

## An eleven year old with persistent leg pain – osteoid osteoma

Laura Bretton F2 Doctor – Paediatrics.  
Darlington Memorial Hospital  
[lbretton@doctors.org.uk](mailto:lbretton@doctors.org.uk)

### Abstract

An eleven year old boy presented with a history of left sided leg pain. Initial examination, investigations and imaging revealed no abnormality. The pain persisted over an eleven month period and night pain became an increasing problem. Examination after eleven months revealed a swelling of the left anterior tibial area that had not been present in four previous examinations. Further imaging revealed an osteoid osteoma – a benign bone-forming tumour.

### Case History

An eleven year old boy was referred to the paediatric outpatient department with a one month history of left sided leg pain. He was taking regular ibuprofen with little improvement. The pain was a “squeezing” pain that had started in his ankle and spread to the calf, knee and upper thigh. The pain increased on waking and movement. Ibuprofen would only help relieve the pain for two to three hours.

There was no history of trauma or injury. He was otherwise well with no history of previous illness, infection or viral symptoms.

On examination there was no gait disturbance. Inspection revealed no obvious joint deformity, swelling or erythema. There was mild tenderness of the left hip but no abnormality on examination of other joints. Pelvic Xray showed no abnormality.

The initial differential diagnosis included post-viral arthralgia, idiopathic pain syndrome or growing pains. He was reassured and advised to use analgesics if required.

One month later the patient was reviewed and the pain persisted. He was still waking three to four times at night. Repeat examination

revealed no new findings. The tenderness seen previously on examination of the left hip had resolved.

He was admitted to the Children’s Day Unit for blood tests and further imaging. Full blood count, electrolytes, urea and CRP were all normal and autoantibody screen was negative. Plain Xray of the lower leg was also normal. A diagnosis of idiopathic pain syndrome was made. He was advised to use paracetamol in addition to ibuprofen for an increased analgesic effect.

The patient was seen for his third visit to the outpatient clinic six months later. The pain persisted in the left leg below the left knee. He continued to be waking with pain during the night. There were no new findings on repeat examination. At this time it was decided to refer the patient to a child psychologist and physiotherapist for further assessment.

The patient returned for review six months later. He had not attended his appointment with the physiotherapist. He was awaiting an appointment with a consultant psychologist. The pain had continued and he was now off school. He and his mother had noticed a swelling in the left lower leg since the preceding week. He denied any recent trauma to the leg.

On examination there was a tender swelling noted of the left lower tibia with no associated skin changes or erythema.

Repeat bloods and X-Ray were performed. Again the blood tests were all negative, but the Xray showed new findings (figure 1).

There was a lucent nidus with central calcification within the posterior cortex of the mid tibia with eccentric cortical reaction over a wide area.

Appearances were those of osteoid osteoma or possibly Brodie's abscess. CT was therefore performed to clarify (figure 2).



Figure 1.

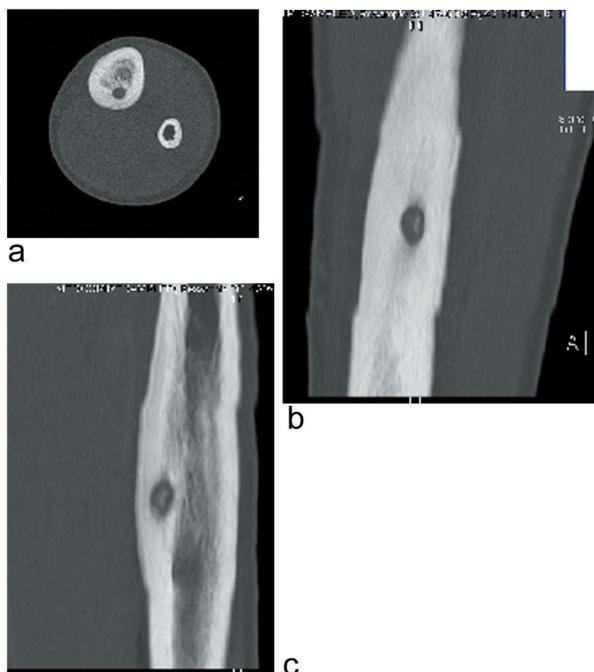


Figure 2.

