

# OSTEOID OSTEOMA AS A CAUSE OF KNEE PAIN A REVIEW OF 10 CASES

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**Osteoid osteoma is a benign tumor frequently situated around the knee. It should therefore be considered as a possible cause of atraumatic knee pain in young adults. The mean interval from onset of symptoms to diagnosis is 14 months. Clinical symptoms are the most reliable diagnostic factors. Block resection is the treatment of choice. A retrospective study of 10 patients is presented.**

**Keywords :** osteoid osteoma ; atraumatic knee pain.  
**Mots-clés :** ostéome ostéoïde ; genou douloureux non-traumatique.

## INTRODUCTION

Since the first report by Jaffe in 1935, osteoid osteoma has become a well-known entity. It's a benign osteoblastic tumor of the adolescent and consists of a nidus of osteoid tissue surrounded by a perifocal reaction of osteosclerosis (1). The tumor can occur in any bone but has a predilection for the distal femur and the proximal tibia (3, 5). It can be located in the spongiosa, in the internal cortex, in the cortex or between cortex and periosteum, the latter location sometimes being responsible for a slight swelling or restriction in motion of the affected joint (1, 7, 11, 12).

Lesions in the proximal femur, the lesser trochanter and the femoral neck can also be a cause of knee pain (1). The tumor has once been described in fracture callus (9). The diagnosis should be suspected when the patient has an ill-defined pain, present especially at night and relieved by aspirin or drugs containing acetylsalicylic acid (1, 2, 3, 8, 10). The radiographic evaluations may fail to show the lesion.

A technetium Scan is positive in most cases, even though Leroy has reported false negatives. Since the knee joint in a young active patient is often a source pain, mostly traumatic, a high index of suspicion is needed to identify an osteoid osteoma as the cause.

## PATIENT MATERIAL

A retrospective study was made of 10 patients referred with atypical knee pain between 1980 and 1989 (Table I). Clinical charts, radiographs, isotope scans and other investigations were reviewed together with the pathology reports of the resected specimens.

The mean age of the patients was 23 years (ranging from 18 to 33). There were 8 males and 2 females. There was no history of significant trauma in any of the cases. The mean interval from the onset of the symptoms to diagnosis was 14 months (ranging from 5 to 36 months). The distribution of lesions around the knee is given in figure 1.

One of the patients (Table I nr. 5) had a recurrence after being operated elsewhere. A second patient (Table I nr. 6) had a biopsy taken elsewhere showing no abnormality. He was treated for a stress fracture of the distal femur. Because of the typical history he had a bloc resection of a part of the distal femur. The pathology of the specimen showed an osteoid osteoma.

All 10 patients had pain of insidious onset that was diffuse and aching in nature. Two of the 10 cases reported an episode of trivial trauma that could not

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Table I. — A retrospective study and subsequent findings in 10 patients

case	age	sex	duration symptoms	nocturnal pain	aspirine relief	physical	X-ray	Tomo	Donescan	previous treatment	pathol. nidus	result
1	28	M	6 months	+	+	slight Q-atrophy	+	+	+	I. Acort.	+	perfect
2	33	F	36 months	+	+	Q-atrophy +++ extension def.	-	-	+	I.A.cort. lat. Menis laminect. resection	-	temp.
3	18	M	7 months	+	+	Q-atrophy +	+	±	+		-	aspirine depend
4	27	M	24 months	+	±	Q-atrophy +	+	+	+	101.A.Cort reoccurred	+	perfect
5	24	M	24 months	+	+	-	-	±	+	1983	+	perfect
6	21	M	9 months	+	+	Q-atrophy suprapat eff.	+	+	+	Stressfra	+	perfect
7	19	M	5 months	+	+	Slight Q-atro	-	+	-	-	+	perfect
8	19	M	16 months	+	+	-	±	±	±	resect 1979 osteomeyl ?	+	perfect
9	25	M	7 months	+	+	-	-	+	+	Ascop. osteomeyl ?	+	perfect
10	24	F	9 months	+	+	-	-	+	+	-	+	perfect

