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Original Article

Pharyngocutaneous Fistula- Frequency and Risk Factors

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Abstract

Setting: *Study was conducted in the Department of Otolaryngology and Head-Neck surgery of Bangabandhu Sheikh Mujib Medical University (BSMMU), Bangladesh from 2006 to 2017.*

Objectives: *To find out the frequency, risk factors, and its effect on the management of pharyngocutaneous fistula (PCF).*

Methods: Observational, Cross Sectional study. Number of laryngectomized patients 249.

Results: *Total PCF developed 48 (19.27%). Irradiated patients with multiple co-morbidities had more chance to develop PCF.*

Conclusion: *High incidence of pharyngocutaneous fistula mostly due to advanced stage of disease, various levels of surgical expertise and post irradiated patients with multiple comorbidities.*

Key Words: *Pharyngocutaneous Fistula (PCF), Laryngectomy, Pectoralis Major Myocutaneous Flap (PMMC)*

Introduction

Pharyngocutaneous Fistula (PCF) is the communication between the pharynx and cervical skin around the surgical incision or, less commonly in the stoma of the tracheostomy.[1]

Head and neck cancers account for approximately 4% of all cancers in the United States. These cancers are more than twice as common among men as they are among women. Head and neck cancers are also diagnosed more often among people over age 50 than they are among younger people[2].

Researchers estimated that more than 65,000 men and women in this country would be diagnosed with head and neck cancers in 2017 Carcinoma Larynx is the one of the important components of Head- Neck Cancer. Total Laryngectomy still the treatment of choice for the advanced laryngeal cancer.

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High frequency also observed in Bangladesh.

This is a type of salivary fistula. The salivary amylase of this fistula may cause injury to neck vessels and injury to major neck vessels may leads to catastrophic complication like carotid blowout.

As long as Pharyngocutaneous fistula is there, patients need to feed through Nasogastric feeding tube. Maintenance of Nasogastric tube and feeding through it for longer period is troublesome for patient, family and physician.

Most of the Pharyngocutaneous fistulas are usually healed spontaneously by giving careful conservative treatment. Primary patients without radiotherapy heals early. But in irradiated patients take longer time to heal. Healing also disturbed by comorbidies of patient. Positive margins are very notorious for fistula formation. Anaemia, hypoalbuminamia, electrolyte imbalances are commoner comorbidities. Hypothyroidism is also common in postirradiated patients. Blood transfusion may give very good outcome in selected patients.

Surgery also required for some patient when Pharyngocutaneous fistulas not healed spontaneously. Repaired with Deltopectoral flap or Pectoralis major myocutaneous flap usually required. Free flap can also be used for surgical repair.

A very systematic comprehensive management is required to prevent Pharyngocutaneous fistula and to treat Pharyngocutaneous fistula.

Pharyngocutaneous fistula is the most common debilitating complication after total laryngectomy. This complication rarely may arise from extensive Thyroid Surgery for very advanced Thyroid disease with extrathyroid extension. Pharyngocutaneous fistula (PCF) may also develop as a sequel of long term complication of tracheostomy.[3]

Survey for Pharyngocutaneous fistula (PCF) should be done meticulously. Suspicion of development of Pharyngocutaneous fistula (PCF) was suspected by detection of its atypical smell from wound which is developed by necrosis and putrefaction of organic materials. It is manifested by local erythema, wound swelling or increased neck drain output. Local temperature is usually raised. Wound Amylase concentration is higher in biochemical study. Radiological assessment was done by fistulogram/CT fistulogram.

It appears around 4th to 10th postoperative day.

The reported incidence of PCF is widely varied, from 3.6 to 65%.[4]

Pharyngocutaneous fistula leads to increased morbidity, delay in starting subsequent treatment, prolong hospitalization and raised treatment costs.

Objectives

To find out the frequency and risk factors pharyngocutaneous fistula (PCF).

To learn the preventive strategy and other techniques to avoid PCF

Methods

This is an Observational, Cross- Sectional study which is conducted in the Department of Otolaryngology and Head-Neck surgery of Bangabandhu Sheikh Mujib Medical University (BSMMU), Duration of study was 12 years, from 2006 to 2017.

All patients treated with Total laryngectomy for advanced laryngeal carcinoma and Total Thyroidectomy for advanced thyroid disease with extrathyroidal extension has been included in this study. Patients with thyroid

disease but no extrathyroidal extension was excluded from this study

Variables

Variables are usually categorized into modifiable, possibly modifiable, non-modifiable groups by many experts.

Modifiable- Surgical technique, Positive margin, Reconstruction, smoking, alcoholism

Possibly modifiable- Perioperative Anaemia, Hypo-albuminaemia, Hypothyroidism, Electrolyte Imbalance

Non modifiable-Radiotherapy, Tracheostomy, Tumour Stage, Age, Sex, Tumour site and subsites, Neck dissection, Co-morbidity-DM, COPD, IHD, CKD.

