ABSTRACT

Fourth branchial complex anomalies are rare and typically present in neonates or adolescents. Surgical management via open excision is the traditional approach to prevent recurrence. However, endoscopic sinus cauterization has recently been reported as a less invasive alternative. The current case report represents the first published account of a fourth branchial pouch presenting in an adult patient effectively managed through endoscopic excision. We compare this method to open excision and endoscopic ablative techniques.

INTRODUCTION

Although branchial complex anomalies account for 20% of cervical masses in children, fourth branchial pouch anomalies are exceedingly rare. Over 90% occur on the left as compressive symptoms in neonates or recurrent neck abscesses in adolescence. Traditional surgical approach entails complete en bloc excision with or without an ipsilateral hemithyroidectomy. However, reports of definitive endoscopic sinus cauterization have been accruing.

CASE REPORT

A 24 year old woman presented with episodic neck swelling, pain, and difficulty swallowing occurring every 9 to 12 months for seven years despite antibiotic treatments. The patient reported symptom relief only with unexpected expectoration of purulent debris. A contrast enhanced neck computed tomography (CT) scan at the latest recurrence revealed a multi-loculated abscess extending 6.1 cm inferiorly from the level of the hyoid to the level of the thyroid and to the left carotid space laterally. After spontaneous decompression, a modified barium swallow was obtained that showed a tapered tract extending inferiorly from the apex of the left pyriform sinus (Figure 1).

ENDOSCOPIC TECHNIQUE

An Ossoff-Karlan modified Dedo laryngoscope (Pilling: Fort Washington, Pennsylvania) was used to expose the sinus puncta in the left pyriform (Figure 2). Using a CO2 laser on an ultrapulse setting with the Acublade® system (Lumenis, Santa Clara, California), a curved line pattern (1.8-2.0 mm in length and 500 microns in depth) was used to make a mucosal incision encircling the sinus puncta and excising it at a depth of 1.5 cm. Three interrupted 6-0 Vicryl sutures were then placed to approximate the edges of the incised pyriform mucosa (Figure 4).

RESULTS

The patient was discharged on post-operative day one on a mechanical soft diet. Pathology revealed a squamous epithelial-lined tract and reactive lymphoid tissue consistent with a branchial pouch sinus. An MRI obtained eight months later showed no sinus recurrence. As of her nine month follow-up visit, she has had no symptom recurrence.

DISCUSSION

The branchial apparatus is the embryological derivative of the human pharynx. During week four of embryogenesis, it is composed of six mesodermally derived arches, demarcated by the approximation of endodermally-lined pouches from the primitive pharynx with ectodermally-lined clefts on the embryo’s external surface. Failure of mesodermal migration to obliterate these structures accounts for first and second branchial complex anomalies. However, the complex mesodermal migration of the fourth branchial structures does not adequately explain fourth branchial complex anomalies, which more likely arise later in development from the persistence of the ultimobranchial body (week seven). Reports of ultimobranchial-derived C-cells in fourth branchial pouch sinuses substantiate this theory. Furthermore, their left-side predominance may be explained by the frequent absence of a right ultimobranchial body.

The current case contributes to increasing evidence of successful endoscopic management of pyriform anomalies in adolescent and adult patients. Technical approaches have involved direct obliteration via electro-cauterization with diode or carbon dioxide lasers and chemical destruction via trichloroacetic acid or silver nitrate. These procedures are quick, relatively easy to perform, and may be done on an outpatient basis. They are less painful than the traditional approach and avoid unsightly scars and operative risk to the recurrent laryngeal nerve. Recurrence rates vary from 0-25%, with at most two procedures needed for definitive sinus closure.

CONCLUSION

Endoscopic excision of fourth branchial pouch anomalies in adults may have a theoretical decreased risk of recurrence over endoscopic cauterization while also providing technical and safety advantages over open en bloc excision.

REFERENCES