Primary Leiomyosarcoma of the Tibia – Five Years without Recidivism

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ABSTRACT

Primary leiomyosarcoma of the bone is a rare malignancy. Clinical follow-up suggests that primary osseous leiomyosarcoma has an aggressive biologic behaviour with poor survival time. We report a case of primary leiomyosarcoma arising from the proximal metaphysis of the right tibia of a 55-year old woman with a long follow-up period, without recidivism. Primary leiomyosarcoma has to be considered as a differential diagnostic possibility in the case of bone tumours seen on routine initial plain radiographs as lytic lesions. If the tumour has been adequately excised at the time of diagnosis, as in the present case, with adjuvant therapy protocol, the long-term prognosis of such an aggressive tumour can be exceptionally good.

Leiomiosarcoma Primario de la Tibia – Cinco Años Sin Recidivas

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RESUMEN

El leiomiosarcoma primario del hueso es un tumor maligno raro. El seguimiento clínico sugiera que el leiomiosarcoma óseo primario tiene un comportamiento biológico agresivo con escaso tiempo de sobrevivencia. Reportamos un caso de leiomiosarcoma primario proveniente de la metáfisis proximal de la tibia derecha de una mujer de 55 años de edad con un largo período de seguimiento, sin recidivas. El leiomiosarcoma tiene que ser considerado una posibilidad de diagnóstico diferencial en el caso de tumores óseos observados en radiografías simples iniciales de rutina como lesiones líticas. Si el tumor ha sido debidamente extirpado en el momento del diagnóstico – como en el caso presente – con un protocolo de terapia adyuvante, la prognosis a largo plazo de un tumor tan agresivo puede ser excepcionalmente buena.

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INTRODUCTION

Bone leiomyosarcoma is a rare tumour that can present as either a primary or secondary lesion (1, 2). It is considered to be primary after exclusion of either a soft tissue tumour extending into bone or the presence of a leiomyosarcoma elsewhere (1–6). Primary leiomyosarcoma of bone is a rare malignancy (1–9). In 1944, Carmody first reported a case arising in the mandible (10). In 1965, Sanerkin and Evans reported the first primary leiomyosarcoma arising from the tubular bone (left proximal tibia) (11). Our review of the literature revealed that only 144 such cases were reported since 1944 (2, 3, 7–9).

Clinical follow-up suggests that primary osseous leiomyosarcoma has an aggressive biologic behaviour (1, 12–16). Radiological features of the tumours are rather nonspecific and most had osteolytic lesions (2, 7, 15). Early surgical intervention by radical or wide excision offers the best chance of cure (5). Adjuvant therapy is questionable (1, 5, 12–14, 16, 17). We report a case of primary leiomyosarcoma arising from the right proximal tibia with infiltration of the bone marrow and surrounding soft tissue with 62 months of follow-up without recidivism.

Case Report

In May 2000, a 55-year old Caucasian woman presented to hospital with gradually worsening painful swelling in her right upper tibia. She could not recall any relevant trauma to the area. Walking-distance without pain decreased to 100 metres. Family history and other past medical history were unremarkable. The patient denied any medications or allergies.

Physical examination revealed antalgic gait. The affected area was warmer and a soft painless mass was present on palpation. No further masses were visualized or palpated in

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the right lower extremity and no inguinal lymphadenopathy was present. The patient experienced pain with passive or active motion in the knee. Range of possible motion was from 10° to 90° of flexion. Vascular and neurological parameters were normal, with no apparent peripheral sensory or motor loss except muscular hypotrophy of the right leg.

The abnormal laboratory findings were a sedimentation rate of 70 mm in the first hour (Westergren) and alkaline phosphatase of 285 units per litre (U/L) (normal 60–142 U/L). The erythrocytes, leukocytes, electrolytes, and serum enzymes levels were within normal limits. Radiograph of the right leg revealed a poorly defined osteolytic mass with destruction of bone in the upper third of the tibia. The tumour had a mainly metaphyseal location extending into the epiphysis. This neoplasm occupied the medullary channel breaking through the cortex and extending to surrounding soft tissue with aggressive periosteal reaction (Fig. l). Magnetic resonance revealed large intraosseous and extraosseous components with heterogeneous signal intensity throughout the lesion. The tumour was adjacent to the fibula but without invasion (Fig. 2). The scintigraphy (Tc-99m) revealed accumulation only in the right proximal tibia. The computed tomography scan of the chest, abdomen and pelvis was performed to exclude primary or secondary malignancy. The uterus and gastrointestinal tract were evaluated and no malignancy was found. The systemic review showed no evidence of metastatic disease.

