Clinical Pattern and Frequency of Pharyngocutaneous Fistula Formation In Patients Who Underwent Total Laryngectomy

Hurtamina Khan,[1*] Sameer Qureshi [1]

ABSTRACT

Objective	*To determine the clinical pattern of patients who had total laryngectomy with special emphasis on pharyngocutaneous fistula formation (PCF).*
Study design	*Retrospective descriptive case series.*
Place & Duration of study	*Department of ENT and Head & Neck Surgery, Jinnah Postgraduate Medical Centre Karachi, from January 2014 to December 2018.*
Methodology	*The records of all patients of total laryngectomy were reviewed. Variables analyzed included age, gender, primary diagnosis, history of addiction, treatment provided and outcome in these patients. Pre designed form was used to enter data. Descriptive statistics were applied for reporting purpose.*
Results	*Total numbers of patients were twenty-six patients of which 23 (88.46%) were males and 3 (21.54%) females. Mean age of the patients was 49±3.50 year. Twenty-two (84.61%) patients had history of addiction. Preoperative radiotherapy, extensive lesion and uncontrolled diabetes mellitus was found among 4 (15.38%), 01 (3.84%) and 02 (7.69%) patients respectively. Total laryngectomy along with lobectomy and thyroidectomy was performed in 3 (11.53%) and in 1 (3.84%) case respectively. The frequency of PCF formation was 26.92% noted in seven patients.*
Conclusion	*Assessment of preoperative risk factors can help in counseling the patients for possibility of PCF formation which adds to the morbidity and at times mortality.*

Key words *Pharyngocutaneous fistula, Risk factors, Total laryngectomy.*

INTRODUCTION:

Pharyngocutaneous fistula is defined as leakage of the saliva through pharyngeal closure site to the skin. PCF is the most common and disastrous postoperative complication following total laryngectomy with the incidence ranging from 7.6% - 50%.[1,2] In total laryngectomy which is done for advanced stage of laryngeal cancer, the entire voice box is removed, which may have a great impact on the patients' quality of life due to difficulty in breathing and communication.[3] The anatomy and physiology of the airway changes considerably after laryngectomy. The connection between mouth and trachea as well as nose and trachea are affected. For this reason, these individuals are labeled as total neck breathers. In such condition mouth should be kept closed and nose should be sealed to prevent air escape during resuscitation.[4]

[1] Department of ENT & Head & Neck Surgery JPMC, Karachi.

Correspondence:
Dr. Hurtamina Khan[1*]
Department of ENT and Head & Neck Surgery
Jinnah Postgraduate Medical Centre, Jinnah Sindh Medical University Karachi
Email: drhurtamina@hotmail.com

PCF results in continuous leakage of saliva outside throat.[5] Number of risk factors for the formation of pharyngocutaneous fistula have been reported in literature.[6] They may be either related to tumor, patient or result of treatment provided. Furthermore, PCF leads to an increased morbidity rate, delayed postoperative therapy, prolonged hospital stay and financial burden. This study was carried out to document the clinical pattern of patients who underwent total laryngectomy and those who developed pharyngocutaneous fistula after surgery.

METHODOLOGY:

This retrospective descriptive case series was conducted in the Department of ENT and Head & Neck Surgery, Jinnah Postgraduate Medical Centre Karachi, from January 2014 to December 2018. Patients between 35 years - 65 years of age, who underwent total laryngectomy initially or patients who underwent total laryngectomy following failure of chemo-radiotherapy or conservative surgery were included. Patients with inoperable tumor (loss of prevertebral fat planes and mediastinal involvement), having comorbidities like congestive heart failure and obstructive pulmonary disease and not fit for general anesthesia, were excluded.

Prerequisites for total laryngectomy were fiberoptic direct laryngoscopy, and CT scan from base of skull to upper mediastinum. Preoperative assessment comprised of past medical and surgical history including age, gender, co-morbidities, history of addiction, chemotherapy and radiotherapy history, hemoglobin and albumin levels. Follow up period was one-year post-laryngeal surgery. Data was entered and analyzed using SPSS software version 23. Descriptive analysis was carried out to find the frequencies, mean and standard deviation.

RESULTS:

During study period, a total of 26 cases were found in whom total laryngectomy was performed with or without neck dissection. Mean age of patients was 49±3.50 year (From 35 years – 65 years). Twenty-three (88.46%) were male and three (21.54%) female patients. History of smoking, alcohol consumption and *naswar* use was noted in 22 (84.61%) patients. Four (15.38%) patients had received preoperative radiotherapy, 01 (3.84%) had extensive lesion and 02 (7.69%) with uncontrolled diabetes mellitus. Characteristics of our study patients are presented in table I. Total laryngectomy was performed in all cases however in 3 (11.53%) patients total laryngectomy with lobectomy and in 1 (3.84%) case total thyroidectomy was also performed. Selective neck dissection was done in 5 (19.23%) cases. Seven (6.92%) patients developed PCF in this series.

All laryngeal framework, lobectomy, total thyroidectomy, selective neck dissection specimens were sent for histopathology. Postoperatively oral feeding commenced after 2 weeks of procedure. In majority of patients leak manifested 2 weeks after surgery when oral feeding started. Pharyngeal closure was performed in three layers. T-shaped reconstruction was done. Nasogastric feeding continued for two weeks. In present study, most of pharyngo-cutaneous fistulae developed in patients who had preoperative radiotherapy, extensive lesion of larynx and uncontrolled diabetes.

