

## EDİTÖRE MEKTUP / LETTER TO THE EDITOR

### Unilateral hypertrophy of the C5 vertebra spinous process in an adolescent

Adölesan olguda C5 vertebra spinöz proçesinin tek taraflı hipertrofisi

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#### To the Editor,

Congenital anomalies of the cervical vertebrae are rarely observed situation<sup>1</sup>. These anomalies include persistent apophysis of the transverse process, vertebral platyspondylia, fusion of vertebral bodies at various levels, vertebral hypoplasia and unilateral spinous process hypertrophy<sup>2</sup>. They may accompany congenital abnormalities like Klippel-Feil syndrome, Morquio syndrome, diastrophic dwarfism, spondyloepiphyseal dysplasia, and osteogenesis imperfecta<sup>3, 4</sup>. Congenital abnormalities of the transverse and spinous process are generally coincidentally identified on radiologic imaging but may cause clinical symptoms like pain or esthetic problems<sup>1</sup>. This report discusses the clinical and radiologic findings of a male adolescent case with unilateral hypertrophy of the C5 vertebra spinous process.

A 16-year old male patient attended the neurosurgery clinic due to noticeable painless swelling in the posterior cervical region. The patient had no history of trauma or previous operation for any reason. Physical examination identified a palpable, painless, hard and fixed mass in the posterior cervical region. Neurological examination did not identify any neurological deficit. Firstly, AP and lateral radiographs were obtained for the cervical vertebra with the aim of assessing the relationship of the lesion to the bone structures. The spinous process of C5 vertebra was assessed as

hypertrophic (Figure 1).



**Figure 1. C5 vertebral spinous process hypertrophy on lateral AP radiograph (white arrow).**

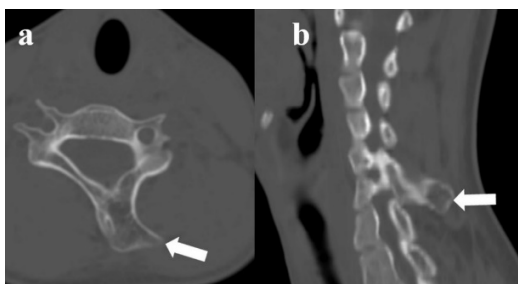
Cervical computed tomography (CT) identified left-side asymmetric hypertrophy of the C5 vertebral spinous process along with stenosis of the C5-C6 disk interval (Figure 2 a, b). For possible spinal and soft-tissue pathologies, magnetic resonance imaging (MRI) of the cervical, thoracic and lumbar vertebrae was performed. On MRI, the left half of the C5

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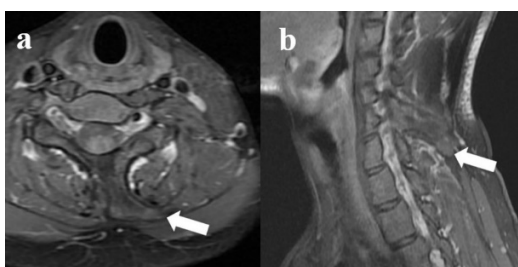
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vertebral spinous process was identified to have hypertrophy with similar intensity to bone structures in axial and sagittal planes and on all sequences (Figure 3 a, b).



**Figure 2 a, b. Axial (a) and sagittal (b) CT images: hypertrophy of C5 vertebral spinous process on the left (white arrow).**

Bilateral neural foramen widths were normal, with no additional spinal cord or paravertebral soft tissue pathology identified. The patient had no active complaint and did not accept surgical treatment so monitoring was considered appropriate.



**Figure 3 a, b. Axial (a) and sagittal (b) T2-weighted MRI: hypertrophy of C5 vertebral spinous process on the left (white arrow).**

The spine is a complicated and vital structure, serving as structural support for the body and as a channel for neural structures ensuring communication with the brain<sup>5</sup>. Vertebral arc development begins in the 3-6th week intrauterine and continues until the second decade with the completion of fusion of secondary ossification centers<sup>3, 6</sup>. Dysfunction in the embryologic period may cause one or more congenital anomalies. The cause of unilateral hypertrophy of the lamina or spinous process is not fully known. Additionally, abnormal extension of chondrification and other normal development and ossification of the vertebral column may explain present anomalies. Mostly it is asymptomatic and coincidentally

identified.

Developmental anomalies of the cervical vertebrae may accompany congenital syndromes like Klippel-Feil syndrome, Down syndrome, fibrodysplasia ossificans progressive or Rubinstein-Taybi syndrome<sup>7,8</sup>. In addition to developmental abnormalities, acquired diseases like ankylosing spondylitis, psoriatic spondylitis, diffuse idiopathic skeletal hyperostosis, ossification of the posterior longitudinal ligament, sternoclavicular hyperostosis, juvenile chronic arthritis and acromegaly, and diseases causing hyperostosis or ossification of the cervical spine should be considered for differential diagnosis<sup>9</sup>. Hypertrophy of the spinous process of the cervical vertebrae may be a part of a syndrome but may occur as an isolated abnormality. If it occurs as an isolated congenital anomaly, it rarely causes clinical symptoms. Clinical findings may occur in the form of cervical movement limitation, cervical pain, neurological deficits and esthetic abnormalities. In the absence of clinical findings, it may be coincidentally identified on radiologic assessments performed for different reasons like trauma<sup>10</sup>. In our case, there was no active complaint other than esthetic anomaly.

The first choice for treatment of spinous process hypertrophy of the cervical vertebrae should be conservative methods like analgesics, muscle relaxants and physical therapy methods. If conservative methods fail or there are severe symptoms, the choice should be surgical resection<sup>10</sup>. As our case did not have an active complaint, he did not accept surgical intervention, and the decision was made to monitor him. Additionally, as our case was an adolescent and the vertebral development process was continuing, close follow-up was important.

Definite diagnosis of congenital anomalies of the cervical vertebrae are placed with radiologic methods. The first and most commonly used method is direct radiography, but this may be insufficient for complicated bone anomalies or in the presence of trauma. If the diagnosis is uncertain the second method that should be used is CT. The use of CT and MRI together is the most useful choice to assess spinal anomalies, allowing detailed investigation. Though the majority of congenital spinal deformities do not have clinical symptoms, they have high incidence rates with intraspinal pathologies of 30-35%<sup>11</sup>. Additionally, in the presence of trauma, CT is beneficial to differentiate

pathologies like fracture, pseudoarthrosis and hematoma. MRI is superior to identify additional trauma or inflammation markers of bone marrow edema and traumatic spinal lesions. Cross-sectional imaging methods can assess paravertebral soft tissue planes, intervertebral disk intervals and bone marrow variations in detail<sup>10</sup>. In our case, CT and MRI methods were applied together, with no additional anomalies or mass lesions identified. This data is very beneficial to plan the treatment and follow-up process for our case.

In conclusion, in adolescent cases attending with preliminary diagnosis of mass on the cervical vertebrae congenital anomalies like unilateral spinous process hypertrophy should be included in differential diagnosis. Along with clinical assessment, direct radiography, CT and MRI are very beneficial radiologic methods for diagnosis and monitoring.

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