*Axial CT of the left tibia and fibula (a) with coronal (b) and sagittal (c) reconstructions*

The CT showed fusiform sclerotic cortical thickening involving the posterior aspect of the lower shaft of the tibia containing a well-defined radiolucency or nidus with a sclerotic centre. There is evidence of a laminated peri-osteal reaction. The appearances are those of a cortical type of osteoid osteoma

**Discussion**

Osteoid osteoma is a benign bone-forming tumour three times more common in males than females<sup>1</sup> with an increased incidence in adolescents and young adults. It is very rare in those older than fifty years of age<sup>2</sup>. Typically the nidus is less than one centimetre in diameter<sup>1</sup>.

Clinically the typical presentation is pain. This is often described as dull or aching<sup>2</sup>. Initially the pain tends to be mild and intermittent but increases in intensity and persistence with time. The pain is more common at night and patients may suffer with night waking secondary to the pain<sup>3</sup>. Soft tissue swelling and tenderness are often associated with progression of the disease<sup>2</sup>. The pain is usually relieved by anit-inflammatory drugs but not by rest<sup>1,2,3</sup>. Osteoid osteoma can cause growth aberrations, muscular atrophy and skeletal deformity in the immature skeleton<sup>4</sup>.

Macroscopically it is a small (less than one centimetre), well circumscribed red mass likened to a cherry<sup>1</sup>. Microscopically the bone and osteoid is arranged into trabeculae with no organised pattern of growth<sup>2</sup>. The intertrabecular tissue is very vascular, with spindle cells and fibroblasts and many large osteoblasts with occasional osteoclasts<sup>2</sup>.

Radiography is the initial examination of choice and may be the only examination required. CT is used for precise localization of the nidus and may be used for guiding percutaneous radiofrequency ablation. MRI is a useful imaging technique, but CT appears superior for

precise localization<sup>4,5</sup>.

Radiologically there is a rounded zone of translucency<sup>1</sup>. Cortical lesions are often surrounded by bone sclerosis whereas medullary lesions rarely so<sup>2</sup>.

Isotope bone scan will show marked increase in activity<sup>1</sup>.

Seventy percent of osteoid osteomas are found in long bones, with fifty to sixty percent in the femur or tibia. Twenty percent are found in the hands and feet<sup>2</sup>. Other bones are infrequently involved.

The pain can often be temporarily treated with aspirin, ibuprofen or other anti-inflammatory drugs<sup>1,2,3,4</sup>. Surgical intervention is usually necessary for complete palliation<sup>1,4</sup>. Osteoid osteomas may spontaneously resolve without treatment, but there is currently no way of detecting if and when this is likely to occur<sup>6</sup>.

The treatment of choice is minimally invasive radiofrequency ablation<sup>3,4,5</sup>. This has been found to cause minimal damage to bone and muscle with no significant increase in structural weakness of the bone<sup>3,4,5</sup>. The treatment is lower cost and can be done on an outpatient basis with short recovery time<sup>3</sup>. The procedure is normally done under general anaesthetic and is only performed if safe access can be gained to the lesion without risk to nerves, major blood vessels and skin<sup>3</sup>. Normally rapid pain relief is apparent within the first two or three days after the procedure. Surgical removal may also be attempted, but to be successful the lesion must be completely excised. Recurrence is rare and usually results from incomplete resection due to a second nidus in the lesion or a second lesion in the same or different bone. Failure to relieve symptoms may suggest the original diagnosis was incorrect, but there are no reports of malignant transformation or metastasis from the lesion<sup>2</sup>.

## Summary

Although Osteoid Osteoma is rare, this case highlights the difficulty in establishing a clear diagnosis in some patients. In this case imaging secured a diagnosis relatively late. Bloods were normal throughout as was initial imaging. This patient received radiofrequency ablation and made a good recovery.

## References

1. [www.gpnotebook.com](http://www.gpnotebook.com)
2. <http://brighamrad.harvard.edu/Cases/bwh/hscach/54/full.html>
3. <http://www.radiology.ucsf.edu/patients/rfa>
4. Rosenthal D, Hornicek F, Torriani M, Gebhardt M, Mankin H. Osteoid Osteoma: Percutaneous Treatment with Radiofrequency Energy. *Radiology* 2003;229:171-175.
5. <http://www.emedicine.com/radio/TOPIC498.HTM>
6. [http://en.wikipedia.org/wiki/Osteoid\\_osteoma](http://en.wikipedia.org/wiki/Osteoid_osteoma)