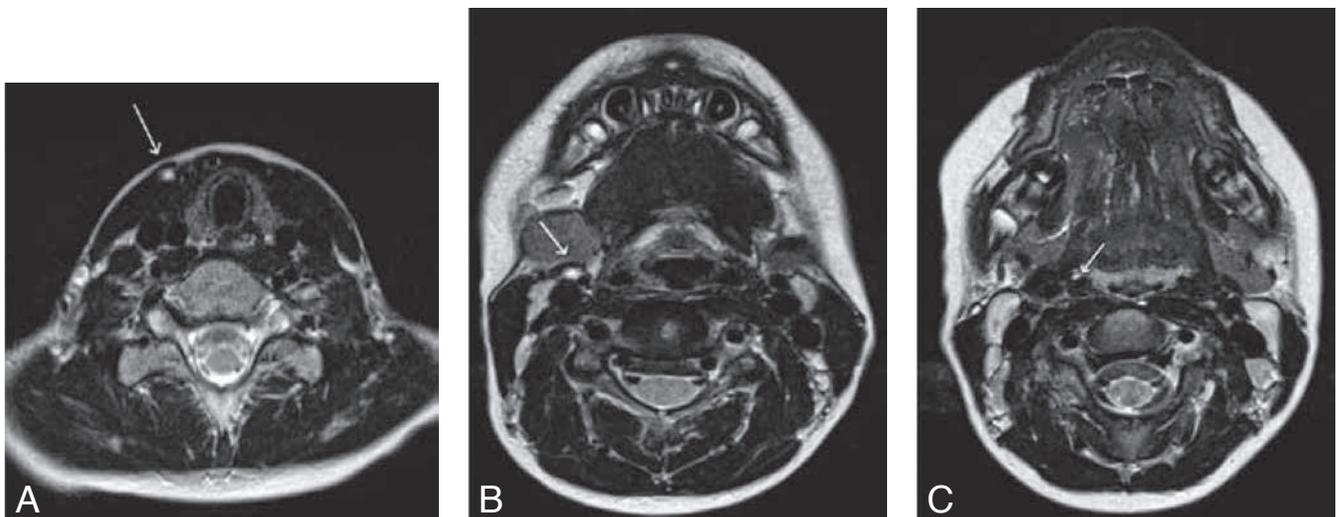
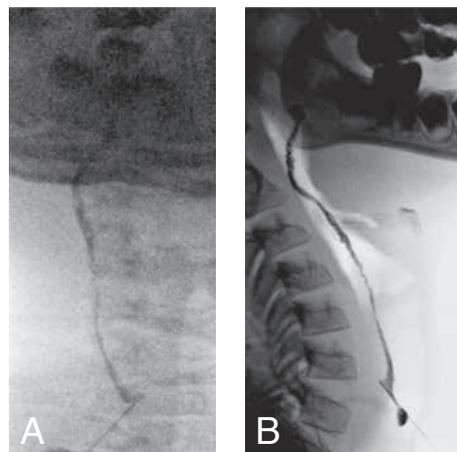


BILATERAL BRANCHIAL CLEFT FISTULA

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Key-word: Branchial cleft

Background: An 8-year-old boy was admitted to the pediatric department with two small lumps a few centimeters above the clavicles, medial from the mid-clavicular line, in a symmetrical arrangement (Fig. 1). Sometimes fluid was leaking out of the lump on the right side. During physical examination the lumps were suspected to be part of a branchial cleft abnormality. Medical history revealed microcephaly without a cause and bilateral hearing loss. The parents were consanguineous. Diagnostic tests for a genetic cause, in particular the branchio-oto-renal syndrome, were negative.



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Fig.

1A	1B
2A	2B 2C

Work-up

On clinical photograph of the neck (not shown), two small lumps a few centimeters above the clavicles, medial from the mid-clavicular line, in a symmetrical arrangement are demonstrated.

On X-ray fistulography during administration of contrast medium through the opening in the lump on the right side (Fig. 1) (A: posterior-anterior view, B: lateral view during the same procedure), contrast extends to the submandibular space.

On MRI of the neck (Fig. 2) (A: axial T2-weighted image at the level of the thyroid), small, rounded hyperintense structure at the periphery or next to the anterior border of the right sternocleidomastoid muscle is seen (arrow). On axial T2-weighted image at the level of the submandibular glands (B), the same hyperintense structure is seen dorsal to the right submandibular gland (arrow). On axial T2-weighted image at the level of the oropharynx (C), a punctiform hyperintense structure is observed in the pharyngeal mucosa (arrow). This could correspond to the cranial opening of the tract ventral to the right middle pharyngeal constrictor muscle.

Radiological diagnosis

Based on physical examination and the typical radiological findings, a *bilateral branchial cleft sinus/fistula* was diagnosed. The boy is scheduled for surgical excision.

Discussion

Branchial cleft abnormalities are cysts, sinuses or fistulas that arise because of incomplete obliteration of the branchial clefts.

Cysts have no connection with surrounding tissue, while sinuses connect with skin, and fistulas connect with both skin and pharyngeal mucosa. Anomalies of the second branchial cleft are more common than anomalies from the first, third or fourth cleft.

Branchial cleft abnormalities are congenital in origin. However, patients present at any age with complaints of swelling, painful when infected. Bilateral abnormalities are present in 2-3%, and often familial, in particular in case of the branchio-oto-renal syndrome.

Conventional neck radiographs (fistulography) can be performed if there is a connection with the skin. Following injection of contrast in the opening, the extension and course of the tract can be visualized.

On ultrasonography, especially second branchial cleft cysts are suitable for examination, due to their location anterior to the sternocleidomastoid muscle. They manifest as a sharply marginated, anechoic to hypoechoic, thin-walled lesion, with no Doppler signal in it.

CT shows a low attenuation lesion or tract with a thin wall.

On MRI it manifests as a low to intermediate signal intensity lesion on T1, high signal intensity on T2.

In our hospital, MRI is the imaging method of choice for depicting the anatomic relationships in children.

When infected, the wall of the cyst usually becomes thick and irregular, and may enhance after administration of contrast medium.

Treatment of branchial cleft anomalies consists of complete surgical excision.

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