

Initial symptoms and delayed diagnosis of osteosarcoma around the knee joint

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ABSTRACT

Purpose. To identify initial symptoms of osteosarcoma around the knee joint.

Methods. Records of 19 men and 11 women aged 9 to 34 (mean, 17) years with osteosarcoma around the knee joint were reviewed. Each patient was interviewed (for a mean of 1.5 hours), and a detailed history of symptom onset recorded.

Results. In all patients, the first symptom was pain, which was more pronounced on weight bearing in 16 (53%) of them and was worse at night in 11 (37%). Swelling was noticed in 28 patients (a mean of 7 weeks after pain onset). 16 (53%) of the patients had a history of minor trauma around the time of symptom onset. 20 (67%) of the patients had a limp, in 9 of whom it was not associated with pain on weight bearing; only 2 (7%) had a pathological fracture. The mean interval from the onset of symptoms (pain) to presentation was 10 (range, 0–49) weeks. The mean interval from

presentation to radiography was 3 (range, 0–20) weeks; in 8 patients this interval exceeded 3 weeks despite a noticeable swelling. The mean interval from radiography to referral to our hospital was 2 (range, 0–14) weeks. Together with the 2 weeks for diagnostic workup and biopsy, the mean total delay was 17 (range, 4–55) weeks.

Conclusion. Physicians should be aware of the symptoms of osteosarcoma and promptly refer patients to tumour centres, especially adolescents, those who present with pain that may be worse at night and on weight bearing, and those in whom a swelling and/or a limp is evident.

Key words: diagnosis; knee joint; osteosarcoma; signs and symptoms

INTRODUCTION

The prognosis for patients with primary malignant tumours of the limbs (especially osteosarcoma) has

improved markedly with advances in limb salvage surgery and chemotherapy. Nonetheless, delay in presentation, referral, diagnosis, and/or treatment may result in limb loss or even death,¹ especially in patients with aggressive osteosarcomas that predominantly affect the young. We reviewed a series of patients with osteosarcomas around the knee joint to identify common initial symptoms and elucidate reasons for delayed diagnosis.

MATERIALS AND METHODS

Records of 19 men and 11 women aged 9 to 34 (mean, 17) years with osteosarcoma around the knee joint who presented between 2003 and 2008 were reviewed. Patients with other tumours or osteosarcomas involving other sites were excluded. The osteosarcomas were located in the distal femur (n=22), proximal tibia (n=8), and proximal fibula (n=1). Each patient was interviewed (for a mean of 1.5 hours), and a detailed history of symptom onset

recorded. Symptoms that arose after presentation (inability to walk, joint deformities, sensory deficit, malaise, loss of appetite, and loss of weight) were not logged for this study.

RESULTS

In all patients, the first symptom was pain, which was more pronounced on weight bearing in 16 (53%) of them and worse at night in 11 (37%) [Table]. The pain was variable, but at the beginning it was often just an intermittent ache. A concurrent swelling was noticeable in 2 patients. In 28 patients, a swelling became noticeable (a mean of) 7 weeks after onset of the pain. Two patients did not have a swelling at presentation. 16 (53%) of the patients had a history of minor trauma (most often a slip or fall) around the time of symptom onset. 20 (67%) of the patients had a limp, in 9 of whom it was not associated with pain on weight bearing; only 2 (7%) had a pathological fracture.

Table
Presenting symptoms and delays in presentation, referral, and diagnosis in patients with osteosarcomas around the knee joint

