

Case Report

Repair of Pharyngocutaneous Fistula (PCF) Using Montgomery Salivary bypass Tube after Salvage Total Laryngectomy following Failed Primary Radiotherapy: A Case Report

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Abstract

The occurrence of pharyngocutaneous fistula (PCF) after total salvage laryngectomy following radiotherapy as primary treatment is quite common. In most cases, pharyngocutaneous fistula can heal spontaneously with conservative measures. Here, we are reporting a 69-year-old male with a residual carcinoma of the larynx following failed radiotherapy as primary treatment who later underwent a salvage total laryngectomy. Post-operatively, it was complicated by the formation of pharyngocutaneous fistula which was failed to heal with conservative measures and few attempts of surgical repair. The fistula later healed with the application of Montgomery Salivarybypass tube after 3 weeks. The application of the salivary bypass tube should be considered and used to promote healing in persistent pharyngocutaneous fistula especially in a post radiotherapy patient.

Keywords: Pharyngocutaneous Fistula, Laryngectomy, Salivarybypass tube

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Introduction

Pharyngocutaneous fistula (PCF) is known complication for a post-radiated patient who subsequently underwent a total salvage total laryngectomy^[1-3]. Fistula occurred due to poor tissue and wound healing, surgical scar tension and also compounded by infection during the healing process. Fistula can be very difficult to treat in cases with primary irradiation to the neck^[4-7]. However, it often resolves without surgical intervention. Thus, meticulous interventions should be planned out to reduce morbidity and mortality of a patient.

The aim of this case report is to highlight the important of application of Salivarybypass tube in promoting fistula healing in case that initially exposed to radiation therapy. The success of healing using this method came after we had exhausted several surgical attempts to close the fistula ranging from the simple primary surgical closure to the usage of myocutaneous of pectoralis major pedicled flap.

Case Report

We are reporting a 69-year-old man, an ex-smoker who was diagnosed to have carcinoma of the larynx staged T1N0M0 (WHO: well-differentiated type). He underwent radical radiotherapy of 66Gy for 33 fractions. The patient presented to us (ORL team) five months later with residual tumour with symptoms of hoarseness and mild stridor. Due to fail primary radiation, he underwent a total laryngectomy and total thyroidectomy with bilateral selective neck dissections. Post operatively the wound seems normal, without any evidence of infection or leaking of saliva. However, the laryngostoma site started to become erythematous and discharging pus at the wound edge on post-operative day 5. Gastrograffin swallowing test revealed a leak at the anastomotic site of neopharynx. Due to small fistula, conservative treatment was initially opted with IV Glycopyrolate and daily Dermacyn liquid dressing.

Despite conservative dressing and antibiotics, the fistula failed to close spontaneously. Two week later, an attempt to close the fistula by using the pectoralis major myocutaneous pedicled flap was performed. But the result was not good. There was still saliva leaking due to wound breakdown. Due to unresolved fistula after three-week post closure with pedicled flap, the fistula was again re-explored, the unhealthy tissue debrided and partial approximation of the fistula with 3/0 absorbable suture and it was layered with Bioglue and Surgicel. A Montgomery Salivary Byass tube (size 14mm of external diameter) was inserted into the neopharynx and upper esophagus and anchored to the neck externally using non absorbable 2/0 suture material (anchored using

Litchenberger technique) to prevent dislodgement of the tube. Since the later operative procedure, there was no more saliva leakage and the fistula wound slowly healing up and healed perfectly after 3 weeks and salivary bypass tube removed after that. The patient was discharged well and on subsequent follow up within 2 years, there were no more sign of leakage and no tumour recurrence.

Discussions

Laryngeal carcinoma is one of the commonest head and neck malignancy. Total laryngectomy is commonly performed as salvage surgery with the evolution of non-surgical organ preservation strategies for laryngeal carcinoma^[2]. Among the complications of total laryngectomy include wound infection, pharyngocutaneous fistula, pharyngeal stenosis and nodal metastasis^[3]. In the illustrated case, complication of pharyngocutaneous fistula occur following total laryngectomy with preceding risk factor of primary neck irradiation.

In literature, 28.9% pooled incidence of pharyngocutaneous fistula is complicating salvage total laryngectomy^[4]. PCF remains a common complication of total laryngectomy which multiple risk factors have been implicated. In the meta-analysis of Cecatto et al. and Paydarfar et al., it was found that the first tracheotomy, hemoglobin less than 12.5g/l, hypoalbuminemia, tumor resection margins, radiation therapy, preoperative are risk factors are all reported as risk factors^[8,9]. PCF usually occurred between postoperative day five to seven as oral feeding typically started during those period. Early diagnosis of PCF is essential to plan out further managements. Contrast or methylene blue dyes swallow is performed to assess the leak^[5]. Occasionally, a proper direct laryngoscopy and oesophagoscopy can be done to look into the inner lumen leakage site. With this guidance, severity of the PCF and prognosis of the patient can be predicted to plan out an early management.

Management of PCF has been classified into conservative and surgical intervention. There is a consensus that the initial management of fistulae should be conservative, as they close spontaneously in most cases^[11,12]. Conservative management of PCF includes control surgical site infection, appropriate wound drainage, wound dressing, IV antibiotics, anticholinergic agent^[4-6]. However, conservative management may fail due to a residual/ recurrent tumour, infection over the wound, massive fistula with extensive mucosal dehiscence, poor general status or concomitant metabolic problems of the patient. After addressing of failed

conservative treatment, delayed closure in the presence of healthy granulation tissue can be considered. PCF can be closed with primary closure or using reconstruction method with either free flap or pedicled flap ^[8-10].

The choice of surgical closure is very individualized and depends on patient comorbidity, prior treatment, and institutional expertise. The goals of reconstruction of pharyngeal defects following laryngectomy primarily to



Figure 1: Infected tracheostoma wound at day 5 post total salvage laryngectomy



Figure 2: An arrow showing a large pharyngeal defect

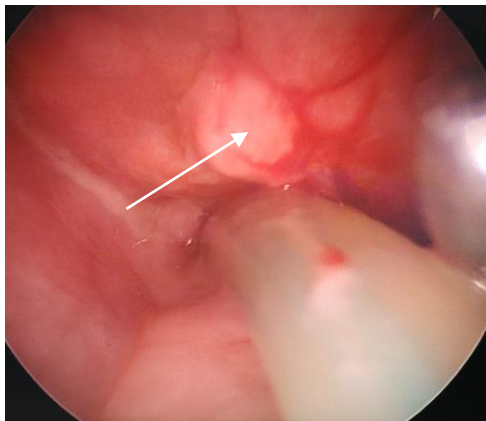


Figure 3: An arrow showing endoscopic view of pharyngeal defect

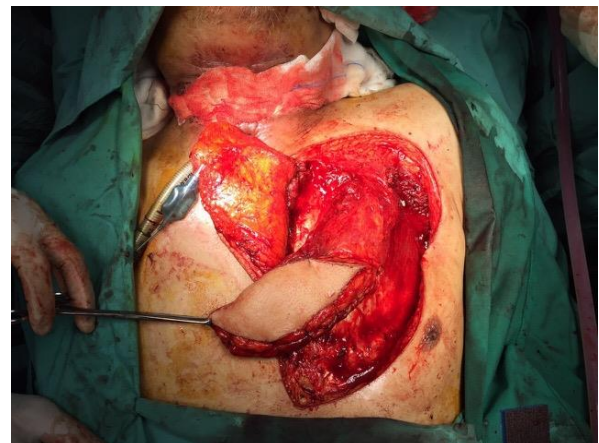


Figure 4: An arrow showing pectoralis major myocutaneous pedicled flap to repair the fistula

restore a patent pharyngeal conduit that permits swallowing and favourable speech. The secondary goal would be preventing complications, minimizing systemic and donor site morbidity. However, optimal outcome of reconstruction depends on various factors, including nature of the defect, prior treatment, patient comorbidity, patient's survival outcomes, surgeon's experiences and facilities availability. The ideal pharyngeal reconstruction should involve a simple technique favourably single stage procedure with short hospital stay, good flap

viability, low complication rate and prevention of life-threatening complications.

Reconstruction of PCF is one of the most challenging surgery for head and neck surgeon, especially for the post chemo radiotherapy patients. Much reconstructive surgery has been described in the past, including pedicled flaps, stomach transposition, and free forearm or jejunum grafts. Some techniques are time consuming, complex and often need an additional surgical team to help out. In

the past, free jejunal interposition was the first reconstructive option for pharyngeal defect as it demonstrated successful high restoration of swallowing and acceptable healing of the fistula and stricture. With the evolution of the reconstructive surgery, numerous regional flaps, including the deltopectoral, sternocleidomastoid, pectoralis major and latissimus flap have been described for the PCF closure. However, many studies have demonstrated that pedicle flap such as pectoralis major myocutaneous flap could be an option to reconstruct the pharyngeal defects due to the advantages of its anatomical position of the flap^[13-15] as described in this case. Moreover, most head and neck surgeons are trained to use this myocutaneous flap for the reconstruction of neopharynx during laryngectomy. Pedicle flaps are remarkably better option in providing vital vascularized tissue for good wound healing. Despite considerable success on the management of PCF using the various flaps, the closure of some complicated PCF is predictable, requiring some adjunct therapies to be employed in the management of these PCF. These include hyperbaric oxygen therapy^[13], negative pressure wound therapy^[6,7] and salivary bypass tube^[15]. Similarly, in the illustrated case, due to the fistula refuse to close despite surgical reconstruction, we employed the usage of Montgomery salivary bypass tube meant to bypass the fistula so that the saliva will be freely diverted into lower esophagus rather than bathing the fistula preventing it from healing. The tube is usually used for palliative treatment for patients with hypopharyngeal or esophageal stricture, but it also indicated for pharyngocutaneous fistulas following total laryngectomy or laryngoesophagectomy^[15]. It should be considered as an adjunct management with non-healing pharyngocutaneous fistula despite surgical intervention has been performed. This salivary bypass tube channelled the saliva from the oropharynx direct into the oesophagus and reduced saliva bathing over the soft tissue of the neck wound, specifically on the neopharynx site post total laryngectomy. Hence, it promotes faster healing and supports spontaneous closure of pharyngocutaneous fistula.

PCF is a common complication post laryngectomy. Crucial factors of its development should be looked into precisely especially on organ preservation failure patient for salvage laryngectomy. There is a still lack of proper analytic studies in the area regarding the management of PCF in salvage laryngectomy, especially in case of reconstructive surgery failure. As there is some literature that supports the evidence of prophylactic use of the pectoralis major myocutaneous flap, it should be given as an option to the patient if facilities and good hands are available. Nevertheless, in cases of complicated PCF without a prophylactic flap, conservative treatment should opt first. Step by step, approach is still essential to impede the unnecessary need for second open surgery.

For high-risk patient or no improvement, reconstructive surgery may come into play to salvage the leaking neopharynx. Finally, an unresolved PCF despite reconstructive surgery, surgeon can always ascertain adjunctive treatments that are available.

Conclusion

PCF is a known complication of total laryngectomy, especially patient with history of radiotherapy. Spontaneous healing is expected in majority of patients, but some may need surgical closure with the commonly employed pectoralis major myocutaneous pedicled flap. In a more complicated cases, in addition to the traditional flap surgery, an adjunct therapy is enforced to promote healing and ultimate closure of the fistula. Here, we report this persistent PCF case which gain a complete healing and closure after the application of Montgomery salivary bypass tube. It is good to note that, early application of Montgomery salivary bypass tube during primary total salvage laryngectomy in post-radiated patient is highly recommended.

Conflict of Interest Statement

No conflict of interest to be declared.

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