

• CASE REPORT •

Robotic-Assisted Salvage Supraglottic Laryngectomy

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Traditional open surgery has historically been the standard approach to treating many head and neck conditions. The introduction of the first robot into the surgical world in 1985 has been a keystone in the development of minimally invasive surgical (MIS) techniques.

Transoral robotic surgery (TORS) is a minimally invasive technique used for the treatment of head and neck pathologies, including benign and malignant lesions. When performed in select patients, TORS offers low post-operative morbidity, along with very few functional and cosmetic compromises. Herein, we present the first TORS supraglottic partial laryngectomy performed in Puerto Rico or in any region in Latin America.

A 68-year-old male who had previously undergone radiation therapy presented with hoarseness and weight loss. A suspension microlaryngoscopy showed a lesion of the left false vocal cord; a biopsy was performed. The patient was diagnosed with a supraglottic squamous cell carcinoma (T2N0M0); the tumor was completely excised using TORS. No post-operative complications occurred. [*P R Health Sci J* 2014;33:88-90]

Key words: Robotic, Cancer, Laryngectomy, Supraglottic, Salvage

The field of head and neck surgery has incorporated minimally invasive techniques in order to increase the accuracy and efficiency of surgical treatments. In the fall of 2004, the Department of Otorhinolaryngology – Head and Neck Surgery of the University of Pennsylvania became the first to develop and put into practice trans oral robotic surgery (TORS) using the da Vinci Robotic Surgical System® (Intuitive Surgical, Sunnyvale, CA) (1). TORS was approved by the U.S.-FDA in the latter part of 2009 and cleared for use in the treatment of both benign and malignant tumors of the head and neck in adults (1, 2).

In April 2011, the first TORS supraglottic partial laryngectomy to be undertaken in Latin America was performed in Puerto Rico. We intend to give an overview of this new and exciting technique.

Case Report

A 68-year-old male with a history of laryngeal carcinoma, and who had been treated with radiation therapy, presented with a 4-month history of progressive hoarseness and weight loss. He denied suffering from any level of odynophagia, experiencing shortness of breath, or regularly consuming either tobacco or alcohol.

On examination, utilizing a flexible laryngoscope, the patient was found to have a lesion of the left false vocal cord, extending caudally to the left true vocal cord and ventricle (Figure 1).

A panendoscopy with a biopsy of the lesion was performed, and a diagnosis of supraglottic squamous cell carcinoma (T2N0M0) was made (Figure 2). The operating room was

configured for TORS, according to the protocol used by O'Malley and Weinstein (3). The patient was placed supine on the operating table; endotracheal intubation was achieved using flexible laryngoscopic assistance. An FK Retractor Set® (Olympus America Inc., Center Valley, PA) was used and secured to the operating table. A 12 mm endoscope, using a 3D HD camera, was inserted through the oral cavity, providing an excellent view of the surgical field. Two robotic arms, with a 5 mm Maryland forceps and a monopolar cautery, were also inserted through the oral cavity.

A supraglottic partial laryngectomy was performed, as has been described by Weinstein (3). The tumor was grossly resected; with focally positive margins present, the significance of such pathologic findings was questioned (4). The surgery was uneventful with minimal bleeding. The patient remained intubated for airway protection for 72-hours post-op. He was discharged home on post-op-day #5. A nasogastric feeding tube remained in place for 2 weeks. No post-operative complications occurred.

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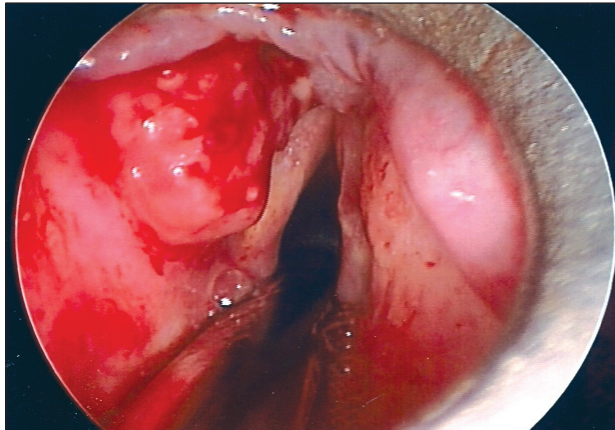


Figure 1. Direct laryngoscopy showing a lesion of the left false vocal cord, extending caudally to the left true vocal cord and ventricle.

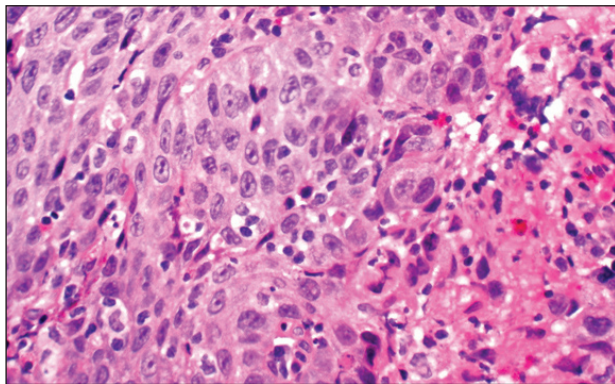


Figure 2. H&E 400X: Moderately differentiated squamous cell carcinoma without keratinization.

No adjuvant treatment was needed since, during the evaluation done by the post-operative tumor board, we questioned the significance of these pathological findings. The patient remains at his 30-month follow-up. The patient is also tolerating all diet consistencies and neither a tracheostomy nor a gastrostomy was needed. His quality of voice is acceptable (Figure 3).

