CLINICAL REPORT

Arthroscopic removal of an osteoid osteoma of the talar neck

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Summary
Osteoid osteoma is uncommonly located at the ankle joint level. Arthroscopic resection is an unusual treatment modality in this tumour situation. We report the case of a young man presenting with an osteoid osteoma of his talus neck. Diagnosis was made by MRI. Since the tumour was intra-articular and subperiosteal, it was arthroscopically removed. Pathological examination confirmed the diagnosis of osteoid osteoma. Recovery was uneventful; immediate and complete pain relief followed surgery and the patient remains asymptomatic several months after his operation. Arthroscopic techniques allow complete exploration of the joint and total excision of the tumour. This minimally invasive approach reduces infectious and functional risks (joint stiffness). Less invasive resection techniques should be advocated, when applicable, to achieve pathological diagnosis of the surgical specimen.

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Osteoid osteoma is a benign bone tumor which is predominantly found in young men around the age of 20. This tumor is relatively frequent and makes up approximately 2 to 3% of all bone tumors [1]. It mainly occurs in the long bones, in particular the femur and the tibia (75%). The occurrence of this type of tumor on the talar neck is rare and occurs in approximately 2% of cases, but is characteristic in the foot [1].

Treatment is predominantly surgical and complete excision of the tumor results in a cure with only a rare risk of recurrence [2].

With the subperiosteal intra-articular localisation of the tumor, arthroscopic resection was possible reducing morbidity compared to open surgery and allowing a pathological diagnosis of the lesion.

Case report

A 23-year-old man consulted for pain in the right ankle, with swelling, which had been present for 6 months. The patient’s symptoms were thought to be caused by a sports injury which had occurred 8 months before, resulting in a talar fracture. Pain was persistent, despite the different drug treatments and physical therapy. At the same time, it was noted that pain was relieved by salicylates.

The clinical examination revealed sharp pain of the anteromedial joint space when touched. There was no
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Figure 1 Bone scan does not show focal hypervascularization of the osteoid osteoma, but diffuse intense uptake in the anterointernal dome of the talus.

There was no associated tendinopathy in the tibialis anterior. There was no instability, stiffness or trophic disorders, and the neurovascular examination was normal. Biological tests were normal.

Plain X-ray of the ankle revealed a post-traumatic bone lesion of the talar neck. Bone CT did not provide additional information.

Bone scan did not reveal any focal hypervascularization of the tumor, but there was diffuse intense uptake in the anteromedial part of the talar dome (Fig. 1).

The diagnosis was a secondary osteochondral lesion of the talar dome, probably associated with a lesion of the subchondral plate. The diagnosis of osteoid osteoma was made on MRI which showed a well-circumscribed low signal focus in the anteromedial edge of the talus, with cortical expansion, low signal intensity T1-images and high signal intensity T2-images associated with an appearance suggesting edema in the peripheral soft tissue (Fig. 2).

Figure 2 MRI T2-weighted image of the right ankle showing enhancement of the tumor.

Arthroscopy of the right ankle was performed under general anesthesia.

The patient was in the dorsal decubitus position with a bent knee and the leg hanging in the air. Manual distraction was used to free the tibiotarsal joint. A pneumatic tourniquet was used.

An anterolateral approach was used to insert the 4.5 mm arthroscope because the lesion was located on the anteromedial edge of the talar neck and could be reached easily in this way.

Evaluation of the joint showed a bluish cortical lesion on the anterointernal part of the talar neck which could be separated from the underlying bone with a probe. En bloc resection of the tumor was performed. The cavity of the excised tumor was then cleaned with a shaver. The synovial edges of the rest of the joint were slightly hypertrophic and were resected with the shaver. There were no apparent lesions in the cartilage. No associated lesions were noted in the tendons.

Pathological examination of the excised tumor confirmed the diagnosis of osteoid osteoma and showed the nidus of the tumor composed of richly vascularized conjunctive tissue with non-mineralised bone matrix surrounded by prominent osteoblastic margins. Reactional osteogenesis of the nearby bone tissue was noted.

The postoperative course was uneventful, and all pain disappeared immediately following the intervention. The patient was released the next day. The patient was rapidly allowed to place weight on the foot, because there were no functional symptoms and was practicing sports within 1 month after surgery. The patient has been regularly followed up. There was no recurrent pain 2 years after surgery, and no functional problems. Clinical follow-up shows normal joint mobility.

Discussion

Osteoid osteoma is characterised by a specific structure, the nidus, which is surrounded by reactional sclerotic bone and represents 12% of all benign bone tumors [1]. The location on the talus is rare, and may delay diagnosis. The history of fracture in our patient delayed the diagnosis by several months. A diagnosis of osteochondral lesions of the talar dome was first suggested. In the series of five patients with osteoid osteoma by Snow et al., an average of 2.5 years was necessary before a diagnosis was made [3].