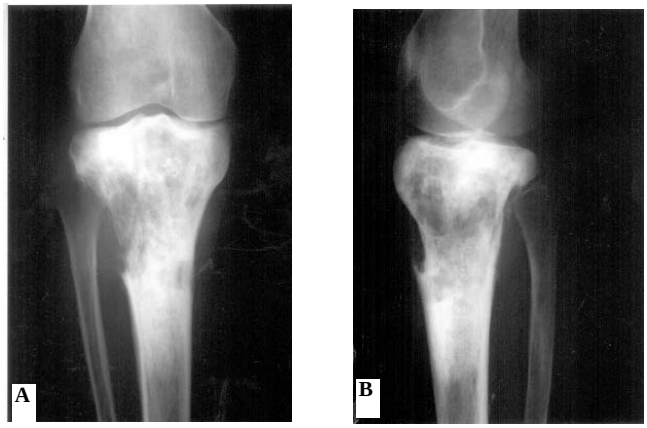

Fig. 1: Radiograph of the proximal right tibia. **A,** AP radiograph demonstrates a lytic, destructive mass in the metaphyseal region. Note the aggressive periosteal reaction with Codman's triangle. **B,** profile radiograph shows irregular transition zone and spared articular surface.

The patient was admitted to hospital and had an open biopsy of the lesion. At the time of surgery, this was observed to be a fleshy, white lobulated mass, which arose from the upper end of the tibia and involved the surrounding soft tissues. Microscopically, the tumour was composed of atypical spindle cells arranged in fascicles. Under higher magnification, nuclear pleomorphism with atypical mitosis was present. Immunohistochemically, the tumour cells expressed strong positivity for smooth muscle actin (Fig. 3). An above-knee amputation was performed through the middle section (disphyseal) of the right femur. Five courses of adjuvant chemotherapy were performed according to ifosfamide plus epirubicin chemotherapy regimen (18). The patient has been reviewed every three months with no signs of local recurrence or metastasis for the last 62 months since operation.

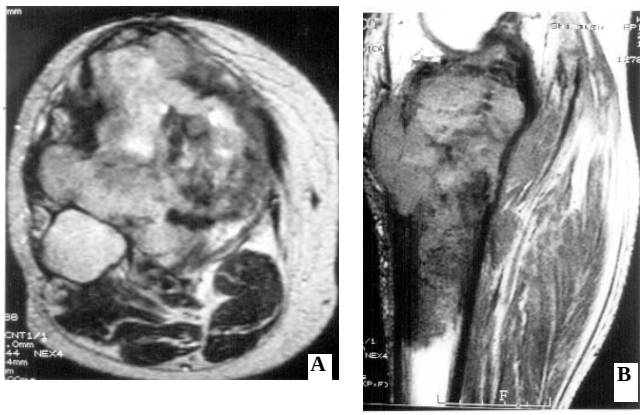

Fig. 2: MRI of the right tibia. **A**, Axial FSE T2 weighted image (5800/88) reveals large intraosseous and extraosseous components with heterogeneous signal intensity throughout the lesion. Tumour is adjacent to the fibula, without invasion. **B**, Sagittal SE T1 weighted image demonstrates the expansive lesion with intermediate signal intensity involving proximal metaphysis of the tibia, extraosseous penetration and periosteal reaction. Note hypointensive bone marrow oedema extension toward the diaphysis.

