



## Case report

## Rare presentation of intra-spinal extradural grade 1 chondrosarcoma: A case report

Isam Sami Moghamis<sup>\*</sup>, Moh'd Ishaq Alamlah, Mutaz Awad Alhardallo, Samir Al Hyassat, Salahuddeen Abdelsalam, Abdulmoen Baco

Hamad Medical Corporation, Doha, Qatar

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## ABSTRACT

**Introduction:** Lumbar Spine Chondrosarcomas are rare entities that accounts for less than 10% of all spinal Chondrosarcomas, patients can present with symptoms of nerve root irritation secondary to direct compression caused by the tumor mass effect. Radiologically these tumors are destructive in nature with soft tissues classifications, and the treatment of choice for it is complete surgical excision, however in some scenarios they are difficult to access and complete resection becomes not feasible.

**Presentation of case:** A 37 years old male, presented to our spine clinic with chief complaint of chronic low back pain with radicular symptoms, normal power in both lower limbs, while his radiological evaluation showed intra-spinal extra-dural Chondrosarcoma arising from the posterior cortex of the 5th vertebral body, for which he underwent surgical decompression of the lumbar canal with resection of the lesion and unilateral stabilization of the spinal segment.

**Conclusions:** Unlike Chondrosarcomas of the appendicular skeleton, lesions arising in the spinal element may be difficult to detect on plain radiographs and further imaging is crucial for better evaluation, as this will help in surgical planning for excision of the tumor. In difficult cases with inaccessible locations, marginal excision of spinal Chondrosarcomas can be achieved utilizing a minimally invasive technique with preservation of some spine motion with acceptable clinical outcomes.

## 1. Introduction and importance

Chondrosarcomas is the second most common primary bone tumor, accounts for less than 10%, and it may arise de novo or from a pre-existing benign cartilaginous neoplasm such as osteochondroma or enchondroma [1–4]. Middle-aged males are more commonly affected with pelvis girdle being the most commonly affected bone, followed by shoulder and proximal femur and humerus [4,5].

Spinal involvement is a rare occurrence and it accounts for less than 10% of all Chondrosarcomas. The Thoracic spine is the main involved part of the whole spine [2,4,6–8]. Radiologically these tumors appear as destructive lesions or can present as intra-spinal or Para-spinal calcifications [4,6]. Patients usually complain of localized back pain with or without signs of nerve root compression, spinal cord compression or history of increasing back swelling [9–12]. Surgical excision of these tumors when feasible is the treatment of choice while in some scenarios they are not accessible and therefore complete resection of the tumor

becomes difficult [13,14].

We are reporting a rare case of a patient who presented to our clinic with signs and symptoms of lumbar foraminal stenosis due to mass effect of secondary Chondrosarcoma arising from the body of the 5th lumbar vertebral, treated by surgical resection with residual mass. We report this case in line with the updated consensus-based surgical case report (SCARE) guidelines [15].

## 2. Case presentation

40 years old, fit & healthy male with no history of any chronic illnesses, presented to our spine clinic with 5 months history of low back pain radiating to his both lower limbs reaching both feet. The pain was associated with numbness in the first web space bilaterally with difficulty of weight bearing, especially on the right lower limb. There was no history of any trauma or constitutional symptoms, no symptoms of cauda equina and there was no family history of similar complaint. On

<sup>\*</sup> Corresponding author.

E-mail address: [imoghamis@hamad.qa](mailto:imoghamis@hamad.qa) (I.S. Moghamis).

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examination the patient had an antalgic gait on the right lower limb, straight leg raising test was positive bilaterally at 45°, power was 5/5 in both lower limbs with a diminished sensation of the first web space and the lateral aspect of the dorsum of the foot bilaterally, in the course of sacral 1(S1) & lumbar 5(L5) dermatomes, and his rectal examination was normal.

Initial radiographs in the clinic were obtained and showed an ill-defined calcification lesion; it was superimposing the spinal canal at the 5th lumbar vertebra body (Fig. 1). The patient then was admitted to the hospital for further evaluation of the lesion. His laboratory results including complete blood count, electrolytes, biochemical profile, erythrocyte sedimentation rate, C-reactive protein, thyroid function test, parathyroid hormones levels all were within normal limits.

