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Case Report

Periosteal chondroma of pelvis - an unusual location

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Abstract: Periosteal chondroma is a slow growing benign tumor with prevalence rate of less than 2% of all chondromas. This tumor is mostly observed in clavicle, ribs and humerus and only one previous case has been reported in pelvis. Here we present an unusual case of periosteal chondroma due to uncommon presentation, location and age range. Our case is a 39 year-old male diagnosed with periosteal chondroma in pelvis. He had unspecific signs and symptoms overlapping with low back pain and disk herniation. By the time of admission he had gluteal muscle atrophy and also claudication. Differentiation of periosteal chondroma from other malignant tumors are pivotal in order to prevent aggressive and inappropriate therapies. He underwent surgical procedures and periosteal chondroma was ascertained by both radiological and Histopathological evidence. 6 months after surgery, he declared no pain, he was able to walk freely. He claimed partial paresthesia but he also declared that his paresthesia has ameliorated.

Keywords: Periosteal chondroma, low back pain, pelvis, case report

Introduction

Periosteal chondroma or juxtacortical chondromas is known as a benign, slowly growing tumor. This lesion was first described by Lichtenstein and Hall in 1952 as a lesion arising adjacent to the cortex beneath the periosteum. Based on previous epidemiologic data, less than 2% of all chondromas are periosteal chondromas which make this disease rare [1]. These studies also indicate that periosteal chondroma is diagnosed mostly in male patients especially before 30 years of age. Previous studies have reported cases of periosteal chondroma in humerus, femur, tibia, ribs and toes [2, 3]. The most common clinical presentation of periosteal chondroma is swollen or painful palpable masses and less common, painless masses [4]. Periosteal chondromas are diagnosed both based on imaging studies and pathological and histological evidence [5]. Here in this paper, we report a 39 year-old case of hip periosteal chondroma which was presented with low back pain that is also a rare condition and presentation for periosteal chondroma.

Case

A 39 year-old married male was referred to Kashani hospital due to severe pain in right lower extremity. The patient was a carpenter, married for 10 years and with 2 children. He claimed the presentation of low back pain for 3 years prior to his admission. His low back pain was suspected to be due to spinal disk herniation and medical treatments were suggested. 3 years ago, he had been under conservative treatments due to intervertebral disk herniation based on magnetic resonance imaging (MRI) report. His drug history was only nonsteroidal anti-inflammatory drug (NSAIDs) usage from 3 months ago. No positive familial history of tumors or malignancies declared by the patient. The severity of pain increased within the past 6 months and especially 1 month before admission when the pain was unresponsive to NSAIDs. His pain was in the low back and had diffusion to the distal of the limb. The pain was persistent with worsening episodes especially with physical activities. He declared severe pain in posterior of the calf, thigh and sole of the foot and was unresponsive to

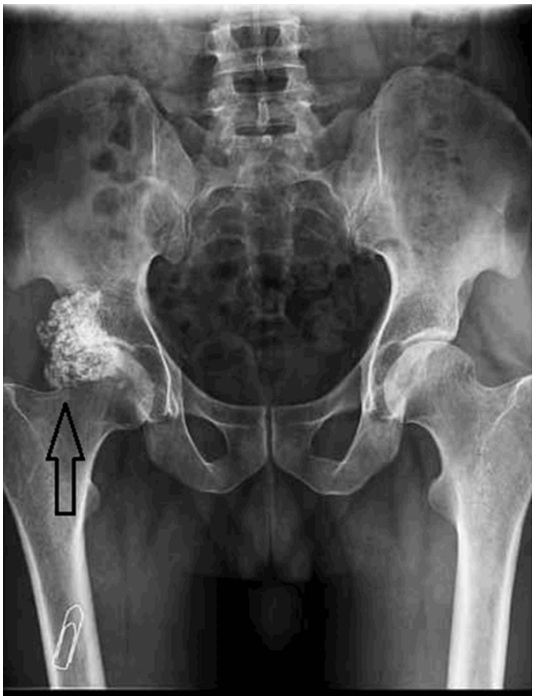

Figure 1. PXR of the patient 2 weeks before admission.

medical treatments and had caused malfunctions in his daily activities. He had complains about limb paresthesia and issues in sensation and motor functions also with diffusion to the distal of the limb when resting sitting and sleeping.

