Management of patients with cancer of the larynx in Suez Canal University Teaching Hospital: 5 years' experience

Mohamed T. El Tabbakh[a], Mohamed R. Ahmed[a], Doaa F. Sedik[b], Diaa El Hennawi[a]

[a]Department of Otolaryngology, Faculty of Medicine, Suez Canal University and [b]Ismailia General Hospital, Ismailia, Egypt

Correspondence to Mohamed R. Ahmed, MD, Department of Otolaryngology, Faculty of Medicine, Suez Canal University, Ismailia, Egypt
Tel: +20 128 504 3825; fax: +20 66 341 5603
e-mail: m_rifaat@hotmail.com

Received 27 March 2013
Accepted 25 August 2013

The Egyptian Journal of Otolaryngology
2014, 30(1):30-33

Background
Suez Canal University Hospital, which is the only tertiary care facility in the Suez Canal and Sinai area, is estimated to service more than 5 million patients. Cancer of the larynx, which is the most common head and neck cancer, is also the most common tumor presented to the otolaryngology departments.

Aim
To evaluate the results of interventional protocols for patients with cancer of the larynx treated in Suez Canal University Hospital.

Patients and methods
This was a retrospective study carried out on 53 patients with cancer of the larynx reviewed from 1 January 2007 to 1 January 2012 according to demographic, clinical, radiological, operative, pathological data, and possible complications.

Results
Fifty-three patients, mean age 58 years (71.1% were from urban areas), were studied. The main presenting symptom was hoarseness of voice (66%). Glottis carcinoma was the most common type of cancer found in 41.1% patients.
Stage IVa was the most common presenting stage in 39.6% of the patients. Emergent tracheostomy was performed for 39.6% of the patients.
According to the treatment protocol, single treatment modality was recommended for 38 (71.6%) patients: 17 (32%) patients were recommended total laryngectomy, followed by radiotherapy in 11 (20.7%) patients, chemotherapy was recommended for eight (15.1%) patients, concurrent chemoradiotherapy was offered to one (1.9%) patient, and partial laryngectomy with preservation of both arytenoids was offered to one (1.9%) patient. In addition, 15 (28.4%) patients were subjected to combined therapy: total laryngectomy combined with radiotherapy in nine (17%) patients and total laryngectomy with chemoradiotherapy in six (11.4%) patients.

Conclusion
Although the standards of management of laryngeal carcinoma in Suez Canal University hospital are almost in compliance with regional and international standards, we need to deal with the time delay between the diagnosis and definitive treatment to revise the items in the medical records and its registration.

Keywords:
cancer of the larynx, management, Suez Canal

Egypt J Otolaryngol 30(1):30-33

1012-5574

Introduction

Cancer of the larynx, which is the most common head and neck cancer and the second most common neoplasm of the respiratory tract, is the most common tumor presented to the otolaryngology departments [1–3].

Cancer of the larynx usually occurs in middle-aged men, representing about 1.6% of all malignant tumors in men and 0.4% in women [4,5].

Many studies have reported that the frequency of cancer of the larynx in urban areas is much higher than that in rural areas [6].

The risk factors for development of cancer of the larynx are usually smoking, alcohol consumption, passive smoking, chronic laryngeal irritation from gastroesophageal reflux, and viral infection [6–10].

Squamous cell carcinoma is the most common pathological type in cancer of the larynx (98% approximately); unfortunately, 40% of patients with cancer of the larynx have late manifestation in stage III or IV disease when it is first evaluated [11].

The incidence of lymph node metastasis is low: Almost 0% for T_1 lesions, ~5% for T_2 lesions, 15–20% for T_3 lesions, and 20–30% for T_4 lesions [12–14].

Laryngeal carcinogenesis has survival rates in the range of 73–92% for early disease stages (I and II) and 50–64% for advanced disease stages (III and IV) [15]. Factors

influencing the survival of the laryngeal cancer patients include resection margins [16] and treatment modality [17,18], whereas known clinical factors include site of origin, disease stage, and nodal involvement [19].

