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Transoral surgery for laryngeal cancer: bleeding complications

Abstract

Introduction: Transoral laser surgery is the treatment of choice in many centers for patients with laryngeal tumors with an early T (Tis-T1-T2) and in selected patients with T3 tumors. Outcomes are comparable to those of other therapeutic approaches that preserve laryngeal function. The aim of this study is to determine the postoperative incidence of hemorrhagic complications in patients treated for larynx tumors using a transoral approach.

Methods: A retrospective assessment of the patients treated for laryngeal tumors using transoral approach between March of 2004 and April of 2016 was made. Hemorrhagic complications were registered.

Results: A total of 128 patients treated for laryngeal tumors with transoral approach were identified. One hundred and sixteen of them were male and 12 were female. A total of 148 surgeries were made. Three patients had postoperative hemorrhage. The total postoperative hemorrhage incidence was 2.34%. The incidence of postoperative bleeding in patients with T3 tumors was 9.09% (2/22) whereas the incidence, in patients with T1, T2 or Tis tumors was 0.94% (1/106). Total mortality rate due to postoperative hemorrhage was 0.78%.

Conclusion: Transoral laser surgery is a safe and effective approach to treat laryngeal tumors in selected patients. Postoperative hemorrhage in transoral surgery is rare but potentially fatal. However, it represents the most common complication in this type of surgery.

Keywords: hemorrhage, transoral surgery, laryngeal tumors

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Introduction

Transoral surgery is nowadays, the first therapeutic option in many centers around the world to treat laryngeal cancer with early T (Tis-T1-T2), and it is a possibility for the treatment of T3 tumors. This technique allows the use of different types of surgical dispositives, including radiofrequency, electrocautery and laser.[1–3] The advantage is that it has the same oncologic results that open surgery but with less morbidity.[1] Like any surgical technique, transoral surgery has possible complications, which are rare but should be taken into account; one of them is postoperative bleeding, which is the topic of discussion of this article.

Objectives

To determine the incidence of postoperative bleeding in patients treated for laryngeal cancer by transoral surgery.

Design

Descriptive and retrospective study.

Materials and methods

The bleeding complications were registered in a Microsoft Office Excel table; also it was registered postoperative time of bleeding, location of the tumor in the larynx and stage, type of treatment of the complication, and sequelae/mortality, in all patients who were treated with transoral surgery for laryngeal cancer. Mild postoperative bleeding (bloody spittle) that occurred 24/48hours after surgery and did not require treatment were excluded.

Transoral surgery was performed with electrocautery, radiofrequency or CO_2 laser in continuous mode with super pulse. A Newton microscope, MEC 5 LED OT s/XXI model, was used. Suspension laryngoscopes of different diameters, scalpel and monopolar protected of 24cm length, straight and angled forceps, micro scissors and dissectors straight and angled for laryngeal microsurgery were used. A Lumenis Acupulse CO_2 Laser was used. Patients were operated under general anesthesia.

Results

There were treated 128 patients for laryngeal cancer with transoral surgery at the ENT department of Hospital Italiano de Buenos Aires between March of 2004 and April of 2016. One hundred and sixteen were men (91%), and twelve were women (9%), the average age was 62years. 128 transoral surgeries (128 were primary surgeries and 20 reoperations for ampliation of the margins or persistence of the tumor) were performed. Three patients of 128 suffered postoperative bleeding and they required treatment. A patient operated of a glottic laryngeal cancer staged T1N0M0 using radiofrequency presented a bleeding 15days after surgery. At the operating room under general anesthesia with microscopic, an active bleeding from the anterior commissure was identified. The bleeding vessel was coagulated with no complications.

Another patient with transglottic cancer with extension to piriform sinus, staged T3N0M0, who had been operated with radiofrequency, presented a bleeding 20hours after surgery. During primary transoral surgery, a blood vessel that had a significant bleeding was cauterized, which possibly the same that caused postoperative was bleeding. It was necessary to perform an emergency tracheotomy at the patient´s room, and was operated immediately. The bleeding site in the side wall of the pyriform sinus was identified. The vessel was coagulated, but persisted a mild bleeding and it was decided to ligate the laryngeal artery by an external approach, achieving the hemostasis. The patient died, because of the blood aspiration and brain anoxia 48hours later.

The third patient had a bleeding 8days after surgery (CO_2 laser) of a glottic cancer staged T3N0M0. Under general anesthesia, the larynx was explored and no bleeding site was identified. An external approach was performed and the right and left laryngeal arteries were ligated. 17hours after being admitted, started to bleed again. A digital angiography was performed. At the angiography room, he had a sudden cardiac arrest due to blood aspiration. Immediately, a cricothyroidotomy and RCP was performed, saving his life. The angiography showed a branch of the right inferior thyroid artery that had caused the bleeding. The branches of the inferior thyroid artery were occluded bilaterally, so the bleeding was controlled. The patient was discharged 10days later with occluded tracheotomy and without sequels (Table 1).

