

Midline cervical sinus: a rare branchial anomaly.

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Section: Head & neck imaging

Area of Interest: Ear / Nose / Throat

Procedure: Education

Procedure: Diagnostic procedure

Imaging Technique: Image manipulation / Reconstruction

Imaging Technique: Ultrasound

Imaging Technique: CT-High Resolution

Imaging Technique: CT

Special Focus: Congenital Case Type: Clinical Cases

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Patient: 3 years, male

Clinical History:

We present the case of a 3-year-old male with a mid-line lower cervical discharging opening with a nipple-like projection just cranial to the opening since birth. No evidence of mobility during swallowing or protrusion of the tongue.

Imaging Findings:

High resolution sonography and CT-fistulography (OMNIPAQUE 300 1:1 dilution) demonstrated a short sinus tract measuring 1.8 cm in the subcutaneous plane. No deep extension / secondary tracts. No relation to the hyoid bone. No associated mass, collection or abscess.

Discussion:

Midline cervical cleft (MCC) is a rare congenital anomaly (less than 100 cases reported) due to failure of fusion of the first and second branchial arches during embryogenesis [1]. It may present as a midline defect in the anterior neck with a skin tag or sinus, or as a subcutaneous fibrous cord [1, 2].

Imaging facilitates prompt noninvasive diagnosis and furthermore helps exclude secondary tracts, an associated mass or a collection in cases of secondary infection. Ultrasound can be a useful first step to image the tract and to search for other cervical anomalies. A CT fistulogram rules out any deep extension and branching. Most cases in the literature describe a cleft variant of this anomaly, however our case demonstrates a sinus variant.

Such defects are often overlooked, misdiagnosed and inadequately treated which may lead to secondary complications such as impaired neck extension, microgenia, exostosis, torticollis, or infection [1]. Prompt diagnosis and treatment during early infancy leads to better functional and aesthetic outcomes with less complicated surgical intervention [1, 2].

Treatment consists of probing and complete excision of the neck lesion with closure of the defect by Z-plasty

technique. Fahadi et al reports excellent wound healing of the Z-plasty without wound contractures in the neck at 1 and 6 month follow up [2].

Common differentials include other pharyngeal arch anomalies:

Third and fourth branchial arch anomalies typically arise from the piriform sinus of the hypopharynx [3]. Their tract proceeds superiorly, coursing over the hypoglossal nerve and may open externally in the neck at the anteroinferior margin of the sternocleidomastoid muscle [4]. They may present with inflammatory neck masses, involving a thyroid lobe, most often on the left side [3]. Third branchial apparatus abnormalities which generally present as a fistulous tract, have a similar course to fourth arch anomalies, but exit the pharynx above the superior laryngeal nerve. Differentiation on imaging is often difficult [4].

The salient feature of second branchial arch anomalies is their course, ascending superficial to the hypoglossal nerve and stylopharyngeus muscle. They also pass between the internal and external carotid arteries and usually originate in the tonsillar fossa.

First branchial arch anomalies may present as a cystic mass or fistula posterior to the pinna (type I) or duplication of both membranous and cartilaginous portions of the external auditory canal (type II) [4].

Thyroglossal fistulae appear in the midline/paramidline location and clinically demonstrate movement with swallowing and elevation on tongue protrusion.

Differential Diagnosis List: Midline Cervical Sinus, Thyroglossal duct fistula, 3rd/4th branchial cleft sinus, Infected sinus

Final Diagnosis: Midline Cervical Sinus

References:

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- B. Thomas M. Shroff V. Forte S. Blaser A. James (2010) Revisiting Imaging Features and the Embryologic Basis of Third and Fourth Branchial Anomalies. Am J Neuroradiol 31:755– 60 (PMID: [20007720](#))
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Figure 1

a



Description: Midline lower cervical discharging opening with a nipple-like projection just cranial to the opening. **Origin:** Binston Thomas, Department of Radiology, KIMS Kottayam, Kottayam Kerala. India.

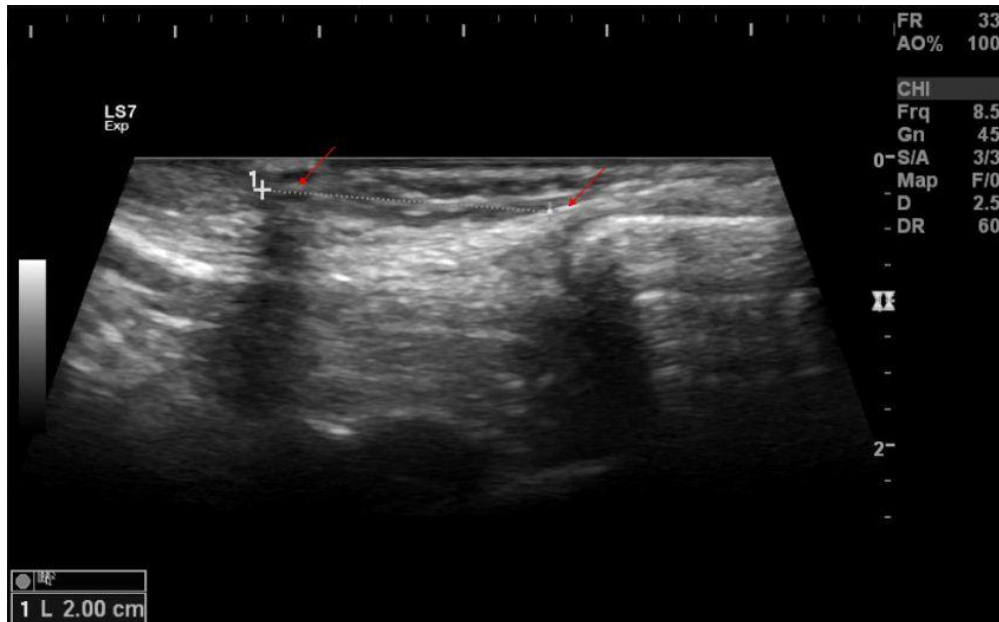
Figure 2

a



Description: Axial images: High resolution sonography demonstrated a short sinus tract measuring 1.8 cm in the subcutaneous plane **Origin:** Binston Thomas, Department of Radiology, KIMS Kottayam, Kottayam Kerala. India

b



Description: Sagittal images: High resolution sonography demonstrated a short sinus tract measuring 1.8 cm in the subcutaneous plane **Origin:** Binston Thomas, Department of Radiology, KIMS Kottayam, Kottayam Kerala. India

Figure 3

a



Description: CT fistulography (Axial): demonstrated a short sinus tract measuring 1.8 cm in the subcutaneous plane. **Origin:** Binston Thomas, Department of Radiology, KIMS Kottayam, Kottayam Kerala, India.

b



Description: CT fistulography (sagittal): demonstrated a short sinus tract measuring 1.8 cm in the subcutaneous plane. **Origin:** Binston Thomas, Department of Radiology, KIMS Kottayam, Kottayam Kerala. India.