By the time of admission, the patient had normal vital signs. The physical examinations of the hip were performed in standing, sitting, supine and lateral positions. Standing examination showed antalgic gait. The patients limped to minimize the stance phase on the painful side. Other tests in standing position showed no problems. Sitting physical examinations indicated limitations. The internal rotation of the right limb was limited to 10° and the external rotation was limited to 10-15° (in sitting position). Supine physical examinations showed an accepted flexion range in right hip (90-100°) but full flexion was limited. Abduction was also limited to 25° and adduction to 10° showing limitations as well (in supine position). The limb had normal pulses. Examinations in lateral position also revealed mild tenderness in the right hip (in lateral position). Examinations of deep tendon reflexes including patellar and Achilles tendon reflexes were also performed and no problems were observed. Other physical examinations including sensory examination of tibial and proneal nerves indicated decrease in sensory functions and as spoken above, paresthesia was declared by the patient. Motor examinations showed no limitation in toe flexion or extension but due to severe pain and limitations in usage of muscles, muscle atrophies in gluteal area, posterior thigh and calf were observed.

1 month before his admission and by the time of increase in pain, he had referred to a private orthopedic clinic and simple pelvic x-ray (PXR) (**Figure 1**) and MRI (**Figure 2**) were performed. The initial report of his MRI of both hips showed: "There is a 39*29 mm multicystic lesion with puncted signal void which could be related to hemisiderin deposit, but bony abnormality is seen. The study reveals symmetrical and normal signal intensity of both hips and pelvis bones, with no evidence of arthritis disease. Muscles also show normal signal intensity. Impression: RT joint pigmented villonodural synovitis (PVNS)" (**Figure 2**).

2 weeks later and after intensity of pain increased, he was then referred to Kashani hospital which is the orthopedic and trauma center of Isfahan, Iran. A computed tomography (CT) scan was performed for patient at the time of admission. Pelvic CT scan of the patient showed: "There is a lytic sclerotic bony lesion adjacent to superoposterior aspect of the right acetabulum with mild adjacent acetabular cortical thickening. Diffuse calcified matrix is evident in the lesion. These findings are mostly suggestive for juxta cortical chondroma" (**Figure 3**). His initial MRI was then observed and reported by 4 expert radiologists in our center and they reported: "Heterogeneous signal bony lesion adjacent to right acetabulum containing high signal chondroid lobules and low signal calcifixed matrix suggestive for juxta cortical chondroma".

Within 2 weeks, the patient underwent a tumor extraction surgery and lesions were extracted (**Figure 4**). We should also note that the patient filled a written informed consent and the ethical committee of Isfahan University of