The aim of our study was to evaluate the results of patients with cancer of the larynx who were treated in Suez Canal University Hospital during the period from 2007 to 2012 according to demographic, clinical, radiological, operative, pathological data, and possible complications.

Patients and methods

A retrospective study was carried out in Suez Canal University Hospital, Ismailia, Egypt, from January 2007 to January 2012. All patients with cancer of the larynx admitted to the Otolaryngology — Head & Neck Surgery Department were included in our study. Any patient with a history of a previous management protocol was excluded from our study.

The following data were collected from all patients with cancer of the larynx:

(1) Demographic data: age when diagnosed, sex, occupation, residence, smoking, and any other habits.
(2) Presenting symptoms: hoarseness of voice, stridor, dysphagia, and other clinical presenting symptoms.
(3) Direct laryngoscope results: site of the tumor (supra, trans, subglottic), vocal cords mobility, and tumor extension.
(4) Tumor stage: localized, regional, or distant.
(5) Radiological data: computed tomography, neck and chest radiograph, abdominal ultrasound, and MRI if available.
(6) Lymph node metastases: clinical, radiological, and pathological.
(7) Pathological data: excision biopsy.
(8) Management procedures: surgical radiotherapy, others (adjuvant, neoadjuvant, concomitant therapy).
(9) Reported complications: management.

Results

Fifty-three patients with cancer of the larynx who fulfilled the previous inclusion criteria were admitted to Suez Canal University Hospital from January 2007 to January 2012.

Their ages ranged from 28 to 82 years, mean age 58 years.

Twenty-nine (54.7%) patients were from Ismailia city, five (9.4%) were from Port Said city, five (9.4%) were from North Sinai, four (7.5%) were from the Suez Governorate, two (3.8%) were from Fayed, two (3.8%) were from El Qantra Shark, and for six patients (11.4%) the address was missing from the record.

On the basis of the previous data, we found that 38 (71.7%) patients were from urban areas, whereas 15 (28.3%) were from rural areas.

In terms of habits, all patients were smokers, except one, and all of them were nonalcoholic.

According to the clinical presentation, the most common complaint was hoarseness of voice in 35 (66%) patients, followed by stridor in 21 (39.6%), dysphagia to solids in four (7.5%), odynophagia in two (3.8%), and dry cough and hemoptysis with referred otalgia in one (1.9%).

The glottis was the most common site involved with respect to the tumors, found in 22 (41.5%) patients; the second most common site involved was the supra glottis in 13 (24.5%) patients, followed by the transglottis in 12 (22.6%) patients, hypopharyngeal extension to pyriform, postcricoids, and posterior pharyngeal wall in two, one, and three (3.8, 1.9, and 1.9, respectively) patients, and finally, the least common site involved was the subglottis, found in only two (3.8%) patients.

Cervical lymph node metastasis occurred in seven (13.2%) patients, six (11.3%) of them had an N1 neck and one (1.9%) had an N3 neck, whereas N0 was found in 46 (86.8%) patients (Fig. 1).

Cartilage and bone invasion was present in 12 (22.6%) patients as indicated with computed tomography with contrast of the neck.

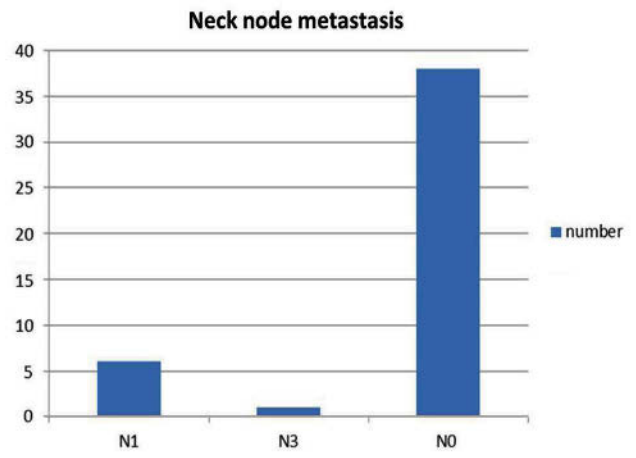
According to the tumor staging system, it was found that the most common stage was IVa in 21 (39.6%) patients, followed by stage II in 13 (24.5%), stage III in 11 (20.8%), stage Ia in seven (13.2%), and the least common stage 0 in one patient (1.9%) (Fig. 2).

