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**OUTCOME OF TOTAL LARYNGECTOMY IN
MANAGEMENT OF LARYNGEAL CANCER IN
PORT HARCOURT, NIGERIA.**

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ABSTRACT

Introduction: The larynx is the voice box responsible for voice production when air passes through it. The glottis is the commonest subregion of the larynx where malignancy occurs. Laryngeal cancer contributes about 25% of all head and neck cancers, and 2% of all cancers in the body. Laryngectomy is a surgical procedure done to remove the larynx, and a total laryngectomy is usually done in advanced disease. This study was aimed at highlighting the outcome of total laryngectomy done in patients diagnosed with laryngeal cancer in Port Harcourt, Nigeria.

Methods: This was a retrospective study of 16 patients diagnosed with laryngeal cancer, out of which 12 subjects consented to and had total laryngectomy. The study was carried out in the ENT department of the University of Port Harcourt Teaching Hospital within the period of January 2002 and December 2019. Clinical records were obtained from the Medical records department of the hospital. Data obtained was presented in tables, figures and percentages.

Results: The study noted that all 16 patients diagnosed with laryngeal cancer were males, age range of subjects were 45-73 years, and only 12 had total laryngectomy because some patients were lost to follow-up after diagnosis. Pharyngo-cutaneous fistula was the commonest complication noted in this study and highest number of subjects had survival rate of 2-5 years.

Conclusion: Laryngeal cancer is treatable if diagnosed early, late presentation with advanced disease worsens prognosis and increases the predisposition to total laryngectomy. Advanced disease also increases the chances of residual tumour or tumour recurrence while decreasing survival rate following surgery.

Recommendation: More enlightenment should be carried out to improve awareness of laryngeal cancer and its treatment, this may improve early presentation to hospital. Ordinarily, treatment of cancer is financially cumbersome on patients paying out of pocket for healthcare. So the adverse effect of poverty on the management of cancers, can be alleviated if an established source of funding can be created by government to aid treatment of cancers.

Keywords: *Larynx; Laryngeal cancer; Total laryngectomy; Neck dissection; Nigeria.*

INTRODUCTION

The Larynx is otherwise known as the voice box and is responsible to produce voice when air passes in or out of the lungs. The larynx is anatomically divided into 3 regions by the vocal cords, thus: the supraglottic region, the glottis, and the subglottic region. Malignancy of the larynx is referred to as laryngeal cancer, and the highest occurrence is at the glottis (70%), followed by the supraglottic region (25%), then the subglottis (5%). At the late stage of laryngeal cancer, the malignancy can be transglottic affecting all three regions of the larynx, and this necessitates a total laryngectomy. Among head and neck cancers, laryngeal cancer contributes approximately 25% and makes up 2% of all malignancies. Globally, it is responsible for 83,000 deaths per annum [Globocan, 2014]. Men are affected more than women in the ratio of 7:1 and laryngeal cancer occurs mostly between age 50-60 years (Lorenz, 2017).

Laryngectomy is a surgical procedure done to remove part or all of the larynx as partial or total laryngectomy respectively, depending on the stage of the disease. A British surgeon Patrick Watson in 1866 did a post mortem total laryngectomy, however, the first total laryngectomy done in a living human was by Billroth in Vienna in 1873. He performed a total laryngectomy in a patient with malignancy in the larynx (Sreedharan, 2018). Laryngectomy is an age-long procedure that has stood the test of time, but due to improved surgical techniques, better post-operative rehabilitation, and infection control, the focus of treatment has become more conservative in approaches that aim at both anatomical as well as functional preservation of the larynx (Sreedharan, 2018). It is a common belief that total laryngectomy inflicts more emotional trauma on patients when compared to any other surgery. Due to its functional impairment and resultant negative psychological impact (Noonan and Hegarty, 2010), it is carried out in patients with tumours that are not cleared by radiation (Farrand and Duncan, 2007). These patients are subjected to laryngectomy to control their disease. This procedure is often carried out in about 50% or less of these patients with advanced laryngeal cancer because of various reasons (Donnelly et al, 2009).

This study aimed to highlight the outcome of total laryngectomy carried out in patients diagnosed with laryngeal cancer in the Ear, Nose and Throat (ENT) department of the University of Port Harcourt Teaching Hospital, Rivers state, Nigeria.

METHODS

This was a retrospective study of 16 patients diagnosed with laryngeal cancer in the ENT department of the University of Port Harcourt Teaching Hospital, Port Harcourt, Rivers State, Nigeria. The period of study covered was from January 2002 to December 2019. Approval was obtained from the hospital medical records department, and the clinical records of these patients were retrieved and analysed. Data collected included their age, sex, presenting complaint, histological diagnosis, complications, and follow up records which included form of speech rehabilitation. A tracheostomy was done to relieve airway obstruction prior to total laryngectomy and selective neck dissection which was carried out for all patients that consented to surgical

removal of the larynx. During tracheostomy, a direct laryngoscopy, examination under anaesthesia was done, and biopsy for histology was taken. A histological diagnosis was obtained in all cases taken to theatre. Post-operative complications in these patients were also noted. Speech rehabilitation done was pharyngeal/oesophageal speech, patients were referred for post-operative radiotherapy and chemotherapy with the oncology unit. Follow-up was done for all patients and notable findings within this period was documented.

RESULTS

The rate of total laryngectomy in patients diagnosed with laryngeal cancer in the centre within the study period was 75%. All the 16 patients diagnosed with laryngeal cancer were males, and their age range was 45-73 years, Presenting complaints were hoarseness, stridor, cough, and breathlessness. Out of the 16 subjects diagnosed with laryngeal cancer, 14 had tracheostomy done. Ten (10) came in airway obstruction and had emergency tracheostomy, while 4 had elective tracheostomy for impending airway obstruction. Out of the 16 subjects with laryngeal cancer, 12 consented to, and had total laryngectomy done. Confirmed histological diagnosis of squamous cell carcinoma was reported for 14 subjects. Two patients were lost to follow up after initial presentation without tracheostomy or tissue biopsy done, while two patients were lost to follow-up after tracheostomy (see table 1). Pharyngo-cutaneous fistula was the commonest complication recorded following total laryngectomy. Other complications seen are shown in the table 2 below. The survival rate of subjects following total laryngectomy is highlighted in table 3 below.

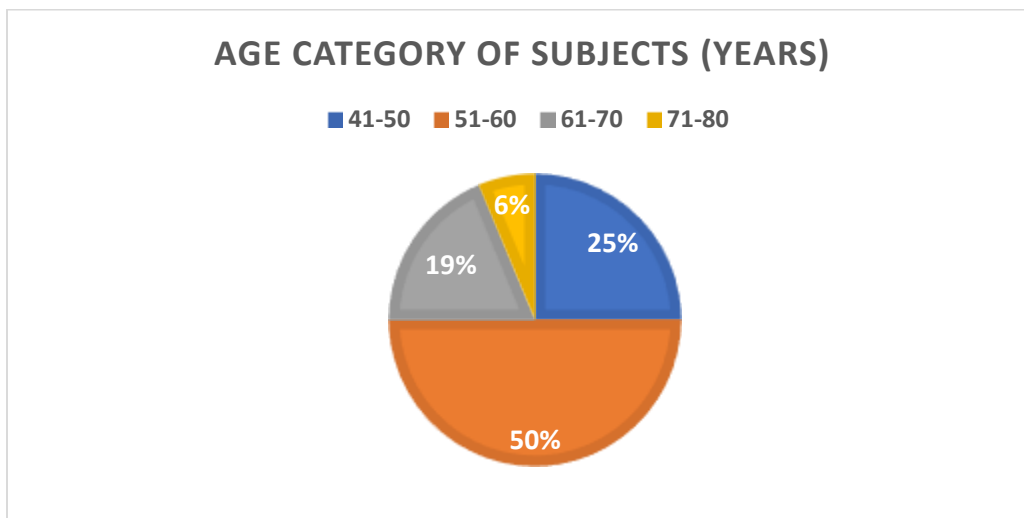


Figure 1: Age distribution of subjects diagnosed with laryngeal cancer

Table 1: Follow-up record of 16 subjects diagnosed with laryngeal cancer.

Stage of management	Number of subjects seen at stage	number lost to follow-up after stage	Number of subject remaining
Diagnosis	16 (100%)	2 (12.5%)	14 (87.5%)
Tracheostomy done	14 (100%)	2 (14.3%)	12 (85.7%)
Total laryngectomy done	12 (100%)	0 (0%)	(100%)

Table 2: Complications seen in the 12 subjects that underwent total laryngectomy.

Complication	Number of subjects	Percentage %
No complication	6	50.0
Pharyngo-cutaneous fistula	2	16.7
Cervical nodal enlargement	2	16.7
Pharyngeal stenosis	1	8.3
Stomal stenosis	1	8.3
Total	12	100

Table 3: Survival rate of 12 subjects that continued follow up after total laryngectomy.

Duration	Number of subjects	Percentage %
<2years	2	16.7
2-5 years	6	50.0
6-8 years	3	25.0
>8 years	1	8.3
Total	12	100

DISCUSSION

This study noted that the rate of total laryngectomy in patients diagnosed with laryngeal cancer was 75%, which is greater than the 50% or less reported by Donnelly et al in 2009, and they reported that various reasons can be responsible for the rate of patients with laryngeal cancer who will eventually consent to total laryngectomy.

