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Retropharyngeal Effusion in Acute Calcific Prevertebral Tendinitis: Diagnosis with CT and MR Imaging

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Summary: Three patients with the diagnosis of acute calcific prevertebral tendinitis underwent CT or a combination of CT and MR imaging, which showed previously described findings of calcifications within the tendons of the longus colli muscles. In addition, however, we detected a retropharyngeal effusion in all three patients. The importance of this finding lies in the need to differentiate this effusion from retropharyngeal infection.

We present three cases of fluid collections in the retropharyngeal space associated with acute calcific prevertebral tendinitis, an inflammatory condition caused by deposition of calcium hydroxyapatite in the superior oblique tendon fibers of the longus colli muscles. A knowledge of this association as well as the pathognomonic clinical and imaging findings in this entity can prevent misdirected medical therapy and inappropriate attempts at surgical drainage.

Case Reports

Case 1

A 31-year-old woman with a 3-day history of neck stiffness and sore throat was seen at an outside institution. CT and MR imaging studies were obtained, and on the basis of those findings, she was transferred to our institution with the diagnosis of retropharyngeal abscess. On arrival, her temperature was 37.2°C, the neck had a limited range of motion, and the posterolateral portion of the neck was tender at palpation. There was no history of trauma, upper respiratory infection, or dental problems. No lymphadenopathy was noted and there was no redness or bulging of the oro- or nasopharynx. The WBC count at that time was 12,800 per cubic millimeter with no increase in percentage of neutrophils or immature band forms. Erythrocyte sedimentation rate was 31 mm per hour. Unenhanced CT (Fig 1A) and MR imaging (Fig 1B) studies from the outside hospital revealed a retropharyngeal space fluid collection and calcifications within the tendons of the longus colli muscles near their insertions on C1. The diagnosis of acute calcific prevertebral tendinitis was made and the patient was started on a regimen of nonsteroidal anti-inflammatory drugs (NSAIDS), with prompt clinical improvement noted.

Case 2

A 40-year-old man had a 2-week history of waxing and waning neck pain. No history of trauma, upper respiratory infection, or dental problems was elicited. On examination, his temperature was 37.4°C, there was limited range of neck motion, and no masses or adenopathy. The WBC count was 9200 per cubic millimeter, and measured serum electrolyte concentrations were normal. A contrast-enhanced CT scan (Fig 2) revealed a fluid collection smoothly expanding the retropharyngeal space. Tendinous calcifications were seen within the longus colli superiorly. Because of the retropharyngeal fluid collection and concern over the possibility of an abscess, the patient was admitted to the hospital and started on a regimen of oral amoxicillin with clavulanic acid and oral NSAIDS, with marked improvement noted 5 days after admission. At no time was the patient in a clinically toxic condition.

Case 3

A 50-year-old woman had a 10-day history of sore throat and neck pain. She was afebrile at the time of admission, and findings at endoscopic examination were normal. Throat cultures were negative. A CT study (Fig 3) revealed a retropharyngeal space fluid collection and calcifications within the superior tendinous fibers of the longus colli. She improved after 5 days on a regimen of intravenous antibiotics and intravenous dexamethasone.

Discussion

The longus colli muscle (Fig 4) is a bilaterally paired neck flexor that, along with the longus capitis muscles, makes up the bulk of the prevertebral space. The prevertebral space is delimited anteriorly by the deep layer of deep cervical fascia, and is separated by it from the retropharyngeal space. The retropharyngeal space is a fat and lymph node containing deep neck space separated from the visceral space anteriorly by the middle layer of deep cervical fascia. It is separated laterally from the parapharyngeal spaces by the sagittal partition (cloison sagittale) and posteriorly from the prevertebral space by layers of the deep layer of deep cervical fascia (1).