Almost all the patients had infiltrating (invasive) squamous cell carcinoma, found in 52 (98.1%) patients, and only one patient (1.9%) had carcinoma *in situ*.

According to the clinical presentation of the patients and the severity of their symptoms, 21 (39.6%) patients needed an emergent tracheostomy, whereas 32 (60.4%) patients did not undergo tracheostomies as they did not require any urgent intervention.

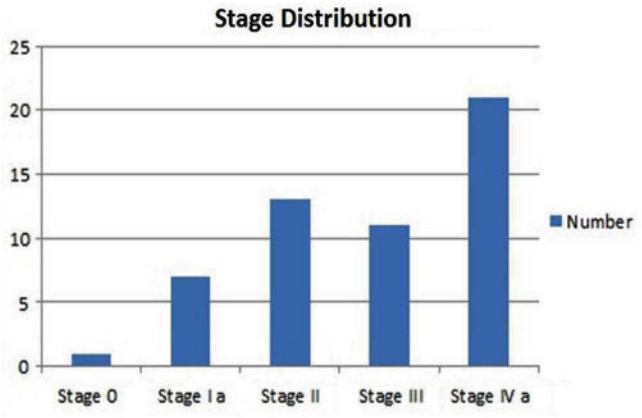
According to the treatment protocol, single treatment modality was recommended for 38 (71.6%) patients; 17

Figure 1



Lymph node metastasis among patients with cancer of the larynx.

Figure 2



Stage distribution among patients with cancer of the larynx.

(32%) patients were recommended total laryngectomy, the largest proportion of patients, followed by radiotherapy in 11 (20.7%) patients, chemotherapy for eight (15.1%) patients, concurrent chemoradiotherapy in one patient (1.9%), and partial laryngectomy with preservation of both arytenoids in one (1.9%) patient. In addition, 15 (28.4%) patients were subjected to combined therapy [total laryngectomy combined with radiotherapy in nine (17%) patients and total laryngectomy with chemoradiotherapy in six (11.4%) patients].

Selective neck dissection was performed in 16 (30.2%) patients and one (1.9%) patient underwent bilateral dissection.

In terms of postoperative complications, hematoma occurred in two, pharyngocutaneous fistula in five patients, wound infection in one patient, and stomal stenosis in one patient.

Finally, two patients died 2 h after tracheostomy: massive myocardial infarction in one and respiratory failure in the other. Another patient died from hepatic coma 5 months postoperatively.

Discussion

To date, there are no published data on management protocols for cancer of the larynx in the Suez Canal area. All the patients studied were men as cancer of the larynx is much more common among men than women [20]. In our study, the mean age of the patients was 58 years; the risk usually increases with age. The incidence increases three-fold between 45 and 65 years of age, whereas the mortality rate increases seven-fold [21].

In our study, the main presenting symptoms were hoarseness of voice in 69.8% of patients; Licitra *et al.* [22] reported that hoarseness is the main attending symptom.

In our study, a glottic tumor was found in 41.5% of patients and supraglottic cancer in 32% of patients. In a study in India, the overall incidence of supraglottic cancer was higher. This variation in demographics can be attributed to the higher prevalence of tobacco chewing rather than smoking in the Indian subcontinent, which results in tobacco-rich saliva coming in contact with the supraglottis; in contrast, smoke from tobacco smoking results in more contact with the glottis [17].

An emergency tracheostomy was performed in 39.6% of the patients and electively in 11.4% of patients. In a retrospective study of 270 patients with carcinoma of the larynx, tracheostomies were performed in 150 (55.6%) patients when the tumor interfered with endotracheal intubations [23,24].

In our study, 17 (32%) patients were recommended total laryngectomy and radiotherapy was performed in 11 (20.7%) patients. Cardesa *et al.* [19], in a retrospective study, found that primary surgical treatment is an effective modality against T3 glottic carcinomas.