CT scan of the lesion showed large intra-spinal extradural calcified soft tissues lesion originating from posterolateral cortex of L5 body, occupying the left lateral recess at L5-S1 level (Fig. 2). The MRI scan showed that the lesion is causing compressing of the left exiting nerve root while displacing the thecal sac to the right (Fig. 3). There was no metastasis of the lesion, and due to the unusual site and difficulty in accessing the lesion, decision was to undergo directly with surgical decompression of the spine including excision of the mass and unilateral stabilization.

Later; the patient underwent microscopic surgical excision and the senior spine consultant performed decompression of the lesion utilizing a left-sided Wiltse approach after minimal invasive unilateral stabilization of right L5-S1 level. A left hemilaminectomy was performed with careful dissection around the Dura. Macroscopically the entire mass causing compression of the neural element was removed and adequate bilateral neurological decompression was obtained. Histopathological findings were consistent with grade 1 Chondrosarcoma arising from osteochondroma (Fig. 4). The surgery was performed in a tertiary hospital with high surgical capabilities and the surgery underwent in combination between the orthopedics spine and oncology teams.

Post-operative course was uneventful; the patient had complete relief of his back pain as well as his radicular pain. He did not have any new neurological deficit. He did not receive any chemo or radiotherapy following the surgery, and he was followed in the clinic for 3 years.

During this period he went back to his normal lifestyle and regular exercise, also he did not have any new symptoms and last lumbar spine MRI showed no increase of the residual mass (Fig. 5).

### 3. Discussion

Spinal Chondrosarcomas are usually presenting ad a slowly growing mass with an insidious onset; usually, they are associated with pain, swelling, local tenderness, and associated sensory or motors deficits resulting from spinal cord compression at the time of presentation [16]. Clinical symptoms usually develop over a long period since most tumors are low-grade and slow-growing lesions [9,17,18].

In the case of secondary spinal Chondrosarcomas arising from osteochondroma, it manifests radiologically as large lobulated masses with bone destruction calcification or true ossification [9]. Our patient presented with a painful intra-spinal huge mass associated with sciatic pain and signs of nerve root irritation with no clinical signs of malignancy. The plain radiographs and other images showed the classical features of Chondrosarcoma with significant compression of the cauda equine as well as both exiting nerve roots, and histologically the mass showed a classical low-grade Chondrosarcoma.

Fundamentally, complete excision of the tumor at the time of definitive surgery is of great importance, as this will affect the recurrence of the tumor. However total resection is not always feasible, due to lesion size and location as well as the risk of neurological deficit [9,17,18].

For secondary spinal Chondrosarcomas, two surgical options were described in the literature, the first option involves *en bloc* resection with a wide disease-free margin; it is fraught with multiple surgical and technical difficulties such as the size of the tumor, anatomical constraint, risk of spinal instability and inflecting of new neurological deficits [1,19,20]. These factors may lead to incomplete surgical excision of the tumor in the spine and thus, the surgical cure is uncertain and local recurrence and risk of distance metastasis increased [3,9,13,14]. The second option is extensive intra-lesional curettage followed by local adjuvant chemical or thermal ablation and bone grafting in selected cases of low-grade tumors, and good functional outcomes have been

