

COMPLICATIONS OF TOTAL LARYNGECTOMY IN AL-JAMHORY TEACHING HOSPITAL, MOSUL, IRAQ BETWEEN YEARS 2003-2007

*¹Ahmed Saad Allah Ahmed, ²Ghassan Mohammed Ahmed and ³Ali Ahmad Hasan AL-Sayegh

¹C.A.B.M. S, D.L.O. (ENT), AL-Jamhory Teaching Hospital, Mosul, Iraq.

²C.A.B.M.S. (ENT), AL-Jamhory Teaching Hospital, Mosul, Iraq.

³F.I.B.M.S. (ENT), AL-Jamhory Teaching Hospital, Mosul, Iraq.

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*Corresponding Author: Ahmed Saad Allah Ahmed

C.A.B.M. S, D.L.O. (ENT), AL-Jamhory Teaching Hospital, Mosul, Iraq.

ABSTRACT

Objective: This is retrospective study of post operative complication following total Laryngectomy for patients attended ENT. Clinic at AL-Jamhory-teaching hospital –Mosul-Iraq for the period from the 1st of June 2003 to the 1st of July 2007. **Methods:** The study included 36 patients. 29 males and 7 females with ratio of 4:1, The mean age of the patients was 58 years with a range of 40-80years. Patients who had total Laryngectomy for proven carcinoma of larynx (Ca larynx) were included in this study. all patient were reviewed after surgery & followed up for any complication that occurred. the presentation, diagnosis, &management of these complication were reported & discussed. **Results:** The recorded complications which occur post operatively during follow up of these patients for 4years period were pharyngocutaneous fistula 25% (09), nodal metastasis 25% (09), stoma recurrence 6% (02), hematoma 6% (02), wound infection 8% (03), difficulty in swallowing 6% (02), stoma stenosis 3%.^[1] **Conclusion:** Pharyngocutaneous fistula & recurrent nodal metastasis were the most common complication in these patients. Preoperative radiotherapy & low general health postoperatively are important factors in developing pharyngocutaneous fistula. Total laryngectomy performed without neck dissection in lesion with highly lymphatic drainage is important factor in developing recurrent nodal metastasis. The location of the tumor is the most important risk factor in development of stomal recurrence. The poor initial tumor differentiation & transglottic tumor localization are the major causes of the nodal metastasis.

KEYWORDS: Clinic at AL-Jamhory-teaching hospital –Mosul-Iraq for the period from the 1st of June 2003 to the 1st of July 2007.

INTRODUCTION

In 1873, Billroth, of Vienna, performed what is considered to be the first successful laryngectomy. The patient was a 36-year-old man with what was thought to be a tumor on one vocal cord which was removed. one month earlier, he had performed a vertical cricothyromy & local intralaryngeal excision of the lesion. Nine days later however, the entire larynx had to be removed because the growth had spread and infection developed. The operation was punctuated by considerable bleeding, coughing on arousal from the anesthetic. A large pharyngocutaneous fistula was developed, but the patient survived for 1 year and then died from a recurrence.^[2] Bottini of Turin performed total laryngectomy in 1875 on a patient who then survived for 10 years. in the 1890 sorensen developed a successful single –stage operation (41). Solis –cohen using similar Gluck –Sorensen

techniques in philadelphia 18929.^[2] in order to be considered successful, laryngectomy had to ensure survival of more than 1 year because it was believed that this length of survival could be achieved by tracheostomy alone.^[1]

PATIENTS AND METHODS

This retrospective study included 36 patients seen at the department of otolaryngology, head & neck surgery, at Al jamhory Teaching Hospital from 1st june 2003 to 1st July 2007. & follow up these patients for 4 years. Most of the patients included in our study came from northern provinces of Iraq. in which the malignant laryngeal tumor seems to be relatively higher.^[1] Inclusion criteria: all patient who underwent total laryngectomy for histologically proven Ca larynx with N0 neck Exclusion criteria: all those patients who underwent total

laryngectomy along with additional surgical procedure like radical or functional neck dissection, patients underwent partial laryngectomy were also excluded from this study because in inform consent with the patient & his family refuse to do for him radical or functional neck dissection. The records of the patients were reviewed & data concerning: age, sex, clinical feature, tumor site, staged according to (AJCC TNM classification) & histopathology of the lesion (well, moderately & poorly differentiated). All patients were observed for any post operative complications during their stay in hospital & after discharge from hospital. a regular Follow up visit record was maintained. Weekly follow up for first month, fortnightly during next two months & monthly follow up

for six months was advised. Later on, patients were called for follow up after every six months for 2 years. during each follow up visit, a thorough, clinical examination was done in all patient & appropriate investigation were carried out when necessary. a complete record of complications, their diagnosis & treatment was maintained during this period.

