



Transoral robotic resection of a retropharyngeal parathyroid adenoma: a case report

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Abstract

Transoral robotic surgery (TORS) has become an increasingly popular option for early malignancies of the oropharynx. It offers superior visualization and has been proven to have acceptable functional and oncologic outcomes. Additionally, indications in head neck have expanded to manage tumors of the thyroid, neck, parapharyngeal space and salivary glands. A 58-year-old female had an incidental finding on CT imaging of a retropharyngeal mass at the level of the hyoid bone. She was referred to a tertiary medical center for further workup and removal of this mass. Due to the midline position of the mass, favorable access and potentially decreased surgical morbidity, TORS excision of the mass was performed for diagnosis and treatment. Histopathology confirmed this to be a hypercellular parathyroid mass consistent with parathyroid adenoma. We report a relatively unusual location of parathyroid adenoma in an asymptomatic patient with normal parathyroid and calcium levels. TORS proves to be a feasible and safe method for complete surgical excision of retropharyngeal parathyroid adenoma without tumor spillage or violation.

Keywords Ectopic parathyroid adenoma · Transoral robotic surgery · Retropharyngeal space mass excision

Introduction

Transoral robotic surgery (TORS) has been used increasingly in otolaryngology in recent years for the resection of oropharyngeal malignancies. Its ability to achieve both superior visualization, magnification, and tremor-free precision have popularized its utility in management of tumors with difficult access. The indications for TORS have expanded to management of parapharyngeal space tumors, neck dissection, distant access thyroid and parathyroid tumors, and salivary gland neoplasms [1–4]. In recent years, TORS has also been described for the management of retropharyngeal masses; excision of metastatic papillary thyroid carcinoma, primary posterior pharyngeal wall squamous cell carcinoma, and benign retropharyngeal masses [1]. It has been presented as a feasible option for tumors of the retropharyngeal space

with benefits including the avoidance of a transcervical incision and risk damage to major vessels of the neck and the lower cranial nerves.

The retropharyngeal space extends from the skull base to the upper mediastinum and is located deep to the pharynx and the esophagus. It is bordered anteriorly by the buccopharyngeal fascia, posteriorly by the alar layer of the deep cervical fascia and laterally by the carotid sheath. This space contains fatty and lymphatic tissues and primary tumors of this space are uncommon. Lipomas are the most common primary neoplasm of this space, while nodal metastases to the retropharyngeal space can come from the nasopharynx, oropharynx, larynx and thyroid. Masses of the nasopharynx and oropharynx can also spread to this space through direct extension. Congenital lesions including branchial cleft cysts can rarely involve this space, and less commonly other tumors including ectopic parathyroid tissue, leiomyomas, nerve sheath tumors, vascular malformations and lymphatic malformations can be found here [5].

This is a case presentation of an incidentally found retropharyngeal mass which was excised with TORS to obtain pathologic diagnosis.

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Case report

A 58-year-old female was referred to a tertiary medical center for further evaluation of a retropharyngeal mass. Patient had a fall with a subsequent intracranial bleed for which she was hospitalized at an outside hospital several months prior to presentation. She had subjective dysphagia at the time and underwent FEES which demonstrated some right sided pharyngeal fullness. A CT scan was performed which revealed a $2.9 \times 1.7 \times 0.9$ cm retropharyngeal mass. Subsequent MRI demonstrated a T2 hyperintense mass in the retropharyngeal space just to the right of midline located at the level of C4 and the piriform sinuses. The

mass was homogeneously contrast enhancing. Bilateral carotid arteries were approximately 3 mm lateral to the mass in each direction, and the mass was well circumscribed (Fig. 1). It was decided to take the patient for excision via TORS to obtain pathologic diagnosis with the lowest risk of morbidity.

