

# The incidental skeletal lesion: ignore or explore?

D. Vanel, P. Ruggieri, S. Ferrari, P. Picci, M. Gambarotti, E. Staals and M. Alberghini

*The Rizzoli Institute, Bologna, Italy*

*Corresponding address: D. Vanel, Istituti Ortopedici Rizzoli, Anatomia Patologica,  
via del Barbiano 1/10, Bologna 40106, Italy.*

*Email: dvanel@ior.it*

## Abstract

The 'leave me alone' bone lesions are very classical, and, as indicated by their name, do not require any further investigation. There are very typical cases, and there are also more difficult ones, and they can be especially difficult to manage if the patient has a known cancer.

**Keywords:** *Skeletal lesion; Incidental; Leave me alone bone lesions.*

---

## The 'leave me alone' bone lesions

Non-ossifying fibroma is a frequent (2% of children) metaphyseal lesion, centred on the bone cortex. It is painless, unless there is an associated fracture. The periosteum at the periphery of the lesion may not be visible on imaging examinations. However, that must not be considered as a sign of aggressiveness (Fig. 1). The lesion integrates progressively into the normal bone and disappears<sup>[1]</sup>.

Desmoid fibroma probably associates a non-ossifying fibroma and a chronic avulsion. It may be painful, is bilateral in 50% of cases (which is very helpful for the diagnosis, but means, of course, that it is unilateral in 50%). Its very typical location (posterior medial condyle of the femur, on the cortex of the metaphysis, near the epiphyseal plate) is the diagnostic key<sup>[2]</sup>. A biopsy must not be performed, as the young irregular bone induced by the avulsion may suggest an osteosarcoma (Fig. 2) histologically. A simple imaging control should be performed after 3 weeks, to completely rule out a malignant tumour in the same location.

Osteochondroma is usually a very easy radiologic diagnosis; it is a piece of bone growing in the wrong direction. The cortex of the osteochondroma in continuity with that of the normal bone is the diagnostic key. The practical problem is a possible secondary chondrosarcoma. A new pain, growth of the lesion in an adult, a thick (more than 3 cm) non-calcified cartilaginous cap suggest a malignant lesion<sup>[3]</sup>. During adolescence, when a child is growing fast, the cap may be thick, without being suspicious.

Fibrous dysplasia is made of fibrous lesions in the medullary cavity of bones (Fig. 3). The diagnosis is easier when the lesion is multicentric. The fibrous tissue is more or less calcified. Complete cortex destruction is very rare. The key point is that a cartilaginous component is possible (in 16% of cases<sup>[4]</sup>) inside the lesion, even without transformation into a chondrosarcoma. This problem must be known by the radiologists and by the pathologists.

