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Outcome of Total Laryngectomy (One Centre Experience)

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Abstract

Objectives: *To assess the patients with advance carcinoma of larynx and its sequelae post total laryngectomy.*
Patients and method: *The study was conducted as a prospective study including patients had undergone total laryngectomy for histologically proven laryngeal cancer at Medical City Complex, Surgical Specialties Hospital at the department of otolaryngology and head and neck surgery from January 1st 2011 to 31st December 2013. Total of (39) patients were included in the study. Patients exluded from the study were those who had undergone neck dissection, total pharyngolaryngectomy, and partial laryngectomy. Local and general complications were noted along with the possible affecting factors. Outcomes were noted in this study and statistical analysis was done by simple percentage and frequency.*
Results*: Total of (39) patients had undergone total laryngectomy over a period of three years and followed for three years. Male: female ratio 3.875:1. Mean age was 56 years, ranged from 40 up to 75. Smokers constituted (87.5%) of patients. Salvage laryngectomy was done for (17.9%) of cases. Histological findings were: 25 (64 %) well differentiated, 1 ( ) verrocus carcinoma, 11 (28.2 %) moderately differentiated and 3 (7.69%) poorly differentiated. Early Complications: pharyngocutaneouse fistula 11 (36.5%), wound infection 5 (12.5%), none of the patients had developed superficial wound necrosis and wound haematoma. Two patients had passed peroperatively due to cardiac problem proved by ECG. One case was admitted to the CCU after developing myocardial infarction at 7th day postoperatively. Subclinical hypocalcaemia was noted in 5 ( ) of the patients detected by regular postoperative electrolyte follow up.*
Conclusion and recommendations*: Total laryngectomy plays major role in the management of laryngeal carcinoma. Pharyngocutaneous fistula was the most common early postoperative complication. The recognition of the risk factors for complications is essential to prevent them.*

Keywords: *Laryngectomy, Laryngeal Carcinoma, Phayngocutaneous Fistula, Wound Infection*

Introduction

Laryngeal carcinoma is the most common head and neck cancer worldwide. As previously undeveloped countries acquire more economic strength, so access to cigarettes and alcohol has increased[(1)]. Advanced-stage larynx cancer (Stages III and IV) was historically treated by dual-modality therapy with surgery and radiation.

For most T3 and T4 tumors, where total laryngectomy is required for the complete removal of the tumor with amply clear margins[(2)]. A total laryngectomy entails the removal of the entire larynx, including the thyroid and cricoid cartilages, possibly some upper tracheal rings, and the hyoid bone. The proximal tracheal stump is anastomosed to an opening at the root of the neck anteriorly in a permanent tracheostomy; this results in the complete anatomic separation of the respiratory and digestive tracts[(3)]. Total laryngectomy remains as the standard by which other forms of treatment for advanced primary laryngeal carcinoma are evaluated. It should still be considered as a primary treatment modality for selected patients[(4)]. Indications for total laryngectomy are:

(1) T3 and T4 cancers not amenable to the partial laryngectomy procedures or organ preservation therapy with chemo radiation, (2) extensive involvement of thyroid or cricoid cartilage, (3) the direct invasion of surrounding soft tissues of the neck, (4) tongue base involvement beyond the circumvallate papillae and (5) salvage therapy for failures of organ preservation strategies. Closure is done by reapproximating the pharyngeal mucosa[(5)]. If a partial or total pharyngectomy is also required because of the size of the tumor, then free flap or regional flap aids the closure and prevents pharyngoesophageal stricture. The ultimate goal is to

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maintain for the patient the ability to swallow by mouth[6]. The main options for the treatment of advanced laryngeal cancer currently are total laryngectomy or chemoradiotherapy[7]. Other options used less commonly include partial open laryngectomy ,neartotal laryngectomy and laser C02 transoral surgery[8]. Higher complication rates can be expected in the setting of preoperative radiotherapy and chemoradiotherapy with longer and more complex salvage procedures[9]. Pharyngocutaneous fistula is much less common in non-irradiated patients. Closure of the pharynx should be done in a meticulous fashion. Other factors that may predispose to complications include positive margins, technical errors, diabetes mellitus, hypothyroidism and poor nutritional status[10].

Complications are usually divided into general and local. General complications are those of any major operation such as pulmonary infection, urinary infection (in association with catheterisation), septicaemia, pulmonary embolism, cardiac and neurological. Localcomplications are mainly related to bleeding or to pharyngeal repair leakage, both of which may lead to wound breakdown and fistula formation[11].

Patients and method

The study was conducted as a prospective study including patients had undergone total laryngectomy for histologically proven laryngeal cancer at Medical City Complex, Surgical Specialties Hospital at the department of otolaryngology and head and neck surgery from January 1st 2011 to 31st December 2013.