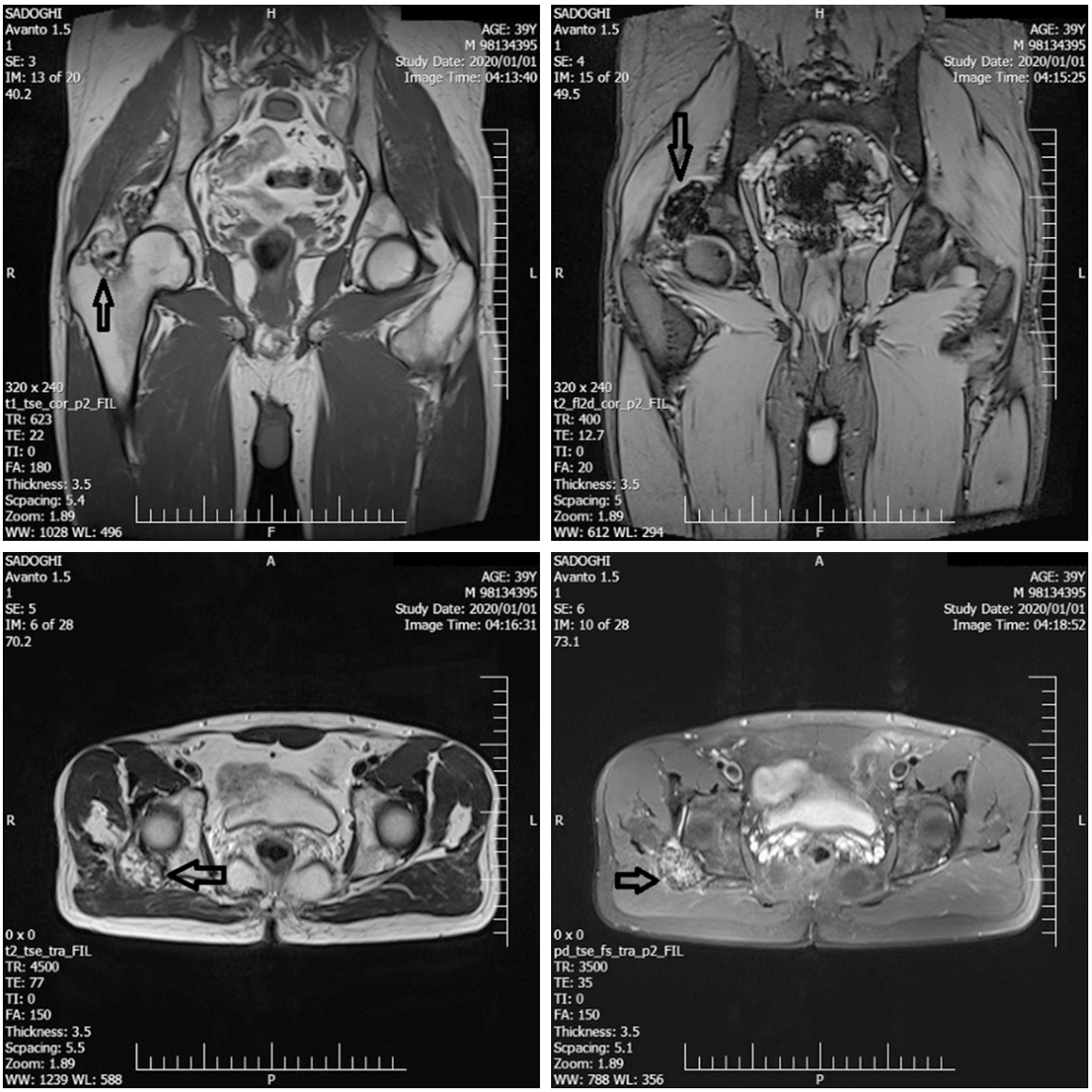

Figure 2. Initial MRI of the patient suspicious to PVNS.

Medical Sciences has approved it. The performed surgical approach to hip and acetabulum was Kocher Langenbeck in lateral position. This approach includes dissection of deep fascia and cutting the piriformis muscle from its origin and also access to acetabulum. During surgery, sciatic nerve was observed which was under pressure by peripheral surrounding muscles and indirectly by the tumor. Histopathological examinations of the extracted tumor indicated: "Sections show proliferation of mature chondrocytes in lobular arrangement. The chondrocytes had small uniform nuclei. No mitotic figure was seen and no evidence of malignancies were observed. The diagnosis is periosteal chondroma" (**Figure 5**). After surgical procedures, the patient discharged from hospital with non-weight bearing condition for 1 week and then partial weight bearing. He used cane as a help for walking for 3 months and 30 sessions physiotherapy was prescribed for him. Post operation PXR was performed 6 months after surgery (**Figure 6**). 6 months after surgery, he declared no pain, and he was able to walk freely. He claimed partial paresthesia but he also declared that his paresthesia has ameliorated amazingly. Follow up physical examinations 6 months

