TRANSORAL ROBOTIC SUPRAGLOTTIC PARTIAL LARYNGECTOMY

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ABSTRACT

In the surgical treatment of supraglottic larynx cancers, “transoral robotic supra glottic partial laryngectomy” has developed as a new endolaryngeal resection technique. The aim of the present article is to describe and present the technique of transoral robotic supraglottic partial laryngectomy.

Key Words: Transoral robotic surgery, Supraglottic partial laryngectomy, Surgical technique

INTRODUCTION

Transoral robotic surgery (TORS), is one of the most rapidly developing techniques in head and neck surgery. Although its first clinical application was focused on oropharyngeal tumors, TORS has becoming more popular in laryngeal region due to advancement of robotic instruments and imaging (1). Oncological safety of this technique rests on the successful results obtained in larynx cancers with laser applications. Robotic surgeries have advantages such as 3-dimensional high resolution image, employment of 0 and 30 degree endoscopes, satisfactory camera stability, reflection of enlarged surgical image, and physiological tremor suppression (2,3). With the increase in experience with this surgical technique, complication rates and duration of hospitalization decrease. In addition, compared to chemotherapy, in TORS applications in oropharynx and supraglottic cancers, short term and long term swallowing functions have been reported to be better (2).

DESCRIPTION OF THE SURGERY

TORS is carried out under general anesthesia. After the patient is intubated with nasotracheal intubation, inverse Trandelenburg posisiton is given. Operation order was established as follows: anesthesia team and operation nurse were on the right side of operating table and second surgeon assisting the surgeon was at the head of the patient. Positioning of the monitorization unit just opposite to assisting surgeon is very important for him/her in order that operation can be monitorized and necessary interventions can be made.

After the eyes are protected, silicon protector is placed in the mouth and by using F-K retractor , epiglottis, vallecula, band ventricles, arytenoids and vocal cords and most importantly tumor are visualised. After the patients is covered with sterile drape, Da Vinci Xi robotic system is established. Bipolar Maryland forceps is used on the 1st- arm of the robot on the left side, 30 degree up endoscope is used on the 2nd- arm in the
middle and monopolar cautery spatula is used on the 3rd-arm on right side (Figures 1, 2).

**SURGICAL STEPS OF THE CASE**

Robotic supraglottic partial laryngectomy was previously carried out according to the technique described by Weinstein et al. (4) At first, until the level of petiole, epiglottis was vertically divided into two (Figure 3). At the second step, horizontal incision was carried out at the mucosa of right vallecula and pre-epiglottic tissues were dissected until the level of hyoid bone (Figure 4). At the third step, after determining the upper limits of thyroid cartilage, dissection was made until anterior commissure level, sparing inner perichondrium. At fourth step, at pharyngolaryngeal fold, superior laryngeal artery and vein were determined. Artery and vein were clipped and cut by monopolar cautery (Figure 5). At fifth step, preserving right arytenoid and its mucosa, incision is made until cord level at the anterior border of arytenoid cartilage. Then tissues at paraglottic distance were dissected and removed from specimen sparing the vocal cord. Surgical steps taken at the right side were repeated at the left side starting from second step and specimen on the left side was also removed. Control biopsies were obtained from surgical margins and operation was then completed (Figure 6). The patient was extubated immediately after surgery and the patient was taken to the ward. He was discharged after a uneventful period of hospitalization with only minimal amount of swallowing problem.

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**Figure 1 and 2:** Intraoperative appearance of the mass. Bipolar Maryland forceps is used on the 1st-arm of the robot on the left side, 30 degree up endoscope is used on the 2nd-arm in the middle and monopolar cautery spatula is used on the 3rd-arm on right side.

**Figure 3:** At first, epiglottis is vertically divided into two.

**Figure 4:** Pre-epiglottic tissues is dissected until the level of hyoid bone.
Transoral Robotic Supraglottic Partial Laryngectomy

Figure 5: Superior laryngeal artery and vein are clipped and cut by monopolar cautery.

Figure 6: Appearance of the larynx after surgery.

TAKE HOME MESSAGES

1. In this region difficult to visualise, the most important advantage of robotic surgery is that it enables wide three-dimensional image of the whole supraglottic area.

2. The most important points in surgery are definition of hyoid bone, thyroid cartilage upper border, and ligation of superior laryngeal artery and vein.

3. In robotic surgery, tracheotomy is not generally required.

4. Oral intake is usually possible after the first 24 hours.

5. Morbidity and duration of hospitalization is lower compared to conventional surgery.

6. The disadvantages of this surgical technique may be stated as the high cost due to special equipment required for surgery and lack of palpation of endolaryngeal structures by the surgeon.

REFERENCES