The retropharyngeal space is prone to infection in children, immunocompromised patients, and persons

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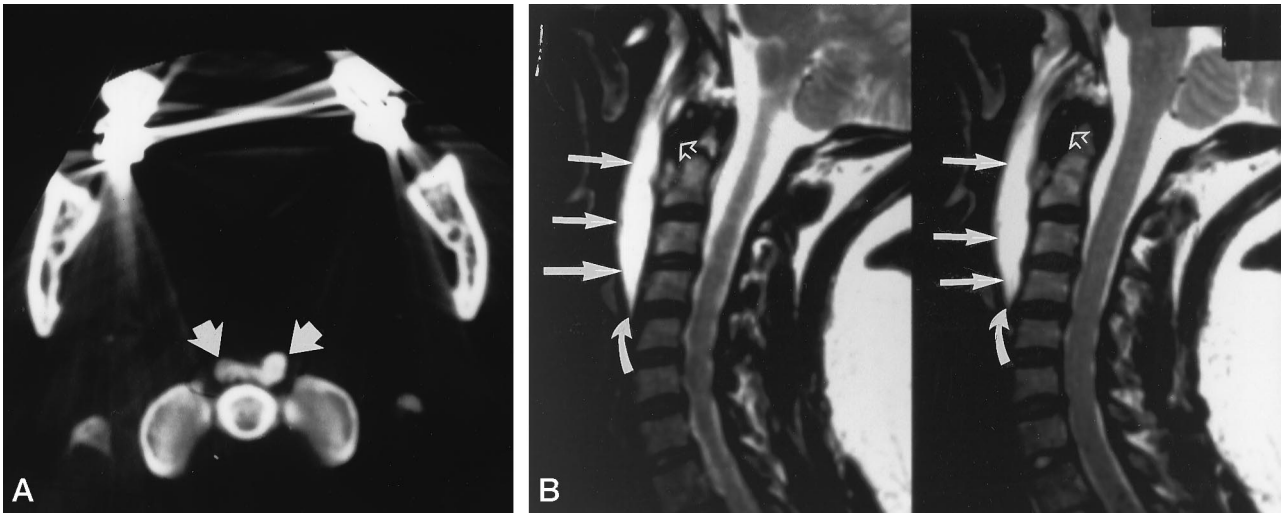

FIG 1. Case 1: 31-year-old woman with 3-day history of neck stiffness and sore throat.
A, CT scan shows the presence of calcific density (*arrows*) within the superior tendons of the longus colli at the C1–C2 level.
B, T2-weighted MR image shows retropharyngeal fluid (*straight arrows*) with acute inferior margin (*curved arrow*) and low signal calcifications in the longus colli tendons (*open arrows*).

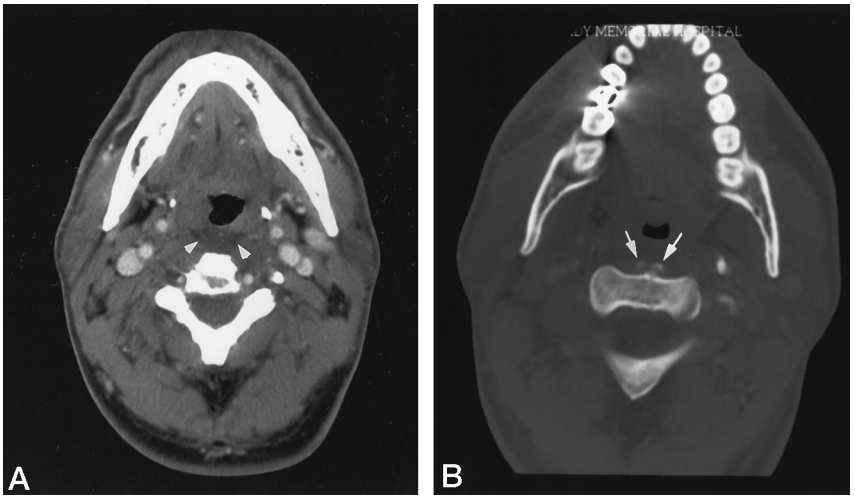

FIG 2. Case 2: 40-year-old man with 2-week history of waxing and waning neck pain.
A and *B*, Contrast-enhanced CT scans show fluid smoothly expanding the retropharyngeal space (*arrowheads, A*) and typical tendinous calcifications within the longus colli (*arrows, B*).