The diagnosis of this entity is difficult; it should be considered in the presence of chronic ankle pain and imaging results that are not always specific. The fact that pain was relieved by aspirin is a strong argument for this diagnosis. A tumoral origin should always be considered in the presence of chronic ankle pain, especially if there is a history of trauma, because it is in these cases that the pain is often blamed, incorrectly, on post-traumatic lesions.

Classic imaging techniques (X-ray and CT scan) suggested a traumatic process or reaction to trauma rather than a tumoral disease. Bone scintigraphy results were incorrect and did not suggest the diagnosis of osteoid osteoma because there was no increased uptake of radiotracers.

A diagnosis of osteoid osteoma with negative bone scintigraphy results is rare. The main hypotheses to explain
this are a technical defect in the examination or low osteoblastic activity in the tumor [4]. The nidus is a small, well circumscribed radiolucent area, with intense uptake of radioactive tracers which is more intense than in the peripheral sclerotic area. If there is low osteoblastic activity in the nidus, the double density radiological image of the nidus will no longer be found.

MRI was the most sensitive imaging technique in our case. Negative CT results were probably due to a technical defect because the slices were not contiguous enough. According to the literature, CT is the most successful diagnostic imaging technique for this entity [5].

On MRI, osteoid osteoma appears as a well limited, focal image, often of low or intermediate signal intensity, with no enhancement on all images. Reactive bone marrow or soft tissue edema outside the bone is often more extensive than the reactional sclerotic bone, and appears as an area of low intensity signal on T1- and a high intensity signal area on T2 or gadolinium-enhanced T1-images (the effect is increased with fat suppression) [6].

The tumor was subperiostal according to Eideken’s classification [7].

The history of a talar fracture in the months preceding the first clinical signs may have played a role in the development of osteoid osteoma because this is a classic association although it has never been proven in a study. Nevertheless, several cases of osteoid osteoma occurring several months after a fracture have been described [8]. One of the hypotheses of the etiology of this disease is that abnormal osteogenesis occurs after the fracture because of a problem with vascularisation. This abnormality would cause the nidus to develop [9]. There are different treatment options. Surgery by direct approach to the joint was the treatment of choice for several years. Surgery involves en bloc resection of the tumor resulting in a cure in all cases. Osteoid osteoma is a small lesion surrounded by significant reactional sclerotic bone, which explains why it is so difficult to identify during surgery, resulting in excessive bone resection in certain cases. Percutaneous resection techniques have been developed.

Percutaneous drill resection [10] of osteoid osteoma makes it possible to identify the tumor by a probe placed in the nidus then to perform resection with a minimal incision. Tumor resection is performed with a toothed drill. Percutaneous resection can be associated with the injection of ethanol into the lesion for tumor eradication.

Percutaneous drill resection allows pathological examination and confirmation of the diagnosis of osteoid osteoma. A CT scan during surgery can confirm that tumor resection is complete.

Interstitial laser photocoagulation destroys the tumor by heating it with an optic fiber under CT-guidance [11]. The tumor tissue sample cannot be analysed with this technique.

Photocoagulation has the advantage of reducing the amount of time the patient must be hospitalized, compared to percutaneous drill resection or surgery. This technique limits the amount of resected bone to a minimum and the patient can return to their normal activities very quickly [11].

The main limits of this technique are for vertebral localisations near the lumbar canal and the fact that this technique is not available in all centers.

There are several advantages to treatment by arthroscopic approach:

- the joint can be explored and the associated lesion can be identified, especially since in our case the patient had a history of ankle trauma;
- arthroscopy is a fast, simple technique that has both diagnostic and therapeutic value;
- activities can be begun again rapidly and there is little risk of infection or joint stiffening compared to an arthrotomy;
- the intraarticular, subperiostal location of the tumor were important arguments in favor of arthroscopy.

Allagui et al. [12] described percutaneous resection of two osteoid osteomas of the ankle with an uneventful postoperative course and no recurrence after 4 years.

We decided upon an arthroscopic approach to the right ankle for diagnosis and treatment because of the intraarticular and subperiostal nature of the tumor. Arthroscopic resection of an osteoid osteoma of the talon neck has been described in several case studies [13,14,15,16].

After approaching the joint with the arthroscope in a lateral position and the instruments in a medial position, the right ankle was rapidly explored and the tumor was identified. Its appearance was completely characteristic of an osteoid osteoma, that is, a small (5 mm) well circumscribed, bluish tumor (Fig. 3). It was resected without any difficulty.

Arthroscopy is an approach which is appropriate for the removal of osteoid ostomas of the ankle and in most cases, whenever the localisation of this type of tumor is intra- or juxtaarticular and subperiostal. The tumor must be separated from the healthy bone with the help of a non-invasive instrument so that the surgical tissue can be analysed, especially since the area between the osteoid osteoma and the peritumoral bone tissue is weakened. Complete exploration of the joint is possible with arthroscopy and the postoperative period is simplified with a reduced risk of infection and
secondary stiffening as well as a lack of pain which occurs in open surgery.

Conflict of interests

None.

References