Surgical technique

A Crowe-Davis mouth retractor was placed into mouth for adequate exposure and a tongue stitch was placed for anterior retraction. A bulge was noted in the posterior pharyngeal wall which correlated with the location of the lesion on CT scan. The robot was brought in and docked with a

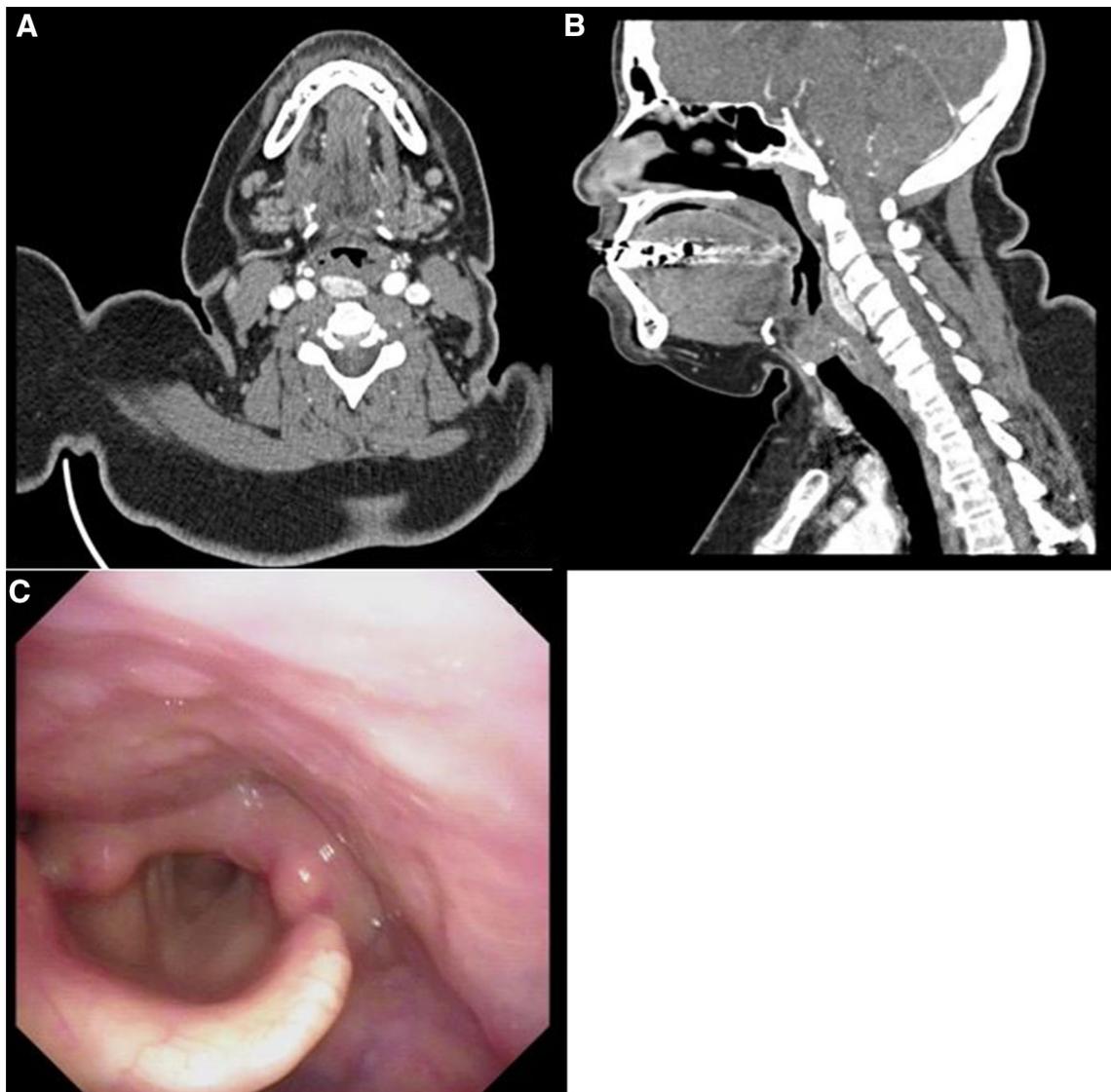


Fig. 1 Axial (a) and sagittal (b) views of contrast enhanced CT demonstrating retropharyngeal mass. c Office flexible endoscopic exam demonstrating fullness of posterior pharyngeal wall just right of midline