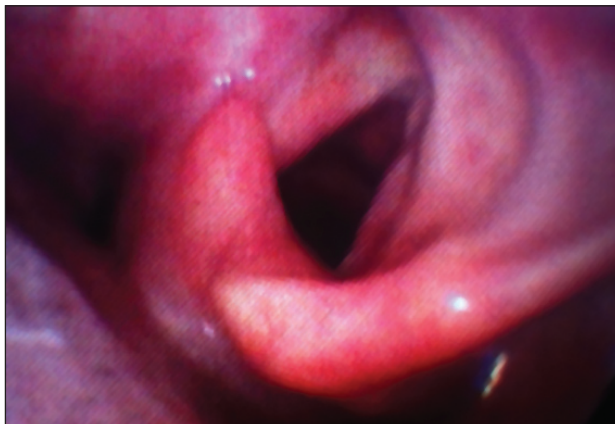


Figure 3. Flexible laryngoscopy (at 18-month follow-up), showing disease-free larynx area.

Discussion

A new paradigm for the treatment of pharyngeal and laryngeal pathology came in the 1960s with the development of the Hopkins rod telescopes and the implementation of xenon light sources (5). The advantages of an endoscopic approach includes a limited need for tracheostomy, decreased hospital stay, and improved post-operative function as measured by quality of life assessment, including a more rapid recovery of swallowing and speech (6).

A robot is a mechanical intelligent agent, which can perform tasks either on its own or with guidance. The introduction of the first robot into the surgical world in 1985 has been a keystone in the development of minimally invasive techniques (7). The da Vinci® Surgical System was introduced to the surgical world in 1997; in 2000, the FDA approved its use for laparoscopic procedures. The robotic system consists of the surgeon's console, a side cart and a vision system, the last of which provides a magnified (10x), high-definition 3D view of the surgical field. Head and Neck surgeons who use this system will discover a number of benefits. For example, it offers an angled endoscope, allows for multiplanar transection of tissues and 4-handed surgery, provides tremor filtration, and makes it possible to avoid a Commando-type lip-splitting procedure. In 2004, the first TORS procedure was described by Bert W. O'Malley and Gregory Weinstein from the University of Pennsylvania (1).

Carcinoma of the head and neck is the sixth most common malignancy in the United States and has one of the highest mortality rates compared to other malignancies. Squamous cell carcinoma comprises 90% of these tumors when skin malignancies are excluded; 75% are seen in patients who smoke and drink chronically. Patients are usually diagnosed in their 60's or 70's; there is a pattern of male predominance (8). Because of the intrinsic nature of the disease and its anatomical location, treatment of such tumors entails a significant amount of morbidity and functional compromise for the patient. Historically, head and neck carcinoma has been treated with open surgical approaches and adjuvant radiotherapy as needed. The local control rates obtained with this treatment paradigm have been excellent, but having maximally invasive open procedures increases the rate of post-operative complications and eventual mortality in this patient group (9).

The most recent trend has shifted to non-surgical treatment in the form of concurrent chemotherapy and radiotherapy. Although such treatment has shown local control rates that compare to open surgery and radiotherapy, the functional outcomes have not been promising (10, 11).

Today, outcome studies illustrate how TORS has dramatically improved the way head and neck cancer patients are treated (12, 13, 14). A recent study, utilizing the MD Anderson Dysphagia Index (MDADI), found that a cohort of 20 patients who underwent TORS with adjuvant chemoradiation, returned to

pretreatment levels at the 6-month mark, while a group of 20 patients who were managed primarily with chemoradiation, consistently experienced a 28% decline in score during this same period (15). Similar studies have yet to be performed to determine to what extent-if at all-TORS affects speech function. A multidisciplinary approach should be used to determine which of the current protocols for the treatment of head and neck cancer will result in the best outcomes. However, given its ability to excise cancer en-bloc without the morbidity and risks that attend open surgical approaches, in addition to its unique ability to preserve speech, swallowing, and other key quality of life, that are so critical to the expected outcomes of head and neck cancer patients, TORS must be strongly considered as a viable treatment modality in this patient population.

Resumen

Los abordajes quirúrgicos abiertos han sido tradicionalmente la norma para tratar mucha de las patologías de cabeza y cuello. La introducción del primer robot quirúrgico en el 1985, ha sido una pieza fundamental en el desarrollo de técnicas mínimamente invasivas (en inglés, minimally invasive surgery o MIS). La cirugía robótica transoral (en inglés, transoral robotic surgery o TORS) es una técnica mínimamente invasiva (MIS, por sus siglas en inglés) usada para tratar diversas patologías de cabeza y cuello, incluyendo lesiones tanto benignas como malignas. Cuando esta técnica es utilizada selectivamente ofrece una ventaja en cuanto a morbilidad se refiere. También tiene la ventaja de disminuir secuelas funcionales y cosméticas. En este reporte de caso, presentamos la primera Laringectomía Parcial Supraglótica mediante una cirugía robótica transoral (TORS) hecha en Puerto Rico o Latino América. Se presenta el caso de un paciente masculino de 68 años de edad, previamente tratado con radioterapia el cual fue referido por pérdida de peso y ronquera. Mediante una micro laringoscopia de suspensión, se observa una lesión en la cuerda vocal falsa izquierda, se hace una biopsia y se diagnostica un carcinoma supraglótico de células escamosas (T2N0M0). Utilizando la técnica de TORS, el tumor fue extirpado sin complicaciones post operatorias.

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