RESULTS

The thirty-six patients included in the study comprised of twenty-nine males and seven females. The age of the patients ranged from 40 to 80 years with an average age of 58 years.

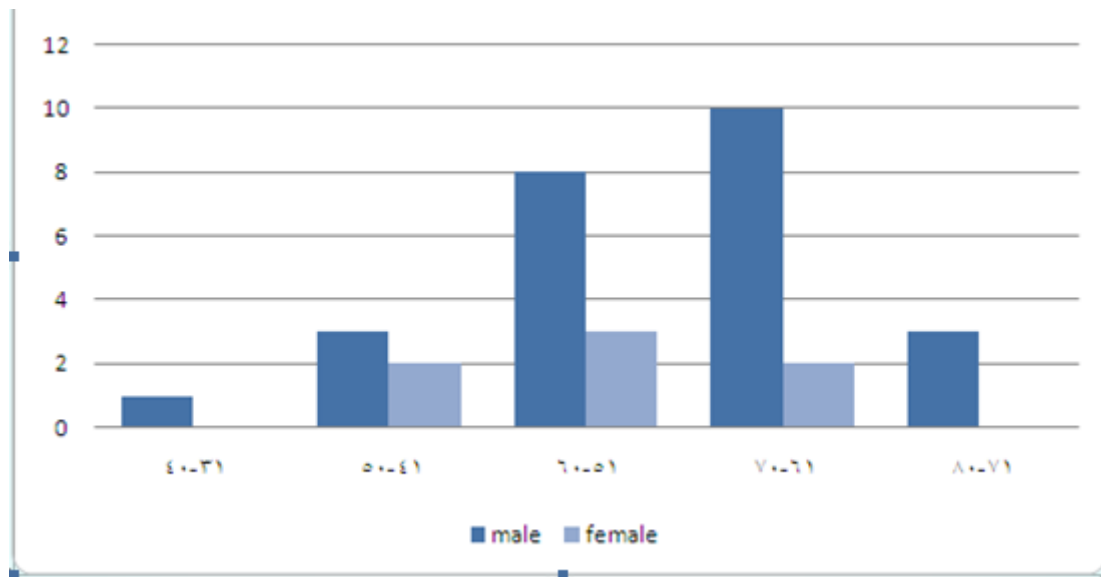


Figure 7: distribution of tumor according to age & sex.

This figure shows that male involvement was more than females in all decades, the peak age incidence was in the seventh decade for male & women tend to younger & the peak age incidence is in the six decades for females.

Twenty-three patients had supraglottic tumor (63%), ten patients had glottic tumor (27%) and three had transglottic tumor (8%). None of the patients had subglottic tumor.

The clinical presentation of the patients according to the site show: in the table (1)

Table 1: symptom of tumor according to the lesion affected.

Involved region	No(100%)	hoarseness	stridor	dysphagia	pain
supraglottic	23(63%)	12	7	3	1
glottic	10(27%)	8	2	-	-
transglottic	3(8%)	3	3	-	-
subglottic	0	-	-	-	-
total	36(100%)	23	12	3	1

this table show that hoarseness of voice was the predominant symptom in all sites where as dysphagia & pain was a feature of supraglottic lesions. The classification of laryngeal tumors according to AJCC TNM classification was T3 N0 M0 in twenty-two patients whereas in eleven patients it was T4 N0 M0. Three patients had Tx N0 M0 tumor.

Table 2: TNM classification From American joint committee, 2003.