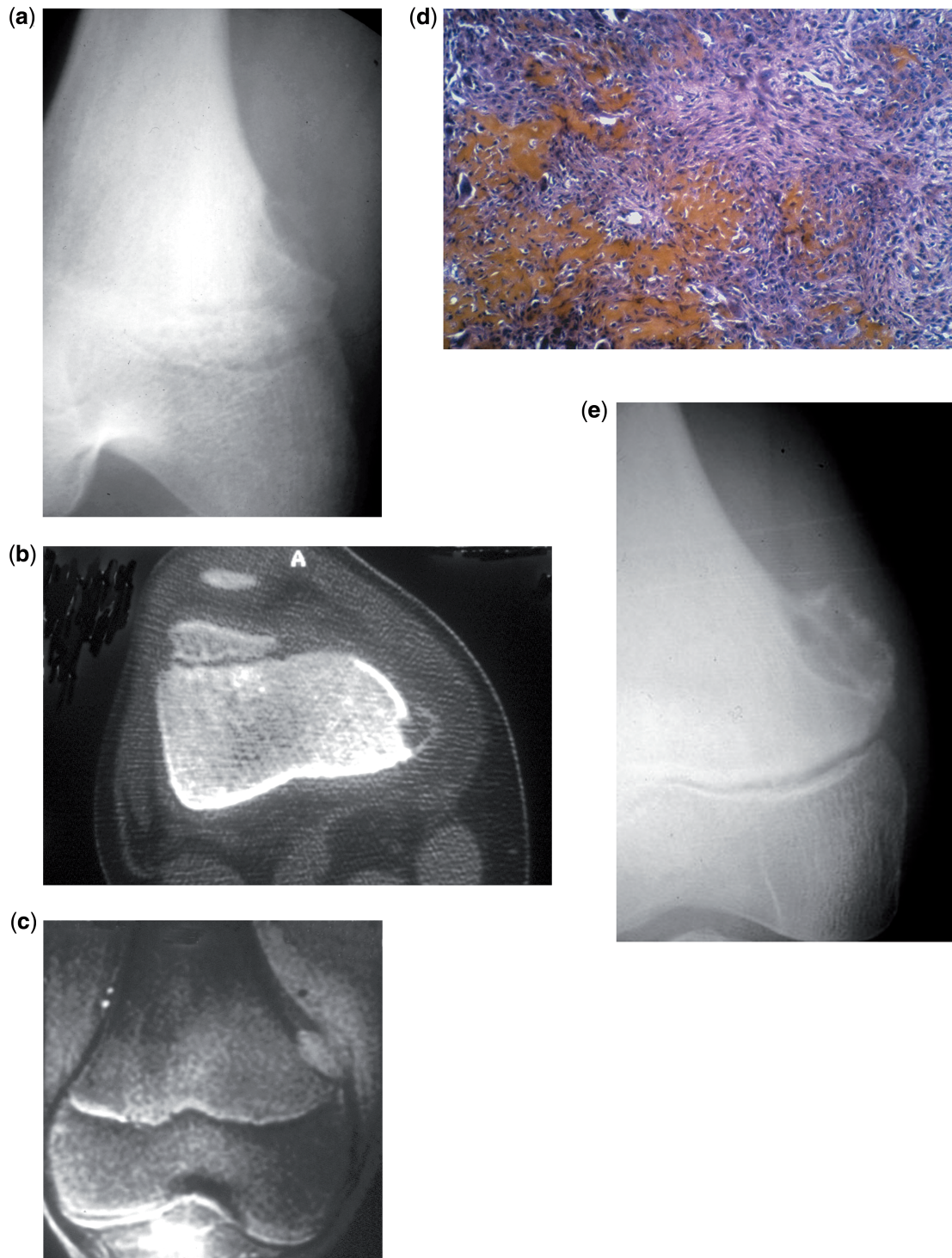
Paget's disease is usually an easy diagnosis, with lesions in the adult involving the end of bones, with a thick lamellar cortex and thick bones. In the difficult early cases, the detection of fat inside the lesion on computed tomography (CT) or magnetic resonance (MR) imaging is a very helpful sign.

Chondroma, cartilaginous tumours, are very often discovered on MR examinations performed for degenerative or traumatic lesions of the shoulder or knee. Their lobular pattern, nodules separated by fat and high signal on T2-weighted MR images are very typical. If no signs of aggressiveness are detected (erosion of the cortex, soft tissue involvement, early uptake after contrast medium injection<sup>[5]</sup>), no biopsy should be taken and follow-up is not necessary (Fig. 4).

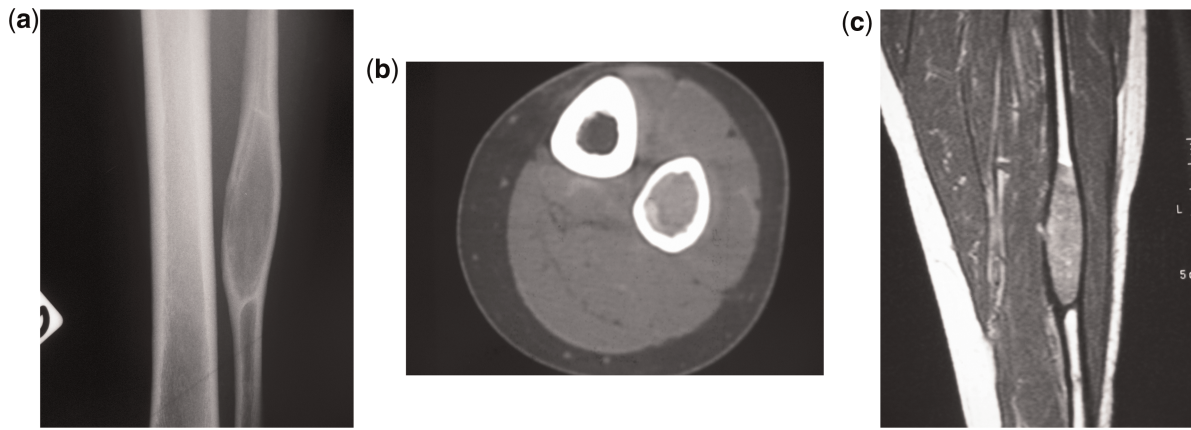
Bone islands, isolated or multiple, are also often typical. They are sclerotic, painless, and spiculated (Fig. 5). When MR imaging is carried out to evaluate a tumour, they appear black and homogeneous with no peripheral uptake after injection of contrast medium<sup>[6]</sup>. In contrast, sclerotic metastases are round, and surrounded by a high signal on T2-weighted sequences and after contrast medium injection.