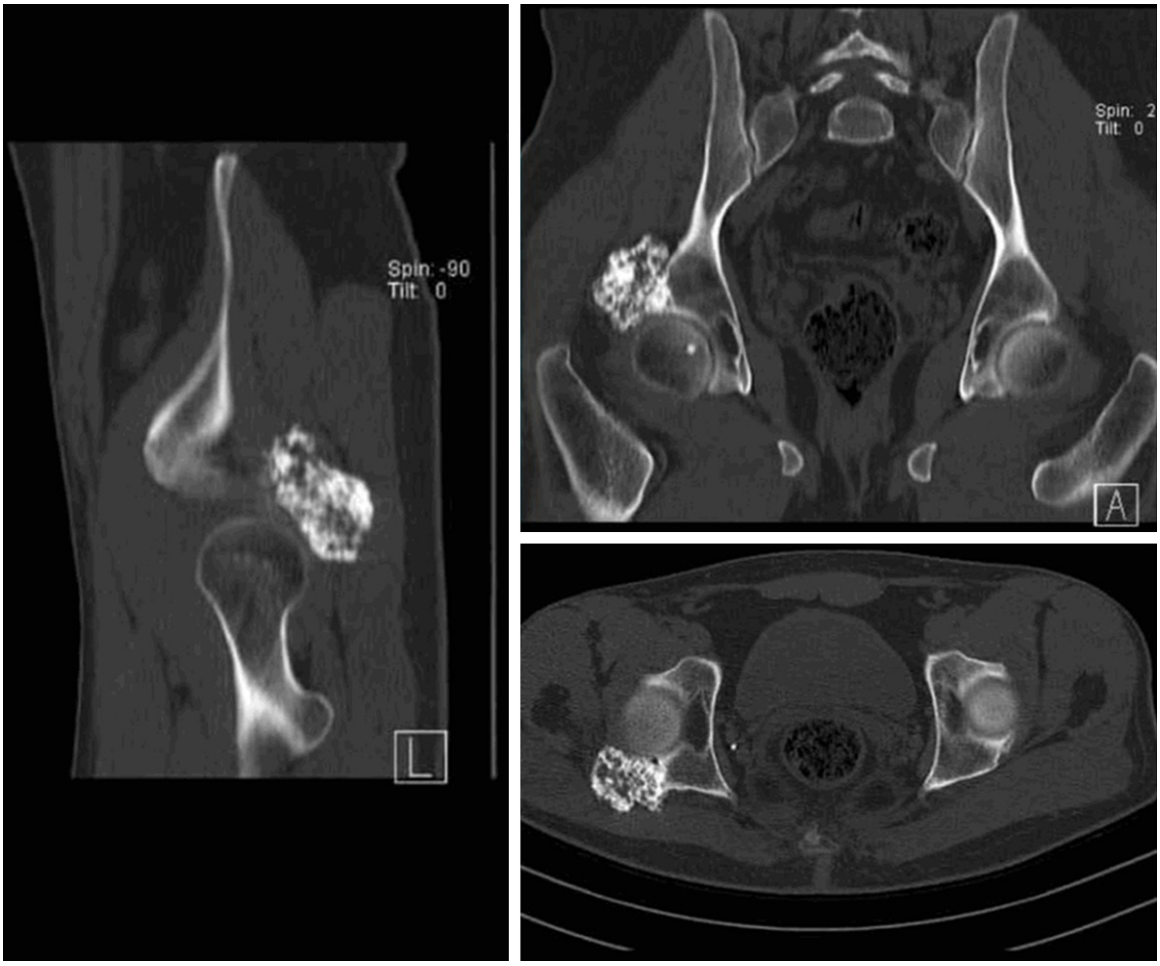

Figure 3. Lytic sclerotic bony lesion adjacent to superoposterior aspect of the right acetabulum indicated in the CT scan.

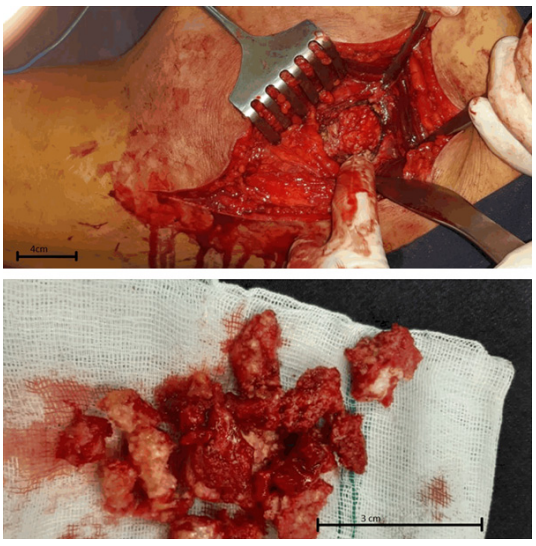

Figure 4. Tumor extraction surgery and extracted lesions.

after surgery were also performed as following: in supine position, the abduction of the hip was 40-45 degrees. Adduction of the hip was also 20-25 degrees in supine position. McCarthy test was also performed in supine position which indicated pain relief in all positions compared to before surgery. Range of flexion and extension and internal rotation of the hip were also increased in supine position and the patient had reduced pain.

