

E-QUID: ANSWER / *Musculoskeletal imaging*

Post-traumatic cyst-like lesion of the radius: A rare but benign lesion[☆]



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Case study

Matéo, a two-year old with no medical history of note, presented to the emergency department for a fracture of the lower extremity of the distal quarter of the two right forearm bones after he fell from his full height (Fig. 1). He made good progress following immobilisation with a plaster cast extending from above the elbow to the hand for a 45-day period. Nonetheless, a follow-up radiograph was requested for three months after the initial fracture. The follow-up radiograph showed cortical punched out lytic lesions, a few millimetres in size, one in the distal radial metaphysis and three others in the mid-diaphysis of the same bone (Fig. 2). The patient was asymptomatic and the forearm examination was unremarkable. Computed tomography of the forearm was then carried out (Fig. 3).

[☆] Here is the answer to the case xxx previously published. As a reminder we publish again the entire case with the response following.

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Figure 1. Anteroposterior and lateral radiographs of the right wrist on the day of the trauma, showing a fracture of the distal quarter of the two forearm bones.



Figure 2. Anteroposterior and lateral radiographs of the right wrist three months after the fracture, demonstrating the presence of lacunae in the radial metaphysis and diaphysis.

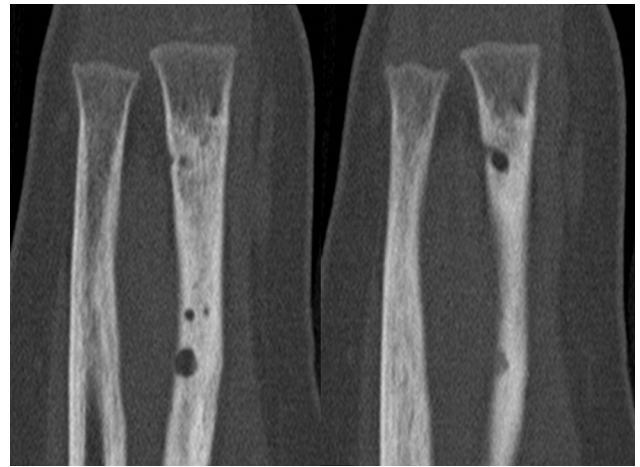


Figure 3. Two successive coronal plane CT views of the two bones of the right forearm three months after the fracture, demonstrating the presence of lacunae in the radial metaphysis and diaphysis.

What is your diagnosis?

On reading the case study, which of the following would be your diagnosis?

- subacute osteomyelitis;
- post-traumatic cyst-like lesion;
- Langerhans cell histiocytosis;
- chondromas;
- non-ossifying fibromas.

Answer

The CT scan confirmed the presence of four cortical lacunae sited in the radius (Figs. 4 and 5). The most distal of these was located just above the site of the initial fracture and measured 4 mm on its longest axis, two other lesions were sited 2–2.2 cm from the preceding lesion and measured 2 mm and 1 mm on their longest axes, and the most proximal was located 4 cm above the most distal lesion and measured 4 mm on its longest axis. All of these lesions had a fatty radiodensity. The cortical bone of the radius was also noted to have thickened.

The absence of fever and pain excluded an infectious process. Furthermore, these lesions appeared to be minimally aggressive and well circumscribed. This meant that we could also exclude the possibility of an aggressive tumour.

In the absence of symptoms, and because these lesions were minimally aggressive and restricted to the cortical bone, as well as having fatty radiodensity, a diagnosis of post-traumatic cyst-like lesions was upheld.

Discussion

Post-traumatic cyst-like lesions are an entity that is rarely described but are a classic phenomenon in paediatric traumatology. They develop some time after a greenstick fracture and more rarely after a torus fracture of the inferior extremity of the radius in patients aged between 2 and 5 years. They are usually sited in the radius but

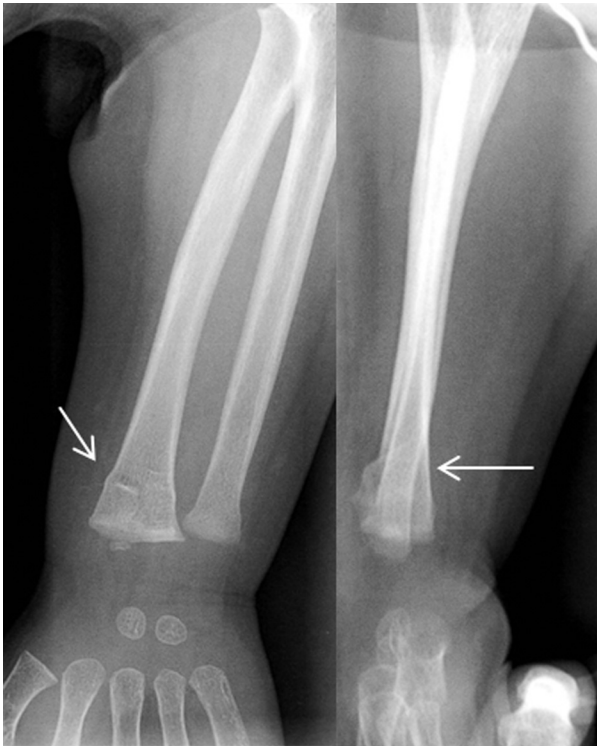


Figure 4. Anteroposterior and lateral radiographs of the right wrist on the day of the trauma showing a fracture of the distal quarter of the two forearm bones (arrows).

they have been described in the tibia [1] and they can be found in the fibula. They are often solitary and they are sited slightly proximally to the initial lesion [2]. In our case, we noted a classic posterior metaphysis lesion slightly proximal to the initial fracture as well as three diaphysis lesions with the same appearance 4 cm away from the initial lesion. After a repeated study of the radiograph three months after the trauma, we noted a thickened radial diaphysis. It is therefore possible, in the absence of displacement, that a plastic fracture of the radial diaphysis had gone undetected. Based on this hypothesis, we can also suggest that the same type of lesion mechanism was involved in the three diaphysis lesions. However, there is no reported case of cyst-like lesions found in the diaphysis in the literature.

