

COMPLICATIONS OF TOTAL LARYNGECTOMY

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ABSTRACT:

Objective: To find out various complications after total laryngectomy, with reference to their presentation, diagnosis, and management.

Design: It was a prospective descriptive study.

Setting: Otolaryngology, Head and Neck Surgery department, Pakistan Institute of Medical Sciences Islamabad, from 1st July 1999 to 31st June 2001.

Patients and Methods: 25 patients undergoing total laryngectomy for proven carcinoma larynx (Ca larynx) were included in this study. Patients were reviewed after surgery and any complication that occurred was recorded. The presentation, diagnosis, and management of these complications are discussed, along with voice rehabilitation after total laryngectomy.

Results: There were 23 males and 2 females. Age of patients ranged from 40 - 65 years. Complications included wound infection (06), pharyngocutaneous fistula (03), pharyngeal stenosis (03), and nodal metastasis (02).

Conclusions: Wound infection and pharyngocutaneous fistula are most common complications after total laryngectomy. Preoperative radiotherapy and low postoperative haemoglobin level are important risk factors for development of pharyngocutaneous fistula in total laryngectomy patients. Postoperative radiotherapy to the neck reduces the risk of nodal metastasis after total laryngectomy.

KEY WORDS: Total laryngectomy, complications, CA larynx.

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INTRODUCTION

Laryngeal cancer is an important malignancy in head and neck region. It represents 1% of all malignancies.¹ There are many

therapeutic options available for the treatment of laryngeal cancer. These include LASER surgery,¹ partial laryngectomies, total laryngectomy² and radiation therapy.

Total laryngectomy is a radical procedure, which involves removal of whole of the larynx. This procedure is useful in the treatment of advanced laryngeal cancer³ and as a salvage procedure when previous partial laryngeal surgery or radiotherapy has failed.²

Complications following total laryngectomy can cause serious implications on the final outcome of the treatment. Severe infection with flap necrosis resulting in carotid blow out can be life threatening.⁴ Pharyngocutaneous fistula can prolong hospitalization and increase morbidity.⁵ Similarly late complications like pharyngeal stenosis can result in swallowing difficulty,⁶ while stomal recurrence may render the tumour incurable thus adversely affecting the prognosis.⁷⁻⁸ It is therefore important to diagnose these complications early so that timely management can be done. The risk factors involved in the development of these complica-

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tions should also be recognized and avoidance of these risk factors will reduce the occurrence of complications.

To find out various complications after total laryngectomy with respect to their presentation, diagnosis and management, this study was conducted on twenty five patients who underwent total laryngectomy from 1st July 1999 to 31st June 2001 in the department of Otolaryngology, Head and Neck Surgery at Pakistan Institute of Medical Sciences Islamabad.

PATIENTS AND METHODS

It was a prospective descriptive study conducted at the department of Otolaryngology, Head and Neck Surgery, Pakistan Institute of Medical Sciences Islamabad, from 1st July 1999 to 31st June 2001.

Inclusion criteria: All patients 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 undergoing partial laryngectomy were also excluded from this study.

Sampling technique: Non-probability purposive sampling technique was used in this study. The otolaryngology department of Pakistan Institute of Medical Sciences (PIMS) and Oncology-radiotherapy department of Nuclear Oncology Radiotherapy Institute (NORI) have organized a Joint Cancer Clinic (JCC).

All patients in present study were initially assessed in Joint Cancer Clinic, where they underwent thorough clinical examination and were staged according to AJCC TNM classification. Only those patients were included in the study who had histopathologically proven carcinoma of larynx with N0 neck and who underwent total laryngectomy alone without neck dissection.

All patients were observed for any post operative complications during their stay in the hospital and after discharge from hospital a regular follow up visit record was maintained.

Weekly follow up for first month, fortnightly

during next two months and monthly follow up for six months was advised. Later on patients were called for follow up after every six months for one year. During each follow up visit a thorough clinical examination was done in all patients and appropriate investigations were carried out where indicated. A complete record of complications, their diagnosis and treatment was maintained during this period.