<i>Primary Tumor (T)</i>	
TX	Minimum requirements to assess the primary tumor cannot be met.
T0	No evidence of primary tumor
Tis	Carcinoma <i>in situ</i>
<i>Supraglottis</i>	
T1	Tumor limited to one subsite of supraglottis with normal vocal cord mobility
T2	Tumor involves mucosa of more than one adjacent subsite of supraglottis or glottis or region outside of supraglottis (e.g., mucosa of base of the tongue, vallecula, medial wall of pyriform sinus) without fixation of the larynx
T3	Tumor limited to larynx with vocal cord fixation and/or invades any of the following: postcricoid area, pre-epiglottic tissues, paraglottic space, and/or minor thyroid cartilage erosion (e.g., inner cortex)
T4a	Tumor invades through the thyroid cartilage and/or invades tissues beyond the larynx (e.g., trachea, soft tissues of neck including deep extrinsic muscle of the tongue, strap muscles, thyroid, or esophagus)
T4b	Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures
<i>Glottis</i>	
T1	Tumor limited to the vocal cord(s) (may involve anterior or posterior commissure) with normal mobility
T1a	Tumor limited to one vocal cord
T1b	Tumor involves both vocal cords
T2	Tumor extends to supraglottis and/or subglottis, and/or with impaired vocal cord mobility
T3	Tumor limited to the larynx with vocal cord fixation and/or invades paraglottic space, and/or minor thyroid cartilage erosion (e.g., inner cortex)
T4a	Tumor invades through the thyroid cartilage and/or invades tissues beyond the larynx (e.g., trachea, soft tissues of neck including thyroid deep extrinsic muscle of the tongue, strap muscles, thyroid, or esophagus)
T4b	Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures
<i>Subglottis</i>	
T1	Tumor limited to the subglottis
T2	Tumor extends to vocal cord(s) with normal or impaired mobility
T3	Tumor limited to larynx with vocal cord fixation
T4a	Tumor invades cricoid or thyroid cartilage and/or invades tissues beyond the larynx (e.g., trachea, soft tissues of the neck including deep extrinsic muscles of the tongue, strap muscles, thyroid, or esophagus)
T4b	Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures

All patients included in this study had squamous cell carcinoma of larynx. Twenty-seven patients (75%) had moderately differentiated squamous cell carcinoma, six

patients (17%) had well differentiated squamous cell carcinoma. three patients (8%) had poorly differentiated squamous cell carcinoma.

Table 3: Histological classification of tumor.

Histological classification	Number of patient	%
well differentiated	6	17%
moderately differentiated	27	75%
poorly differentiated.	3	8%

Three patients received preoperative radiotherapy whereas postoperative radiotherapy was given in twenty-seven patients. Voice rehabilitation with esophageal speech was tried in all patients. Only six out of thirty-six patients developed esophageal speech whereas three patients used electro-larynx for voice rehabilitation. Twenty-seven patients failed to develop esophageal

speech. Primary or secondary tracheoesophageal fistula with Blom Singer valve was not used in any patient. Longest follow up of 48 months was available in thirteen patients whereas ten patients had followed up of 24 months and six had follow up for 18 months. seven out of thirty-six patients did not come for follow up after 12 months.

Following complications were observed in this study

Table 4: list of complication.

Complication	NO of patients	%
Injury to Rt ijv	1	3%
Hematoma	2	6%
Infection	3	8%
pharyngocutaneous fistula	9	25%
pharyngeal stenosis	2	6%
cervical nodal metastasis	9	25%
Stomal stenoses	1	3%
stoma recurrent	2	6%

there is three patient had operative or immediate postoperative complication one patient had intraoperative complication in form of injury to Rt.IJV(right internal jugular vein) occurred & dealt with it intraoperatively & two patient developed hematoma within 24 hours. this complication dealt with by opening one of the stitches, examine the wound thoroughly to see if there is any missing bleeding & check the drain function.

DISCUSSION

In this study the pharyngocutaneous fistula is the most common complication after total laryngectomy, it constitute 25%. in the literature the incidence of pharyngocutaneous fistula which had been reported is between 4% to 15.9%^[26-27], in our study^[9] patients developed this complication. so in comparison of this study with the literature found there is increase in incident of pharyngocutaneous fistula. Preoperative radiotherapy is reported as a significant risk factor in the development of pharyngocutaneous fistula.^[25] But some feel that this is not statistically significant.^[26] In our study preoperative radiotherapy was important risk factor because three patients received preoperative radiotherapy and all the three developed postoperative pharyngocutaneous fistula. Positive surgical margins, extended hypopharyngeal mucosal excision, low haemoglobin level & those with diabetes^[12] have also been reported as risk factors for the development of pharyngocutaneous fistula.^[25] Others did not find, extended hypopharyngeal mucosal excision and positive surgical resection margins to affect the incidence of postoperative pharyngocutaneous fistula.^[26] Low postoperative haemoglobin level is a significant risk factor in the development of pharyngocutaneous fistula. In our study low postoperative haemoglobin level (less than 11 gm/dl) was present in three patients who developed pharyngocutaneous fistula. & the other three patients had past medical history of DM & poor socioeconomic status & preoperative tracheostomy. None of our patients had positive surgical margins or

