Bilateral second branchial cleft sinuses: an unusual case report and review of the literature
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Introduction
Branchial cleft anomalies are commonly seen by a practicing otolaryngologist. However, the incidence of bilateral presentation, is much rarer. It has been quoted in the English literature as occurring between 2-3% of all branchial anomalies. Previous case reports (a total of 7 to our knowledge) have all been patients who had positive family history or other syndromic associations. Our case would be the first report of an isolated bilateral 2nd branchial cleft sinuses in an otherwise asymptomatic child without any known family history or associated syndrome.

Methods
Report of a unique pediatric case of bilateral second branchial cleft sinuses and a review of the existing literature.

Case
A 4-year-old female presented to the pediatric otolaryngology clinic for evaluation of bilateral pits on the front of her neck that were present since birth. They denied ever having noticed swelling or infections of the pits, though they occasionally drained clear fluid. The child had passed her newborn hearing screen and there was no family history of hearing loss, kidney problems, or similar neck pits. A pre-operative CT scan was conducted to confirm our preoperative diagnosis and evaluate for possible thyroid involvement. Basic metabolic panels to evaluate kidney function and thyroid function tests were also obtained and were all normal. The patient was then taken to the operating room and first underwent direct laryngoscopy and had no evidence of piriform sinus pits. Both tracts were subsequently excised and followed superior to the hyoid bone where the fibrous stalk tapered and eventually ended between the internal and external carotid arteries. This was consistent with bilateral second branchial cleft sinuses. The postoperative course was otherwise unremarkable.

Discussion
During the 3rd and 4th week of gestation, distinct branchial cleft arches are formed. By the 5th week of gestation, the 1st and 2nd arches of the pharyngeal wall begin to proliferate and migrate downward to meet the epicardial ridge. This migration results in the closure of the second, third and fourth branchial clefts to the exterior world. Variations of this critical step result in branchial cleft anomalies.

Branchial cleft anomalies are relatively common and usually present unilaterally. Bilateral presentations are rare; approximately 2-3% of all branchial cleft anomalies. In our review of the literature, only 7 other reports of bilateral anomalies exist. Bolman may have been the first to describe a bilateral branchial cleft anomaly in the English literature in 1946. Randall later described a bilateral Work type 1 sinuses of the first branchial cleft. Only one case of bilateral 1st and 2nd branchial cleft cysts has been reported in a patient with a strong familial history, microtia, hypoplastic ossicles and Mondini's malformation. Most recently, Chung et al described the first bilateral intrathyroidal branchial cleft cysts in the newborn. In all of these presentations, there were positive familial histories and or associations with other anomalies. Furthermore, they all underwent eventual primary excision with no reported associated morbidity of mortality.

Conclusion
Bilateral branchial cleft anomalies are rare and can exist in the absence of family history and or syndromic associations as seen in the patient presented here. However, it is important to rule out other such associations in the work up of these patients. Understanding the branchial arch embryology helps us to better understand its anatomy and allows for safe excision. In addition, preoperative imaging can also help in operative planning and confirms the clinical diagnosis. If diagnosed at a young age, prophylactic surgical excision is recommended.