Patient no.	Sex/age (years)	Site	Onset of pain to swelling (weeks)	Onset of pain to presentation (weeks)	Presentation to radiography (weeks)	Presentation to referral (weeks)	Onset of pain to diagnosis (total delay) [weeks]	Symptom						
								Pain	Pain on weight bearing	Pain worse at night	Swelling	History of trauma	Limp	Pathological fracture
1	M/14	Distal femur	8	10	0	1	12	Yes	Yes	No	Yes	Yes	No	No
2	F/14	Distal femur	1	1	1	2	4	Yes	No	No	Yes	Yes	No	No
3	M/23	Distal femur	8	30	6	6	37	Yes	Yes	No	Yes	Yes	Yes	No
4	M/10	Distal femur	17	17	0	2	20	Yes	Yes	No	Yes	Yes	No	No
5	M/20	Distal femur	15	28	8	9	38	Yes	Yes	Yes	Yes	Yes	No	No
6	M/16	Distal femur	7	8	8	9	19	Yes	Yes	No	Yes	No	Yes	No
7	F/32	Distal femur	1	5	2	3	12	Yes	Yes	Yes	Yes	Yes	Yes	No
8	F/17	Distal femur	4	0	20	24	30	Yes	Yes	No	Yes	No	Yes	No
9	M/15	Distal femur	4	2	2	3	6	Yes	No	Yes	Yes	Yes	Yes	No
10	M/11	Proximal tibia	0	16	0	2	17	Yes	Yes	No	No	Yes	Yes	No
11	F/23	Proximal tibia	10	10	0	14	19	Yes	No	Yes	Yes	No	Yes	No
12	M/15	Distal femur	0	0	1	2	4	Yes	No	No	Yes	Yes	No	Yes
13	M/19	Proximal tibia	2	6	0	10	18	Yes	No	No	Yes	No	Yes	No
14	F/14	Distal femur	2	2	6	4	9	Yes	Yes	No	Yes	Yes	Yes	No
15	M/19	Proximal fibula	0	0	0	1	5	Yes	No	Yes	Yes	No	No	No
16	M/21	Proximal tibia	3	0	3	8	9	Yes	No	No	No	Yes	No	No
17	M/12	Distal femur	0	0	11	11	17	Yes	Yes	No	Yes	No	Yes	No
18	F/10	Distal femur	12	13	0	1	17	Yes	No	No	Yes	Yes	Yes	No
19	M/18	Proximal tibia	3	2	2	2	6	Yes	No	Yes	Yes	Yes	Yes	No
20	M/18	Distal femur	2	2	0	0	4	Yes	Yes	No	Yes	No	No	No
21	M/34	Proximal tibia	0	0	0	2	5	Yes	No	No	Yes	Yes	Yes	Yes
22	M/12	Distal femur	14	15	1	1	18	Yes	No	No	Yes	Yes	Yes	No
23	F/12	Distal femur	49	49	0	4	51	Yes	Yes	No	Yes	No	Yes	No
24	F/13	Distal femur	2	6	1	1	9	Yes	Yes	Yes	Yes	No	Yes	No
25	M/13	Proximal tibia	1	1	0	6	9	Yes	Yes	No	Yes	No	Yes	No
26	M/14	Distal femur	2	1	6	12	14	Yes	No	Yes	Yes	No	No	No
27	M/9	Distal femur	0	2	4	6	9	Yes	Yes	No	Yes	Yes	No	No
28	F/17	Distal femur	6	12	0	1	15	Yes	Yes	Yes	Yes	No	Yes	No
29	F/17	Proximal tibia	4	18	0	2	22	Yes	No	Yes	Yes	No	Yes	No
30	F/13	Distal femur	30	49	3	4	55	Yes	No	Yes	Yes	No	Yes	No
Mean (range) or no. (%)	17 (9-34)	-	7 (0-49)	10 (0-49)	3 (0-20)	5 (0-24)	17 (4-55)	30 (100)	16 (53)	11 (37)	28 (93)	16 (53)	20 (67)	2 (7)

The mean interval from the onset of symptoms (pain) to presentation was 10 (range, 0–49) weeks. The mean interval from presentation to radiography was 3 (range, 0–20) weeks; in 8 patients this interval exceeded 3 weeks despite a noticeable swelling. The mean interval from radiography to referral to our hospital was 2 (range, 0–14) weeks. Together with the 2 weeks for diagnostic workup and biopsy, the mean total delay (from the onset of symptoms to histological diagnosis) was 17 (range, 4–55) weeks.

DISCUSSION

The prognosis for osteosarcoma is worse when the tumour is large and has metastasised^{2,3}; both features are indicative of aggressive behaviour. The longer the tumour is left untreated, the larger it grows and the more likely it is to have metastasised. Delays in presentation, referral, diagnosis, and/or treatment in this and other tumours have been reported.^{4–8} In this study, we focused on the initial symptoms at or before presentation with an osteosarcoma around the knee joint.

All our patients had pain as the first symptom. As the tumour expands in the medullary cavity, pressure on the unyielding cortex gives rise to pain. When it breaches the cortex and pushes out into the soft tissues, a swelling is noticeable. This is in contrast to a soft-tissue sarcoma, which is often painless even when large. The pattern of the pain is varied. When it occurs at night, it is severe and not necessarily increased by walking. Pain may

be caused by venous congestion when immobility of the limb in a certain position impedes venous outflow. Once a threshold is reached, the pain can be excruciating and takes time to settle, in which case the patient may be unable to sleep again for the rest of the night. Nine of our patients presented with a limp not associated with pain. This may be a reflex triggered by proprioceptors around the knee to protect the weakened or abnormal part of the bone. Two patients had a painless, pathological fracture, which was only noted at presentation. This may be due to the osteoblastic aspect of the pathology that provides a degree of integral strength, and the aggressive osteolytic nature of the tumour that destroys the growing frontiers without any pressure effects. 16 patients had a history of minor trauma, which may be related to protective reflex mechanisms, resulting in 'giving way' at the knee joint to avoid stressing weakened parts.

The causes of delays in presentation are multifactorial and depend on patient perception of pain, proximity of a clinic, and may be compounded by initial visits to traditional healers. Such delays can be shortened by improvements in public/patient knowledge and health care services. The delays in referral and radiography may be related to the availability of facilities, and/or failure to notice any swelling, or attributing it to minor trauma.⁹ Physicians should be aware of the symptoms of osteosarcoma and promptly refer patients to tumour centres, especially adolescents, those who present with pain that may be worse at night and on weight bearing, and those in whom a swelling and/or a limp is evident.

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