

**A RARE CAUSE OF BACK PAIN: ANTERIOR FAILURE OF SEGMENTATION:  
CASE REPORT**

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**ABSTRACT**

Failure of segmentation which is due to insufficiency in segmentation stage during the formation of the spine from notochord in the embryogenic period; is the name of the two or more vertebrae to be completely or partially connected to each other. If the fusion is bilateral, it is defined as block vertebra; if it is one-sided; defined as unilateral bar. In this case report; an adult patient who had appealed with back pain and diagnosed as anterior failure of segmentation is presented.

**Key words:** Back Pain, Failure Of Segmentation, Unilateral Bar

**NADİR GÖRÜLEN BİR SIRT AĞRISI NEDENİ: ANTERİOR SEGMENTASYON  
DEFEKTİ: OLGU SUNUMU**

**ÖZET**

Embriyojenik dönemde notokorddan omurganın oluşması sırasında segmentasyon evresinin yetersiz olmasına bağlı gelişen segmentasyon defekti; iki veya daha fazla sayıda vertebranın tamamen veya kısmen birbirleriyle birleşik olmasına verilen isimdir. Bu füzyon iki taraflı olursa blok vertebra, tek taraflı olursa unilateral bar olarak tanımlanır. Burada erişkin yaşta sırt ağrısı ile başvuran, anterior segmentasyon defekti tanısı konulan bir hasta sunulmuştur.

**Anahtar kelimeler:** Sırt Ağrısı, Segmentasyon Defekti, Unilateral Bar

## INTRODUCTION

Congenital spine deformities occur as a result of abnormalities in the spine due to developmental disorders in embryogenic period. If segmentation stage is insufficient during the formation of the spine from notochord in the embryogenic period, some vertebrae can not separate completely from each other and this situation is called as segmentation defect<sup>1</sup>. The situation manifests itself with typically symptoms such as scoliosis or kyphosis during early childhood<sup>2</sup>. Conventional radiography, computed tomography (CT) and magnetic resonance imaging (MRI) are the tools used for diagnosis. Treatment is conservative or surgical.

In this case report; an adult patient with back pain and diagnosed as anterior failure of segmentation in multiple vertebrae who was undiagnosed in early childhood is discussed. It is emphasized that congenital spine deformities; although rare, can be diagnosed in middle-older age also. Therefore it should be kept in mind in those patients with neck/back/low back pain.

