Case 8884

Thyroglossal duct fistula

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Case Type: Clinical Cases
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Patient: 48 years, male

Clinical History:

A 48-year-old man consulted for a discharging sinus in the midline of the infrahyoid region of the neck. He had a history of a thyroglossal cyst surgical incision 5 years before at another hospital. The patient was referred for fistulography to our department.

Imaging Findings:

Cannulation of the cutaneous opening and water soluble contrast injection under fluoroscopy revealed a thyroglossal duct fistula and cystic dilatations of the duct in a suprahypoid position. The fistula extended up to the base of the tongue, at the level of the foramen caecum (Fig. 1). During the procedure the patient reported tasting of the contrast medium confirming the radiographic demonstration and the communication of the fistula with the foramen caecum.

Ultrasound, CT and MRI were performed for further investigation of the lesions. A hypoechoic ovoid lesion with a pseudosolid appearance was found during the ultrasound examination (Fig. 2). Contrast enhanced CT and MRI images depicted the main sinus tract and cystic lesions above the hyoid bone presenting mild peripheral contrast enhancement and obliteration of the surrounding fat (Fig. 3, 4). The MR signal intensity was of typical uncomplicated cysts. MRI also demonstrated part of the thyroglossal tract ascending to the base of the tongue (Fig. 4c).

A thyroid scintigram depicted the thyroid gland in its normal anatomical position and showed no presence of ectopic thyroid tissue along the thyroglossal tract (Fig. 5).

The patient underwent complete removal of the fistula with the Sistrunk surgical procedure, which entailed the removal of the thyroglossal tract remnant, the central portion of the hyoid bone, and a core of tissue including the suprahypoid tract up to foramen caecum (Fig. 6, 7). Pseudostratified ciliated epithelium and thyroid follicles in the subjacent stroma were revealed in the histological examination, findings typical of a thyroglossal duct (Fig. 8).

Discussion:

Thyroglossal duct is formed during the descent of the thyroid anlage from the foramen caecum at the base of the tongue to its final position to the anterior visceral space of the infrahyoid neck. This duct normally involutes by the 8th – 10th fetal week. If any segment of the duct persists, secretions from epithelial rests may form a thyroglossal duct cyst (TDC).

In their majority TDC occur in the region of the hyoid bone, commonly in an infrahyoid location. They also may be found at the level of the hyoid or above it. Rarely a cyst can spontaneously rupture and form a thyroglossal sinus or a branched sinus tract. Fistulous communication between the foramen caecum and the skin of the neck is very uncommon and may occur with repeated inflammation and spontaneous discharge of a TDC, following surgical
intervention or very rarely as congenital fistula.

Thyroglossal duct abnormalities (TDA) such as cysts and fistulas are located in the midline or slightly off midline in the anterior neck. The most common paramedian location is on the left side. More than half of the cases present until early adulthood and they present no gender predilection.

TDC usually manifests as an enlarging, painless mass that moves in the vertical plane upon tongue protrusion or swallowing. Many patients initially present with symptoms of cyst infection or with the formation of a draining sinus or fistula.

TDC are routinely investigated with ultrasound, which may reveal a cystic mass at the course of the thyroglossal duct in the midline. They can also be depicted by CT and more detailed with MRI, which can demonstrate the fluid content. However in case of an infected or haemorrhagic TDC, the echogenicity in US and attenuation values in CT or MRI may be variable and simulate solid lesions. Even if in some cases ultrasound and MRI may be helpful, fistulography with water soluble contrast agent represents the modality of choice in demonstrating a thyroglossal duct fistula. It provides accurate information regarding its position, the relationship to adjacent anatomical structures and the extent of the tract.

Ectopic thyroid tissue may remain anywhere along the course of the thyroglossal tract. These remnants may represent the only functioning thyroid tissue in 70% of cases and they can be detected by thyroid scintigram. About 1% of TDA are associated with thyroid carcinoma arising from the ectopic rests of thyroid tissue. In their majority these tumours are of papillary type.

