cervical artery (10, 11).

METHODS

We present the case of a 61 years old male, with a history of smoking and alcohol abuse, who was admitted to the Institute of Phonoaudiology and Functional ENT Surgery "Prof. Dr. D. Hociota" for dysphagia with odynophagia and a right laterocervical tumefaction. These facts were first experienced by the patient 3 months before admission; the neck mass had increased progressively during that period.

Palpation of the cervical area revealed multiple enlarged lymph nodes on both sides and a large (6/4 cm), firm, uncompressible, adherent to deeper structures, non-tender, mobile with swallowing, neck mass on the right side.

Naso-pharyngo-laryngeal endoscopic examination, performed at admission, highlighted an ulcerated tumor in the inferior part of the right tonsil, asymmetrical hypertrophy of the tongue base and stasis in the right pyriform sinus; the vocal folds were free and mobile with a slight impairment on the right side. The lab results (biochemistry, complete blood count, serology, coagulation) and chest radiograph were within normal limits.

The neck ultrasound revealed the presence of a 57/37 mm tumor, with irregular outline, located on middle right side of the neck, compressing the left internal jugular vein; the structure was hypo-



Figure 1. Cervical CT with iv contrast – coronal view



Figure 2. Cervical CT with iv contrast – transverse view

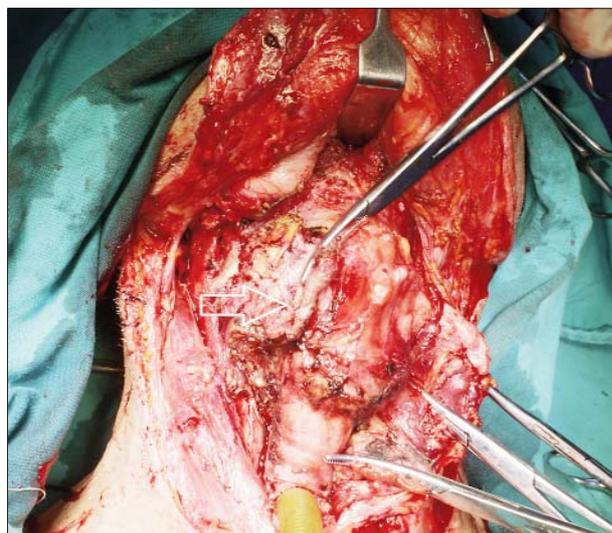


Figure 3. Large tumor of the right pyriform sinus protruding through the lateral pharyngeal wall

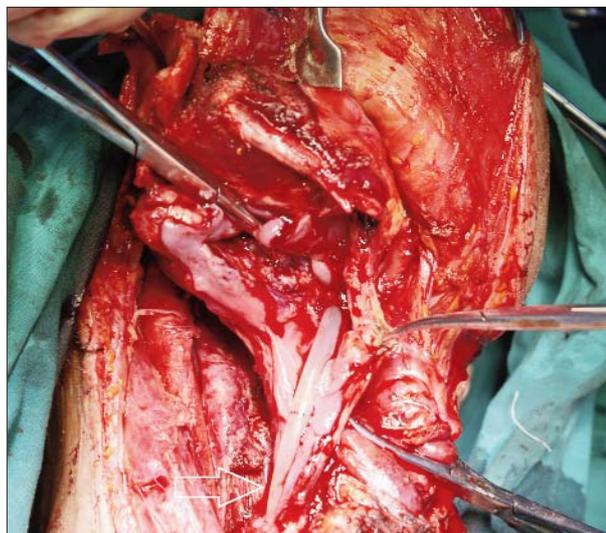


Figure 4. Retrograde pharyngolaryngectomy (the remaining pharyngeal mucosa was insufficient for primary suture)

echogenic with small areas of calcifications. Multiple lymph nodes, levels IIA, III and IV (largest of 21 mm) were also present.

The CT scan showed a large tumor (49/33 mm) in the right pyriform sinus and multiple necrotic lymph nodes (**fig. 1, 2**). The tumor was not fixed to the prevertebral fascia.

A biopsy was performed from the inferior part of the right tonsil and the right pyriform sinus. The result was squamous cell carcinoma for both samples. During admission a nasogastric tube had to be mounted in order to feed the patient.

Due to tumor size and the fact that the prevertebral fascia did not seem involved we established the

indication for total laryngectomy with partial pharyngectomy extended to the base of the tongue and right tonsil, bilateral neck dissection and hypopharynx reconstruction using a regional flap. The cervical approach was performed through an “U”- shaped, Gluck-Sorenson incision. A modified radical neck dissection was practiced on both sides. After the removal of the hyoid bone and dissection of the strap muscles we could observe a large tumour protruding through the lateral wall of the right pyriform sinus with extension to the wing of the thyroid cartilage (**fig. 3**). A retrograde total laryngectomy, extended to the base of the tongue and to the right tonsil, was performed (**fig. 4**). The pharyngeal resection was

