Complete Lumbar Spine Duplication in a Neurologically Intact Man

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Abstract

Background: Duplication of spine is a rare abnormality. Additional vertebral deformities and severe neurovascular, genitourinary, and gastrointestinal system abnormalities coexist in the majority of the cases.

Design: Case report.

Findings: A 44-year-old asymptomatic man was found to have double vertebral and double dural abnormalities of the lumbar spine as an incidental radiographic finding. Unlike most people with split cord malformations, this patient had no neurologic symptomatology or any other systemic abnormality.

Conclusion: In our search of the literature, we did not find another case in a person of this age without any concomitant abnormalities.

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Key Words: Spinal abnormalities, congenital; Split cord malformations; Myelopathy, developmental; Cord syndromes, congenital; Spine duplication; Spinal canal, duplication; Spinal cord, duplication; Dura, duplication

INTRODUCTION

Duplication of the spine is a rare abnormality. Additional vertebral deformities and severe neurovascular, genitourinary, and gastrointestinal system abnormalities coexist in the majority of the cases reported in the literature (1,2). Most of these patients have undergone multiple operations because of associated deformities. This 44-year-old man, the father of 3 children, was found to have double vertebrae and double dura abnormalities in the lumbar vertebrae without any neurologic or any other systemic abnormality. In our search of the literature, we did not find any report of an adult of this age with this congenital abnormality and no concomitant abnormality.

CASE REPORT

A 44-year-old man presented to the university hospital with urinary complaints. He was referred to our clinic, where duplication of the L1 to L5 vertebrae was detected on his plain abdominal film as an incidental finding. He was married with 3 children and had no complaints

about his sexual function. His birth history was unremarkable, and he had no health problems in infancy, childhood, or adolescence. He worked in heavy industry and had never been admitted to a medical institution. His only problem was a recent episode of dysuria. Physical examination revealed normal motor and sensory function, no muscle atrophy, and normal tendon reflexes bilaterally. Gait was normal, and no bladder or bowel dysfunction was noted.

Plain radiographs of the lumbar spine revealed a double vertebral formation from L1 to L5 (Figure 1a). This duplication ended above the L5 vertebra; the L5 vertebra was expanded as if to carry this duplication, but it was not duplicated like the other 4 vertebrae. Lateral radiography did not show any lumbar lordosis, but kyphosis was observed in the lumbar spine (Figure 1b). There were no other vertebral abnormalities. Three-dimensional computerized tomography and magnetic resonance imaging showed a double vertebral column and fusion of the L4 and L5 vertebrae with double spinal canals and dura (Figures 2 through 4). The right nerve root exited from the right colon, and the left root exited from the left colon (Figure 5).

A workup was conducted for urinary symptoms. Urinary tract ultrasonography and abdominal computerized tomography were normal. Low-grade fever was noted, and microscopic examination of the urine and urine culture confirmed *Escherichia coli* infection. Dysuric

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Figure 2. Three-dimensional computerized tomographic scan of the lumbar spine showed double vertebral columns and fusion of the L4 and L5 vertebrae (black arrow).

symptoms completely resolved with 10 days of antibiotic therapy. This patient was monitored closely in the orthopedic outpatient clinic for 1 year, during which no neurological or other symptoms were noted.

DISCUSSION

Spinal duplication of split cord malformation (SCM) is a very rare abnormality that includes a wide spectrum of spinal abnormalities, from spina bifida occulta and diastematomyelia to spine duplication with 2 hemicords. Affected individuals present with clinical pictures ranging from mild to very severe symptoms. Most cases of spinal duplication are accompanied by severe gastrointestinal or neurovascular abnormalities. Dorsolumbar and lumbar regions are the most commonly affected sites. Pang et al (3) described a new classification for all cases of double spinal cords in 1992 and established the term “split cord malformation.” Type I SCM consists of 2 hemicords, each contained within its own dural tube and separated by a dura-sheathed rigid osseocartilaginous median septum. Type II SCM consists of 2 hemicords housed in a single dural tube, separated by a nonrigid, fibrous median septum (3). Although this patient had type I SCM according to this classification, the double cords were not separated by a septum. Each cord had its own spinal canal within its own set of lumbar vertebrae.

Pang and associates (4) conducted the largest study on this subject, which was based on clinical, radiological,

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Figure 1. (a) Anteroposterior radiograph of the lumbar spine showed double vertebral columns from levels L2 to L5 (black arrows). (b) Lateral radiography showed kyphosis of the lumbar spine.

Figure 3. Coronal T2-weighted magnetic resonance image demonstrates double vertebral columns (black arrows) and fat tissue extending between them (small white arrows).

and surgical findings of 39 patients. Among this group of patients, 8 were adults and 31 were children. All 8 adults had pain and progressive sensorial and motor deficits at the time of diagnosis. However, the man presented here had no pain and no sensory or motor deficits. Thus, it is the first case of lumbar duplication reported in a person of this age without any concomitant abnormality.

The surgical treatment for SCM is to release the tethered hemicords by removal of bony spurs, dural sleeves, fibrous septae, or any fibro-neurovascular bands (myelomeningoceles manque) that might transfix the split cord (4). In these patients, cords were split in the single spinal canal. In this patient, there was no evidence of bony spurs, dural sleeves, fibrous septae, or bands. The cords were aligned within the lumbar spine duplication and divided into 2 separate spinal canals.

Pang et al (4) stated that type I cases were technically more difficult and patients had a slightly higher surgical morbidity than those with type II SCM. In their study, approximately 89% of the surgically treated patients showed either improvement or stabilization in their postoperative neurological status. Thus, they concluded

Figure 4. Coronal T2-weighted magnetic resonance image shows double spinal canals and dura (white arrows).

that both types of SCM were cord-tethering lesions likely to cause neurological damage, and both should be treated (4).

CONCLUSION

In the 2 largest reported series of 254 and 203 subjects with SCM, respectively, the authors observed that the risk of neurological deficits increased with age; hence, they proposed that all patients with SCM should have

Figure 5. T2-weighted axial image through L3-L4 level shows bilateral nerve roots exiting separately from each relevant cord (white arrows).

prophylactic surgery, even if they were asymptomatic (5,6).

In this case of SCM, however, the patient had reached middle age with no associated abnormalities and normal function. Therefore, we believe that lack of associated abnormalities and a normal physical examination warranted monitoring the patient before planning surgical intervention. Absence of an accompanying lesion (gastrointestinal or genitourinary) and lack of neurological deficit were the most discriminating characteristics of this case.

In contrast to other investigators, we believe that patients with SCM should not undergo prophylactic surgery unless they have a neurological deficit or an accompanying gastrointestinal or genitourinary abnormality or symptom. However, they should be closely followed considering the risks observed in large series.

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