CASE REPORT

Neck abscess associated with a piriform fossa sinus tract in an adult

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SUMMARY

Perithyroidal inflammatory masses deriving from developmental remnants of the 3rd and 4th brancial pouches are rare. We report a case of an otherwise healthy 31-year-old man, who presented with fever and swelling of the left side of the neck. Neck ultrasound showed a displaced left thyroid lobe with induration of the strap muscles. Fine-needle aspiration biopsy revealed pus, positive for *Staphylococcus aureus* species. Antibiotic treatment led to rapid clinical improvement and reversal of imaging features, without the need for surgical intervention. This rare clinical entity should be always considered in the differential diagnosis of an inflammatory neck mass.

BACKGROUND

Our case features a combination of interesting characteristics that have not been previously observed. Usually, the first presentation of neck abscess associated with a piriform fossa sinus tract in an adult that had not been preceded by past episodes, precipitated by vomiting, with no thyroid involvement and conservative recovery, after long-term follow-up. Differential diagnosis should always include other inflammatory masses of the neighbouring structures of the neck, as well as thyroid gland involvement.

CASE PRESENTATION

A 31-year-old bartender presented with mild discomfort on the left side of the neck, low-grade fever up to 37.8°C, malaise and dysphagia of 1-week duration. He had no significant medical history and was not taking any medications. He denied the use of tobacco, alcohol or illicit drugs and had not travelled abroad. On persistent questioning, he recalled an episode of vigorous vomiting 10 days prior to the onset of symptoms with no apparent associated illness.

On physical examination, he was comfortable at rest, had a temperature of 37.2°C and had normal vital signs. Examination of the thyroid showed a normal right lobe and a stony hard diffuse swelling of the left side of the neck, extending from the angle of the jaw to the clavicle. There was no inflammation of the overlying skin and the oropharynx was clear.

INVESTIGATIONS

Laboratory tests showed white blood cell count 15 000/ μ L (with 85% neutrophil shift), erythrocyte sedimentation rate (ESR) 75 mm/h (normal 0–20), C reactive protein 191 mg/L (normal <5), thyroid

stimulating hormone (TSH) 2.31 μ IU/mL (normal 0.5–5), negative thyroid antibodies and serum calcitonin 2.8 pg/mL (normal <10). Investigation for viral hepatitis and HIV was negative, as it was for other viral markers (Ebstein-Barr virus, herpes simple virus and cytomegalovirus) and *Brucella*. Interestingly, he had a weakly positive Mantoux reaction.

CT scan of the cervical area revealed a normal right lobe and a disorganised, heterogenous mass anterior to the left thyroid lobe, with a maximum width of 28 mm and depth of 29 mm on transverse plane (figure 1A). Oedema was noted at the area of the left piriform fossa. The lesion involved the strap muscles sternothyroid, sternohyoid and possibly the medial head of the sternocleidomastoid, with blurring of fascia borders and extension to the thoracic outlet behind the clavicle (figure 1A).

Direct pharyngoscopy was performed, which showed oedema at the area of the left piriform fossa and retrocricoid area, but no sinus pit was recognised. Ultrasound-guided fine needle aspiration of the mass macroscopically yielded purulent material and approximately 5 ml of pus was drained. Cytology showed abundant polymorphonuclear cells in a background of necrotic material. Culture of the fluid grew *Staphylococcus aureus* species.

TREATMENT

The patient was placed on intravenous vancomycin for 5 days, with rapid improvement of signs and symptoms and was discharged on oral ciprofloxacin for 1 month.

OUTCOME AND FOLLOW-UP

Repeat direct pharyngoscopy on discharge was negative. Three weeks from the initiation of antibiotic treatment, a cervical MRI demonstrated an improvement in the soft tissue appearances (figure 1B).

DISCUSSION

Perithyroidal inflammatory masses are commonly the result of cervical developmental remnants¹. Most branchial cleft anomalies (>98%) involve the first and second pouches, so that 3rd and 4th brancial pouch remnant sinuses are exceedingly rare.^{1 2} They both originate at the apex of the piriform sinus fossa at the hypopharynx.

Differentiating the derivation of a sinus between a 3rd brancial pouch, the thymopharyngeal duct of the 3rd pouch, 4th branchial pouch or the ultimobranchial body of the 4th pouch is often neither

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Figure 1 (A) CT scan of the hypopharynx during the acute stage, at the level of the piriform fossae. (B) Transverse and coronal MRI images during convalescence, indicating improved appearance.

possible nor necessary for achieving surgical cure.^{1 2} However, delineation of the tract with CT imaging and/or barium esophagography is successful in most cases³ and when needed, direct laryngoesophagoscopy and/or perioperative catheterisation can aid to successful extirpation.⁴

The evidence to the existence of a pathological tract may be indirect, such as swelling at the apex of the piriform sinus or the presence of pus in the hypopharynx. Barium swallow in the acute or subacute phase may be negative owing to oedema. Once in convalescence, the tract can be seen in 50–100% of cases by barium swallow.^{3 4}

First, the presence of thyroid involvement is important because excision of the ipsilateral (usually left) lobe is necessary for surgical cure and second, coexisting thyrotoxicosis may cause perioperative complications. Apart from suppurative thyroiditis, subacute thyroiditis, anaplastic thyroid carcinoma, thyroid lymphoma and intrathyroidal haematoma must also be included in the differential diagnosis.⁴

Our case features a combination of interesting characteristics that have not been previously observed: his first presentation in adulthood had not been preceded by past episodes, was precipitated by vomiting, had no thyroid involvement, recovered conservatively and has not demonstrated any recurrences after long-term follow-up. To our knowledge, a few similar cases have been described in the literature so far.^{1 2 5}

In conclusion, we described a rare case of neck abscess associated with a piriform fossa sinus tract in an otherwise healthy adult, as result of infection by *S aureus*. Differential diagnosis should always include other inflammatory masses of the neighbouring structures of the neck, as well as thyroid gland involvement. After short-term conservative medical treatment with antibiotics, complete resolution without recurrence was achieved.

Learning points

- ▶ Perithyroidal inflammatory masses are commonly the result of cervical developmental remnants. Most branchial cleft anomalies (>98%) involve the first and second pouches, so that the 3rd and the 4th branchial pouch remnant sinuses are exceedingly rare.^{1 2} They both originate at the apex of the piriform sinus fossa at the hypopharynx.
- ▶ The evidence to the existence of a pathological tract may be indirect, such as swelling at the apex of the piriform sinus or the presence of pus in the hypopharynx. Barium swallow in the acute or subacute phase may be negative owing to oedema. Once in convalescence, the tract can be seen in 50–100% of cases by barium swallow.^{3 4}
- ▶ The presence of thyroid involvement is important because excision of the ipsilateral (usually left) lobe is necessary for surgical cure, and second coexisting thyrotoxicosis may cause perioperative complications. Apart from suppurative thyroiditis, subacute thyroiditis, anaplastic thyroid carcinoma, thyroid lymphoma and intrathyroidal haematoma must also be included in the differential diagnosis.
- ▶ We described a rare case of a neck abscess associated with a piriform fossa sinus tract in an otherwise healthy adult, as result of infection by *Staphylococcus aureus*. Differential diagnosis should always include other inflammatory masses of the neighbouring structures of the neck, as well as thyroid gland involvement.

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