30° endoscopic camera oriented upwards. A midline vertical incision was made and carried down just to the right of midline through posterior pharyngeal wall mucosa and constrictor musculature. The placement of the incision was directed by active feedback by direct palpation and assistance from the first assistant at the head end of the patient, and measured approximately 1.5–2 cm. The availability of an experienced and active assistant overcomes, in most cases, the deficiency of haptic feedback with the robotic unit. The capsule of the mass was then noted and was found to be well circumscribed and soft. It was bluntly dissected easily from surrounding tissues until fully excised and sent for pathology. Figure 2 demonstrates surgical technique and the operative specimen obtained. Hemostasis was obtained and a single horizontal mattress suture was used to re-approximate the posterior pharyngeal wall using 3–0 vicryl suture.

Hospital course

The patient was transferred to the ICU for overnight observation and received three doses of Decadron as well as perioperative Unasyn. Enteral feeds were started post operatively through her dohoff feeding tube. She was transferred to a step-down unit on POD#1 and progressed well post

operatively. The patient had an uneventful postoperative course and passed a modified barium swallow test on postoperative day 4. The patient was discharged home on the 5th postoperative day without any dietary restrictions.

Pathology returned as hypercellular parathyroid tissue, consistent with parathyroid adenoma. The mass measured 1.9 cm in its greatest dimension. The patient had pre-operative labs with normal calcium level of 10.3, with post op calcium of 9.1.

Discussion

Parathyroid glands have a complex course of embryologic development, with the superior and inferior glands being derived from the fourth and third pharyngeal pouches, respectively [6]. During the sixth week of gestation, they migrate caudally with the thyroid and thymus coming to rest in the perithyroidal fat. Parathyroid adenomas can be located at any location along the embryologic pathway of descent, with the most common locations being the anterior mediastinum, thymus, retroesophageal region or intrathyroidal [7]. The retropharyngeal location of the parathyroid gland is due to the common embryologic origin of the superior

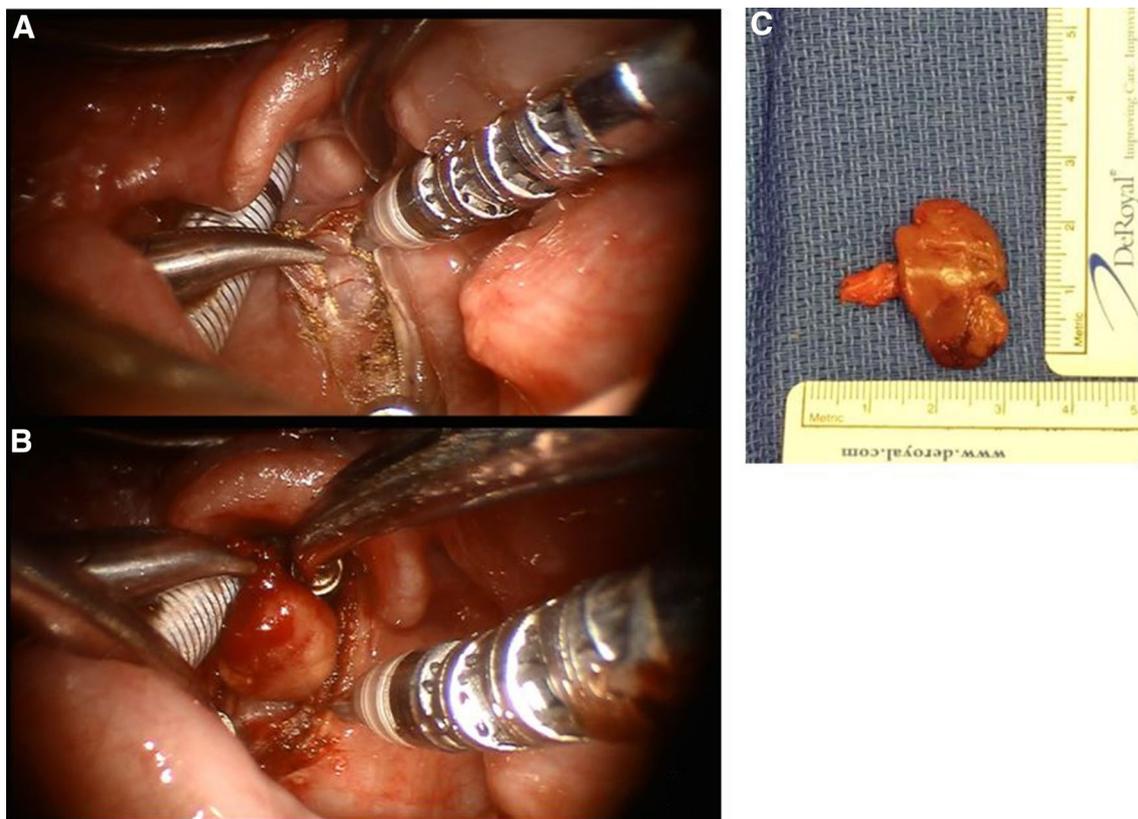


Fig. 2 a Dissection through constrictor muscle. b Dissection around parathyroid adenoma. c Specimen fully excised with capsule intact

parathyroid gland and the apex of the piriform sinus from the fourth branchial pouch. If the gland fails to separate from the piriform sinus, the structures may migrate together to a retropharyngeal location [8].

There are multiple case reports of ectopic parathyroid adenomas in a retropharyngeal location; one of which underwent a TORS resection. In this particular case, the patient had elevated parathyroid hormone and calcium levels and had undergone a failed neck exploration; further imaging then revealed a retropharyngeal mass [9]. In our case, the adenoma was an incidental finding on a CT scan, in a patient who was asymptomatic and also had normal preoperative calcium levels; the latter makes the diagnosis more interesting and unusual. One of the risks associated with parathyroid surgery is tumor spillage and the rare but real possibility of parathyroidomatosis [10]. Consequently, the approach for parathyroid surgery must provide adequate access and safe dissection to allow a complete removal of the gland. The advantages of a transoral approach include avoidance of an external incision, reduction of dissection of the retropharyngeal space and consequently lower morbidity from post op dysphagia, and more importantly mitigating the risks and morbidity associated with the traditional transcervical or transmandibular approaches to the retropharyngeal space, are all well known [3]. Givi et al. [1] found that TORS dissection of retropharyngeal lymph nodes was well tolerated in patients with papillary thyroid carcinoma, however, patients with squamous cell carcinoma were at risk for increased complications. Moore et al., performed a prospective study on patients undergoing TORS resection of oropharyngeal carcinoma and found that resection of retropharyngeal lymph nodes was appropriate in low risk patients with post-operative radiation being the treatment of choice for retropharyngeal lymph nodes in the remaining patients.

Our experience demonstrates that the removal of a retropharyngeal ectopic parathyroid adenoma can be preformed safely with adequate surgical access and precision, avoiding tumor spillage. Bearely et al., reported the first successful use of TORS for ectopic parathyroid adenoma of the retropharyngeal space. The location of the adenoma and the technique used was similar to the patient described in this study and mirror our findings. The major advantages that TORS offers for managing lesions in the retro pharynx include superior visualization, precise excision and avoidance of the risks associated with traditional approaches to the retropharyngeal space through the neck [3]. However, we believe that the presence of an experienced assistant can be vital in allowing appropriate haptic feedback to the operating surgeon that the da Vinci system does not offer, exposure and retraction—all of which are vital to a successful outcome.

Major risks associated with this approach include post-operative dysphagia due to interruption of the constrictor

musculature and risk of injury to the carotid arteries. The patient described in this study was able to be advanced to a regular diet and did not have any post-operative complications.

Conclusion

TORS is a feasible and safe option for the removal of masses of the retropharynx, including parathyroid lesion with precision and efficiency. Preoperative planning with availability of an experienced assistant can overcome deficiencies of lack of haptic feedback are vital to safe and efficient TORS procedures.

Compliance with ethical standards

Conflict of interest All authors declare that they have no conflict of interest.

Informed consent Written informed consent was obtained from the patient for publication of this Case Report/any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

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