ENDOSCOPIC LASER SURGERY FOR EARLY GLOTTIC CANCER–COMMENTS ON A CLINICAL CASE

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Abstract

The main objective in larynx cancer is to successfully control the malignant process. As conservative procedures develop, increased importance is given to organ preservation. Glottic tumors can be discovered in early stages, as the most common symptom, hoarseness develops rapidly. Transoral LASER surgery is a convenient option for early stage glottic cancer as it assures both a complete resection of the tumoral mass and preserves the larynx, thus its functions. Generally, it is reserved for T1 and TII cancers, but in experienced centers its indication can be extended to more advanced tumors. Depending on tumor extension, clinical status and imagistic examinations, the surgical treatment can be associated with other therapeutic options (radiotherapy, chemotherapy or both). The therapeutic plan must be decided by a multidisciplinary team that includes an ENT surgeon, an oncologist and an anatomopathologist.

Keywords: transoral laser surgery, laryngeal cancer

Introduction

Laryngeal cancer is the second most common head and neck malignancy after thyroid cancer [1]. In Europe, head & neck cancer rates have increased for most age groups since 1990, the largest increase, for both male and female patients, being the 50-59 group. Variations in different countries may appear due to different risk factors, use of screening and diagnostic methods [2, 3]. It is most common in men, with a 4:1 male to female ratio, with an increasing incidence in females due to a growing number of smoking females [4]. The main risk factors are tobacco use and alcohol consumption, but there are others such as workplace exposure, poor nutrition, HPV infection. A recent study performed in Central and Eastern Europe showed that smokers have a tenfold risk to develop laryngeal cancer, while past smokers present a 5-fold risk. On the other hand, for alcohol it did not demonstrate an independent effect, but an important, multiplicative one between alcohol and tobacco use [2].

The larynx is divided into three compartments: supraglottis, glottis and subglottis. The glottic space consists in the vocal cords and 1 cm inferiorly. The vocal folds, which have 1,6-2 cm in females and 2-2,4 cm in males, are multilayered structures and include the mucosal covering, vocalis muscle and the vocal ligament. Histologically it contains five layers: the squamous epithelial lining, which holds the shape of the vocal cord, the lamina propria, which is divided in three
separated layers, superficial, intermediate and deep; the superficial layer is also known as Reinke’s space and the intermediate and deep layers of lamina propria constitute the vocal ligament; the last layer is the vocalis muscle [5].

The larynx has an important role in speech, swallowing, breathing and airway protection. Glottic cancer involves the true vocal cords, the anterior and posterior commissures. Commonly it is a squamous cell cancer and it develops in the free margin of the vocal cords, from where it extends anteriorly or posteriorly. The most frequent symptom for glottic tumors is persistent and progressive hoarseness, which typically appears at an early stage [6].

The main therapeutic option in larynx cancer is represented by surgery, either by monotherapy or combined with other therapeutic methods. Surgical treatment consists in tumor removal with oncological safety, but it must also aim the conservation of the larynx functions.

For glottic cancers there are several types of cordectomies. Cordectomies can be performed in two ways: external approach, open cordectomy through laryngofissure, or endoscopic approach, transoral, using a surgical CO2 LASER.

Based on the vocal folds anatomy, the European Laryngological Society proposed a classification of endoscopic cordectomies to facilitate postoperative evaluations: subepithelialcordectomy – type I, subligamentalcordectomy – type II, transmuscularcordectomy – type III, total coderctomy – type IV; type V cordectomy includes: Va extended cordectomy to the contralateral vocal fold and anterior commissure, Vbcordectomy including the aytinoid, Vc extendedcordectomy to the subglottis and Vdcordectomy extended to the ventricles [7].

Transoral endoscopic CO2 LASER cordectomy is a preferred option in early stage cancer (T1 - TII) because of its many advantages and low rates of immediate and late side effects.

Case presentation

The authors present the case of a 79-year-old patient, female, who was admitted in our clinic with persistent hoarseness that had a progressive evolution for 6 months. The patient presented with an anatomopathological result of squamous cell carcinoma from another ENT department, performed 2 months earlier.

The nasal fiberoptic endoscopy of the larynx showed aninfiltrative tumoral mass situated in the middle part of the right vocal fold toward the anterior commissure; the vocal cords presented normal respiratory and phonatory movements. Laboratory results showed high fibrinogen values and an elevated erythrocyte sedimentation rate.