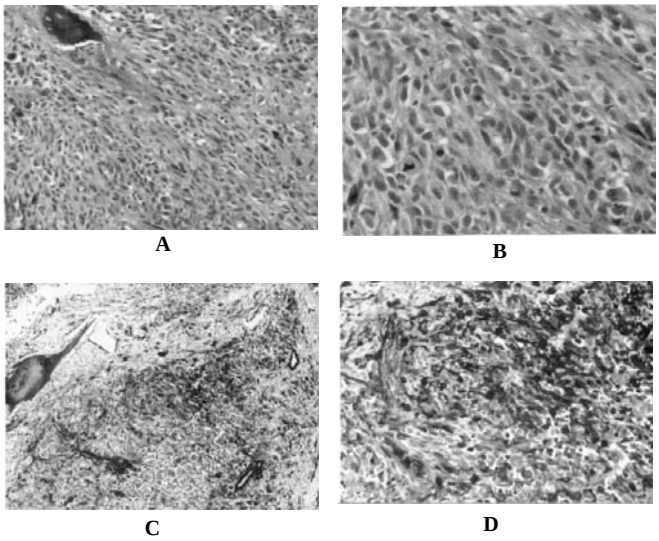

Fig. 3: Leiomyosarcoma of bone. **A**, hypercellular tumour composed of atypical spindle cells arranged in fascicles (x40). **B**, nuclear pleomorphism with atypical mitosis is evident under higher magnification (x200). **C**, **D**, strong positivity of tumour cells for smooth muscle actin (x40, x200).

DISCUSSION

Primary leiomyosarcoma is considered a very rare tumour with biologically aggressive behaviour (1, 3, 12–16). Pri-

mary leiomyosarcoma of bone is an extremely uncommon malignant condition with poor prognosis. Approximately 50% of reported patients die of metastatic disease mostly involving the lung (1, 14). Usually, it is located in the intramedullary portion of the long bones, although extension to soft tissues, as in this case, is not rare and does not rule out the diagnosis (19). In the 144 cases of primary leiomyosarcoma reported, the mean age of the patients was 49.1 years (2, 3, 7–9). Men and women were equally affected (3, 19). The knee region was the favoured site (35.5%) (3). The present case correlates with this observation of age and site.

When a leiomyosarcoma is noted in the bone, one must first consider metastatic bone disease (1–3, 5, 6). In the present case, the neoplasm was diagnosed and its localization only in the right proximal tibia was confirmed on the basis of clinical examination, radiological data, scintigraphy and magnetic resonance examination. Radiologically, this tumour and most of the reported primary leiomyosarcoma of long bones showed similar findings: they are usually osteolytic and may exhibit aggressive characteristics such as permeation of the cortical bone and extension to surrounding soft tissue. Leiomyosarcoma of bone does not have a typical radiographic appearance and can mimic any other primary or secondary malignant tumour, even the radiological shape of osteoid osteoma (1, 2, 4–8, 15, 19). Histological examination, including immunohistochemical studies, determines the precise diagnosis of primary leiomyosarcoma. Immunohistochemical demonstration of strong positivity for smooth muscle actin in tumour cells has been shown to be a particularly useful diagnostic tool.

The surgical treatment of osseous leiomyosarcoma does not differ from that of other primary malignant bone tumours in which early surgical intervention by radical or wide excision offers the best chance of cure (5). The literature shows no uniformity of management and the role of adjuvant treatments, however, remains unclear (1,5, 12–14, 16, 17). In the index case, after the amputation of the affected leg, the patient received adjuvant chemotherapy and after 62 months there was no recurrence of disease. There are few reports of follow-up without recidivism beyond two years and only one beyond 40 months (1). The present report is the only documented case of treated primary leiomyosarcoma with such an exceptionally long period without recidivism – 62 months. It suggests that early radical excision and adjuvant chemotherapy could be a reliable option in treatment. The small number of cases, most reported as individual case reports, makes it impossible to prove whether a combination of radiotherapy and chemotherapy would improve the prognosis (1, 5, 12–14, 16, 17).

Primary leiomyosarcoma has to be considered as a differential diagnostic possibility in case of bone tumours seen on routine initial plain radiographs as lytic lesions. Furthermore, the combination of immediate and adequate excision with adjuvant chemotherapy could provide good long-term prognosis for leiomyosarcoma.

Further studies are necessary to understand the nature of these tumours, to evaluate the role of adjuvant treatment options and to establish precise management protocols. This is a worthwhile goal, as it is only with observation and experimentation of treatment protocols based on a larger group of these tumours that more precise management protocols will be developed.

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