extended hypopharyngeal mucosal excision. Spontaneous closure of fistula with conservative measures has been reported in 70% of cases.^[27] In our study all fistulae closed spontaneously without any surgical intervention. The incidence of regional lymph node metastasis has been reported as 31-54% for supraglottic carcinoma, 10% for subglottic carcinoma and 7-12% for glottic carcinoma.^[28] In our study, nine patients (25%) developed nodal metastasis. These were managed with postoperative radiotherapy, three patients of them underwent radical neck dissection then followed by radiotherapy. The reason for this high rate of nodal metastasis in our series may include: performance of total laryngectomy as salvage surgery, degree of tumor extension, infiltration of cervical lymph nodes at the time of initial diagnosis, poor initial tumor differentiation and trans-glottic/sub-glottic tumor localization.^[29] in our study one patient developed nodal metastases with history of preoperative radiotherapy & total laryngectomy done for him as salvage operation, two patients had supraglottic tumors^[30], three had transglottic tumor & three had poor initial tumor differentiation, table(1)(2), so this result show that the poor initial tumor differentiation and transglottic tumors localization are the major cause of the nodal metastasis. in the literature^[29] The higher recurrence rates is mainly for supraglottic and transglottic tumors & its related mainly to the higher rates of cervical lymph node metastasis at diagnosis. so in conclusion found that performance of total laryngectomy without neck dissection in lesion with highly lymphatic drainage is important factor in developing recurrent nodal metastasis. Postoperative wound infections are major source of infectious morbidity in total laryngectomy patients. The overall incidence of postoperative wound infection after major head and neck surgery is 23% and this becomes higher in those patients who have received preoperative radiotherapy.^[31] The most important aetiologic factor is methicillin resistant staphylococcus aureus (MRSA).^[32] Administration of prophylactic antibiotics reduces the

risk of postoperative infection. In total laryngectomy patients, 1 gm cefazolin with 500 mg of metronidazole have been recommended as surgical prophylaxis.^[33] In this study three patients (8%) developed postoperative wound infection. Out of these three patients, two also developed pharyngocutaneous fistula and has received preoperative radiotherapy. All the patients who developed postoperative wound infection had methicillin resistant staphylococcus aureus isolated on culture and sensitivity and all were treated with vancomycin. Preoperative prophylaxis was not given in any patient. Postoperative cephalosporins and metronidazole were given to all patients. the high incidence of post operative wound infection in this study might be explained on the bases of the economical blockade & war status of the country at that difficult time. The reported incidence of dysphagia varies from 16% to 42%.^[34,35] In our study two patients (6%) developed this complication. On endoscopic examination pharyngeal stricture was seen which was treated with repeated dilatations after ruling out recurrence. outpatient dilation is usually effective. An adequate lumen is necessary not only for swallowing & nutrition but also for tracheoesophageal speech production.^[12] The stomal recurrence rate with reference to several risk factors, such as primary tumor stage, location of tumor, lymph node metastases, timing of tracheotomy, and presence of a postoperative pharyngoperistomal fistula, was analyzed. The overall incidence of stomal recurrence was 10%.^[36] in our study two patient(6%) developed stomal recurrent both of them had transglottic tumors so the location of the tumor is the most important risk factor in development stoma recurrent. The reported incidence of somal stenosis varies, ranging from 4% to 42% & typically is found more frequently in women than men.^[37] other more recent studies reported 4% to 13% of of stomal stenosis(38) In our study one patient 3% developed stomal stenosis which is manged conservatively & this patient had past medical history of diabetic.

CONCLUSION

Pharyngocutaneous fistula & recurrent nodal metastasis are the most common complication in these patient study. pre operative radiotherapy & low general health postoperatively are important factor in developing pharyngocutaneous fistula. total laryngectomy performed without neck dissection in lesion with highly lymphatic drainage is important factor in developing recurrent nodal metastasis. The location of the tumor is the most important risk factor in development stoma recurrent.

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