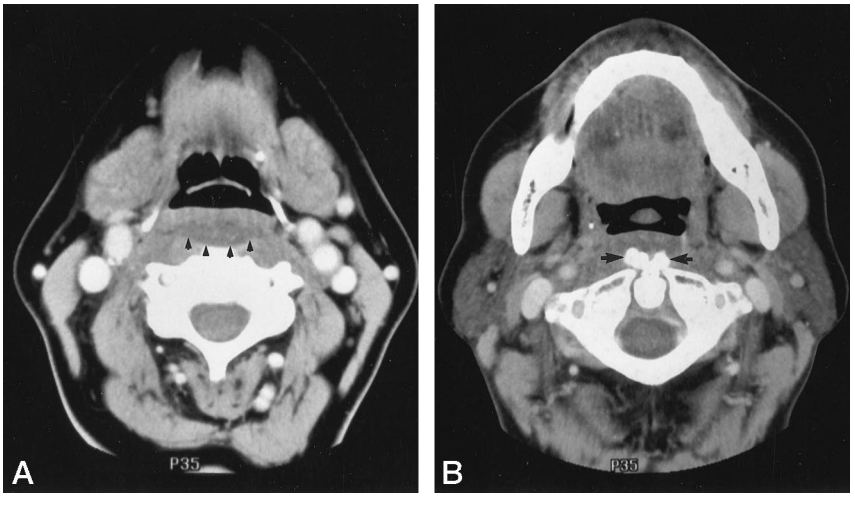

FIG 3. 50-year-old woman with 10-day history of sore throat and neck pain.
A and *B*, Contrast-enhanced CT scans show smooth expansion of the retropharyngeal space (*arrowheads, A*) and nearly identical calcifications within the longus colli tendons (*arrows, B*).

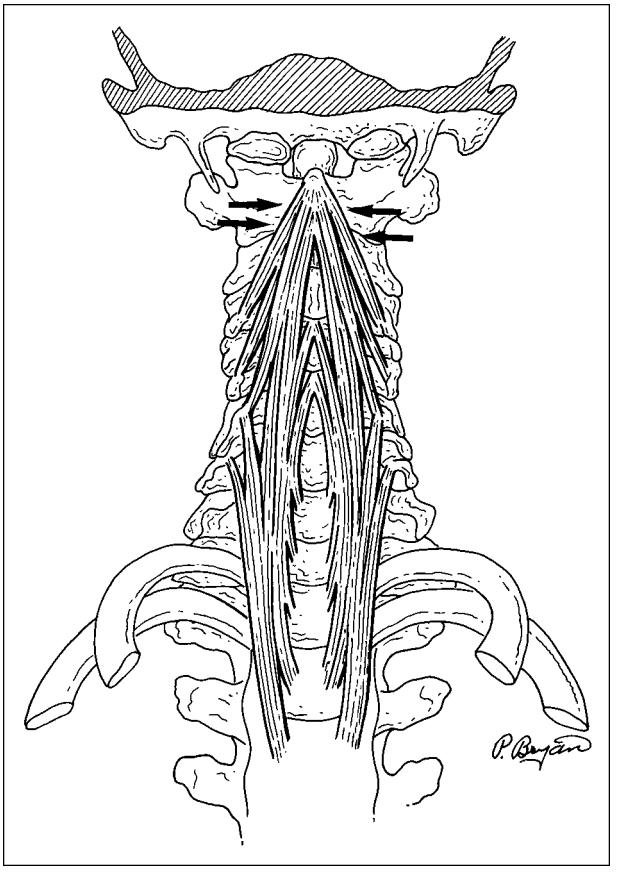

FIG 4. The paired longus colli muscles. The superior oblique fibers (*arrows*) are those involved in acute calcific prevertebral tendinitis.