In our study, partial laryngectomy with preservation of both arytenoids was performed in one patient (1.9%). Goodman *et al.* [25] reported that resection of the arytenoids may interrupt physiologic airway protection in the early postoperative period; thus, a carful postoperative follow-up is needed to prevent the risk of pneumonia.

In our study, neck dissection was performed in 30.2% [26] of patients; they underwent ipsilateral selective neck dissection. A total of 242 patients with a diagnosis of carcinoma of the larynx were studied by César and Javier [30]. All of them underwent

surgery. A total of 160 patients underwent functional neck dissection, with a total of 206 performed. The results confirmed that functional neck dissection is the procedure of choice in cases with NO disease and in cases with mobile nodes [27].

In our patients, hematoma occurred in two patients, pharyngocutaneous fistula in five patients, wound infection in one patient, and stomal stenosis in one patient. A retrospective study was carried out at Ganesh Man Singh Memorial Academy of ENT and by Maharjan et al. [31] to observe the various complications following total laryngectomy, carried out in 54 patients; 20 patients developed complications, the most common complications being pharyngocutaneous fistula (six patients, 30%), wound infection (four patients, 20%), superficial flap necrosis (two patients, 10%), and chylous fistula (two patients, 10%) [28].

In our study, mortality was documented in 11.4% of patients; one patient (1.9%) died 2 h after tracheostomy, one (1.9%) died because of respiratory failure type I, one (1.9%) died because of postcricoid carcinoma, and one (1.9%) died because of hepatic metastases. SEER Cancer Statistics Review of National Cancer Institute, from 2005 to 2009, showed that the median age of populations in the USA at death because of cancer of the larynx was 68 years. The age-adjusted death rate was 1.2/100 000 men and women per year [29].

However, the limitations of the study should be kept in mind, which were the lack of standard medical records, a small sample size, and missing data in the records that limited our statistical results.

Conclusion

Although the standards of management of laryngeal carcinoma in Suez Canal University Teaching Hospital are almost compliant with regional and international standards, we need to deal with the time delay between the diagnosis and definitive treatment and to revise the items in the medical records and its registration.

Acknowledgements

Conflicts of interest

None declared.

References

1 Jemal A, Siegel R, Ward E. Cancer statistics, 2007. CA Cancer J Clin 2007; 57:43–66.

2 Farrington W, Weighill J, Jones P. Total laryngectomy for cancer of the larynx. J Laryngol Otol 1986; 100:53–58.

3 Marioni G, Marchese-Ragona R, Cartei GA. Current opinion in diagnosis and treatment of laryngeal carcinoma. Cancer Treat Rev 2006; 32:504–515.

4 Boring C, Squires T, Tong T. Cancer statistics. Cancer 1994; 44:7–26.

5 Wake M. The urban/rural divide in head and neck cancer the effect of atmospheric pollution. Clin Otolaryngol 1993; 18:298–302.

6 William B, David E, Robert H. Malignant tumors of the larynx; anatomy and embryology [part 6, section 5, chapter 107 — paragrah 2]. Cummings otolaryngology – head and neck surgery. 5th ed. Washington University School of Medicine: Mosby; 2010; 2:1482

7 Armstrong W, Netterville J. Anatomy of the larynx, trachea, and bronchi. Otolaryngol Clin North Am 1995; 28:685–699.

8 Frazer E. The development of the larynx. J Anat Physiol 1909; 44:156.

9 Michael S, Erik S, Udo S, Lawrence MR, Edward DL, Markus V. Atlas of anatomy. Head and Neuroanatomy (THIEME Atlas of Anatomy) [Paperback], 1st Edition, 2010, p. 414.

10 Michael G, George G, Martin J. Anatomy of the larynx. Scott-Brown's Otorhinolaryngology Head and Neck Surgery [chapter 162]. 7th ed. Michael J Gleeson, George Browning, Martin J Burton, Ray C Clarke, John Hibbert, Nicholas Jones, *et al.* (Editors): Hodder Arnold: London; 2008; 2:2132.