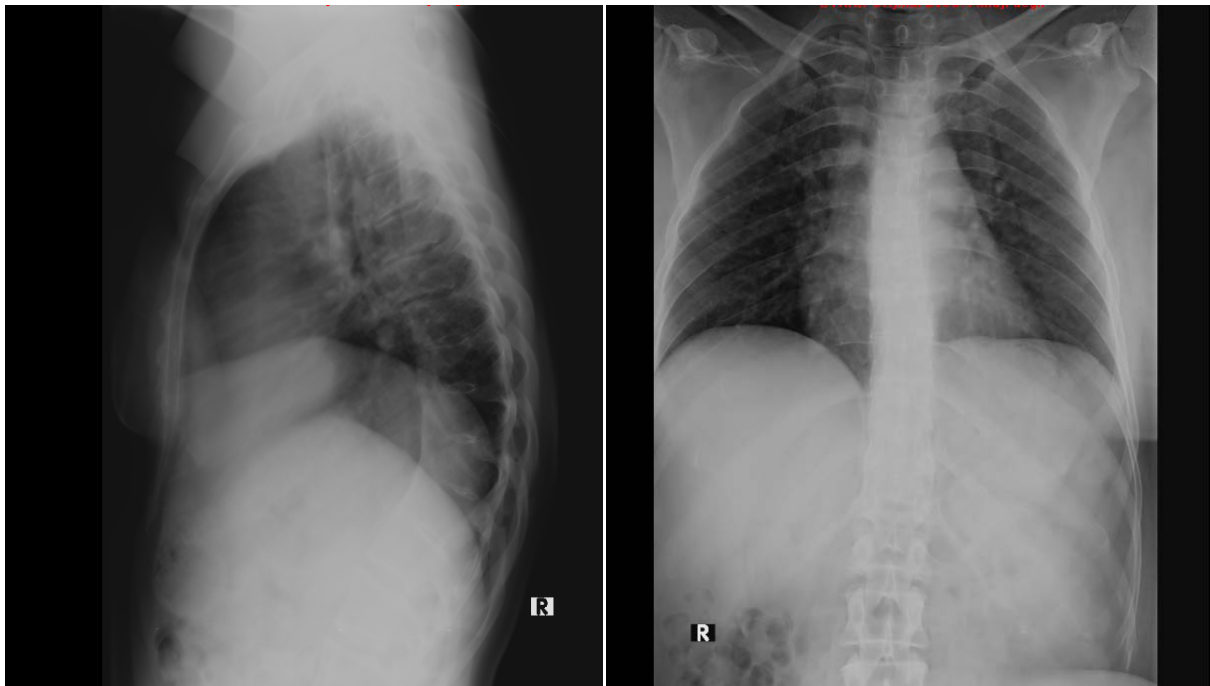
## CASE

A 43 years old female patient with the complaint of back and low back pain was referred to our Physical Medicine and Rehabilitation Outpatient Clinic. Pain was lasting for 3-4 years but not resorting to a doctor with this complaint before. The medical history and family history were unremarkable.

A major pathology was not found in systemic examination of the patient. In the examination of the musculoskeletal system; minimally increased thoracic kyphosis and increased lumbar lordosis was detected with inspection. There were local tenderness with palpation on the fibrositis in bilaterally paravertebral region on back. No local tenderness was detected with palpation and percussion the spinal column. Range of motion of lumbar vertebra was within normal ranges with minimal pain, sacroiliac joint compression tests were negative, straight leg raising tests were bilaterally negative and FABER tests were bilaterally negative with no pain. Neurological examination of lower extremities was normal. Modified schober test and chest expansion were in normal ranges. In laboratory examination there were no significant finding except the sedimentation rate with 35 mm/hour.

Firstly, antero-posterior, lateral thoracic and lumbosacral radiographies were performed. Fusion of multiple vertebrae at the anterior of thoracic spine were detected in lateral thoracic

radiograph (Figure 1). Minimal thoracic scoliosis curves to the right was noticed in antero-posterior thoracic radiograph. Whereupon thoracic vertebral CT is performed, fusion view of T7-T12 vertebral bodies on the anterior edge and marked narrowing of all T7-L1 intervertebral disc spaces were detected. As prediagnosis, two situations, rheumatic diseases characterized with ankylosing and anterior segmentation defects were considered. Deepening of the patient's history did not conduct a significant suspicion for any rheumatic disease. HLA-B27 test and sacroiliac MRI were performed to make the differential diagnosis of other rheumatic diseases characterized with ankylosing, showed no pathology.



**Figure 1:** Lateral thoracic radiography showing fusion of multiple vertebrae at the anterior region of thoracic spine. Antero-posterior thoracic radiography showing minimal thoracic scoliosis.

When clinical findings, laboratory and imaging results were considered together, the patient was diagnosed as anterior segmentation defect. Thoracic vertebra MRI was performed for a probability of spinal cord disorders that may accompany like spinal tumor, diastematomyelia, tethered cord syndrome and syringomyelia. Additional anomaly was not detected except fusion of vertebral bodies from T7-12 (Figure 2). Abdominal ultrasonography was performed in order to find out any renal anomalies which may be concomitant, but showed no pathology.