**Figure 1** This child has a nephroblastoma. The lytic painless lesion of the femur has a regular well-demarcated medial border on anteroposterior (AP) radiographs (a) and lateral view (b). The lateral view is poorly limited. That led to a CT scan (c). Bilateral lesions are easily detected. Despite the lack of calcified periosteum, the lesion is typical of non-ossifying fibromas. The lateral border was not sharp on the AP radiograph because of its oblique direction.



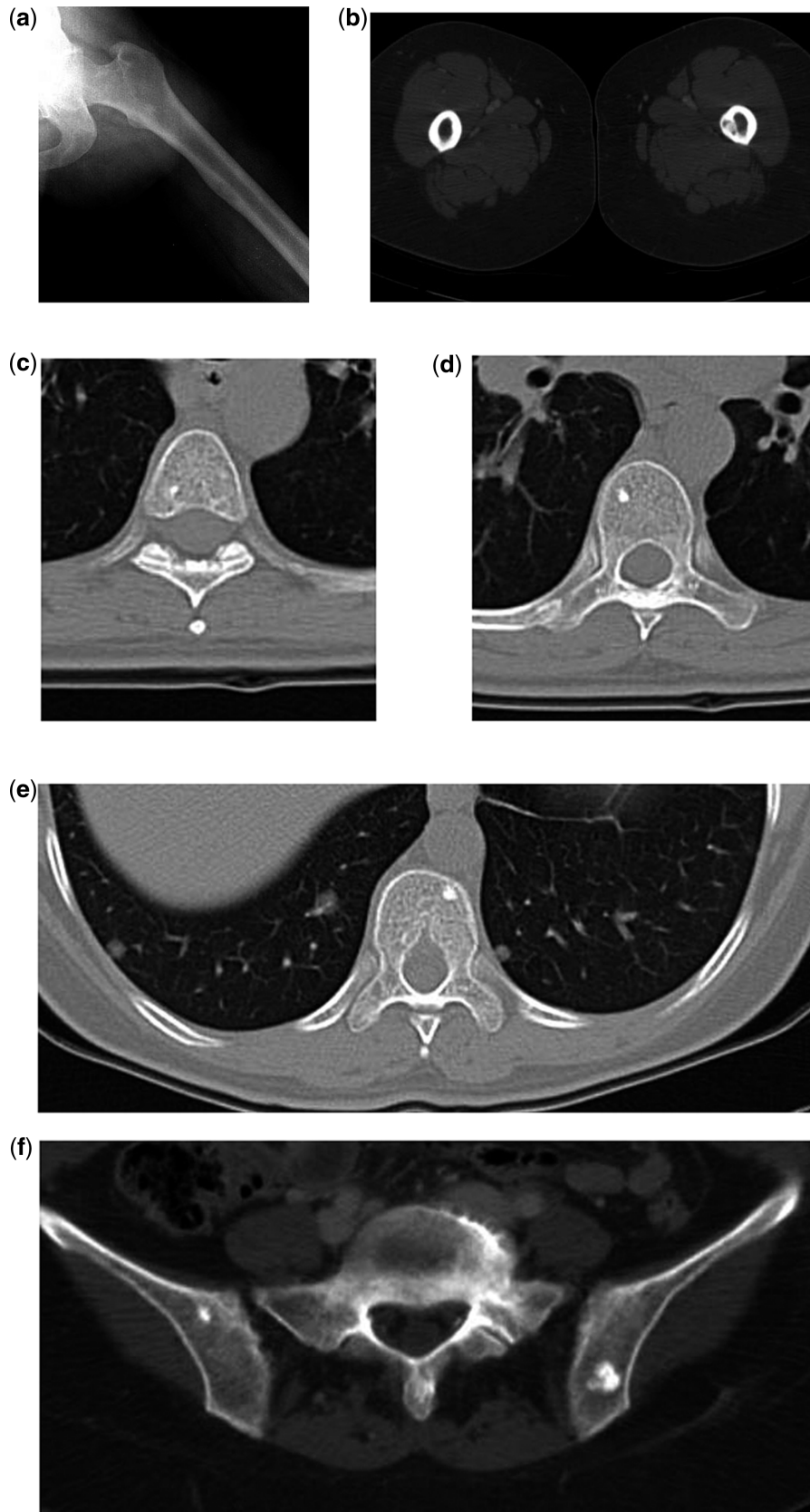
**Figure 2** Cortical desmoids: radiographs (a), CT (b), coronal MR (c), histology (d), and radiograph 3 weeks after the biopsy (e). The lytic lesion looks aggressive, with cortical destruction and perpendicular periosteal reactions. The typical location, on the cortex of the metaphysis of the medial condyle was so suggestive of the diagnosis that the biopsy should not have been performed. Histologically, the irregular young bone formation suggested an osteosarcoma. The follow-up film, displaying the calcified hematoma, made the diagnosis still more difficult. Everything went back to normal, without further treatment.



**Figure 3** Incidental discovery of a regular, well-limited, ground glass lesion, very typical of a fibrous dysplasia on radiograph (a), CT (b) and MRI (c).



**Figure 4** Sprain of the knee while jogging. On radiographs (lateral view; a), a calcified mass typical of cartilage was discovered. On MR (a, sagittal T1; b, sagittal T2FS; c, axial PD), both the bone bruise and the avulsion of the anterior cruciate ligament, and the cartilage tumour were detected. The pain disappeared within 3 weeks. Despite the partial erosion of the cortex, a decision not to treat the probable low grade cartilaginous tumour was made, and the lesion is stable 10 years later.



**Figure 5** Renal cell carcinoma and pain in the thigh. On radiographs (a) a cortical lytic lesion was detected and confirmed on CT (b). CT also revealed multiple sclerotic, speculated, bone lesions (c–g) typical of benign bone islands.

## Conclusion

There are well-known leave me alone lesions. When typical, and as indicated by their name, they should not be touched. In a cancer patient, in case of doubt, follow-up most often solves any possible problem. Only a strong doubt, or a possible complete treatment change, should lead to a biopsy.

## References

- [1] Yanagawa T, Watanabe H, Shinozaki T, Ahmed AR, Shirakura K, Takagishi K. The natural history of disappearing bone tumours and tumour-like conditions. *Clin Radiol* 2001; 56: 877–86. doi:10.1053/crad.2001.0795. PMID:11603890.
- [2] Kontogeorgakos VA, Xenakis T, Papachristou D, *et al.* Cortical desmoid and the four clinical scenarios. *Arch Orthop Trauma Surg* 2009; 129: 779–85. doi:10.1007/s00402-008-0687-6. PMID:18612646.
- [3] Masciocchi C, Sparvoli L, Barile A. Diagnostic imaging of malignant cartilage tumors. *Eur J Radiol* 1998; 27(Suppl 1), S86–90. doi:10.1016/S0720-048X(98)00048-5. PMID:9652507.
- [4] Kyriakos M, McDonald DJ, Sundaram M. Fibrous dysplasia with cartilaginous differentiation (“fibrocartilaginous dysplasia”): a review, with an illustrative case followed for 18 years. *Skeletal Radiol* 2004; 33: 51–62. doi:10.1007/s00256-003-0718-x. PMID:14647989.
- [5] Skeletal Lesions Interobserver Correlation among Expert Diagnosticians (SLICED) Study Group. Reliability of histopathologic and radiologic grading of cartilaginous neoplasms in long bones. *J Bone Joint Surg Am* 2007; 89: 2113–23. doi:10.2106/JBJS.F.01530. PMID:17908885.
- [6] Schweitzer ME, Levine C, Mitchell DG, Gannon FH, Gomella LG. Bull’s-eyes and halos: useful MR discriminators of osseous metastases. *Radiology* 1993; 188: 249–52.