The most likely hypothesis of pathophysiology is extravasation of blood and bone marrow through the posterior fracture line under the periosteum, which remains intact. The periosteum calcifies around the bone marrow, creating the cyst-like appearance of this lesion [3].

The fact that these lesions develop some time after a trauma is doubtless the reason why their incidence is underestimated. In most traumas, to the inferior quarter of the radius that is not or is only minimally displaced, it is not necessary to carry out repeat radiographs as long as the fracture is stable and the risk of secondary displacement is very low. In contrast, a radiograph becomes essential 10 days and 30–45 days after a displaced fracture of the lower quarter of the two forearm bones, both due to the risk of secondary displacement and also to assess consolidation. However, cysts seem to form at a



Figure 5. Anteroposterior and lateral radiographs of the right wrist three months after the fracture demonstrating the presence of lacunae in the radial metaphysis and diaphysis (arrows).

later stage. A later radiograph, as was taken three months after the trauma in our case, is not considered essential as long as there is no clinical warning sign. It is therefore possible for these cyst-like lesions to go undetected (Fig. 6).

Spontaneous recovery is good without treatment. It is therefore advisable to reassure parents that these lesions are benign [4]. Given the characteristic appearance of these lesions, a repeat radiograph some time later in order to ensure that the lesions have fully resorbed, does not seem to be absolutely essential. In our case, radiography eight

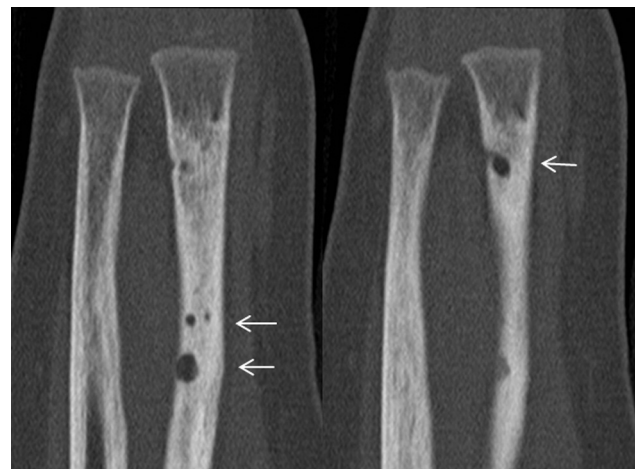


Figure 6. Two successive coronal plane CT views of the two bones of the right forearm three months after the fracture, demonstrating the presence of lacunae in the radial metaphysis and diaphysis with fatty radiodensity. The CT scan confirms that the lesions are well circumscribed, with fatty tonality and situated within cortical bone.

months after the trauma showed almost complete resorption of the inferior metaphysis lesion. However, we noted that the lesion in the diaphysis persisted where less bone remodelling had occurred (Fig. 7). The patient was asymptomatic.

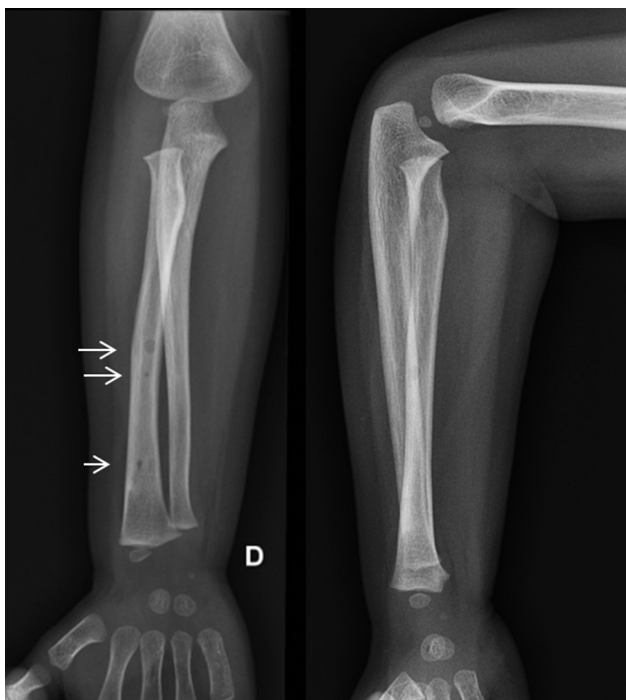


Figure 7. Anteroposterior and lateral radiographs of the right wrist eight months after the trauma. The metaphysis lesion is in the process of remodelling and is no longer visible on the lateral view. We note that the diaphysis lesions are still present and they have not increased in size. If we compare this radiograph to that in Fig. 2, we note that the relative sizes of the diaphysis lesions in relation to the radius nonetheless seem to have reduced because of the increased size of the radius due to normal growth.

Conclusion

Post-traumatic cyst-like lesions are rare. They usually occur following a trauma to the inferior quarter of the radius. They make good spontaneous progress, and therefore, in the absence of symptoms, do not require any additional investigations.

Disclosure of interest

The authors declare that they have no conflicts of interest concerning this article.

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