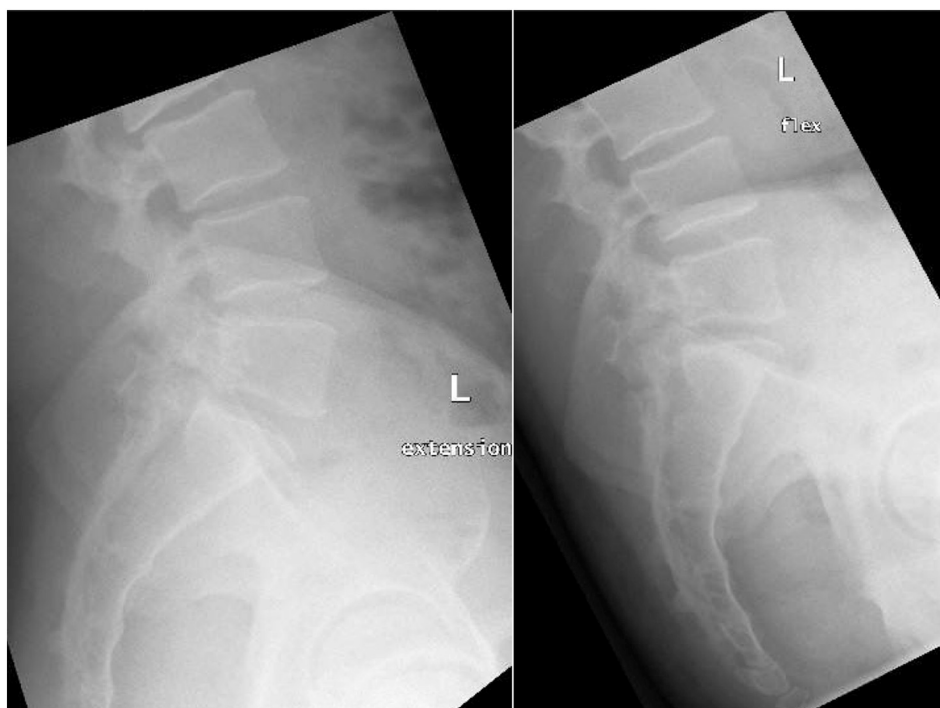
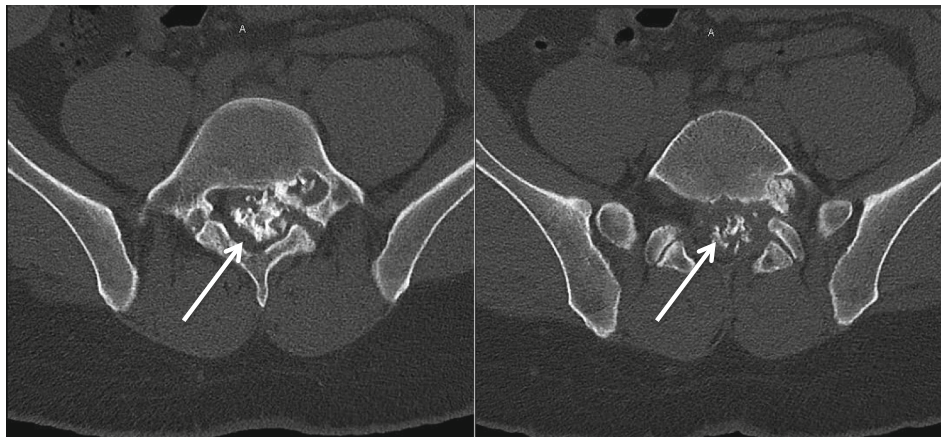
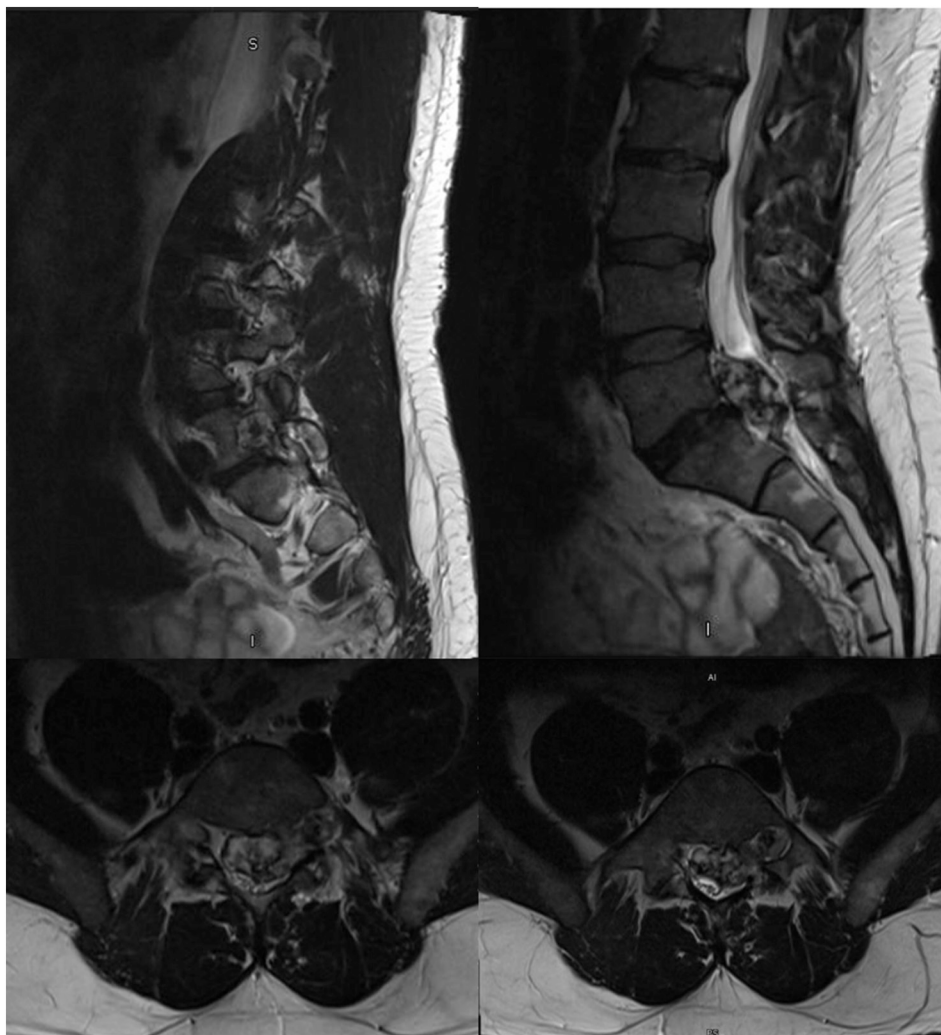