11 Janfaza P, Nadol J, Galla R. Surgical anatomy of the head and neck [chapter 11]. Anatomy of the neck. Philadelphia: lippincott Williams & Wilkins; 2001.

12 Van de Graff W. Thoracic influence on upper airway patency. J Appl Physiol 1988; 65:2124–2131,

13 Sant'Ambrogio F, Mathew O, Clark W. Laryngeal influences on breathing pattern and posterior cricoarytenoid muscle activity. J Appl Physiol 1985; 58:1298–1304.

14 Brancatisano T, Dodd D, Engel L. Respiratory activity of the posterior cricoarytenoid muscle and vocal cords in humans. J Appl Physiol 1984; 57:1143–1149.

15 Hagen P, Lyons G, Haindel C. Verrucous carcinoma of the larynx: role of human papilloma virus, radiation, and surgery. Laryngoscope 1993; 103:253–257.

16 Ferlito A, Altavilla G, Rinaldo A. Basaloid squamous cell carcinoma of the larynx and hypopharynx. Ann Otol Rhinol Laryngol 1997; 106:1024–1035.

17 Paulino A, Singh B, Shah J. Basaloid squamous cell carcinoma of the head and neck. Laryngoscope 2000; 110:1479–1482.

18 Thompson L, Wieneke J, Miettinen M. Spindle cell (sarcomatoid) carcinomas of the larynx. Am J Surg Pathol 2002; 26:153–170.

19 Cardesa A, Zidar N. Barnes L, Eveson JW, Reichart P, Sidransky D, (editors). Spindle cell carcinoma. World Health Organization classification of tumours. Pathology and genetics of head and neck tumours. Lyon: IARC Press; 2005; 127–128.

20 Koch B, Trask D, Hoffman H. National survey of head and neck verrucous carcinoma: patterns of presentation, care, and outcome. Cancer 2001; 92:110–120.

21 Cardesa A, Zidar N. Barnes L, Eveson J, Reichart P, Sidransky D, (editors). Verrucous carcinoma. World Health Organization classification of tumours. Pathology and genetics of head and neck tumours. Lyon: IARC Press; 2005. 122–123.

22 Licitra L, Bernier J, Grandi C, Locati L. Cancer of the larynx. Crit Rev Oncol Hematol 2003; 47:65–80.

23 Bodnar M, Rekwirowicz H, Burduk P. Impact of tobacco smoking on biologic background of laryngeal squamous cell carcinoma. Przegl Lek 2009; 66:598–602.

24 Sawsan HK. Studing the Relationship between 5'-Nucleotidase Activity and Body Mass Index in Obese Individuals, Medical Journal of Babylon, 2009; 6:3–4.

25 Goodman M, Morgan RW, Ray R, Malloy CD, Zhao K. Cancer in asbestos-exposed occupational cohorts: a meta-analysis. Cancer Causes Control 1999; 10:453–465.

26 Menvielle G, Luce D, Goldberg P. Smoking, alcohol drinking and cancer risk for various sites of the larynx and hypopharynx: a case–control study in France. Eur J Cancer Prev 2004; 13:165–172.

27 Qadeer M, Colabianchi N, Strome M. Gastroesophageal reflux and laryngeal cancer. Am J Otolaryngol 2006; 27:119–128.

28 Weinstein G, Laccourreye O, Brasnu D. Reconsidering a paradigm: the spread of supraglottic carcinoma to the glottis. Laryngoscope 1995; 105:1129–1133.

29 Redaelli de Zinis L, Nicolai P, Tomenzoli D. The distribution of lymph node metastases in supraglottic squamous cell carcinoma: therapeutic implications. Head Neck 2002; 24:913–920.

30 César Gavilán, Javier Gavilán. Five-Year Results of Functional Neck Dissection for Cancer of the Larynx; Arch Otolaryngol Head Neck Surg. 1989; 115(10):1193–1196.

31 Maharjan R, Adhikari P, Khalilullah S, Sinha BK, Baskota DK. Early Complications of Total Laryngectomy: A Retrospective Study. Nepalese Journal of ENT- Head and Neck Surgery 2010; 1(2):17–18.