Trochlear calcification - Mimicker of intra-orbital foreign body
Published on 24.10.2017

DOI: 10.1594/EURORAD/CASE.15159
ISSN: 1563-4086
Section: Head & neck imaging
Area of Interest: Eyes
Procedure: Diagnostic procedure
Technique: CT
Special Focus: Foreign bodies Case Type: Anatomy and Functional Imaging
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Patient: 54 years, male

Clinical History:
A 54-year-old man with no known medical history presented following a road traffic accident complaining about loss of consciousness for a short time and left peri-orbital haematoma. On examination, his visual fields and eye movements were normal. He had no neurological deficit, but underwent brain CT to exclude intracranial pathology.

Imaging Findings:
A computed tomography (CT) on brain and orbits showed fractures of the lateral and inferior walls of the left orbit (Fig. 5) with no intracranial bleed.

Inverted "U" shaped hyperdensities were observed within both orbits at their superomedial aspect, adjacent to superior oblique muscles (Fig. 1, 2).

Such hyperdensity represents incidental trochlear calcification (Fig. 4), which can mimic an intra-orbital foreign body, especially in trauma cases.

Avulsion of the superior oblique muscle is also a possibility. However, clinical suspicion of this injury was low in our case due to lack of signs of superior oblique muscle palsy.

Discussion:
The trochlea is a 'U' shaped fibro-cartilaginous pulley attached to the frontal bone in the superior nasal quadrant of the orbit. Its main function is to allow unimpeded movement of the superior oblique muscle.

The superior oblique muscle, which arises from the orbital apex just above the annulus of Zinn, passes anteriorly and upwards along the superomedial wall of orbit before gradually becoming tendinous and passing through the trochlea (Fig. 3). At this point, it turns posterolaterally, lying below the superior rectus muscle, before inserting into the posterolateral surface of sclera behind the equator of the globe [1-6].
The equator of the globe is an imaginary line encircling the globe, perpendicular to the axis of the eye and equidistant from the anterior and posterior poles. Due to its insertion posterior to the equator and on the temporal aspect of the globe, contraction of the superior oblique muscle internally rotates, abducts and depresses the globe.

The prevalence of trochlear calcification varies from 3-16%, as reported by several authors [1-3]. The exact aetiology of such calcification remains unknown. Hart et al reported an association of diabetes mellitus with trochlear calcification [2]. However, subsequent studies have shown conflicting results [3, 6].

The distinction between incidental trochlear calcification and an intra-orbital foreign body is important, particularly in the setting of orbital trauma. Shriver et al reported a case whereby trochlear calcification was reported as a metallic foreign body by the radiologist [4]. As a result, the patient underwent unnecessary surgical exploration. Xiao et al also reported several cases of misinterpretation of this calcification as a foreign body in their study [5].

We believe that there are certain clues that we can use to differentiate trochlear calcification from a foreign body:
- Location: trochlear calcification is located adjacent to the superomedial wall of orbit. Calcification elsewhere is likely to represent a foreign body.
- Morphology: This varies significantly. However, Xiao et al reported 3 common types of trochlear calcification - comma-shaped, dot-shaped, and an inverted "U" appearance [5].
- Symmetry: Up to 47% of trochlear calcification is bilateral [1, 4].

In summary, trochlear calcification is common and can be misinterpreted as a foreign body in orbital trauma cases. Therefore, it is important for radiologists and ophthalmologists to be aware of this entity to prevent misdiagnosis and subject the patient to unnecessary surgery.

**Differential Diagnosis List:** Trochlear calcification, Intra-orbital foreign body, Fracture bony fragment, Superior oblique muscle avulsion

**Final Diagnosis:** Trochlear calcification

**References:**
Figure 1

Description: Bilateral trochlear calcification (yellow arrows). Note the inverted "U" shaped morphology on the left and comma-shaped morphology on the right. Origin: Department of Radiology, Sarawak General Hospital, Malaysia
Description: Bilateral trochlear calcification (yellow arrows). Origin: Department of Radiology, Sarawak General Hospital, Malaysia
Figure 3

**Description:** Left lateral orbital wall fracture (red arrow). **Origin:** Department of Radiology, Sarawak General Hospital, Malaysia
Description: Image demonstrating the relationship between the left superior oblique muscle (red and green arrows) and the calcified trochlear (yellow arrow). Note that the muscle makes a posterior course after passing through the trochlear. Origin: Department of Radiology, Sarawak General Hospital, Malaysia.
Description: Figure demonstrating the relationship between the superior oblique muscle and trochlear.
Origin: Grey's Anatomy for Student