Self-limiting sternal tumours of childhood (SELSTOC): a trap for physicians
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Section: Paediatric radiology
Area of Interest: Thoracic wall
Procedure: Localisation
Procedure: Diagnostic procedure
Procedure: History
Technique: Conventional radiography
Technique: Ultrasound
Technique: Ultrasound-Colour Doppler
Technique: Image manipulation / Reconstruction
Special Focus: Tissue characterisation Neoplasia Case
Type: Clinical Cases
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Patient: 12 months, female

Clinical History:

A 12-month-old Caucasian girl was seen in the Emergency Department for a sternal swelling, which had developed the day before, without any prior trauma. There were no others symptoms or history. Examination revealed a 3 cm-long solitary inflammatory mass in the right para-sternal region. The overlying skin was discoloured (Fig 1). Infection parameters were normal.

Imaging Findings:

X-ray examination showed a soft tissue swelling without any calcification or underlying bone anomaly (Fig 2). An ultrasound examination was performed. Use of a 9 MHz linear probe revealed a pre-sternal soft tissue swelling associated with a 14 x 13 x 7 mm hypo-echoic, inhomogeneous mass. This mass had a dumbbell shape with irregular outlines. It was not connected to the adjacent structures: bone or muscle (Fig 3). The Doppler ultrasound showed poor vascularization (Fig 4).

Discussion:

A. Background:
Chest wall tumours are rare in childhood and can be divided into benign and malignant tumours [1-4]. These constitute only a minority of primary malignancies in childhood, about 1.8% of all paediatric neoplasms [5]. Since 1994, three studies [6-8] reported several cases of acute sternal tumours with neither neoplastic nor infectious origin, called self-limiting sternal tumour of childhood (SELSTOC) by Winkel et al. [8]. The aetiology of this tumour remains uncertain, with probably traumatic factors and immunological increased response in young children. Active or chronic unspecific inflammation and sterile culture were found in histological evaluation.

B. Clinical Perspective:
These acute sternal tumours occur in very young children (median age 16 months [6-8]) with few symptoms and no signs of general illness. The physical examination reveals an isolated pre or parasternal solid tumour, which can be painful, with local heat and a red/blue coloured skin. The biological analyses (C-reactive protein or blood cell counts) are normal. These tumours show spontaneous resolution within 6 months. Therefore imaging is very useful, as there are typical findings that can help identify this entity and avoid invasive
surgery.

C. Imaging Perspective:
X-ray reveals soft tissue swelling without any bony involvement. Computed tomography and MRI frequently observe increased distance between ossification centres of the sternum due to inflammation of the cartilage. But the most informative examination is ultrasonography. It shows, as in our case, soft tissue swelling around a typically dumbbell-shaped, poorly vascularized tumour. These are hypo-echoic, inhomogeneous masses which have irregular contours [6-8].

D. Outcome:
Paediatric radiologists should be aware of such an entity, and when faced with a rapidly growing tumour in young children with no general illness, they should look for these ultrasound findings. Thus, an invasive procedure can be avoided and the patient closely monitored clinically.

E. Take Home Message, Teaching Points:
A SELSTOC is a benign sternal swelling occurring in childhood, but rapidly growing, so it is alarming. The typical ultrasonographic dumbbell-shaped sign associated with young age and lack of general features should advocate an attitude of expectation and close follow-up.

**Differential Diagnosis List:** Self-limiting sternal tumour of childhood (SELSTOC), Ewing’s sarcoma, Rhabdomyosarcoma, Lymphoma, Aneurysmal bone cyst, Haemangioma, Osteomyelitis

**References:**
**Figure 1**

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**Description:** Self-limiting sternal tumour at diagnosis, with red/blue discoloured skin

**Origin:** Department of pediatric surgery, CHU de Caen, avenue de la côte de Nacre, 14033 Caen cedex 9, France
**Figure 2**

Description: Chest X-ray of a sternal soft tissue swelling without any bony involvement

Origin: Department of pediatric radiology, CHU de Caen, avenue de la côte de Nacre, 14033 Caen cedex 9, France
**Figure 3**

*Description:* Doppler showing a poorly vascularized tumour *Origin:* Department of pediatric radiology, CHU de Caen, avenue de la côte de Nacre, 14033 Caen cedex 9, France
Figure 4

Description: Ultrasound of a dumbbell-shaped sternal tumour

Origin: Department of pediatric radiology, CHU de Caen, avenue de la côte de Nacre, 14033 Caen cedex 9, France