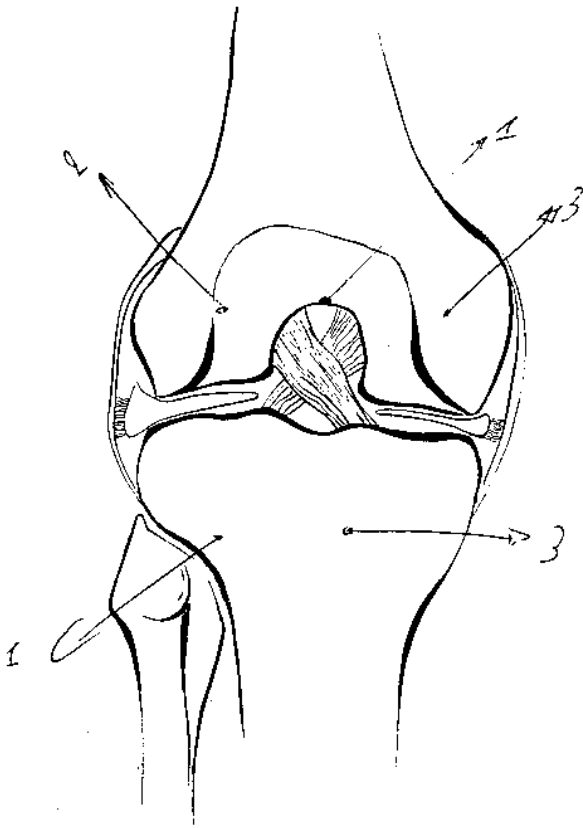


Fig. 1. — Distribution of osteoid osteoma at the knee.

be related to the pain. All 10 cases had night pain. In 9 patients the pain disappeared completely with aspirin, one patient felt partial relief.

The symptoms were out of proportion to the clinical signs which were very minor. The most constant sign was a quadriceps atrophy being present in 6 of the 10 cases. One patient had a suprapatellar effusion. In this patient the osteoid osteoma was located subperiostally in the distal femur. Only one patient had a slight restriction of knee extension, the time between the onset of symptoms and diagnosis was 3 years !

There were no general manifestations of illness. Fever, loss of weight or lethargy could not be demonstrated. One patient with leg pain had Bechterew disease even though his pain disappeared completely after the resection of a femoral osteoid osteoma.

Many patients had previously been treated for other causes of knee pain. The incorrect diagnoses are summarized in table II. Other authors have also reported a variety of initial incorrect diagnoses (6, 7, 8). A wide variation of initial treatments were given. Most patients had intraarticular hydrocortisone injections

(one patient had 20 injections). Two patients had had a previous resection ; in one patient osteomyelitis was diagnosed.

One patient initially had intraarticular hydrocortisone injections followed by arthroscopic resection of parts of the lateral meniscus, again followed by a laminectomy L4-L5 because of a positive myelogram. The diagnosis of osteoid osteoma of the distal femur was made 3 years following the onset of symptoms. Resection gave a relief of symptoms for only a short time. No histological evidence of a nidus was found at surgery.

### Radiological assessment

The essential radiological feature is an area of radiolucency of 1 centimeter (the nidus) surrounded by a zone of sclerosis. This typical finding is not always present and may not appear for several months (1). Only 3 out of 10 cases had radiological findings suggesting an osteoid osteoma.

Tomograms were routinely performed. Five of our patients had a tomogram clearly showing the typical appearance of the lesion. A technetium scan was positive in all cases. In 3 out of 10 cases it was difficult to interpret both tomogram and isotope scans, because of previous surgery with diffuse increased uptake.

Computerized tomography was performed in 7 out of 10 cases. The typical lesion could only be demonstrated in 4 cases. This can be explained by the small size of the tumor. The subperiosteal location in one of our patients, however, could clearly be demonstrated (Fig. 2).

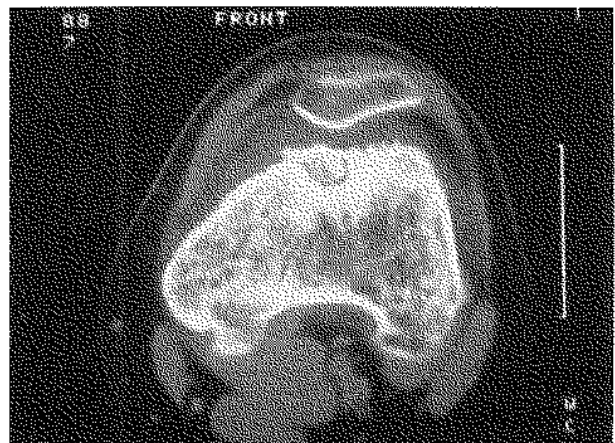


Fig. 2. — Computer tomography of a subperiosteal osteoid osteoma.