The presence of calcification, nodularity and/or soft tissue mass within a TDC in CT or MRI scans may raise the suspicion of thyroglossal duct carcinoma. The diagnosis can be supported by fine needle aspiration of the TDC.

The differential diagnosis of TDC includes branchial cleft cysts, cystic hygroma, laryngocele, dermoid cyst, ectopic thymic cysts, abscess and necrotic lymph nodes.

The definite treatment for TDA is surgical. It is indicated in the presence of recurrent infections, malignancy, mass effect or for cosmetic reasons. The Sistrunk procedure has minimised the recurrence rates and constitutes the most effective surgical approach.

Differential Diagnosis List: Thyroglossal duct fistula

Final Diagnosis: Thyroglossal duct fistula

References:


Description: CECT at the upper level of the thyroid gland shows ring enhancement of the main duct and obliteration of the surrounding fat due to the prior surgery or previous infections (arrow). Origin:
Description: CECT at the level of the calcified thyroid cartilage also presents the mild enhancement of the main duct and the adjacent fat stranding (arrow). Origin:
Description: CECT cranially to the hyoid bone depicts the multiple cystic components of the sinus with peripheral enhancement. Origin:
Description: Lateral view depicts the thyroglossal tract (arrow), and a sinus dilatation in a suprathyoid position (empty arrowheads). Note the extension of the tract to the base of the tongue (empty arrow). [C:cannula, H:hyoid bone] Origin:
Description: New side branch appears in a later view starting from the level of the foramen ceacum (empty black arrow) and leading to a sinus dilatation superior to the hyoid bone (empty arrowheads) [H:hyoid bone, arrow:main tract] Origin:
Description: Anterioposterior view demonstrates the midline position of the thyroglossal tract [C: cannula]. Origin:
Description: Cannulation of the cutaneous opening. Origin:
Figure 3

Description: Sagittal T1-weighted image shows low signal of the thyroglossal sinus and cysts above the hyoid bone (arrow). Origin:
Description: Sagittal fat-suppressed T2 weighted image demonstrates the suprhyoid thyroglossal sinuses and cysts with high signal intensity (arrow) and the projection of the tract to the base of the tongue. Origin:
Description: Coronal STIR image demonstrates the high signal intensity of a cystic suprathyroid lesion (open arrow). Origin:
**Description:** Axial post gadolinium T1-weighted image shows the ring enhancement of the cysts (empty arrowhead). Note the cluster of cysts just in front of the hypopharynx (arrowhead). **Origin:**
Figure 4

**a**

Description: A fistulous ostium is noted in infrahyoid position just left from the midline. **Origin:**

**b**

Description: An elliptic excision is indicated in the presence of a fistula, previous infection or drainage procedure. **Origin:**
c

Description: The surgeon removes the middle third of the hyoid with bone-cutting forceps. Origin:

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d

Description: The thyroglossal tract has been skeletonized, and the assistant is retracting the specimen. Origin:
Description: No ectopic thyroid tissue was demonstrated in the scintigram. Origin:
Figure 6

a

Description: Surgical gross specimen (scale in centimetres and inches). Origin:

b

Description: Cut specimen showing the main thyroglossal duct and the cut middle portion of the hyoid bone. Origin:
Description: Cut specimen of the suprathyroid region demonstrates the cluster of cystic lesions. Origin:
Figure 7

a

Description: Sinus tracts lined by pseudostratified ciliated epithelium (arrow). Thyroid follicles are seen in the subjacent stroma (arrowheads) [HE x200]. Origin:

b

Description: Sinus tract lined by pseudostratified ciliated epithelium. Secondary inflammation cells are seen in the subjacent stroma [HE x400]. Origin:
Figure 8

Description: Ultrasound examination just above the thyroid isthmus shows an ovoid hypoechoic lesion, surrounded by hyperechoic tissue (open arrow). No clear posterior enhancement was noted. Origin:

Description: Doppler US revealed a subtle flow in the periphery of the lesion (open arrow). Origin: