

Total Laryngectomy: An Experience of 26 Cases in a Tertiary Care Hospital

Fazal I Wahid, Adil Khan, Iftikhar Ahmad Khan

ABSTRACT

OBJECTIVE: To determine the clinical features, diagnosis and complications of total laryngectomy at a tertiary care hospital.

MATERIAL AND METHODS: This descriptive prospective study was conducted at the department of ENT, Head and Neck Surgery, PGMI/ LRH Peshawar from January 2001 to December 2010. All patients were thoroughly evaluated and disease was staged according to TNM. After informed consent total laryngectomy was performed in all patients followed by chemoradiotherapy.

RESULTS: A total of 26 patients underwent total laryngectomies for histologically confirmed laryngeal cancers. The age of the patients ranged from 38-72 years with mean age of 57.34 \pm S.D 9.6 years. Hoarseness was the commonest (100%) presenting feature. According to TNM staging system 15 patients (57.69%) had stage III and 11 patients (42.30%) had stage IV carcinoma larynx. There was wound infection in 6 patients (23.07%) and 4 patients (15.38%) developed pharyngocutaneous fistula.

CONCLUSION: The commonest presentation of laryngeal carcinoma was hoarseness, so any smoker patient having age greater than 40 years with persistent hoarseness must be investigated for laryngeal carcinoma.

KEY WORDS: Hoarseness, Carcinoma larynx, Total laryngectomy.

INTRODUCTION

Laryngeal cancer is the most common head and neck cancer and the eleventh most common cancer in men worldwide but is relatively uncommon in women.¹ Laryngeal cancer accounts for approximately 1.2% of all new cancers diagnosed in the United States. In Pakistan an incidence of laryngeal cancer ranges from 6.3% to 8%.² In a multicentre study conducted in Pakistan laryngeal cancer along with other head and neck cancers has been listed in the top ten. Laryngeal carcinomas are identified by their location in one of three anatomic regions: supraglottic, glottis, or sub-glottis.² Symptoms of laryngeal cancer vary according to location, size and degree of invasion of tumour. Tumour's location and extension pattern within one or more of these regions provide information regarding the progression of disease and expected response to treatment.^{1,2} The vast majorities of malignant neoplasms of the larynx arise from the surface epithelium and are therefore classified as keratinizing or non-keratinizing squamous cell carcinomas (SCC). Other rare malignant forms include verrucous carcinoma, adenocarcinoma, fibrosarcoma, and chondrosarcoma.³ Head and neck cancer, including laryngeal cancer, is associated with exposure to environmental toxins and chemical

carcinogens, such as tobacco and alcohol, asbestos, wood dust, cement, polycyclic aromatic hydrocarbons and therapeutic radiation. Gastroesophageal reflux disease (GERD), nutritional deficiency particularly that of vitamins and iron has been linked with hypopharyngeal and laryngeal carcinoma.⁴ The treatment of patients with laryngeal carcinoma should be planned to provide optimal survival, free of disease, with maximum functional results. The treatment for T1 and T2 lesions usually involves radiotherapy or endoscopic surgery with or without laser. Total laryngectomy alone or in conjunction with neck dissections and/or radiotherapy with or without chemotherapy is used for advanced T3 and T4 lesions.⁵ The first laryngectomy was performed by Billroth in 1873 and for much of the 20th century; this procedure has been recognized as the gold standard treatment for advanced cancers of the larynx and hypopharynx.⁶ Complications of laryngectomy such as pharyngocutaneous fistula, wound infection, chyle leak, swallowing, and airway problems have a significant impact on morbidity causing prolonged hospitalization and, inevitably, increased health care costs. Many factors have been implicated in the development of complications including previous radiotherapy, preoperative tracheostomy, radical neck dissection, and extensive surgery

and flap reconstruction.⁷ The prognosis for small laryngeal cancers that do not have lymph node metastasis is good with cure rates of 75-95%, depending on the site, the size of the tumor, and the extent of infiltration. Five year survival for Stage I is >95%, Stage II 85-90%, Stage III 70-80%, and Stage IV 50-60%.⁸

The result of this study with help us to know about burden of describe in the population, pattern of management and associated complications.

MATERIALS AND METHODS

This descriptive prospective study was conducted at the department of Ear, Nose, Throat, Head and Neck Surgery, Postgraduate Medical Institute Lady Reading Hospital Peshawar from Jan. 2001 to Dec. 2010 (10 years). This study included 26 patients of different age and of either sex, who were subjected to total laryngectomy for advanced carcinoma larynx. The patients having laryngectomy in other hospital, laryngectomy with pharyngectomy, and those who were lost from follow up were excluded from the study. A detailed history was taken and every patient was examined thoroughly specifically focusing on laryngeal examination. Besides base line investigation CT scan of the neck was carried out and MRI was performed in some of the cases where CT scan was not informative. The patients were assessed for metastasis of the disease. Endoscopy was done in all cases and biopsy was taken to get histological diagnosis. The disease was staged according to the TNM (Tumor, Node, and Metastasis) staging system. All the patients / relative were counseled regarding nature of the disease, treatment options, expense of the surgery and voice rehabilitation. A well informed consent was taken from patients /relatives explaining the total laryngectomy, its risks, benefits and associated complications and the study was approved by the hospital ethical committee. Total laryngectomy was performed in all patients.

