PHARYNGOCUTANOUS FISTULA AFTER TOTAL LARYNGECTOMY

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CHAPTER 4

SUMMARY

Pharyngocutaneous fistula is a serious complication that occurs after total laryngectomy operations. Its incidence varies and ranges from 2% to 66% according to different authors starting from year 1951 and ending in the year 2009.

The aetiological predisposing factors are grouped into 3 big groups:

1. **Preoperative factors: which include: previous irradiation, systemic affections, co-morbidity index and the presence of previous tracheostomy. Systemic affections include: anaemia, inadequate control of nutritional status, diabetes, hepatic dysfunctions, abnormal blood parameters, chronic obstructive lung disease and the presence of AIDS.**
2. **Operative factors: that includes mainly the type of closure of the pharynx and the extent of the tumours (TNM stage and the free safety margin during the operation). Also, the type of sutures used, are all important factors.**
3. **Postoperative factors: including the type of PO feeding, with or without the use of NGT. The presence of PO complications as: seroma, wound infections and failure of skin healing are the main PO predisposing factors.**

The squeals of PCF include both: 1-Morbidity like delayed oral feeding, prolonged hospitalization with possible additional surgery, increased cost and exposure to hospital acquired infection. 2- Mortality with the fatal complication like the rupture of the carotid artery.

The prevention of PCF includes mainly the avoidance of all the predisposing factors and also the immediate and early management of fistula formation in a conservative measure using local toilet with local control of infection.

CONTENTS

List of Abbreviations

PCF : Pharyngoeutaneous Fistula.

DPF : Deltopectoral Flap.

TL : Total Laryngectomy.

NGT : Naso-Gastric Tube.

PO : Post Operative.

RFFF: Redial Free Forearm Flap.

PIG: Pharyngeal Interposition Graft.

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CHAPTER 1
INTRODUCTION

Cancer larynx is the most common carcinoma of all head and neck malignancy; it represents about 1 % of all malignancies in men. It has, in common with many head and neck cancers, a predominantly squamous pathology as well as early interference with both function and emotions. Also it shares, with only a few other types of cancer, a high rate of cure, which in certain sub sites may reach over 85 % and overall exceeds 50 % *(Powell & Robin, 1983*). Therefore, cancer larynx places upon the surgeon a much greater responsibility than usual, as careful evaluation and treatment offer a high probability of cure, while failure may be followed by a relatively uncomfortable death *(Robin & Olofsson, 1997*).

Since the first laryngectomy done by Billroth in 1873, total laryngectomy is still one of the effective modalities in treatment of cancer larynx *(Maran, 2000).*

One of the most common and troublesome complication in the early post operative period following total laryngectomy is the development of pharyngocutaneous fistula (PCF), *(Volling et al., 2001)*.

PCF is defined as a salivary leak due to break of the pharyngeal suture line with the development of a track between pharynx and skin (*Allen, 2003*). The presence of saliva results in infection of the surrounding tissues, with microvenous thrombosis and progressive tissue loss causing the surrounding neck skin to become tender and

dark red in color (*Galli et al., 2009*).

PCF develops just above the tracheostoma, at the weakest point of the suture line of the pharyngeal mucosa, and it is always associated with surrounding tissue necrosis. Also, salivary fistulas can also occur higher in the neck, at the junction between the pharyngeal mucosa and the base of the tongue (*Galli et al., 2009*).

CHAPTER 2
AIM OF THE WORK

This study aims to identify and define the factors that can contribute to the occurrence of pharyngocutaneous fistula and how to prevent its occurrence. This would be conducted by reviewing the recently published literature regarding postoperative pharyngocutaneous fistula, Moreover, analysis of the different methods of closure of pharyngocutaneous fistula will be discussed.

CHAPTER 3
REVIEW OF LITERATURE
I. INCIDENCE

According to the world literature, the incidence of PCF after total laryngectomy varies from 2% to 66% (*Bresson et al., 1974*). However, a rate between 13% and 23% has been frequently reported over the last two decades (*Soylu et al., 1998). Also, (Joseph et al., 2006*) reported incidence ranging from 3% to 65%. In a publication from Egypt, (*Abdel Aziz et al, 2003*) reported an incidence of 16% out of a series of 214 patients.