**Figure 2:** MRI of thoracic vertebra showing fusion of vertebral bodies from T7-12.

Conservative management was considered for this patient depending on two reasons. The patient's defect had not lead to a serious posture and functional disorder until now, and also the surgical treatment has high morbidity and mortality rates. Medical treatment for pain, exercises for correction of posture and strengthening the back-abdominal muscles were given to the patient and follow-up was recommended.

## DISCUSSION

Congenital deformities of the spine are divided into three types according to the localization, the shape of deformity and anomaly. Cervical, cervicothoracic, thoracic, thoracolumbar, lumbar and lumbosacral; are the types divided by localisation. Scoliosis, kyphoscoliosis, lordoscoliosis and kyphosis; are the types made according to the shape of the deformity. Segmentation defect and formation defect; are the types divided by shape of anomaly<sup>1</sup>.

Hemi vertebrae or wedge vertebrae may occur depending on the formation defect of the spine. If segmentation stage is insufficient during the formation of the spine from notochord in the embryogenic period, some vertebrae can not separate completely from each other and this situation is called as segmentation defect. If no joint was formed between two vertebrae, it is called block vertebrae. If there is an incomplete separation with a bone junction remaining

between two vertebrae, it is called unsegmented bar. If the fusion is bilateral, it is defined as block vertebra; if it is one-sided; defined as unilateral bar. The term "unilateral bar" is divided into sub-groups as anterior, anterolateral, posterior, posterolateral and circumferentially according to the localization of segmentation defect<sup>1</sup>. The deformities are most commonly encountered in thoracic and thoracolumbar region. Usually, they manifest themselves with symptoms as scoliosis or kyphosis during early childhood. Sometimes more than one anomaly can be seen together<sup>2</sup>. In our patient, the anterior segmentation defect was present in thoracic region. It did not cause any clinical signs during childhood and was undiagnosed until now.

Deformity may lead to serious problems based on the severity and shape of the anomaly in the spine. Congenital spinal deformities may be simple and benign without any spinal deformity. On the other hand, they may be complex and lead progressive spinal deformity with serious complications such as cor pulmonale and paraplegia for instance. Because it is a congenital anomaly, deformity is usually noticeable in the early period of life. Although it varies according to the shape of the anomaly, deformity is usually progressive. Unilateral unsegmented bar is the type with the highest progression rate. The most benign type is block vertebrae<sup>3</sup>. In general, the possibility of progression of the thoracic spine abnormalities is more common than cervical and lumbar. It is reported that women have a poor prognosis than men<sup>2</sup>. Our case is a female patient with unilateral unsegment bar in the thoracic spine. There was no deformity except minimal kyphosis in clinical examination and minimal thoracic scoliosis in conventional radiography. For the diagnosis of congenital deformities of the spine; conventional radiography, CT, three-dimensional CT and MRI are highly valued. MRI examination seems to be an obligation because of the probability of accompanying intra spinal neurological anomalies.

Congenital anomalies of the spine may be associated with renal anomalies by 20% and congenital heart disease by 7-12%. Intraspinial anomalies such as spinal tumor, diastematomyelia, tethered cord syndrome, syringomyelia were reported in 20-40% of cases<sup>4-6</sup>. In our patient, there was no abnormality neither on abdomen ultrasonography performed for probable genitourinary malformations nor on thoracic MRI for intraspinal anomalies. Because of it is a progressive deformity, surgery is often the treatment due trend. In cases without any lead to progressive deformity, conservative treatment and follow-up can be selected. Usually surgery is not necessary in anterior segmentation defects on thoracic and thoracolumbar regions<sup>7</sup>. In our patient not required surgical treatment, conservative treatment was preferred. Congenital deformities of the spine which mostly show a progressive nature, are diagnosed in early childhood. However, rarely

they may progress with mild clinical complaints and can be diagnosed in adult age as in our patient. Therefore in those adult patients with neck/back/low back pain, congenital spine deformities also should be kept in mind. If the diagnosis is congenital spine deformity, the patients need further examinations because of the potential accompaniment of spinal or renal abnormalities.

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