Since an osteoid osteoma is highly vascular, one could consider the use of an arteriogram as a diagnostic tool. Three of our cases had an arteriogram but only one established the diagnosis of a highly vascular spot on the lateral femoral condyle.

Magnetic Resonance Imaging (MRI) was performed in only one case and has identified the lesion. Its diagnostic value lies in the more exact location of the osteoid osteoma, facilitating surgical excision.

## DISCUSSION

### Diagnosis and differential diagnosis

The most reliable symptom is ill defined pain, worse at night and relieved by aspirin. Differential diagnosis should be made with a solitary exostosis and Brody's abscess (1).

A solitary exostosis is asymptomatic and can not be correlated to the clinical symptoms of the patient. There is no local tenderness and a radiograph will not show the surrounding sclerosis. In Brody's abscess the pain pattern is different from that of an osteoid osteoma. The past history may reveal local tenderness and swelling. Differentiating an osteoid osteoma from a Brody's abscess can be very difficult. In fact, all the misdiagnoses listed in table II must be considered as differential diagnostic possibilities. The definitive diagnosis is made by histopathology which shows a granular nidus consisting, in varying proportions, of osteoid tissue and newly formed trabeculae set in a highly vascularized osteogenic connective tissue (5). The histopathology as described above is diagnostic. The difficulties are exacerbated if the nidus has

been removed from its original setting. Under these circumstances and because of the presence of active osteogenic cells, the lesion might be mistaken for an osteogenic sarcoma (1). Of course, the likelihood of this error is reduced when one considers the total clinical and radiographic picture.

### Treatment and prognosis

Surgical removal of the lesion brings immediate relief of the symptoms. If the lesion is resected "en bloc" in its surrounding bone, the danger of recurrence will be greatly reduced.

It is important that the nidus can be demonstrated by histologic examination to ensure complete removal of the lesion. In the two cases where the nidus could not be demonstrated, there was only temporary relief of the symptoms. One patient was lost to follow-up, in the other the pain was controlled with aspirin. The nidus was probably not resected properly.

It is conceivable that after many years, an osteoid osteoma might come to a spontaneous clinical arrest. However in view of the troublesome symptoms and the accessibility for surgical removal, it should preferably be resected.

## CONCLUSION

Osteoid osteoma must be considered as a possible cause of knee pain in the absence of trauma in a young individual. The diagnosis is made by the history of an ill defined and aching pain, worse at night and relieved by aspirin.

A radiograph may demonstrate the typical nidus but false negative results are common.

An isotope scan is a reliable alternative even though previous interventions to the bone might render the interpretation difficult. Leroy pointed out that an isotope scan can give a false negative result (4). This was not the case in our study.

In a rare occasion of intraarticular location, arthroscopic resection can be possible (12) but surgical extirpation by bloc resection of the nidus is curative and recommended as the treatment of choice (1, 5, 13).

Table II. — Overview of the different diagnoses made before the definitive diagnosis of osteoid osteoma

<i>Previous diagnosis</i>
— Lateral meniscus lumbar lesion
— Discusherniation. disc pronation
— Chondromalacia patellae (2 cases)
— Friction syndrome of the iliotibial tract
— Bechterew disease
— Stress fracture (with algoneurodystrophy)
— Algoneurodystrophy

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## SAMENVATTING

*D. STOFFELEN, M. MARTENS, L. RENSON en G. FABRY. Osteoid osteoma, kniepijn veroorzakend.*

Een osteoid osteoma is een goedaardige tumor die zich dikwijls rondom de knie situeert. Daarom zou men er op bedacht moeten zijn in geval van atraumatische kniepijn bij jonge volwassenen.

Het gemiddelde tijdsverloop tussen begin van de symptomen en de diagnose is 14 maanden.

De klinische symptomen zijn het belangrijkste in de diagnosevorming. Een blokresectie blijkt de voorkeursbehandeling te zijn. Een retrospectieve studie van 10 patiënten wordt gegeven.

## RÉSUMÉ

*D. STOFFELEN, M. MARTENS, L. RENSON et G. FABRY. Ostéome ostéοide, cause de genou douloureux.*

L'ostéome ostéοide est une tumeur bénigne qui dans la majorité des cas est située au membre inférieur, près du genou. Le diagnostic doit être envisagé en cas de douleur aiguë térébrante chez un jeune adulte. Le délai moyen entre l'apparition des signes cliniques et le diagnostic est de 14 mois. Le diagnostic repose essentiellement sur les signes cliniques. La résection en bloc reste le traitement de choix de préférence au curettage. Étude rétrospective de 10 cas.