Computed tomography indicated a minimal contrast enhancement of the anterior half of the right vocal fold, extended both anteriorly and posteriorly (10mm) with 3 mm depth, without exceeding the median line (Figure 1).

Considering the clinical presentation, imagistic findings and histopathological result we opted for surgical management. Under general anesthesia and using a surgical microscope in laryngeal suspension, we performed a type II ELS cordectomy by dissecting the tumoral mass, using the CO2 LASER beam, with macroscopic safety margins. Utilizing various LASER modules and proper powers (continuous beam, P=2 – 6 watts and swift beam, P= 2 – 4 watts) the tumoral mass was completely excised and sent for histopathological examination. (Figure 2). The TNM staging for this case was T1N0Mx.

The patient had a positive evolution. The histopathological result confirmed the diagnosis of squamous cell carcinoma and the
immunohistochemical examination sustained the result and showed a positive CK34BetaE12, positive P63, between 10 and 15% positive Ki67 and positive P53 in tumoral cells.

Follow-up at three months after the surgery showed normal healing and hypomobility of right hemylarynx, without any macroscopic signs of tumoral residue (Figure 3).

Discussions

When deciding for a therapeutic management in larynx cancer, several factors must be considered, such as the patient’s oncological background, tumor stage, clinical presentation, endoscopic and imagistic findings [8].

Treatment options include surgical therapy, radiotherapy, chemotherapy or combined therapy and is a complex decision which requires a multidisciplinary team.

Generally, early staged glottic carcinomas are approached by a single modality treatment (endoscopic surgery or radiotherapy). Moderately advanced cancers receive a combined treatment, while invasive, extended tumors require total laryngectomy as primary surgical treatment [9].

For early stage glottic cancer, stage I-II, transoral CO2 LASER microsurgery is a preferred option as it has many advantages, the main ones being organ preservation and voice preservation, which have an important impact on the quality of life of the patient. Others are a shorter hospitalization period, fewer early and later side effects, with a faster healing process and lower costs compared with radiotherapy and open surgery [2]. Compared with other surgical options, LASER therapy has lower morbidity.
than open laryngectomy and a reduced necessity of tracheostomy and nasogastric feeding [2]. Studies demonstrated local control rates between 86 and 93%, with a 95% rate of larynx preservation and 5-year recurrence free rate of 89% [10].

Conservative open surgery also has the advantage of preserving the larynx. Cordectomy by laringofissure is a suitable option for patients with unsatisfactory larynx exposure, but has the disadvantages of open surgery and a higher probability of developing a tracheal stenosis [11].

In our case, to decide the therapeutic management and given the fact that the patient presented with a histopathological diagnostic of carcinoma, we assessed: endoscopic aspect, clinical examination, computed tomography findings. Considering the location of the tumor on the right vocal fold without anterior commissure extension, reduced size of the tumor, the normal mobility of the larynx, without any asymmetries of the organ and absence of lymphadenopathies (no palpable lymph node, nor lymph nodes greater than 1 cm revealed on computed tomography) we opted for a conservative surgical treatment. In this case, performing a transoral CO2 LASER cordectomy ensured complete removal of the tumor and a promising functional outcome for the patient.

Following the oncological consult, we decided for an aggressive follow-up, at three months for two years. Any modification in the patient’s status, recurrence or lymphadenopathies, would require the reevaluation of the therapeutic strategy. One long-term advantage of using transoral LASER surgery is the existence of other therapeutic options in case of recurrence (radical surgery, radiotherapy, chemotherapy) [2].

Any cancer patient requires a multidisciplinary team to achieve the best therapeutic results and to improve the quality of life. In larynx cancer cases there must be a close communication and collaboration between the otolaryngologist, the histopathology laboratory, oncologist and psychologist.

Conclusions

Glottic cancer presents an increasing incidence each year and is a pressing problem, considering the functions of the larynx. The goals for early glottic cancer are tumor control and organ preservation. There are several therapeutic options for glottic malignancies. Transoral endoscopic CO2 LASER cordectomy is a preferred option in early stage cancer and has positive results in local cancer control, larynx functions preservation, with limited immediate and late side effects.

References