Total of (39) patients were included in the study. Patients exluded from the study were those who had undergone neck dissection, total pharyngolaryngectomy, and partial laryngectomy. All the patients were staged by the TNM classification used by the American joint Committee on cancer AJCC and the International Union against Cancer (UICC). Staging was done by clinical examination and detailed endoscopic examination, and Radiological imaging in the form of CT scan and occasionally MRI.

Patients included were STAGE III or stage IVa of squamous cell laryngeal carcinoma.

Inclusion criteria were:

a) Patients diagnosed squemons cell carcinoma of the larynx (histologically proven)
b) Patient staged at stage III or IVa
c) Patients underwent total laryngectomy procedure only as a primary or salvage surgery after failure of primary treatment choice.

Exclusion criteria were as follow:

a) Any patients underwent neck dissection at the time of the
b) Patients underwent total pharyngolaryngectomy Details of each case were obtained and follow up data regarding patients were taken from patients hospital records. The data was organized by a questionnaire.

Questionnaire

Age:
Gender:
Presentations:
* Hoarseness of voice/ change of voice
* Persistent pain/ discomfort
* Difficulty in breathing (dyspnoea)
* Difficulties in swallowing
* Stridor
* Weight loss
Need for tracheotomy at presentation:
History of smoking and alcohol:
Medical history:
Surgical history:
Site of tumour:
* Glottic
* Supraglottic
* Subglottic
Staging of the tumor and histopalhology:
Operative details:
* Primary or salvage and previous modality of treatment:
* Tracheotomy time in relation to the operation:
* Intraoperative findings:
* Repair (closure) details:
Postoperative findings and general condition:
Follow up data:

All patients underwent preoperative clinical assessment by taking full detailed history and full clinical examination, endoscopic examination, laboratory investigations including complete blood count, blood sugar levels, renal and liver function test, serum electrolyte levels, bleeding profile, and virology screen tests for HIV, hepatitis virus type C and B.

Radiological examination including chest X-ray, abdominal ultrasound neck CT scan were done for every patient and MRI only in some occasions. ECG and Echocardiography were done routinely. Panendoscopy was done for every patient at the time of direct laryngoscopy along with the full neck examination and tongue base assessment. Medical consultation preoperatively included: Nutritional assessment, dental evaluation, pulmonary evaluation and psychological consoling.

As in any surgical procedure in which the upper aerodigestive tract is entered through the neck, antibiotics are administered perioperatively (during induction of anaesthesia). All our patients, except for one, had undergone tracheotomy before the operation date and mostly as an emergency setting. Tracheotomy tube was changed at night preoperatively. Patient was placed in supine position with shoulder and head ring to maintain the neck in extension.

Results

Age: Mean age 56 years (started from 40 up to 75 years).

Gender: Male: female ratio 3.875:1 (31 males to 8 females).

Smoking: Smokers are (87.5%) of the patients, more than two third of them were smoking more than 40 cigarette (2 packs) per day for more than 30 years.

Alcohol intake: Number of patients with history of alcohol intake was 4 (10.2%) only.

Presenting Complaints

Table 1 Distribution of patients according to presenting complaint

Presenting Complaints	No. of Symptom cases	Percentage (100%)
Hoarseness/ Change of voice	39	100
Persistent pain/ Discomfort in the throat	12	30.7
Difficulty in breathing (Dyspnoea)	13	33.3
Difficulty in swallowing (Dysphagia)	7	17.9
Stridor	7	17.9
Weight loss	5	12.8

Tracheostomy: All cases but one (38) patients had required tracheotomy preoperatively, 29 (76.9%) of them, as an emergency tracheotomy.

Tumour site: Of these patients, 23 (61.53%) had glottis tumour; 15 (38.4%) had supraglottic tumour and 1 (2.5%) had subglotic tumour.

Cartilage invasion: Cartilage invasion was detected in 8 (20.5%) of the cases.

Histologic findings: for the tumour were as follows: 25 (64 %) well differentiated squamous cell carcinoma; 11(28.2%) moderately differentiated sqnamous cell carcinoma; 3 (7.69%) poorly differentiated squamous cell carcinoma; 1(2.5%) verrocus carcinoma.

Pharyngocutaneouse fistula: had developed in 11 (28.2%) cases**,** 9 (23%) of these patients developed it in the first 4 weeks, 6 (15%) of them had received chemo-radiotherapy, 2 (5%) of them had postoperative anaemia and hypoproteinaemia which was corrected by blood transfusion and dietary supplement and 2 (5%) patients had diabetes mellitus. 3 (7.6%) of these patients had an extensive tumour and only narrow strip of pharyngeal mucosa was preserved for the neopharynx repair. All these cases were treated conservatively and no surgical intervention was required for closer.

None of them had showed recurrence at the fistula site.

Wound dehiscence: was found to occur in 4 (10.2%) patients, 2 (5%) patients had a history chemo-radiotherapy.

Wound infection: developed in 3 (7.6%) patients only, 2 (5%) of them had previous chemo radiotherapy.

Superficial skin necrosis and wound hematoma was not noticed in any case.