Table 1 Patients with bleeding complications

Sex	Age	T	Localization	Time of Bleeding	Treatment	Sequela/Mortality
M	61	I	Glottis (Anterior Comissure)	15 days	Transoral Coagulation	No
M	59	III	Glottis/Supraglottis/ Piriform Sinus	20 hours	Laryngeal Artery Ligature	Death 48hs Later
M	61	III	Glottis	8 days	Bilateral Laryngeal Artery Ligature / Embolization	Traqueotomy

The incidence of postoperative bleeding in patients treated for laryngeal cancer with a transoral approach was 2.34%. If we consider all the transoral procedures that were performed to treat laryngeal cancer, the incidence of postoperative bleeding was 2.02%. The incidence of bleeding complications in patients with tumors staged T3 was 9.09% (2/22). In patients with Tis, T1, and T2 cancer, the incidence was 0.94% (1/106). Postoperative bleeding mortality was 0.78%.

Discussion

Transoral laser surgery for laryngeal cancer is the treatment of choice for patients with Tis, T1 and T2 tumors and is an alternative for patients with T3 cancer, with similar results to other therapies that preserve the laryngeal function. The surgeries are performed transorally and resection can be performed with electrocautery, radiofrequency or CO_2 laser. Experimental studies in animals, show similar damage in tissues using cautery or CO_2 laser super pulse mode.[1–3] The use of CO_2 laser can reduce bleeding in the surgical field, but cannot coagulate vessels larger than 0.5mm, so it should always be available an electrocautery.

Bernal et al.,[4] classifies postoperative complications in minors, when they are self-limited, can be managed with medical treatment and leave no sequelae, and mayors, when they required surgical resolution, intensive care or leave sequelae that may require a tracheostomy or gastrostomy feeding tube definitively.[4] Steiner & Ambrosch[5] had no intraoperative complications for the CO_2 laser technique, in 704 patients treated for tumors of the larynx and hypopharynx. The most common complications are postoperative and can occur with any equipment used, and they are inherent to the surgical technique itself.[6]

Ellies & Steiner[7] reported complications in 1528 patients that were operated with CO_2 laser, with tumors of the upper aerodigestive tract. Excluding tumor of the oral cavity (180), oropharynx (178), and base of tongue (75), there were treated 1095 patients for cancer of the larynx and hypopharynx. The percentage of complications including all stages was 6, 11%. The most common complication was postoperative bleeding. In glottic tumors staged T1-a (N: 337) hemorrhage occurred in 2(0.59%). In 30 patients staged T1-b there was 1 hemorrhage (3.33%), and in 338 patients staged T2-3, three hemorrhages (0.88%). The incidence was low for the early stages of glottic cancer T1a-b, and increased in advanced stages. In T1-T2 supraglottic cancer (N: 83), there were 5 postoperative bleeding (6%), and in T3-T4 tumors (N: 133), 13 bleeding (9.8%). Patients who had tumors that compromised the piriform sinus (N: 174) had 10 hemorrhages (5.7%). There was a higher risk of bleeding in patients with supraglottic tumors and piriform sinus.

Other articles[4,8] mention an incidence of 0.4 to 8% for postoperative bleeding. In a multicenter study of transoral treatment in advanced tumors,[9] it is reported, a postoperative bleeding of 6% and mortality of 5 % within 30days after surgery. These mortality rates are still favorable compared with 3% and 5% mortality for radiotherapy and concurrent chemotherapy-radiotherapy respectively.[10] Steiner et al.,[5] compares his results of transoral surgery with those reported in the literature for conventional surgeries using external approaches, and found no differences in the incidence of postoperative complications.[5]

Bernal et al.,[11] reported a complication incidence of 12.3% in 680 patients.[11] Bleeding was the most common complication (5.9%), followed by aspirative pneumonia (3.2%). The complications were mild in the 6.8% of the cases and severe in the 5.6%. It is interesting to note that in a previous study published in 2003,[4] by the same group, the incidence of complications was 18.9%. So we are able to infer that the learning curve is very important to reduce the number of complications.

In our study, there were 3 patients with postoperative bleeding complication (2.34%). The incidence was lower than those reported by Ambrosch et al.,[12] (N: 1095, 3.1% bleeding) and Bernal et al.,[11] (N: 680, 5.9% bleeding), although the number of patients is significantly lower than in those two series. Mortality reported because of postoperative bleeding ranges from 0 to 0.3%,[7,5,11,12] in our study was 0.78% (1/128). In our experience, routinely at the end of the surgery, when we are waiting, the results of intraoperative biopsies, we ask the anesthetist to perform a Valsalva maneuver to increase blood pressure and displaying a bleeding vessel.

In advanced tumors, especially those located in supraglottis and hypopharynx, it is advisable the patient to stay at the ICU the first 24hours postoperative. It is also advisable if it is done a simultaneous neck dissection, to ligate the superior laryngeal artery in the same surgical procedure. Although more studies of larger number of patients are needed, we think that transoral surgery is safe and effective technique for the treatment of laryngeal tumors.

Conclusion

Transoral surgery is nowadays, the first therapeutic option in many centers around the world to treat cancer of the larynx with early T (Tis-T1-T2), and is a possibility for the treatment of T3. This technique allows the use of different types of surgical dispositives, including radiofrequency, electrocautery and laser CO_2. Like any surgical technique, transoral surgery has possible complications, which are rare but should be taken into account; one of them is the postoperative bleeding. In our series there were 3 bleeding complications (2.34%).

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The incidence was lower than those reported in other series, but with a number of patients treated significantly lower. In conclusion, in our experience transoral surgery was safe and effective technique for the treatment of laryngeal tumors.

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Conflicts of interest

Author declares there are no conflicts of interest.

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