RESULTS

The twenty-five patients included in the study comprised of twenty-three males and two females. The age of the patients ranged from 40 to 65 years with an average age of 52.5 years.

Fourteen patients had glottic tumour (56%), nine had supraglottic (36%) and two had transglottic tumour (8%). None of the patients had subglottic tumour. The stage of tumour was T3 N0 M0 in sixteen patients whereas in six patients it was T4 N0 M0. Three patients had Tx N0 M0 tumour.

All patients included in this study had squamous cell carcinoma of larynx. Nineteen patients had well differentiated squamous cell carcinoma and six patients had moderately differentiated squamous cell carcinoma. None of the patients had poorly differentiated squamous cell carcinoma. Three patients received preoperative radiotherapy whereas postoperative radiotherapy was given in thirteen patients.

Voice rehabilitation with oesophageal speech was tried in all patients. Only four out of twenty-five patients developed oesophageal speech whereas two patients used electro-larynx for voice rehabilitation. Nineteen patients failed to develop oesophageal speech. Primary or secondary tracheoesophageal fistula with Blom Singer valve was not used in any patient.

Longest follow up of 24 months was available in only one patient whereas six patients had follow up of 18 months and five had follow up for 12 months. Three out of twenty-five patients did not come for follow up after six months.

In this study the basic aim was to note and compile the complications of total laryngectomy and their management. A record of all

the patients was maintained throughout the study and any complication that occurred was noted along with appropriate management. Following complications were observed in this study. In this series no operative or immediate postoperative complication occurred.

Complications: Six patients developed wound infection near the stoma after an interval of 4 to 6 days following surgery. Pus was sent for culture and sensitivity testing. In the mean time empirical antibiotic treatment was given which was modified according to the results of culture and sensitivity report. Local wound care and antibiotic therapy sufficed to control the infection and no further surgical intervention like debridement was required.

Out of these six patients, three patients also developed pharyngocutaneous fistula, one patient at 9th postoperative day and two patients at 11th postoperative day. It was managed conservatively. Patients were kept NPO while feeding continued through nasogastric tube. Patients were given high protein diet and their haemoglobin level was raised up to 11g/dl through blood transfusion. Fistulae closed spontaneously in two patients without any surgical intervention within three weeks. In third patient it took long but fistula closed in about two month time. No other intermediate postoperative complication was seen in this study.

Three patients developed pharyngeal stenosis at an interval of 3 to 4 months following surgery and presented with dysphagia, which was progressive for solids. It was managed by dilatation of neopharynx with gum elastic bougies, after recurrence was excluded by rigid esophagoscopy. Repeated dilatations were required.

Two patients developed cervical nodal metastasis six months after total laryngectomy. Fine needle aspiration cytology of the lymph node confirmed metastatic carcinoma. These were managed with ipsilateral radical neck dissection. One of these patients again developed loco-regional failure on side of neck dissection and only palliative treatment was offered. The other one is free of disease six months after second surgery, on last follow up.

DISCUSSION

Carcinoma of larynx is an important malignancy in head and neck region. It accounts for 40% of all head and neck malignancies.⁹ Its incidence varies globally.^{1,10} In a multicentre study conducted in Pakistan, by Pakistan Medical Research Council and Cancer Registry Cell Sindh, laryngeal cancer along with other head and neck cancers has been listed in the top ten. The peak age of incidence in Pakistan is 50 years.¹¹ In our study the mean age of patients was around 52 years. Male to female ratio varies globally and lies between 2:1 to 9:1.¹⁰ In our study male to female ratio was 11.5:1. There is an accepted relationship between use of tobacco and alcohol and appearance of tumour.⁹ Histologically most of these tumours are squamous cell carcinomas.⁹ In our study all patients had squamous cell carcinoma.

The mode of treatment is based on clinical staging of tumour, its histologic type and general health of the patient. Other factors, which should be considered, are age of patient, ancillary facilities available and experience of surgical team.

