

## Solitary osteochondroma arising in lumbar spinous process: Case report



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### ABSTRACT

Solitary osteochondromas rarely occur in the axial skeleton. Those tumors mostly arise on the posterior elements of the cervical column causing various symptoms especially when developing within the spinal canal. Exophytic lumbar variety is uncommon presenting with palpable mass or spinal deformity. We report a 20-year-old man presenting with a solid painless mass at the lower lumbar region. Radiological examinations revealed an exophytic lesion arising in the third lumbar spinous process appearing to be a solitary osteochondroma. The lesion was treated by en-bloc resection; histopathological examination confirmed the diagnosis of osteochondroma with no evidence of recurrence at the end of 2-year follow up.

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### Introduction

Osteochondromas are the most common primary benign bone tumors.<sup>1–4</sup> Also known as osteocartilaginous exostoses or exostoses, those tumors are frequently located in the appendicular skeleton especially on the metaphyseal parts of long bones. They may occur in association with multiple hereditary exostoses (MHE) or as solitary lesions which rarely involves the spinal column.<sup>1–3</sup> According to Albrecht et al. 1.3–4.1% of solitary osteochondromas are located in the spinal column with predilection for the posterior elements of the cervical spine causing a variety of signs and symptoms.<sup>2</sup> The lumbar spine is an uncommon localization. A few cases of lumbar osteochondromas expanding in the spinal canal and presenting with neurological signs have been reported in the literature.<sup>5–14</sup> This is a report of an unusual case of solitary osteochondroma arising from the spinous process of the third lumbar vertebrae.

### Case report

A 20-year-old man presented with low back pain for 12 months. On clinical examination, a 4 × 3 cm palpable subcutaneous mass of the midline of lower lumbar region was detected. The mass was immobile, solid and painless. The lumbar range of motion and neurological examination were normal. Lumbar plain radiographs showed a well-defined calcified lesion between L3 and L4 spinous process appearing to be a solitary osteochondroma (Figs. 1 and 2). Computed tomography (CT) demonstrated an exophytic lesion originating from L3 spinous process. The cortex and spongiosa of the lesion were in continuity with the underlying parent bone (Figs. 3 and 4). T2-weighted spinal magnetic resonance imaging (MRI) also revealed the pedunculated calcified mass arising from the caudal border of L3 spinous process 42 × 36 × 40 mm in size with a 2 mm thick cartilaginous cap (Figs. 5 and 6). This lesion distributed to layers A–B, sectors 1–12 according to the Weinstein-Boriani-Biagini (WBB) Classification.<sup>15</sup> Tumor en-bloc excision was performed in prone position through a posterior approach (Fig. 7). Histopathological examination revealed a benign osteochondroma, therefore classified Stage 1 (benign latent) according to the Enneking classification.<sup>16</sup> No further complaint or local recurrence has been noticed at the end of 24 months postoperatively.

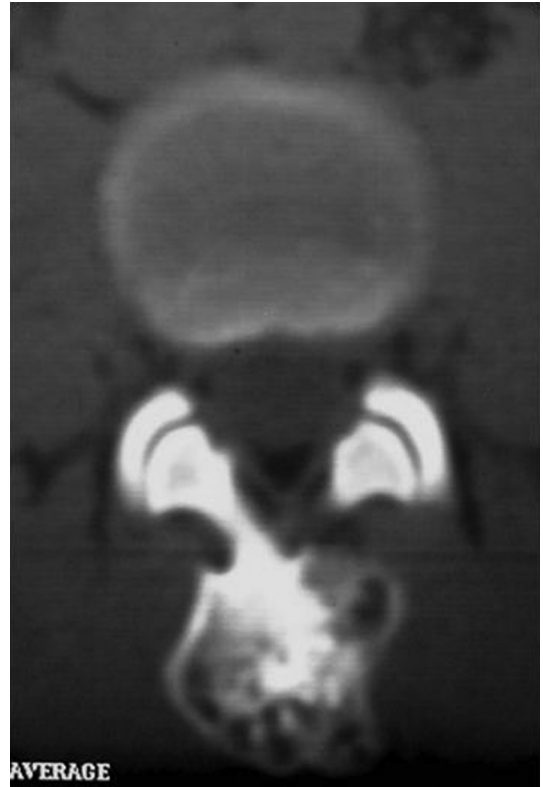
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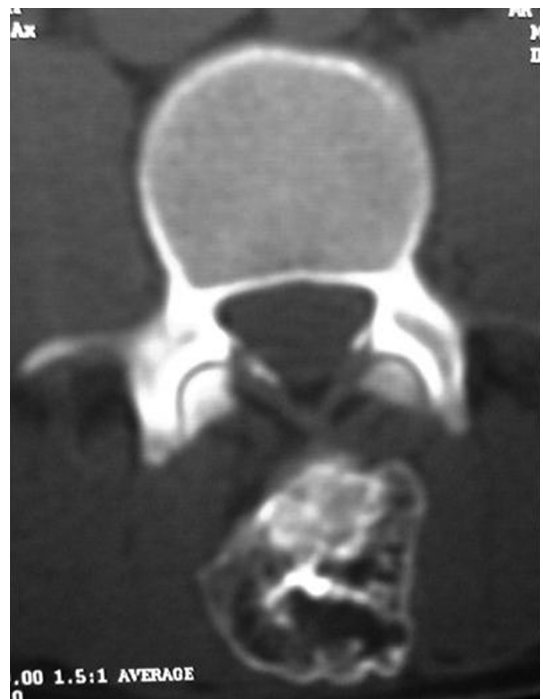
**Fig. 1.** Antero-posterior plain radiograph showing a well-defined calcified lesion between L3 and L4 spinous process.