Discussion

Periosteal chondromas are very rare benign tumors and as spoken above, less than 2% of all chondromas are periosteal chondromas. This type of tumor is a slow growing benign tumor and patients might also be symptom free. Based on previous studies, the highest frequency of this tumor is among patients

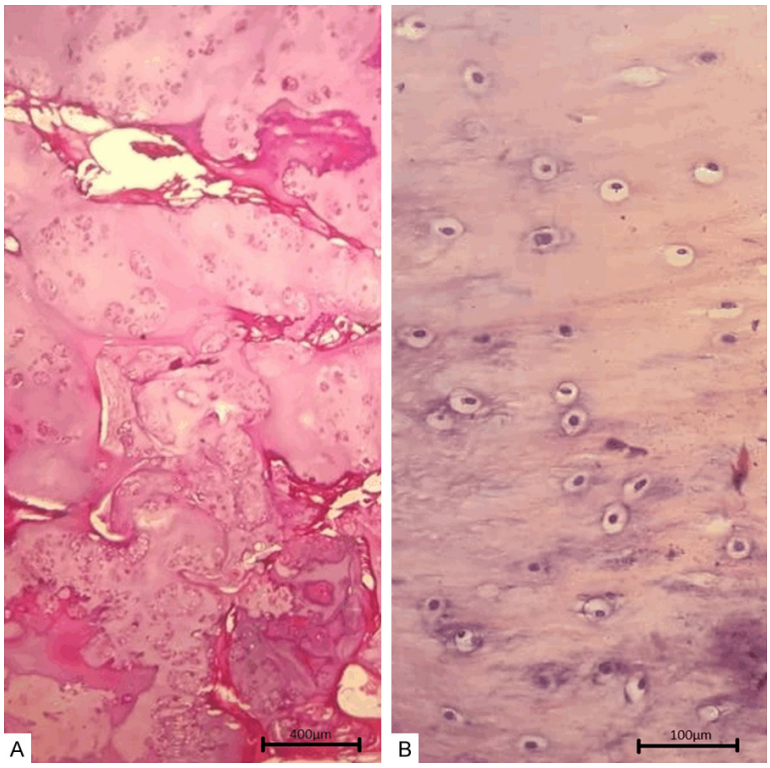

Figure 5. Histopathological studies of the tumor indicating a well-differentiated area of compact mature lamellar bone similar to cortical bone by hematoxylin-eosin [H&E] staining. (A: Magnification ×10, B: Magnification ×40).

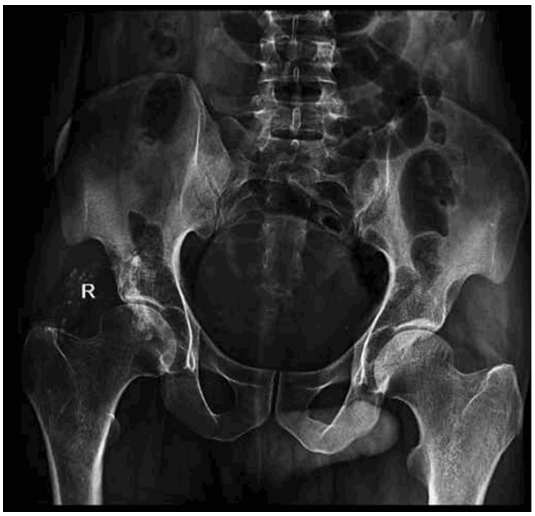

Figure 6. Post operation PXR was performed 6 months after surgery.

younger than 30 years but here we presented a 39 year-old case of periosteal chondroma. An important point of the present case was the location of the tumor. Pelvis periosteal chondroma is very rare and to the best of our knowledge, only one previous case of pelvis periosteal chondroma was reported in English literature. Akansu and colleagues have reported a 51 year-old male with pelvis periosteal chondroma in ischium in 2012 [6]. This case had palpable fixed mass in in the ischium and the lesion was extracted via surgery. A difference point of the current case was that the patient had no palpable mass and he had symptoms mimicking sciatica.