Fig. 1. Standing lateral flexion and extensions Plain radiographs showing Heterogenous ill-defined calcific shadow superimposing the spinal canal at L5.



**Fig. 2.** Axial cuts CT scan of the L5-S1, showing the intra-spinal extradural calcified soft tissue lesion, located para-centrally, originating from the posterior cortex of L5 vertebral body, and occupying the spinal canal, as well as the left neural foramen.

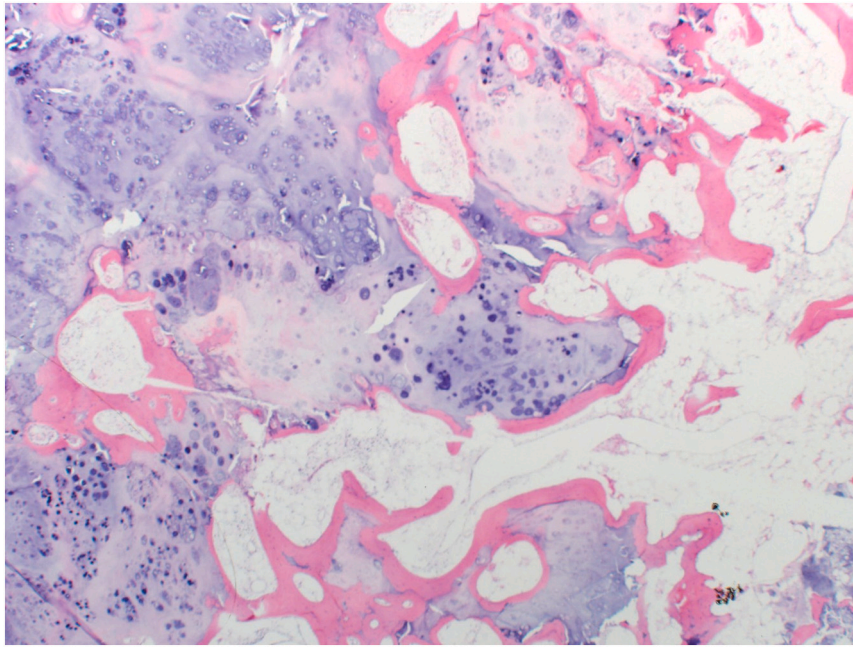


**Fig. 3.** T2 weighted sagittal & Axial cuts MRI of the lumbar spine demonstrating large para-central heterogeneous intra-spinal extradural calcified soft tissue lesion, occupying the left lateral recess at L5-S1 level compressing the left L5 exiting nerve, compressing the spinal canal, and significantly displacing the thecal sac to the right side, as well as extending/filling through the left neural foramen.

