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Point of care Ultrasound in skin lesions, an atypical case report.

Ecografía en el punto de atención en lesiones cutáneas, reporte de un caso atípico

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Abstract

INTRODUCTION: The use of ultrasound for soft tissue injuries in pediatric emergency medicine is increasing progressively. Ultrasound can be an invaluable tool for the description of skin disorders, evaluation of the need for abscess drainage and discrimination between invasive and non-invasive lesions.

PRESENT CASE: Patient with an unusual finding in soft-tissue ultrasound that led to additional complementary studies.

CONCLUSIONS: Self-limiting sternal tumors of childhood (SELSTOC) usually present as an area of rapid soft-tissue growth and inflammation located in the pre-sternal region. The nature of this condition means that the lesion is self-resolved before any association with previous trauma or infection can be established.

THEREFORE, we must be aware of this entity and the different diagnostic and therapeutic approaches because recognizing SELSTOC typical features can avoid unnecessary diagnostic tests and/or disproportionate therapeutic strategies, unless we find atypical features in the ultrasound, as was our case.

KEYWORDS: POCUS, SELSTOC, Childhood.

Resumen

INTRODUCCIÓN: El uso de la ecografía en las lesiones cutáneas en la medicina de urgencias pediátricas está aumentando progresivamente. La ecografía puede ser una herramienta inestimable para la descripción de lesiones cutáneas, la evaluación de la necesidad de drenaje de abscesos y la discriminación entre lesiones invasivas y no invasivas.

CASO CLÍNICO: Paciente con un hallazgo inusual en la ecografía de partes blandas que motivó la realización de estudios complementarios adicionales.

CONCLUSIONES: Los tumores esternales autolimitados de la infancia (SELSTOC) suelen presentarse como un área de rápido crecimiento e inflamación de los tejidos blandos localizada en la región pre-esternal. La naturaleza de esta afección hace que la lesión se autolimita antes de que pueda establecerse cualquier asociación con un traumatismo o infección previos. Debemos ser conscientes de esta entidad y de sus diferentes enfoques diagnósticos y terapéuticos, ya que el reconocimiento de los hallazgos típicos puede evitar medidas diagnósticas inútiles o estrategias terapéuticas desproporcionadas, salvo si encontramos hallazgos atípicos en la ecografía, como fue nuestro caso.

PALABRAS CLAVE: Ecografía clínica, Lesión esternal benigna, Infancia.

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BACKGROUND

Point of care ultrasound (POCUS) is a diagnostic tool that enables the basic characterization of skin lesions and is becoming essential in the pediatric evaluation. The aim of soft tissue clinical ultrasound is not to accurately identify skin lesions, but rather to allow the description and extent of the process and differentiate solid lesions from cystic and vascular lesions. This evaluation helps avoiding biopsy and further work-up. Most pediatric skin lesions are benign and do not require additional studies, although some clinical and ultrasound characteristics may lead to further investigation, as in our case¹⁻⁴

CLINICAL CASE

A 19-month-old infant was admitted to the pediatric emergency department with a skin lump located over the lower third of the sternum. This lesion initially presented as a small, hard skin lesion that turned into an erythematous swollen area after 12 days. No other signs or symptoms, such as fever, infective process, or previous trauma, were noted.

Physical examination revealed an erythematous lump in the presternal region, with tenderness and central red fluctuant swelling in the affected area (**Figure 1**). The patient reported no pain. There were neither peripheral lymphadenopathies nor previous history of wounds.

Further work-up included blood tests that showed no abnormalities and chest X-rays (**Figure 2**). Subsequently, point-of-care ultrasound was performed, which revealed a pseudonodule image reaching the subcutaneous tissue. More precisely, the ultrasound finding was a nonhomogeneous lesion with several pinpoint focal echogenic images and sparse and highly vascularized areas. Emerging from the lesion, a deep internal path closely related to the sternal surface was observed, even in continuity with



Figure 1. Photograph of 2.5 x 2.5 cm raised erythematous lump in the presternal region, over the xyphoid apophysis, with central red area.



Figure 2. Lateral chest radiograph demonstrating increased density of the surrounding soft tissue.

the sternoxiphoid joint. The adjacent bone structures (sternum) and muscles were not affected. **Figure 3**

The initial differential diagnoses included an infectious-inflammatory process in the subcuta-

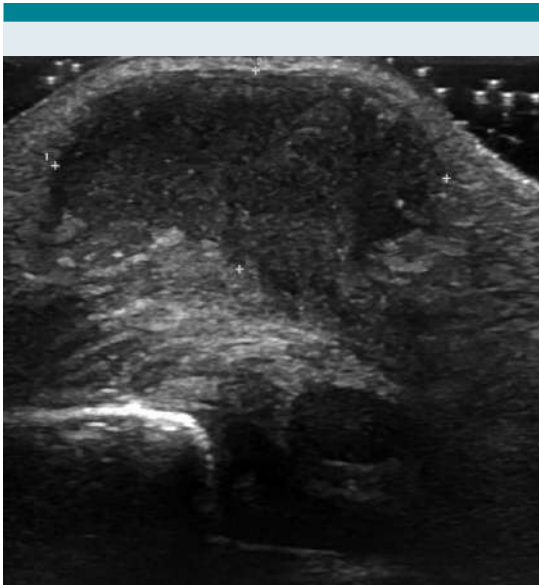


Figure 3. Linear transducer in the transverse plane showing a multiloculated hypoechoic nodule-shaped mass in the subcutaneous cellular tissue with focal echogenic images.

neous tissue and a soft tissue abscess formation secondary to sternal osteomyelitis.

Following the initial evaluation, the patient was transferred for hospitalization, additional examinations, and antibiotic treatment. Magnetic resonance imaging (**Figure 4**) revealed a small superficial abscess, a deep communication pathway, and prominent inflammatory changes in the surrounding soft tissues (posing differential diagnosis between SELSTOC and osteomyelitis of the distal edge of the sternum/xyphoid).

The patient remained hospitalized for seven days and received intravenous cefazolin treatment. A surgical incision revealed friable and necrotic tissue that extended to the cortical layer of the sternum. The cultures were negative and histological examination confirmed the diagnosis of SELSTOC (underlining a collection of inflam-



Figure 4. Magnetic resonance imaging in sagittal view showing altered signal intensity of the xiphoid process and a marked volume increase in the surrounding soft tissue. Additionally, it shows a focal area of high signal density on T2 weighted image, low signal density on T1, ring-enhancing shape, and restricted water diffusion.

matory cells in the middle and deep dermis including histiocytes, abundant plasma cells, macrophage cells and some punctate microcalcifications. No specific germs were evident).

Subsequent clinical and ultrasound evaluations confirmed a positive clinical course with complete resolution of the lesion. **Figure 5**

DISCUSSION

Ultrasound is an accessible and easy-to-apply instrument for the assessment of soft tissue le-



Figure 5. Photograph of the remaining lesion after four weeks.

sions when the mass under consideration is superficial and its size is less than 5 cm². It helps avoid unneeded work-up in a large number of patients while preventing delayed diagnosis in others.⁴ Knowledge of the characteristics and typical findings is helpful in the initial evaluation.⁵ Particularly, when facing sternal masses in childhood, the differential diagnosis includes a wide variety of benign or malignant, inflammatory and infectious processes.^{5,6,7,8}

SELSTOC was first described in the scientific literature in 2010 as a part of a retrospective study including 1700 patients with sternal masses. Winkel et al. noticed that 14 individuals in this sample presented with self-limited and fast-growing tumors, in the absence of infectious or neoplastic etiology, with spontaneous regression in all cases. They showed a particular morphology on ultrasound studies (dumbbell-shaped

appearance). Consequently, this finding was defined as a benign aseptic inflammatory process of unknown origin that tends to regress in a period of 6–18 months.^{4, 5}

It is important to consider SELSTOC when evaluating sternal masses in the absence of local and systemic infectious findings, rapid local growth, and lack of aggressiveness in imaging studies such as invasion of the sternum, pleura, or rib ossification center, steadiness in size in subsequent controls, and tendency to spontaneous resolution.^{5,7} Nevertheless, atypical descriptions in imaging studies might be found and, in these situations, some caution is recommended before confirming a final diagnosis.¹

CONCLUSIONS

The ultrasound examination in most cases reveals some typical characteristics: dumbbell-shaped lesions located in subcutaneous tissue anterior and posterior to the sternum with absence of vascular flow and no underlying cartilaginous or bone lesion in sternum, rib or chondrosternal joint. In these cases, we can avoid unneeded work-up and only perform ultrasound periodic follow-up to certify size reduction.^{1,5,8} The key to deciding further examinations in our patient was the finding of an extension of the limits of the lesion to the sternum beyond the expected contours.

It is feasible to perform POCUS evaluation in soft tissue lesions not only to avoid expensive and unnecessary additional tests but also to select those cases in which other examinations may provide a reassuring diagnosis to the family (considering wait-and-see approach as the most adequate stance).^{1,7} In case of other clinical features (fever, elevated acute phase reactants) or atypical ultrasound findings (images suggesting cartilaginous invasion), we should consider other therapeutic approaches, such as antibiotic therapy or even percutaneous drainage, owing to the risk of superinfection.^{4,6}

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