Total Laryngectomy:

The patient was placed supine, and neck was cleaned thoroughly with antiseptics, from the chin down to the chest at the nipple level. Neck was infiltrated at the site of incision with xylocaine-adrenaline preparation (1%, 1:1000). A transverse incision or Gluck-Sorenson incision was given and deepened to sub-plastysmal layer. Strap muscles were separated in the midline laterally to expose the larynx and the thyroid gland. The thyroid gland was then separated at the isthmus by ligation with 2/0 chromic catgut. Then a permanent tracheostomy stoma was created through a transverse

stab skin wound on the lower skin flap, about 2-4 cm long. The trachea was pulled out through the stab wound and stitched to the skin after the endotracheal tube has been secured in the new tracheostomy. The permanent tracheostomy was carried out in two layers. The first layer was from subcutaneous tissue to the external layer of the trachea in interrupted fashion using 3/0 chromic catgut, and the second layer was from mucosa to the skin using 3/0 nylon. The larynx was delivered from above to below. The hypopharynx was entered on the side opposite to the site of the tumor after the muscles attached to the hyoid bone were divided. The epiglottis was grasped with tissue-grasping forceps after entry into the hypopharynx. Thereafter the whole specimen was removed. The pharynx was repaired by direct mucosal closure with 3/0 chromic catgut after an appropriate sized nasogastric tube has been passed. The second layer was interrupted with the external covering of muscle layers with 3/0 catgut. Neck drains were inserted. The skin was closed with nonabsorbable sutures. A neck dressing was applied. The patient was nursed head up with nil per oral for 10 days. Intravenous broad-spectrum antibiotics were prescribed. Intravenous fluids were given, along with routine analgesics for pain management. NG tube feeding was commenced 24 hours after surgery. Nasogastric tube feeding was continued for 9 to 12 days. On 10th day, oral feeding was attempted with milk drink to see any leakage from the neck or wound site. Graded fluid-form high-protein diet is continued for 1 week before semisolids are commenced in a graded manner before introduction of solids.

The data was collected on a preformed proforma and statistical analysis was performed using the statistical program for social sciences (SPSS version 15). The frequencies and percentages were presented for qualitative variables and Mean \pm SD were presented for quantitative variables.

RESULTS

A total of 26 patients underwent total laryngectomies who had histologically confirmed laryngeal cancers during the same period (24 males, 2 females; M-F ratio, 12:1). The age of the patients ranged from 38-72 years with mean age of 57.34 \pm S.D 9.6 years. Hoarseness was the commonest (100%) presenting feature of these patients (**Table I**). Majority of patients (n-14, 53.84%) belonged to rural area. Eighteen patients (69.23%) were smokers. Among these patients 38.46% were farmers and 19.23% were laborer by occupation (**Table II**). According to TNM staging sys-

tem, 15 patients (57.69%) had stage III and 11 patients (42.30%) had stage IV carcinoma larynx. Total laryngectomy was performed in 26 patients (100%) and radical neck dissection was also carried out in 8 cases (30.76%). There was wound infection in 6 patients (23.07%) and 15.38% patients had developed pharyngocutaneous fistula as complication of total laryngectomy (Table III). After performing total laryngectomy all the patients were subjected to chemoradiation as adjuvant therapy and 90% patients developed oesophageal speech. All these patients were put into regular follow up scheme. The average three year survival in this study was 70% and average five year survival was 50%.

TABLE I: CLINICAL FEATURES OF PATIENTS (n-26)

Clinical features	No. of cases and percentage
Hoarseness	26(100%)
Laryngeal mass	26(100%)
Dysphagia	11(42.30%)
Dyspnea	11(42.30%)
Weight loss	7(26.92%)
Anemia	5(19.23%)

TABLE II: OCCUPATION OF PATIENTS (n-26)

Occupation	No. of cases and percentage
Farmers	10(38.46%)
Laborer	5(19.23%)
Teachers	4(15.38%)
Businessman	3(11.53%)
Government Employee	2(7.69%)
Housewife	2(7.69%)

TABLE III: COMPLICATIONS OF TOTAL LARYNGECTOMY (n-26)

Complications	No. of cases and percentage
Wound infection	6(23.07%)
Pharyngocutaneous fistula	4(15.38%)
Hypoparathyroidism	2(7.69%)
Stomal recurrence	3(11.53%)
Carotid blow out	3(11.53%)

FIGURE I: PICTURE SHOWING PATIENT OF TOTAL LARYNGECTOMY HAVING PHARYNGOCUTANEOUS FISTULA AND MARKING FOR RADIOTHERAPY IS ALSO VISIBLE