Myocardial infarction: 1(2.5%) case was admitted to the CCU after developing myocardial infarction at 7th day post operatively.

Subclinical hypocalcemia: was noted in 5 (12.8%) cases detected by regular postoperative electrolyte test. All these patients had history of total thyroidectomy.

Death: 2 (5%) cases had passed peroperatively due to cardiac problem.

Dysphagia: was a common complaint among all the patients postoperatively but it was ranging from mild in most of patients to a severe complaint in 2 (5%) patients only.

Nodal recurrence: occurred at 5 (12.8%) cases, after a period of disease free ranging from 4 months to 12 months.

Stomal recurrence: One patient (2.5%) had stomal recurrence 13 months postoperatively, for which an operation of stomal mass excision with neck dissection was done and the patient was disease free until the end of the study.

Stomal stenosis: occurred in one (2.5%) patient required stomal dilatation.

Discussion

Total laryngectomy remains a major complex subject in otolaryngology but it remains a major choice for management of delayed laryngeal carcinoma.

The gender distribution of laryngeal cancer in our study is almost similar to that found in the literatures, this may reflect that the smoking habit is similar to that worldwide in which increase in female smoking habits[1,3,4,17,18,20].

Although minority of our patients had a history of alcohol intake but all of the smokers were heavy smokers more than 20 cigarette per day indicating the well-known risk factor in the development of laryngeal cancer. Smoking in the developed countries, represents single most significant cause of premature death. Smokers of more than 25 cigarettes per day lose an estimated 10 years of

their life. Lifelong smokers have a 50% chance of dying directly from tobacco related diseases. Passive exposure to non-smokers also increases the risk of cancer [1,2,3,4,17,18,19].

The commonest complaint was hoarseness of voice followed by dyspnea 100% and 33.3% respectively, the need for pre-operative tracheostomy for most of the patients (38 patients) may refer to delay in presentation of the patients that may reflect the lack of general knowledge about the risk of laryngeal cancer among the medical institutions in our country and the low degree of suspicion in patients with hoarseness of voice were patients delay in seeking for professional medical advice and lack of enough degree of knowledge among the primary health care institutions about hoarseness of voice management. This is comparable to a study by M. Rashid Zia et al which showed 98% of their study patients had hoarseness of voice at presentation[17]. The tumor site at presentation is similar to that noticed in the United States, Canada, England, and Sweden, where glottic SCC is more common than supraglottic; whereas the reverse is true in France, Italy, Spain, Finland, and the Netherlands. In Japan, glottic and supraglottic SCC have a similar incidence[18]. As it is noticed that the post-operative Pharyngocutaneouse fistula was the commonest complications and that preoperative chemo-radiotherapy and skin infection along with anemia and hypotienemia diabetes mellitus are important risk factors in there development and these are well known risk factors that can affect wound healing and the fact of relation between chemoradiothrapy and pharyngocutaneous fistula has been demonsrated in many studies[19,20,21,22,23]. The correction of these factors can aid in the prevention & treatment of that condition with no need for surgical intervention in most of the cases, Intraoperatively meticulous closer without tension of the neo phonynx can help in preventing this complication; in a study by Kevin M. Higgins et al showed the usefulness of non-tension closer technique by the use of a graft that aid in prevention of pharyngocutaneous fistula postoperatively[24]. Risk of cancer recurring should be in mind especially if delay or failure of healing of the fistula and a biopsy from the fistula site and MRJ scanning for any sign of recurrence. Chemo radiotherapy, anemia, hypotienaemia, and diabetes melitus are major risk factors that appear in patient who develop wound dehiscence and wound infection. Detection and identification of risk factors can play an important role in the prevention and management of post-operative complications[25].

Cardiovascular condition in postoperative patients is a major concern that may lead to disastrous outcome. The major electrolyte disturbance in post laryngectomy patients is hypocalcaemia that can be detected and treated as early as possible especially in patients with total thyroidectomy or in previously irradiated patients.

Conclusion and Recommendation

Total laryngectomy remains as a major part of laryngeal cancer management.

Risk factors for the development of laryngeal cancer should be cleared in the health knowledge of the society to avoid such a debilitating condition, and allow patients at risk to be aware of this condition to help them in seeking the correct medical care at the right time and avoid delay presentation.

Pharyngocutaneous fistula remains one of the most important postoperative complication in total laryngectomy, to be expected in risky patients in order to avoid it, especially patients with previous chemo radiotherapy.

Other postoperative complications should always kept in mind to avoid the occurrence of them and early detection and adequate management. At the end of the study we recommend the start of a health care program for the society education about laryngeal cancer and it's risk factors especially smoking, and the natural history of the disease and its early start.

Medical education of the primary health care providers about the laryngeal cancer and its early symptoms especially hoarseness of voice, where the rule of two weeks waiting before laryngoscopy in case of hoarseness of voice may aid in early detection of the disease especially risky patients.

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