Ultrasound picture of a wooden splinter evolved in phlegmon of the hand

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KEYWORDS

US examination;
Subcutaneous;
Foreign body;
Phlegmon.

Abstract *Introduction:* To demonstrate the usefulness of ultrasound (US) in quickly and effectively diagnosing the presence of a foreign body in the superficial soft tissues.

Materials and methods: A young lumberjack underwent US examination due to pain and swelling of the back of his right hand. These symptoms are often due to the presence of a wooden splinter.

Results: On the back of the right hand, US demonstrated a hyperechoic line with acoustic shadowing surrounded by a hypoechoic halo suggesting a foreign body. Next to it in the same area, several hypoechoic areas were observed.

Conclusions: US can quickly identify the exact position of a foreign body embedded in the skin and soft tissues; US can furthermore provide information about the inflammatory process and its spreading.

Sommario *Introduzione:* Dimostrare l'estrema utilità di un esame non invasivo, come l'ecografia, nel fare diagnosi veloce ed efficace di penetrazioni cutanee di corpi estranei.

Materiali e metodi: Abbiamo sottoposto a esame ecografico della cute e del sottocute della mano destra un giovane taglialegna che lamentava, da alcuni giorni, dolore, tumefazione e secrezione purulenta in corrispondenza della presunta sede di penetrazione di una spina lignea (dorso mano destra).

Risultati: L'esame ecografico, condotto a livello della presunta sede di penetrazione della spina, ha messo in luce la presenza di un'area lineariforme iperecogena, con cono d'ombra posteriore, circondata da un alone ipoecogeno; in tale sede si osservavano, inoltre, diverse aree irregolari ipoecogene, da riferire a un processo flogistico del sottocutaneo.

Conclusioni: L'esame ecografico permette non solo di localizzare con estrema precisione e velocità la sede del corpo estraneo, ma fornisce anche informazioni sulla reazione infiammatoria del tessuto circostante.

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Introduction

Medical and surgical intervention is often required after accidental penetration of the skin and subcutaneous soft tissues by a foreign body. Diagnosis is easily made on the

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basis of clinical data including reference to an event which led to penetration by the foreign body and identification of a more or less extended area of inflammation. Removal of the foreign body is extremely important in order to avoid acute or chronic complications such as allergic reactions, inflammation or serious infections [1]. We report the US findings in a case where a wooden splinter had penetrated the subcutaneous soft tissues and caused formation of a phlegmon.

Presentation of the case

A 30-year-old man underwent ultrasound (US) examination of the skin and subcutaneous soft tissues of the right hand due to pain and local swelling following accidental puncture by a twig 3 days earlier while he was cutting wood. The patient reported that he had unsuccessfully tried to remove the foreign body. In the following days, the area had become painful and there was swelling associated with a purulent discharge from the site where the splinter had penetrated the skin. This clinical picture was unchanged at the time of examination.

US examination (Aplio XV, Toshiba, Japan) using a linear 7.5–14 MHz probe showed a hyperechoic line of about 27 mm with posterior acoustic shadowing over the metacarpal bones but extending deeply into the common extensor muscle of the finger, surrounded by a hypoechoic halo. This finding was associated with multiple confluent irregularly hypoechoic areas in the subcutaneous soft tissues (Figs. 1–3) which suggested phlegmonous inflammation.

Discussion

Percutaneous penetration by a foreign body is a common reason for medical intervention. Usually the foreign body is a splinter of wood or a sliver of metal or glass which needs prompt removal to avoid inconvenient short- or long-term complications such as inflammation, infection or allergy [1,2].

Fig. 1 US image of the right hand. A 27-mm long foreign body is located under the common extensor muscle of the hand. Muscles and metacarpal bones.

Fig. 2 US depiction of phlegmon surrounding the foreign body which has penetrated the subcutaneous soft tissue.

First medical approach is a clinical examination of the affected area to identify superficial foreign bodies which can be seen or felt on palpation. Radiological examination can be useful in depicting radiopaque objects such as metal. However, in some cases the foreign body is not detected and its continuous presence in the soft tissues can cause inflammation [3]. In these cases the role of US is crucial [4]. Unlike traditional X-ray, US can depict also radiolucent foreign bodies which all appear hyperechoic with a halo or comet-tail artifact. A surrounding hypoechoic halo suggests an inflammatory process which may eventually cause abscess or granuloma.

Various authors have reported their experience describing the effectiveness of US guidance in the removal of foreign bodies [4,5]. US examination can localize a foreign body with great accuracy, but this method is also useful in pre-surgical examination to measure the distance between the splinter and the surface of the skin.

The limitation of US examination is the possibility of false-positive results due to calcifications and sesamoids in atypical positions which may mimic the presence of foreign bodies, as well as false-negative results due to coagulation and gas bubbles in open wounds which can prevent depiction of foreign bodies. However, despite these limitations US remains an extremely useful diagnostic procedure in injuries presented to the emergency department.

Fig. 3 Sagittal US scan of the foreign body.

Conflict of interest statement

The authors have no conflict of interest.

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