FIGURE II: PICTURE SHOWING SPECIMEN OF TOTAL LARYNGECTOMY HAVING ADVANCED CARCINOMA LARYNX



FIGURE III: PICTURE SHOWING LARYNGECTOMIZED PATIENT WITH PROMINENT STOMA OF PERMANENT TRACHEOSTOMY



DISCUSSION

Laryngeal malignancy accounts for one fifth of all head and neck malignancies. The treatment option for laryngeal malignancy revolve around various factors like the stage of tumour, site of the tumour, lymph node metastasis, general condition of the patient and associated comorbidities. For advanced T3 and T4 stage laryngeal tumours, mainstay of treatment is laryngectomy with post operative radiotherapy. In this study total laryngectomy was performed in patients having age range from 38-72 years with mean age of $57.34 \pm S.D 9.6$ years which is comparable to study of Iseh⁹ where age range was 30-70 years (mean, 50.8 years). Carcinoma larynx is more common in people of middle or older age because of more exposure of this age group to carcinogens. In this study male were the dominant victims of carcinoma larynx which is in accordance to the work of Bhandary¹⁰ who reported that 87 (96%) were males and 3 (4%) were females. The reason for predominant involvement of males could be their more exposure to risk factors of laryngeal tumours. In this study the commonest presentation of carcinoma larynx was hoarseness (100%) while in Iseh⁹ study the commonest feature was upper airway obstruction followed by hoarseness. Likewise in Ahmad¹¹ study the commonest presentation of patients was hoarseness (92%) followed by odynophagia (28%). Similarly Sangi¹² also experienced hoarseness as the commonest (94.1%) presentation of carcinoma larynx. In this study eighteen patients (69.23%) were smokers which are in accordance to the study of Eleftheriadou¹³ where history of smoking was positive in 77.21% patients. However in Bajaj¹⁴ study, a vast majority of the patients (93.2%, 55/59) were smokers. In this study most of the patients (38.46%) were farmers followed by laborers (19.23%) which are in agreement with results of Iseh⁹ who reported that among male most were farmers except one, who was a retired soldier and all female patients were housewives. In this study 15 patients (57.69%) had stage III and 11 patients (42.30%) were in stage IV of carcinoma larynx which is comparable to the results of Sangi¹² where 41.17% patients were in stage III and 38.23% patients were in stage IV of carcinoma larynx. Total laryngectomy was performed in all patients and radical neck dissection was also carried out in 8 cases (30.76%) which are in accordance to experience of Liu¹⁵ where total laryngectomy was performed in 72.39% patients and radical neck dissection was performed in 34.84% patients. Similarly Ampil¹⁶ revealed that total laryngectomy was performed in all the patients having stage IV disease of carcinoma larynx. Surgery of laryngeal tumour may result in complication depending upon factors inherent with disease, patient and surgeon. In this study complications were

experienced and wound infection was on top (23.07%) followed by pharyngocutaneous fistula (15.38%). Similarly Weber¹⁷ also reported that the incidence of major and minor complications ranged from 52% to 59%. Bajaj and colleagues¹⁴ also encountered minor and major complications after total laryngectomy and pharyngocutaneous fistula was 15.2% in his study. Similarly the wound infection in this study is in accordance to Maharjan¹⁸ report where wound infection was 20% but he had higher incidence in form of pharyngocutaneous fistula (30%) and superficial flap necrosis (15%). The results of this study are also at variance from the results of Qureshi¹⁹ who had fistula in 23% and wound infection in 5% patients only. The reason for increased wound infection in this study could be inappropriate sterilization. In this study the average three year survival was 70% and average five year survival was 50%, which is greater than the study of Ampil¹⁶ who found that the overall actuarial and disease-free survival rates at 7 years were 43% and 30%, respectively. But the survival in this study was less than the study of Hall²⁰ who reported that five-year survival for the laryngeal cancer was 67% and this was significantly influenced by T stage and clinical and pathological N stage. Similarly the survival of this study is also not at agreement with study of Bhandary¹⁰ where the average three year survival was 90% and average five year survival was 80%.

CONCLUSION

Total laryngectomy in combination with postoperative radiotherapy affords a longer period of survival for patients of advanced laryngeal cancers as compared to radiotherapy alone.

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AUTHOR AFFILIATION:

Dr. Fazal I Wahid (*Corresponding Author*)

Department of E.N.T
Postgraduate Medical Institute (PGMI), Lady Reading Hospital (LRH)
Peshawar, Khyber Pakhtunkhwa-Pakistan.
Email: drfazal58@yahoo.com

Dr. Adil Khan

Postgraduate Medical Institute (PGMI), Lady Reading Hospital (LRH)
Peshawar, Khyber Pakhtunkhwa-Pakistan.

Dr. Iftikhar Ahmad Khan

Postgraduate Medical Institute (PGMI), Lady Reading Hospital (LRH)
Peshawar, Khyber Pakhtunkhwa-Pakistan.