

PRECISION MEDICINE IN ACTION: EXPLORING TRANSORAL ROBOTIC SURGERY FOR RECURRENT VALLECULAR CYSTS

Authors: Vishak MS* (1); Namanapriya M (2); Kalaiarasi Raja (3)

Authors Affiliations: (1) Senior Resident, (2) Junior Resident; (3) Associate Professor, Department of Otorhinolaryngology; JIPMER, Karaikal

ABSTRACT

INTRODUCTION

Vallecular cysts, comprising approximately 5% of benign laryngeal lesions, often necessitate surgical intervention due to their recurrent nature. While traditional transoral surgery has been a common approach, recent advancements in robotic surgery techniques offer a promising alternative.

METHOD

This case report investigates the utility of transoral robotic surgery for recurrent vallecular cysts. A 16-year-old female presented with dysphagia, breathlessness, and disturbed sleep due to a recurrent vallecular cyst. After two previous transoral surgeries, she underwent transoral robotic surgery using the Da Vinci Xi Robot surgical system.

CONCLUSION

This approach presents advantages like reduced complications and enhanced outcomes, highlighting the potential of precision medicine in managing recurrent vallecular cysts.

KEYWORDS

Precision Medicine, Transoral Robotic Surgery, Vallecular Cysts

INTRODUCTION

About 5% of benign laryngeal lesions are vallecular cysts. Vallecular cysts make up between 10.5% and 20.1% of laryngeal cysts overall. [1] Two (22.2%) patients had vallecular cysts recur in their bodies. [2] Robotic surgery can be employed for recurrent cases rather than endoscopic transoral surgery since it has a 3-dimensional perspective and the cyst can be removed with little risk of leaving a remnant. Vallecular cysts are prone to recurrence due to remaining epithelial remains.

Mucous gland duct obstruction is the cause of vallecula cysts (VCs). Ductal cyst has a diameter of 1 to 5 mm. In adults, symptoms are globus, voice changes, dysphagia, hoarseness, and airway obstruction. The lesion will be usually fluctuant. Vallecular cyst is a benign condition without association with any other syndromes or anomalies. [3]

CASE REPORT

16 years old female presented with complaints of difficulty in swallowing food more to solid food than liquid and breathlessness after walking for some distance. She had disturbed sleep due to breathlessness relieved on sitting and bending forward. Patient had no other known comorbidities. Patient had a past history of two

surgeries for the similar complaints which was diagnosed to be vallecular cyst. On examination patient was not dyspneic, active. Vitals were normal and was maintaining saturation at rest. On examination of neck trachea was in midline, no stridor, laryngeal was present. On indirect laryngoscopy, approximately 3x3 cm mucosa covered cyst in the right vallecula was noted extending to lingual surface of epiglottis. Patient was planned for Transoral robotic surgery. All necessary workup for surgery was done. Under nasotracheal intubation, under GA, patient was positioned and draped. FK retractor was introduced. Using Da Vinci Xi Robot surgical system, endoscopic arm of robot focused to visualise the lesion (Figure 1). Cyst wall ruptured; mucin material was suctioned out. Cyst wall excised with Maryland bipolar forceps (Figure 2) and sent for histopathological examination. Base of cyst being cauterised to prevent recurrence (Figure 3). Postoperative period was uneventful. Biopsy showed stratified squamous epithelium with underlying cyst in sub epidermis lined by stratified squamous epithelium. Features consistent with ruptured vallecular cyst



Figure: Vallecular cyst on right side intra operatively



Figure: Cyst wall excised with Maryland bipolar forceps



Figure: Base of cyst being cauterised to prevent recurrence

DISCUSSION

According to DeSanto's early classification system of laryngeal cysts vallecular cyst belongs to the ductal cyst category. [3] Collection of mucus in the submucosal collecting duct leads to formation of ductal cyst. [4] The retention of mucus might have started following inflammation, irritation or trauma which would have caused blockade of duct. [1] Vallecular cyst aspiration alone won't be enough for complete treatment without recurrence as cyst wall is left behind as source for recurrence. [5] Hence the primary treatment will be transoral surgical removal, or marsupialization using laser, cautery or cold instrument dissection with endoscopic, microscopic or loupes magnification assistance.

[5]Among these CO2 laser is very beneficial as it prevents recurrence by vaporisation of epithelial layer. [5]In cases of recurring vallecular cysts, transhyoid surgery has been used. However, it has drawbacks of its own. Both the transhyoid technique and the transoral median glossotomy approach run the risk of needing a postoperative tracheotomy to preserve the airway, especially in less than 1 year of age. The transhyoid technique also carries a risk of neck scarring and pharyngocutaneous fistula. [6] More and more frequently, benign and malignant oropharyngeal lesions are being removed safely and successfully using the da Vinci robotic system. [7] The robot enables precise bimanual tissue manipulation with high-resolution three-dimensional visualisation, in contrast to conventional endoscopic techniques.It is possible to do cautery marsupialization using a Da Vinci robot with a moderate degree of ease and without any issues.McLeod and Melder³ performed the first robot-assisted surgery for the removal of a vallecular cyst in 2005, with no complications occurring. [6]Technology-wise, transoral robotic surgery has advantages like amplified three-dimensional vision that enables geometric surgical resection and wristed devices that can be used to navigate small spaces without tremors and patient related benefits are decreased blood loss, less complications, short hospital stays and better cosmetic.[5] This method lowers the risk of recurrence because it enables a complete and block excision of the bilateral vallecular cyst. [8]

CONCLUSION

Da Vinci robot assisted vallecular cyst excision can be used in recurrent cases thereby preventing major procedure of transhyoid surgery and its complication.

DECLARATION

Ethics approval and consent to participate: The study was approved by Institutional Ethics committee.

Availability of data and material: The datasets during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author's contribution

NM and VMS are the major contributor in writing the manuscript.KR participated in editing and interpretation along with VMS

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***Corresponding Author:**

Dr. Vishak MS
Senior Resident
Department of Otorhinolaryngology
JIPMER, Karaikal
Email id: jrvishak94@gmail.com

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