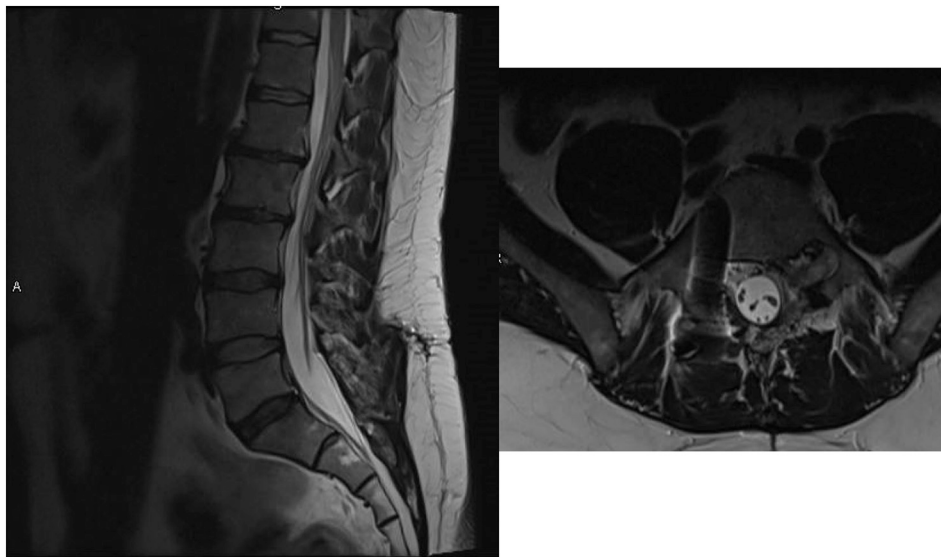
observed with this technique [14,21].

In our case, we were unable to achieve a complete *en bloc* resection of the pathology, and there were no clinical or radiological signs of any

recurrence of the disease at 3 years follow up. However, a delayed course of local recurrence or metastasis in a patient with Chondrosarcoma may occur and long-term follow-up is advised [1,21].



**Fig. 4.** histology revealed bone with a fibrocartilaginous cap in continuity with trabecular bone and bone marrow that is replaced by fat. Occasional bi-nucleated chondrocytes is noted with focal proliferation, hypercellularity, nuclear enlargement with hyperchromatasia and mild pleomorphism, favoring a malignant transformation of osteochondroma into grade 1 Chondrosarcoma.



**Fig. 5.** T2 weighted sagittal & Axial cuts MRI of the lumbar spine post decompression and lumbar spine stabilization 3 years follow up showing the residual mass with no increase of its size.

Drawbacks of incomplete resection of the tumor is the possibility of tumor recurrence, also unilateral spine stabilization might not be sufficient and may lead to future low back pain and instability of the spine but when it there is no other option it might be used as an option with good short term outcomes.

#### 4. Conclusion

Unlike Chondrosarcomas of the appendicular skeleton, lesions arising in the spinal element may be difficult to detect on plain radiographs and further imaging is crucial for better evaluation, as this will help in surgical planning for excision of the tumor. In difficult cases with inaccessible locations, marginal excision of spinal Chondrosarcomas can

be achieved utilizing a minimally invasive technique with preservation of some spine motion with acceptable clinical outcomes.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor of this journal upon request.

#### Registration of research studies

Not first in Man.

## Ethical approval

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Abdulmoeen baco

## CRedit authorship contribution statement

Isam Moghamis: Investigation, Writing - original draft - review & editing. Moh'd Ishaq: Investigation, Writing. Mutaz Awad: Investigation, Writing. Samir Al Hyassat: Investigation, Project administration, Salahuddeen Abdelsalam: Investigation, Project administration, Writing - review & editing. Abdulmoeen Baco: Investigation, Supervision, Project administration, Writing - original draft, Writing - review & editing.

## Declaration of competing interest

The authors have no competing interests to declare.

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