who have sustained penetrating neck injuries. The most common pattern of retropharyngeal infection is lymphadenitis with subsequent suppuration. Edema may occur in the retropharyngeal space during this phase of infection, appearing as a smooth expansion of the retropharyngeal space by mucoid or water attenuation without evidence of an enhancing rim. When a suppurated lymph node ruptures into the retropharyngeal space, a true retropharyngeal abscess may form with an enhancing wall as its imaging hallmark. Edema in the retropharyngeal space may also occur as an expected side effect of therapeutic radiation to the area, or as a sequela to resection of a jugular vein.

The prevertebral space may be involved secondarily by diseases primary to the spine, such as tumor and infection. Primary prevertebral disease, such as in acute calcific prevertebral tendinitis, is relatively uncommon.

Acute calcific prevertebral tendinitis, also known as calcific retropharyngeal tendinitis and calcific tendinitis of the longus colli, is a clinical syndrome that was described originally by Hartley in 1964 (2) and was shown by Ring and colleagues in 1994 (3) to be due to hydroxyapatite deposition disease. The condition affects adults within a reported age range of 21 to 81 years, although most patients are between 30 and 60 years old (4). The presumed mechanism of disease is deposition of crystals with secondary inflammatory tendinitis, such as is seen in other locations in the body, notably the shoulder. The pathognomonic radiographic findings have been repeatedly and consistently described in the literature (2, 4–10) and consist of calcific (nonosseous) density in the prevertebral (or retropharyngeal) soft tissues on the lateral radiograph of the neck, typically at the C1–C2 level, as well as associated soft-tissue swelling. Reports of this diagnosis with CT have confirmed the location of the calcific density within the superiormost fibers of the longus colli tendons and have indicated that the greater contrast resolution of CT makes it a more sensitive technique than plain radiography for the detection of such calcification (8). Although retropharyngeal space soft-tissue swelling has previously been described in association with this entity, the specific finding of a retropharyngeal effusion has not, to our knowledge, been described with acute calcific prevertebral tendinitis. We realize that diffuse edema in a fat-containing space could in theory have a similar appearance to a discrete fluid collection on CT and MR studies; however, we believe that, based on the imaging features described above, especially those on the MR studies, the term *fluid* or *effusion* is more accurate for our cases.

The importance of this distinction in terminology results from the potential of such an appearance to be mistaken for retropharyngeal space infection if four key observations are not made: 1) the fluid smoothly expands the retropharyngeal space in all directions; 2) there is an absence of an enhancing wall around this fluid, as would be seen in a true retropharyngeal space abscess; 3) there is absence of associated suppurative (or presuppurative) retropharyngeal space lymph nodes with low-attenuation centers; and 4) there are pathognomonic tendinous calcifications within the longus colli, which clinch the diagnosis of acute calcific prevertebral tendinitis. The clinical suspicion of infection before imaging is usually moderate, based on the typical presentation of acute to subacute onset of neck pain, dysphagia, or odynophagia; mildly elevated WBC count; and low-grade fever. Erythrocyte sedimentation rate may be mildly elevated, and there may be a recent history of upper respiratory infection or minor trauma to the head or neck.

Conclusion

We emphasize that the finding of a retropharyngeal fluid collection smoothly enlarging the retropharyngeal space should prompt the radiologist to search for evidence of calcifications within the superior tendons of the longus colli, particularly at the C1–C2 level. If found, and in the absence of compelling imaging or clinical evidence of acute bacterial infection, the diagnosis of acute calcific prevertebral tendinitis should be made, and, along with it, the recommendation of appropriate therapy with anti-inflammatory medications.

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