DISCUSSION:

After laryngectomy PCF is the most common complication that appears in early postoperative period. It is associated with increase morbidity, hospitalization, and delays in starting adjuvant radiation therapy. In our study the frequency of PCF formation in total laryngectomy patients was 26.92%. This was comparable with previous studies.[6-10] Mean age of our patients was 49 years. This was much lower than the mean age reported in literature.[11] Majority of affected patients were males. Same was found in other studies.[11,12] Addiction history is a well-known risk factor for pharyngocutaneous fistula formation. In our study it was present in 84.6% of

Table I: Characteristics of Study Patients

Characteristics	n (%)
Total cases	26
Male	23 (88.61%)
Female	3 (11.53%)
Positive addiction history	22 (84.61%)
History of preoperative radiotherapy	4 (15.38%)
Extensive lesion of larynx	1 (3.84%)
Uncontrolled diabetes mellitus	2 (7.69%)

cases as reported by others.[13] In our study, extensive lesion with the involvement of medial wall of pyriform fossa and in one case of supra-glottic tumor required extensive resection of mucosa leading to closure under tension. These conditions have been stated as risk factors for pharyngocutaneous fistula.[7,14]

Preoperative radiotherapy is associated with increased risk of PCF formation. In acute phase it can cause dermatitis or mucositis and in chronic phase, tissue can undergo hypoxia, hypocellularity and become hypovascular. We found PCF formation in patients who had previous radiotherapy than others. Oral feeding should be commenced after 3-4 weeks as it is believed that delayed oral feeding reduces fistula formation after laryngectomy because there is no stress on the suture line. In this study large size nasogastric tube was placed before surgical intervention and removed after 2 weeks. It is generally agreed that most fistulae respond to conservative treatment.[14-17] This study has some limitations as it was retrospective and hence many details at follow up could not be documented. The number of patients with PCF were small thus one cannot generalize the findings. A large multicenter study is thus warranted.

CONCLUSION:

Preoperative radiotherapy, extensive lesion, uncontrolled diabetes mellitus were found in patients with PCF formation.

REFERENCES:

1. Soylu L, Kýroðlu M, Aydoðan B, Çetik F, Kýroðlu F, Akçalý Ç, et al. Pharyngocutaneous fistula following laryngectomy. Head Neck: 1998;20:22-5.

2. Berry SM, Fischer JE. Classification and pathophysiology of enterocutaneous fistulas. Surg Clinics. 1996;76:1009-18.

3. Ward EC, van As-Brooks CJ, editors. Head and neck cancer: treatment, rehabilitation, and outcomes. Plural Publishing; 2014.

4. Brook I. Ventilation of neck breathers undergoing a diagnostic procedure or surgery. Anesth Analg. 2012;114:1318-21.

5. Hasan Z, Dwivedi RC, Gunaratne DA, Virk SA, Palme CE, Riffat F. Systematic review and meta-analysis of the complications of salvage total laryngectomy. Eur J Surg Oncol. 2017;43:42-51.

6. Paydarfar JA, Birkmeyer NJ. Complications in head and neck surgery: a meta-analysis of post-laryngectomy pharyngocutaneous fistula. Arch Otolaryngol Head Neck Surg. 2006;132:67-72.

7. Wang M, Xun Y, Wang K, Lu L, Yu A, Guan B, Yu C. Risk factors of pharyngocutaneous fistula after total laryngectomy: a systematic review and meta-analysis. Eur Arch Otorhinolaryngol. 2020;277:585-99.

8. Wakisaka N, Murono S, Kondo S, Furukawa M, Yoshizaki T. Postoperative pharyngocutaneous fistula after laryngectomy. Auris Nasus Larynx. 2008;35:203-8.

9. Ganly I, Patel S, Matsuo J, Singh B, Kraus D, Boyle J, et al. Postoperative complications of salvage total laryngectomy. Cancer: Interdisciplinary Int J Am Cancer Soc. 2005;103:2073-81.

10. Cavalot AL, Gervasio CF, Nazionale G, Albera R, Bussi M, Staffieri A, et al. Pharyngocutaneous fistula as a complication of total laryngectomy: review of the literature and analysis of case records. J Otolaryngol Head Neck Surg. 2000;123:587-92.

11. Lebo NL, Caulley L, Alsaffar H, Corsten MJ, Johnson-Obaseki S. Peri-operative factors predisposing to pharyngocutaneous fistula after total laryngectomy: analysis of a large multi-institutional patient cohort. J Otolaryngol Head Neck Surg. 2017;46:54. doi: 10.1186/s40463-017-0233-z.

12. Maharani A, Yusuf M. Risk factors of pharyngocutaneous fistula following total laryngectomy. Eur Asian J Biosci. 2020;14:2501-6.

13. Aslýer NG, Doðan E, Aslýer M, Ýkiz AÖ. Pharyngocutaneous fistula after total laryngectomy: risk factors with emphasis on previous radiotherapy and heavy smoking. Turkish Arch Otorhinolaryngol. 2016;54:91.

14. Saydam L, Kalcioglu T, Kizilay A. Early oral feeding following total laryngectomy. Am J Otolaryngology. 2002;23:277-81.

15. Tomkinson A, Shone GR, Dingle A, Roblin DG, Quine S. Pharyngocutaneous fistula following total laryngectomy and post-operative vomiting. Clin Otolaryngol Allied Sci. 1996;21:369-70.

16. Casasayas M, Sansa A, García-Lorenzo J, López M, Orús C, Peláez X, et al. Pharyngocutaneous fistula after total laryngectomy: multivariate analysis of risk factors and a severity-based classification proposal. Eur Arch Otorhinolaryngol. 2019;276:143-51.

17. Markou KD, Vlachtsis KC, Nikolaou AC, Petridis DG, Kouloulas AI, Daniilidis IC. Incidence and predisposing factors of pharyngocutaneous fistula formation after total laryngectomy. Is there a relationship with tumor recurrence. Eur Arch Otorhinolaryngology Head Neck Surg. 2004;261:61-7.

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