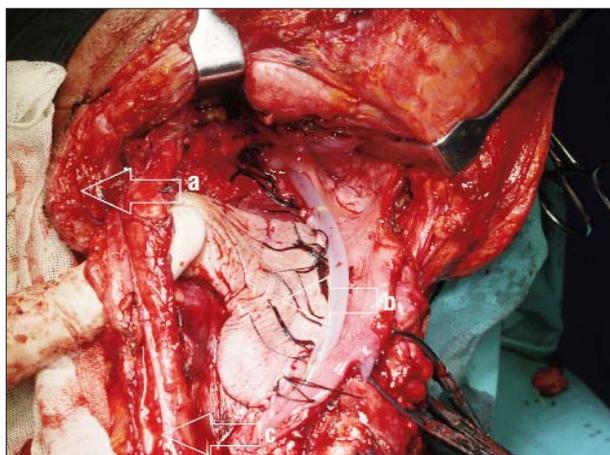


Figure 5. Suture of the medial part of the flap to the remaining pharyngeal mucosa (a. base of the flap, b. the myocutaneous flap c. right main neurovascular bundle of the neck)

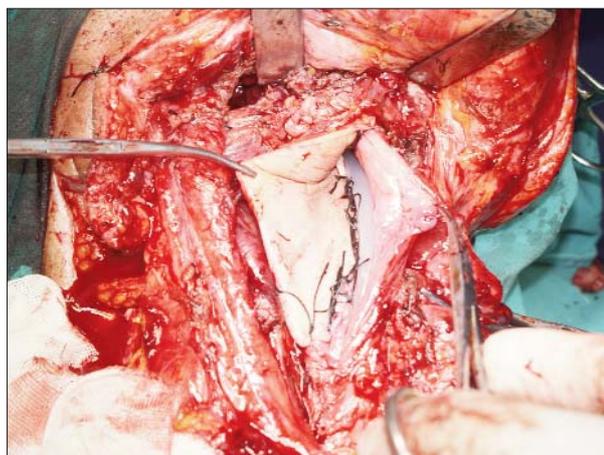


Figure 6. Final position of the flap before midline pharyngeal suture

large according to the principles of surgical oncology. Due to the fact that the remaining pharyngeal mucosa was about 17 mm in width, a flap had to be used for the reconstruction of the lateral wall of the hypopharynx. In order to use as much mucosa as possible, the posterior part of it was carefully dissected from the prevertebral fascia. An incision was created on the posterior margin of the sternocleidomastoid muscle and the muscle with the overlying skin was resected in its inferior part. The flap was rotated and passed under the right neurovascular bundle of the neck. It was sutured, in two layers, to the remaining pharyngeal mucosa (**fig. 5**). The superior part of the flap was sutured to the base of the tongue (**fig. 6**). A watertight suture was performed on the midline and the pharynx was closed (**fig. 7**). The strap muscles were placed in their initial position and a T-shape suture was performed; the myocutaneous “U”-shaped flap was lowered and sutured.

Postoperatively the patient received i.v. treatment with antibiotics, pain relievers, antitussives, mucolytic agents and antacid medication.

RESULTS

The patient was fed by nasogastric tube for 21 days. In the 14th postoperative day a fistula test was performed using methylene blue. The results were negative but the nasogastric feeding tube was maintained for another 7 days as a precaution.

Five weeks after surgery the patient started radiotherapy. After it was completed a naso-pharyngeal flexible endoscopy was performed showing no signs of

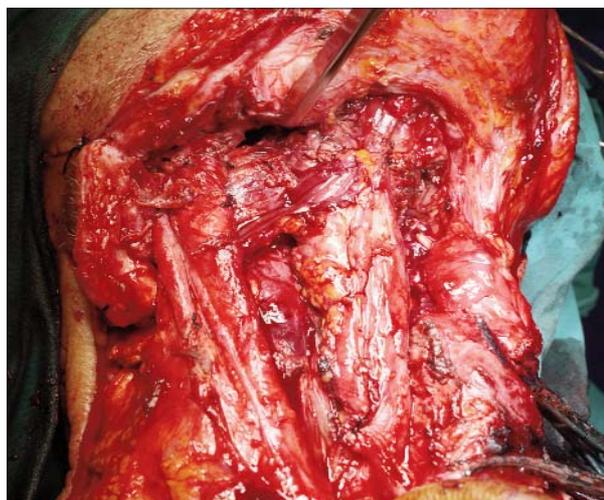


Figure 7. View of the reconstructed pharynx

tumoral recurrence, flap necrosis or stenosis. The follow-up at 3, 6 and 9 months showed no signs of recurrence.

DISCUSSIONS

Hypopharyngeal defect following total laryngectomy associated with partial pharyngectomy, for pyriform sinus advanced stage malignant tumors, require, in most cases, the best use of the available anatomical material for reconstruction. This has always been a challenge for the ENT surgeon because the this stage should provide a neo-hypopharynx suited for deglutition, and later, for phonation (12).

Although there are reports of unreliable viability

of the myocutaneous sternocleidomastoid flap, we consider that it represents a valuable resource in the reconstruction of the lateral pharyngeal wall defects (13). Although the blood supply from the inferior pedicle is not enough to sustain the entire flap, the superior and middle pedicle, together, can maintain the viability of the sternocleidomastoid flap used for hypopharyngeal reconstruction (11). Our results show that this could be a reliable method in cases that do not require radical neck dissection.

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