Previous literature have reported different cases of periosteal chondroma and the main common sites for this tumor was clavicle [1], ribs [7, 8] metaphyses of long bones, particularly the proximal humerus, and small tubular bones of hands and feet [9-12]. As an example, Zheng and colleagues reported a case of periosteal chondroma in femur and also had a survery on similar cases but no periosteal chondroma in pelvis was reported [11]. As described, this reported case presented with signs and symptoms of sciatica which is very uncommon and this tumor had also overlaps in symptoms with low back pain. This issue had caused a late diagnosis so than even gluteal muscle atrophies and claudication were present by the time of admission. It should also be noted that the physicians were suspected to osteochondroma based on his initial symptoms and imaging studies but the diagnosis of periosteal chondroma was ascertained. So far, such clinical presentation has not been reported for a case of periosteal chondroma. Based on previous data, osteochondromas develop on the surface of bones while on the other hand, periosteal chondroma most likely develop through subperiosteal cartilage formation and are not related to metaphyseal plates [13]. In another case report by Santanelli and others, a giant periosteal chondroma was reported with clinical presentation of compression of the digital nerves [14]. This report might have some simi-

Table 1. Previously reported cases of periosteal chondroma

Author	Year	Gender/age	Locations of chondroma
Akansu B [6]	2012	Male/51	ischium
Al-Qudah AS [1]	2009	Male/56	clavicle
Karabakhtsian R [7]	2007	Female/11	ribs
Inoue S [8]	2001	Male/5	ribs
		Male/39	
Ricca RL Jr [9]	2000	Male/7	cuboid
Hagiwara Y [10]	2004	Male/19	fifth toe
Zheng K [11]	2015	Female/14	Femur
Imura Y [12]	2014	Male/17	distal femur
Santanelli F [14]	2013	Male/69	proximal phalanx of the left third finger
Ishida T [15]	1998	Female/19	humerus

larities with the current reported case due to compression effects on nerves but as spoken, pelvis is a very uncommon location for periosteal chondroma.

Studies have also indicated that the differential diagnosis of periosteal chondroma are: osteochondroma, parosteal osteosarcoma, periosteal osteosarcoma and enchondroma [7, 15]. These lesions could be differentiated through histopathological patterns. Osteochondromas are known to be malignant cartilage-producing tumors and comprise almost 15% of all conventional chondrosarcomas in tertiary referral centers [16]. Parosteal osteosarcoma is also a slow-growing tumor originating from the outer layer of the periosteum and also representing 65% of surface osteosarcomas which might also be a surface lesion [17]. Histopathological features of chondrosarcomas shows higher size of tumor in patients and also possibility of extension into the soft tissue which are also mostly observed in patients older than 50 years of age [18]. On the other hand, periosteal osteosarcoma is a rare variant of osteosarcoma exhibiting perpendicular spicules of calcification in pathological studies [6]. Multiple nodules of hyalin cartilage separated by normal marrow in conjunction with partial to complete encompassing plates of lamellar bone that conform to the irregular shapes of the cartilage nodules are histological patterns of enchondroma [19].

Robbin and colleagues have indicated that lobules of immature hyaline cartilage with small chondrocytes interspersed throughout the cartilaginous tissue and also extending from the periosteum into the adjacent cortical bone is the most common histopathologic charsteretic of periosteal chondroma [20] which was also reported in our case.

Imaging studies using CT-scan or MRI might also be beneficial in diagnosis of the disease but we believe that these imagings should be reported by a group of expert radiologists because of the veriety of the differential diagnosis. Simialr reportde cases of periosteal chondroma are summarized in **Table 1**.

Conclusion

Taken together, here the second case of periosteal chondroma in pelvis was represented which was a very uncommon location for this tumor. The first case of periosteal chondroma in pelvis was reported by Akansu and colleagues in 2012 [6]. The patient had also symptms of low back pain and sensory and motor impairements in lower limb caused by the tumor and overlaped with sciatica. Periosteal chondroma was then diagnosed by the means of imaging studeis and confirmed by histopathological methods. Surgical procedures led to better functional abilities and pain amelioration.

Disclosure of conflict of interest

None.

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