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Anomaly of Lumbar Transverse Process Makes Pedicle Screw Insertion Difficult

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We would like to present a case with an anatomical anomaly of the lumbar spine, which made it difficult to insert pedicle screws. This patient is a 75 year old male who has had low back pain and both leg pain for years. Imaging studies showed Grade 1 degenerative spondylolisthesis and severe spinal stenosis at L4-5. He underwent open transforaminal lumbar inter body fusion at L4-5.

Pedicle screw fixation is a basic instrumentation procedure for lumbar spinal fusion surgery. Many of the spine surgeons perform pedicle screw insertion using free-hand technique. When performing free-hand technique, one of the important landmarks of the entry point of pedicle screw is the transverse process. Midpoint of the transverse process is used as the rostral-caudal landmark of the entry point.

During the surgery, we tried to dissect the transverse process as the landmark of the pedicle screw and for the posterolateral fusion. We usually think transverse process of lumbar spine is large enough to palpate during dissection. However, we could find very small left L5 transverse process. In addition, we found that the location of right L5 transverse process is very far from L4/5 facet joint. Due to this unusual anatomy, we decide to insert L5 pedicle screws under fluoroscopy and those screws were placed at the proper position.

Retrospectively looking at the AP view of lumbar spine, right L5 transverse process is much smaller than right L4 transverse process (**Figure 1**). Actually, that small transverse process was even masked by hypertrophied L4-5 facet joint during dissection. X-ray also shows abnormal shape of left L5 transverse process.

Learning points from this case:

- We need to check the morphology and location of transverse process with AP view when performing free-hand pedicle screw insertion.
- Fluoroscopic pedicle screw insertion is an alternative method when we find unusual anatomy.

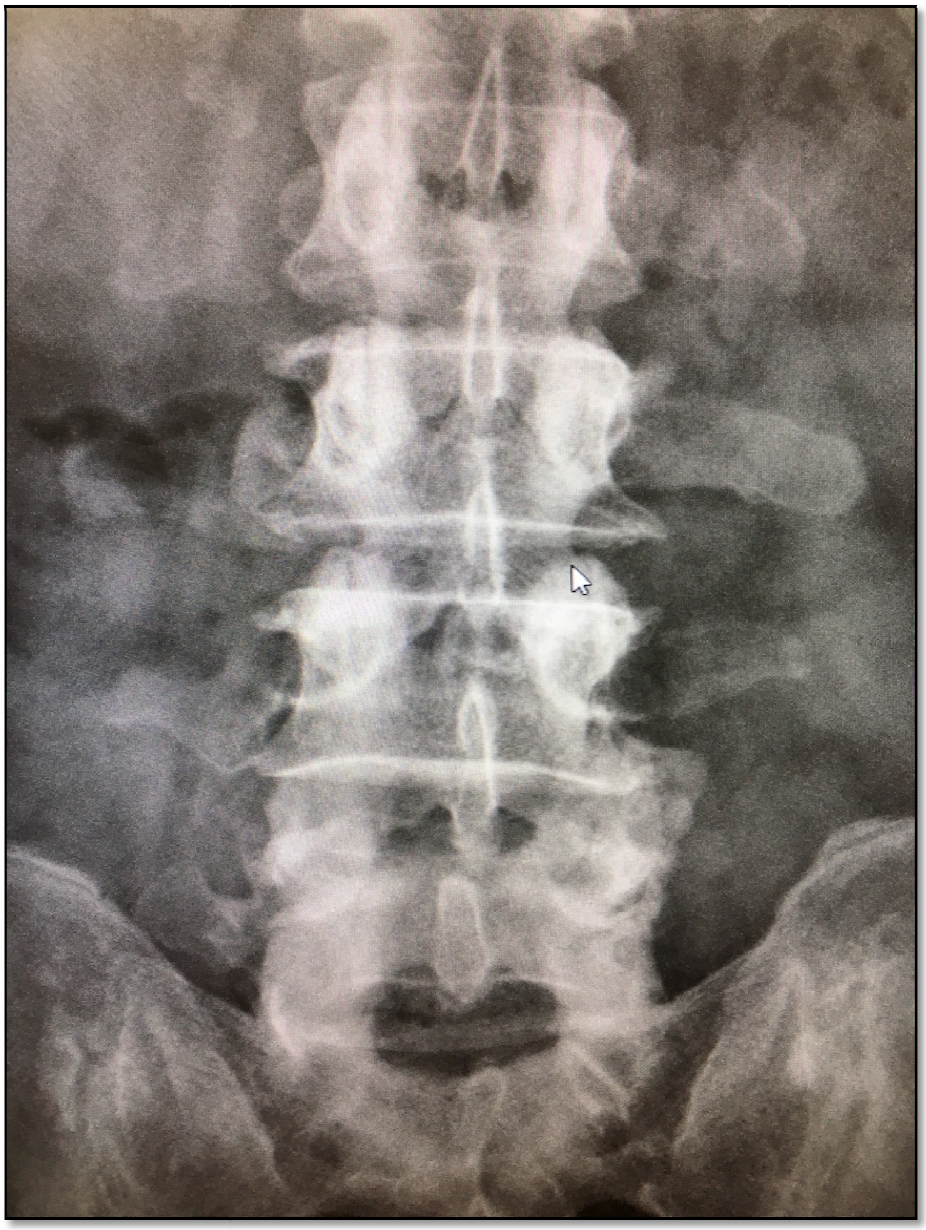

Figure 1. AP X-ray of lumbar spine

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