All cases reported in this study were males, similar to current literature which reports that males are seven times more affected by laryngeal cancer than females (Lorenz, 2017). In addition, the histological diagnosis of all cases were squamous cell carcinoma. Jemal et al, 2008 reported that squamous cell carcinoma of the larynx contributes about 2% of all malignant cancer, and the number of new cases of laryngeal squamous cell carcinoma is about 3000 in men and 400 among women each year in Germany (Maier et al, 1994). Most cases also occur in people aged between

50-60 years (Jemal et al, 2008, Lorenz, 2017). Similarly, the highest number of cases in this study was recorded in subjects aged 50-60 years.

The presenting complaints in this study are hoarseness and symptoms of upper airway obstruction which include stridor, cough, and breathlessness. These are signs of advanced disease, evidenced by the high rate of emergency tracheostomy (62.5%) reported in this study. Late presentation with advanced disease is prevalent in this environment because patients pay out of pocket for healthcare, and treatment of cancer is financially cumbersome. In addition, the common belief of the ordinary Nigerian that fetish means catapulted from aboriginal sources or ‘spiritual attack’ is the cause of such “mysterious illness”, make some patients to seek “healing” in prayer houses, which becomes their first port of call, rather than the hospital. Poverty coupled with ignorance becomes a huge stumbling block to early presentation to hospital. On the other hand, patients lost to follow up after initial diagnosis, and after tracheostomy before total laryngectomy, could be due to unavailability of funds to pay the cost of the total laryngectomy which is the definitive treatment for their late stage disease. Some older patients are also of the opinion that considering their advanced age, the funds available should be used for their funeral rites rather than spent in the hospital for the expensive treatment of their laryngeal cancer. This situation highlights the ignorance and poverty that underlie such patients’ actions and decisions.

Pharyngocutaneous fistula (PCF) was the commonest complication in this study, with incidence of 16.7%. This is in keeping with current literature, where reported incidence for pharyngocutaneous fistula is 14.3% for primary total laryngectomy, and 27.6% for salvage total laryngectomy (Sayles and Grant, 2014). Factors that generally predispose to complication following total laryngectomy can be pre-operative or post operative. The pre-operative factors include previous radiotherapy or chemoradiotherapy, Tumour and Nodal stage of malignancy, and anaemia (Virtaniemi et al, 2001). Post operative factors can include neck dissection, previous tracheostomy, surgical wound infection, interval between surgery and radiotherapy, extent of resection and closure of the pharynx (Virtaniemi et al, 2001). Co-morbidities like diabetes, liver disease and hypothyroidism can also make patients vulnerable to post surgical complications (Sifrer et al, 2016). In this study, it was not conclusive what factors were responsible for the complications noted in the subjects. However, tissue available for pharyngeal repair could be implicated in the pharyngeal stenosis, while radiotherapy following surgery could have led to stomal stenosis. The complications were treated and improvement was reported in the respective patients. Cervical nodal enlargement following surgery indicates residual tumour or tumour recurrence. This reduced following radiotherapy, but the chances of increased tumour presence following surgery does not only depend on stage of disease before surgery, but also on duration of interval between surgery and radiotherapy or chemoradiotherapy.

Voice rehabilitation is imperative following total laryngectomy, however, because the anatomy and physiology of the pharyngo-oesophageal region is markedly altered following total laryngectomy, the quality and intelligibility of the voice is compromised (Arenaz Bua et al, 2016).

In this study, oesophageal voice/speech was the mode of voice rehabilitation. It has been reported by some researchers that trachea-oesophageal voice has a success rate of about 90%, and is a more successful way of restoring communication after total laryngectomy when compared to oesophageal and electrolaryngeal voice (Op de Coul et al, 2000). However, the quality and intelligibility varies largely among patients.

The 5- year survival rate following total laryngectomy has been reported as 62% by Robertson et al, 2012. In this study, the 5 year survival rate was noted to be about 50%. The lower survival rate as compared to the Robertson study carried out in the United Kingdom, may be attributed to the higher life expectancy in UK as compared to Nigeria. There is evidence that subjects that have primary surgery have improved survival rate (Megwalu & Sikora, 2014), but the survival rate expected should take into cognizance the fact that patients who present with laryngeal cancer are usually older and with multiple co-morbidities.

CONCLUSION

Laryngeal cancer is treatable if diagnosed early, late presentation with advanced disease worsens prognosis and increases the predisposition to total laryngectomy. Advanced disease also increases the chances of residual tumour or tumour recurrence while decreasing survival rate following surgery.

RECOMMENDATION

More enlightenment should be carried out to improve awareness of laryngeal cancer and its treatment, this may improve early presentation to hospital. Ordinarily, treatment of cancer is financially cumbersome on patients paying out of pocket for healthcare. So the adverse affect of poverty on the management of cancers, can be alleviated if an established source of funding can be created by government to aid treatment of cancers.

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