Treatment of T3 N0 M0 laryngeal cancer is controversial. It is classified as stage III and recommended therapy for these cancers is both surgery and radiotherapy. Some centers prefer radiotherapy alone and keep salvage surgery in reserve, whereas some centers prefer total laryngectomy alone or in combination with postoperative radiotherapy.³ Regarding the T4 N0 M0 laryngeal cancer, total laryngectomy followed by postoperative radiotherapy is generally accepted mode of treatment.¹⁰

The most common complication after total laryngectomy is pharyngocutaneous fistula.^{5,12,13} In our study pharyngocutaneous fistula was second most common complication. The reason for this was small sample size of twenty five patients. Incidence of pharyngocutaneous fistula has been reported in the literature between 4% to 15.9%.¹⁴⁻¹⁶ In our study three patients (12%) developed this complication.

Preoperative radiotherapy is reported as a significant risk factor in the development of pharyngocutaneous fistula.¹⁷ But some feel that

this is not statistically significant.¹⁴ In our study preoperative radiotherapy was important risk factor because three patients received preoperative radiotherapy and all three developed postoperative pharyngocutaneous fistula. Positive surgical margins, extended hypopharyngeal mucosal excision and low haemoglobin level have also been reported as risk factors for the development of pharyngocutaneous fistula.¹⁷ Others did not find, extended hypopharyngeal mucosal excision and positive surgical resection margins to affect the incidence of postoperative pharyngocutaneous fistula.¹⁴ 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 all patients who developed pharyngocutaneous fistula. 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.¹⁶ In our study all fistulae closed spontaneously without any surgical intervention.

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.¹⁸ The most important aetiological factor is methicillin resistant staphylococcus aureus (MRSA).¹⁹ 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.²⁰ In this study six patients (24%) developed postoperative wound infection. Out of these six patients, three 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. Pre-

operative prophylaxis was not given in any patient. Postoperative cephalosporins and metronidazole were given to all patients. The most important factor resulting in postoperative wound infection in our study was poor hygienic conditions in the ward.

The reported incidence of dysphagia varies from 16% to 42%.^{6,21} In our study three patients (12%) developed this complication. On endoscopic examination pharyngeal stricture was seen which was treated with repeated dilations after ruling out recurrence.

The incidence of regional lymph node metastasis has been reported as 44% for supraglottic carcinoma, 20% for subglottic carcinoma and 5% for glottic carcinoma. In our study, two patients (8%) developed nodal metastasis. These were managed with radical neck dissection. The reason for this low rate of nodal metastasis in our series was that majority of the patients (86.66%) were given postoperative radiotherapy.

Speech rehabilitation after total laryngectomy is a major problem during follow up. Use of oesophageal speech, electrolarynx and tracheoesophageal fistula are popular methods for voice rehabilitation. However much of the literature supports tracheoesophageal puncture speech and prefers it over oesophageal speech and use of electrolarynx.²² Patients using tracheoesophageal puncture speech, rate their overall quality of life higher than those patients who are using either oesophageal speech or electrolarynx.²³ The overall success rate of tracheoesophageal puncture speech after total laryngectomy has been reported as high as 93%.²⁴ In our study four cases (16%) have acquired useful oesophageal speech and two patients (8%) used electrolarynx. Nineteen patients (76%) failed to develop oesophageal speech. Tracheoesophageal fistula with Blom Singer valve was not used in any patient because of its non-availability. Reason for this high rate of failure in developing oesophageal speech in our patients was lack of rehabilitation facilities and trained speech therapist. Fifty percent of our patients cannot read and write. These patients suffer greater psychogenic

trauma after total laryngectomy, if they fail to develop oesophageal speech.

CONCLUSIONS

1. Complications following total laryngectomy are infrequent but when they occur patient's morbidity is considerably increased.
2. Wound infection and pharyngocutaneous fistula are most common complications after total laryngectomy.
3. Preoperative radiotherapy and low post-operative haemoglobin level (less than 11 gm/dl) are important risk factors for development of pharyngocutaneous fistula in total laryngectomy patients.
4. Postoperative radiotherapy to the neck reduces the risk of nodal metastasis after total laryngectomy.

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