Existence of Two Separate Facet Joints on the Same Side: Case of a Congenital Anomaly

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INTRODUCTION

The existence of two separate facet joints on the same side is a rare congenital spine anomaly. Because of its rarity, this anomaly has a high potential for radiographic misinterpretation and misguided clinical intervention (3,6). In addition, it may be associated with other osseous anomalies (10,11). Reported bony anomalies include congenital absence or hypoplasia of the pedicle (8).

Although many congenital anomalies can be diagnosed by plain radiography, other imaging studies and especially computed tomography and magnetic resonance imaging should be performed in order to accurately evaluate the radiological findings and to plan the operation. The present patient is the first case in which existence of two separate facet joints on the same side of the first sacral vertebra has been documented.

CASE REPORT

A 68-year-old woman presented with a 4-month history of low back pain and severe left leg pain. There was no history of any trauma or surgery. Physical examination revealed hypoesthesia on the left S1 root dermatome, significant weakness of the left tibialis anterior and extensor hallucis longus muscles, and positive left straight leg raising at 45°. Dynamic plain radiographies of the lumbar-sacral spine revealed the existence of two separate facet joints on the same side of the first sacral vertebra, severe degenerative changes of both right and left L5-S1 facet joints, and Grade II L5-S1 spondylolisthesis (Figure 1A,B). Computed tomography...
confirmed the existence of two separate facet joints on the same side of the first sacral vertebra, and hypertrophy of both right and left L5-S1 facet joints (Figure 2A, B). Magnetic resonance imaging showed severe degeneration of L2-L3, L3-L4, L4-L5 and L5-S1 intervertebral discs but did not show herniated nucleus pulposus or other osseous abnormalities. Subsequently, she underwent surgery. Intraoperatively, two separate facet joints on the same side of the first sacral vertebra were confirmed (Figure 3). After a carefully exposition and protection of bilateral S1 roots, pedicle screw fixation and fusion were performed. During the surgery, we noted compression of the left S1 nerve root by the hypertrophic L5 inferior articular process and S1 superior articular process but did not observe any abnormality of the dural sac or nerve roots at the L5–S1 level. Pathological examination of the specimen confirmed the diagnosis of articular cartilage (Figure 4). Postoperatively, the patient’s symptoms completely resolved.

Figure 1: A) Anteroposterior radiograph of the lumbosacral spine shows existence of two separate facet joints on the same side (black arrows); B) Lateral radiograph of lumbosacral spine shows Grade II L5-S1 spondylolisthesis.

Figure 2: Axial computed tomography scan A) and axial T2 weighted sagittal magnetic resonance imaging B) through first sacral vertebral body illustrating the existence of two separate facet joints on the same side (black arrows).

Figure 3: Intraoperative photograph showing the existence of two separate facet joints on the same side (black arrows).

Figure 4: Photomicrograph depicting a tissue section obtained from the separate facet joint. The cartilage tissue was noted. Haematoxylin and Eosin X 40.
DISCUSSION

Congenital bony anatomical defects and variations are uncommon anomalies. The embryological pathogenesis of the congenital existence of two separate facet joints on the same side of the vertebra is not conclusively known. Spine formation and development take place by migration, segmentation, and chondrification by the gestational age of 4 weeks. Within 7 weeks of gestation, the chondrification centers are established; ossification of the centrum and lamina follow by 9 weeks (1). The vertebral level forms from six separate chondrification foci, i.e., two for the vertebral bodies, two for the pedicles, lateral masses, and transverse processes, and two for the laminae and spinous processes. Either failure of development of a vertebral chondrification center for the posterior arch of a particular sclerotome or failure of appropriate ossification could lead to the absence of a pedicle, the ventral half of the lateral mass, and the dorsal part of the transverse process (1). Such a developmental anomaly probably develops at the gestational age of 7 to 9 weeks (1,2,7).

In conclusion, we report a unique case that has two separate facets on the same side of the first sacral vertebra. Young neurosurgeons unfamiliar to this type of malformation can misdiagnose it as a fracture, dislocation, or other osseous abnormality. Computed tomography scans coupled with plain films can facilitate accurate diagnoses. Our patient's complaints were resolved after decompression and fusion surgery.

REFERENCES