Table 1: Incidence of pharyngocutaneous fistula after total laryngectomy in the literature:

	No. of patients	No. of fistulae	%
Ogura (1951)	37	8	12.5
Kirchnes & Scatliff (1962)	26	13	50
Lavelle and Maw (1972)	170	64	37.6
Dedo et al.-(1975)	117	9	7.6
Johansen et al. (1988)	106	34	32.1
Papazoglou et al. (1994)	310	28	9
Soylu et al. (1998)	295	37	12.5
Redaeli et al. (1999)	246	40	16
Virtaniemi et al. (2001)	133	20	15
Abdel-Aziz, et al (2003)	214	34	16
Joseph et al(2006)	187	37	19.7
Dedivitis et al (2007)	55	7	12.7
Sharifian et al (2008)	25	4	16
Saki et al (2008)	146	19	13

II. AETIOLOGICAL PREDISPOSING FACTORS

The overall different predisposing factors leading to the occurrence of PCF can be grouped and classified as follows:

A. Pre-operative factor

B. Operative factors

C. Post-operative factors

A. PRE-OPERATIVE FACTORS

These factors could be grouped as follows:

I. Patient features

II. Previous irradiation

III. Systemic diseases

IV. Previous tracheostomy

I.PATIENT FEATURES

PCF is more common in males than females. Old age may increase PCF incidence due to poor healing activity and bad general condition of the elder patient *(Dedivitis, et al 2007).*

Table2. Patient distribution according to demographic, clinical, and treatment characteristic and occurrence of pharyngocutaneous (number of patient 55)(Dedivitis, et al 2007).

Variables	Category	Pharyngocutaneous fistula (%)	
		Yes	No
Sex	Male	7(14.0)	43(86.0)
	Female	0 (0.0)	5(100.0)
Age (years)	> 60	1(3.6)	27(96.4)
	≤ 60	6(22.2)	21(77.8)
Tumour site	Glottis	4(13.3)	26(86.7)
	Subglottis	0(0.0)	3(100.0)
	Supraglottis	2(13.3)	13(86.7)
	Piriform sinus	1(14.3)	6(85.7)
pT stage	T2-3	3 (7.7)	36(92.3)
	T4	4(25.0)	12(75.0)
Neck dissection	No/other types	1(3.7)	26(96.3)
	Bilateral radical	6(21.4)	22(78.6)
Previous radiation therapy	No	4(9.8)	37(90.2)
	Yes	3(21.4)	11(78.6)
Previous tracheotomy	No	4(8.0)	46(92.0)
	Yes	3(60.0)	2(40.0)
Comorbidity	0	1(12.5)	7(87.5)
	≥1	6(12.8)	41(87.2)
Peri-operative blood Transfution	No	4(8.7)	42(91.3)
	Yes	3(33.3)	6(66.7)
Closure with stapler	No	6(12.2)	43(87.8)
	Yes	1(16.7)	5(83.3)

II. PREVIOUS IRRADIATION

Radiotherapy is well known to produce many side-effects. It is stated that the therapeutic ratio between the dose required to cure squamous cancer and the dose at which unacceptable morbidity occurs is small *(Ferlito, 2000).*

The most commonly seen acute complications of radiotherapy for head and neck cancer are on the skin and mucosa. Skin reaction range from erythema and dry desquamation to moist desquamation and ulceration with necrosis, depending on the type of radiation and energy used, the area treated, and doses and fractionation used. When orthovoltage (blow 300 kVp) or electron energy are used, erythema will appear with doses of about 3000 rads in 3 weeks, dry desquamation with slightly higher doses, and moist desquamation with 4500 to5000 rads. With cobalt-60, high energy x-rays (above 4 Mev), neutrons and electrons, subcutaneous fibrosis is frequently observed with doses over 5000 rads. With high doses of irradiation, sever ulceration and necrosis of the skin may be seen (Carlos, *1998*; *Maran, 2000).*

Reaction in the oropharyngeal and laryngeal mucosa are related to damage the germinal cell layer of the epithelium and to vascular changes. The acute phase of the radiation reaction manifests by increased vascular permeability and interstitial edema with associated inflammatory changes. During the first 2-3 weeks erythema of the mucosa is followed by studded mucositis. At this point, the patient begins to complain of a sore throat. After 4000 rads, apatchy fibrinous exudates may be seen, becoming more confluent with doses of over 5000 rads (Carlos, *1998).*

The mucosa undergoes a series of changes similar to skin when