**Fig. 3.** Computed tomography scan showing pedunculated exophytic lesion originating from L3 spinous process.



**Fig. 2.** Oblique plain radiograph showing the calcified mass between arising from L3 spinous process.



**Fig. 4.** The mass is caudally extended to L4 spinous process.



Fig. 5. T2-weighted sagittal spinal MRI revealed the calcified mass arising from the caudal border of L3 spinous process.

## Discussion

Osteochondromas are the most common primary benign skeletal tumor. They occur as a solitary lesion or in association with multiple hereditary exostoses. Only 1.3 to 4.1% of solitary osteochondromas involve the axial skeleton.<sup>2,14</sup> The incidence of

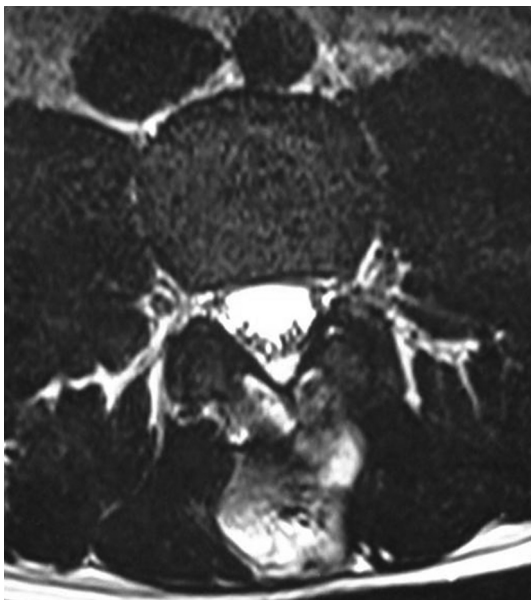


Fig. 6. the mass was 42 × 36 × 40 mm in size with a 2 mm thick cartilaginous cap.

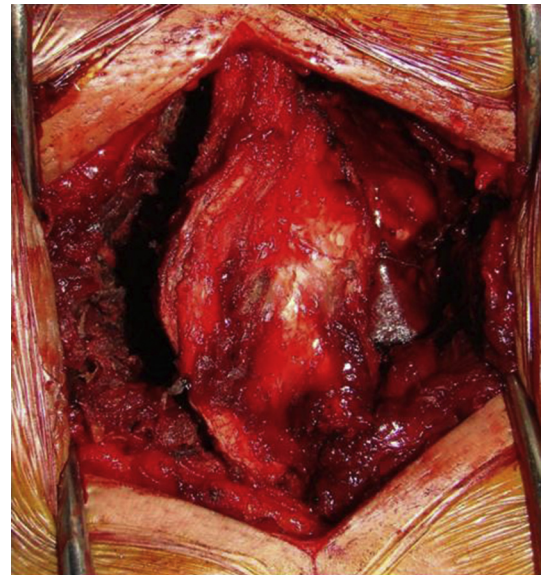


Fig. 7. Operative view of the spinous process mass.

spinal involvement is slightly higher in MHE patients approximately 3%.<sup>17,18</sup> 50% of spinal osteochondromas arise in the cervical spine with predilection for the posterior arch of C2.<sup>2,5,17,18</sup> Lumbar locations are very rare accounting for only 3–4% of spinal lesions.<sup>3,4,11</sup> They result from a developmental defect of growth plate cartilage causing a persistent growth of separated subperiosteal cartilaginous fragment which leads to an osseous excrescence with a cartilaginous cap.<sup>1,4,11</sup> The relative rareness of lower lumbar locations is believed to be the result of lesser flexibility than cervical column and greater resistance to epiphyseal growth cartilage displacement due to microtrauma.<sup>19</sup> The exostosis, more frequent in male, become symptomatic during the second and third decades of life.<sup>3</sup> Lumbar osteochondromas can cause various symptoms and complications depending on their location. Lesions mostly occur in the posterior arch of the vertebra with the possibility to develop within the spinal canal. They present as radiating leg pain due to nerve root compression,<sup>3,4,9,10,12</sup> cauda equina syndrome,<sup>14</sup> foot drop,<sup>13</sup> neurogenic claudication<sup>11</sup> or an atypical spinal curvature.<sup>20</sup> Bess et al estimated that the most common non-neurological presenting symptom for patient with lumbar osteochondroma was a palpable mass (35%) or deformity as reported in our case.<sup>3</sup> The involvement of lumbar spinous process is very rare. To our knowledge, only three cases of similar presentation have been reported.<sup>3,5,21</sup> In some cases, plain radiographs are insufficient to diagnose spinal osteochondromas. Albrecht et al suggested only 21% of osteochondromas were diagnosed by plain radiographs.<sup>2</sup> It is essential to evaluate such lesions with CT combined with MRI especially for measuring thickness of the cartilage cap and the demonstration of nerve root compression in cases with neurological symptoms. Malignant transformation is rarely encountered in solitary osteochondromas and is estimated about 1%.<sup>4</sup> It should be suspected if thickness of the cartilaginous cap exceeds 1 cm or in case of local recurrence. The treatment of choice for osteochondromas is en-bloc resection which can be achieved easily with no need of fusion surgery especially for cases with exophytic growth in the posterior elements. Complete resection of the cartilaginous cap is essential to avoid local recurrence.<sup>2–5</sup>

## Conclusions

In conclusion, this report documents a rare solitary osteochondroma arising from the spinous process of the third lumbar vertebrae presenting as palpable painless mass. Diagnosis is easily achieved by CT scan and MRI. En-bloc excision is the treatment of choice and is almost curative. The patient should be followed with radiological examination to detect recurrence or malignant transformation.

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