Results

All patients with total Laryngectomy for advanced laryngeal carcinoma and Total Thyroidectomy for advanced thyroid disease with extra- thyroidal extension has been studied in the time period. Total number of patient-249. Total PCF developed-48(19.277%)

Table I

Non Modifiable Variable

Non-Modifiable Variables		
Age	18 (<55 yrs)	30 (>55 yrs)
Sex	36 male	12 Female
Radiotherapy (RT)	28 with RT	20 without RT
Tracheostomy	30 with Tracheostomy	18 without Tracheostomy
Tumour site	Supraglottis-26, Glottis-12 Subglottis-2	Medial wall of Pyriform fossa-5 Thyroid-3
Tumour Stage of Larynx and Hypopharynx	T_4-39	T_3-9
Neck Dissection	Comprehensive-26	Selective-22
Co-morbidities	41with Co-morbidities	7-without Co-morbidities

Table II

Possibly Modifiable Variables

Possibly Modifiable	Present	Absent
Anaemia	19	29
Hypoalbuminaemia	10	38
Hypothyroidism	18	30
Electrolyte imbalance	6	42

Table III

Modifiable Variables

Modifiable Variable	Yes	No
T-closure	5	-
I-closure	43	-
Positive margin	7	42
PMMC in RT patient	15	33
Smoking	42	6
Alcoholism	5	43

Discussion

Total number of patients studied in this period of 12 (twelve) years (2006-2017) of time which was 249, total PCF developed in 48 patients. This is 19.277% in this series. The reported incidence in various publications are widely ranged. It is about 3.6% to 65%. It varies from centre to centre. Top ranking Head-Neck Cancer Centre showed their Post laryngectomy PCF rate is very low.[2]

Appearance of PCF from 4th to 10th postoperative day. Some centre reports that commonly it is one or two days earlier or later, which is almost similar to our study. [2, 3]

Patients older than 55 years were associated with poor healing. Age related cut off point, here 55 years has been determined in ATA

guideline, though it is thyroid based.[3] In laryngeal malignancy there is no age related cut off point in guidelines . Usually after 40 years, all organs function decreases 1% by a year. So it is pertinent that in old age decreasing the capabilities to heal.[4]

Male are more affected than female. In this study, male patients are more. Male are more smoker which leads to non-healing wound. Females are also sufferer of PCF. As because in our country females are usual victim of anaemia and hypoalbuminaemia.[5, 6.]

Patients with the history of smoking have developed PCF. Probably, poor healing due to impairment of oxygen carrying capacity by haemoglobin in smoker.[7] Operation related complications are more in smoker. In this study, 42 PCF participants were smoker. This reflects the common etiological association of carcinoma larynx.

Patients with the history of alcoholism more prone to PCF which is attributable to longer time to heal in alcoholics.[3, 8] 5 alcoholics were present among 48 participants in this study. It reflects the pattern of personal habit in the community.

41 participants were suffering from co morbidities. Diabetes delays healing capacity and more prone to infection. So, diabetic patients are more sufferer of PCF formation.[9]

Out of 48 PCF participants 28 patients was irradiated and 20 patients was primary. Radiation are usually associated with PCF formation. This findings are common in other studies also. Radiotherapy causes various types of local and systemic changes in irradiated patients. It reduces vascularity by periarteritis, endarteritis and fibrosis. It reduces immunity. Which all are related with fistula formation.[10]

19 participants were anaemic and 10 patients were suffering from hypoalbuminaemia. Though anaemia may be corrected preoperatively by blood transfusion, there is not usual recommendation to infuse albumin preoperatively. Optimum haemoglobin and albumin level are essential for wound healing. So, anaemia disturbs healing, Hypoalbumineamia interrupts healing. Low BMI patients more related with PCF formation.[8, 11]

Any sort of metabolic disorder has detrimental effects on healing. In this series 18 participants were suffering from Hypothyroidism. It delays healing, which leads to PCF formation.[9]

6 patients were suffering from electrolyte imbalance. It is associated with fistula formation. It has negative impact on wound healing.

Cardiorespiratory status and renal status has delays healing.[10]

Presence of combination of multiple comorbidities in Laryngectomy patient usually leads to PCF formation. 7 patients were suffering from multiple comorbidities.

In this series, most of participants were in advanced stage. In our socio-economic setup, patients usually presents with advanced stage of disease. In any disease, early stage management very effective, curative. In advanced stage surgery, difficult to achieve clear margin excision. Effective reconstructions are also troublesome in limited resource centre after surgery. So, more advanced tumour, more chance of fistula formation and recurrence.[12]

Usually medial wall pyriform fossa lesion were included in this study. Pyriform fossa are more related with fistula formation. Probably this is due to that this sites are more prone to tumour dissemination. In Trachiostomised patient more chance of fistula formation. Longer preoperative time for laryngectomy after tracheostomy more chance of fistula formation.[13]

Gastro-oesophageal reflux disease (GORD) has negative impact on wound healing after upper aerodigestive tract surgery.[14]

Time of oral feeding is an important issue. One week is the optimum time to start oral feeding in primary cases and 2 weeks is the optimum time for postirradiated patients in our setup. Too early oral feeding related to more PCF formation.[15]

Surgical technique is an important issue in PCF formation. Meticulous surgical technique is essential for good outcome, good healing. Positive surgical margin is the most important determinant for fistula formation and non-healing tendency. [12, 16] Type of closure of neopharynx may be related with proper healing i.e. PCF formation. In this series, I-type closure were mostly done, which was 43 out of 48. In irradiated patients, Pectoralis Major Myocutaneous Flap (PMMC) usually uses to prevent PCF formation.[17] In this series, in 15 patients with PMMC were developed PCF. In initial period of this series, this concepts of use of PMMC during laryngectomy in irradiated patients was not adopted. Some patients developed fistula in spite of using PMMC. The development of PCF with PMMC may be multifactorial.[18, 19.]

Conclusion

Postlaryngectomy pharyngocutaneous fistula is one of the commonest morbidity after major Head-Neck Surgery. High occurrence of pharyngocutaneous fistula mostly due to advanced stage of disease, various levels of surgical expertise and post irradiated patients with multiple comorbidities. Some of this may be preventable by taking adequate measure.

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