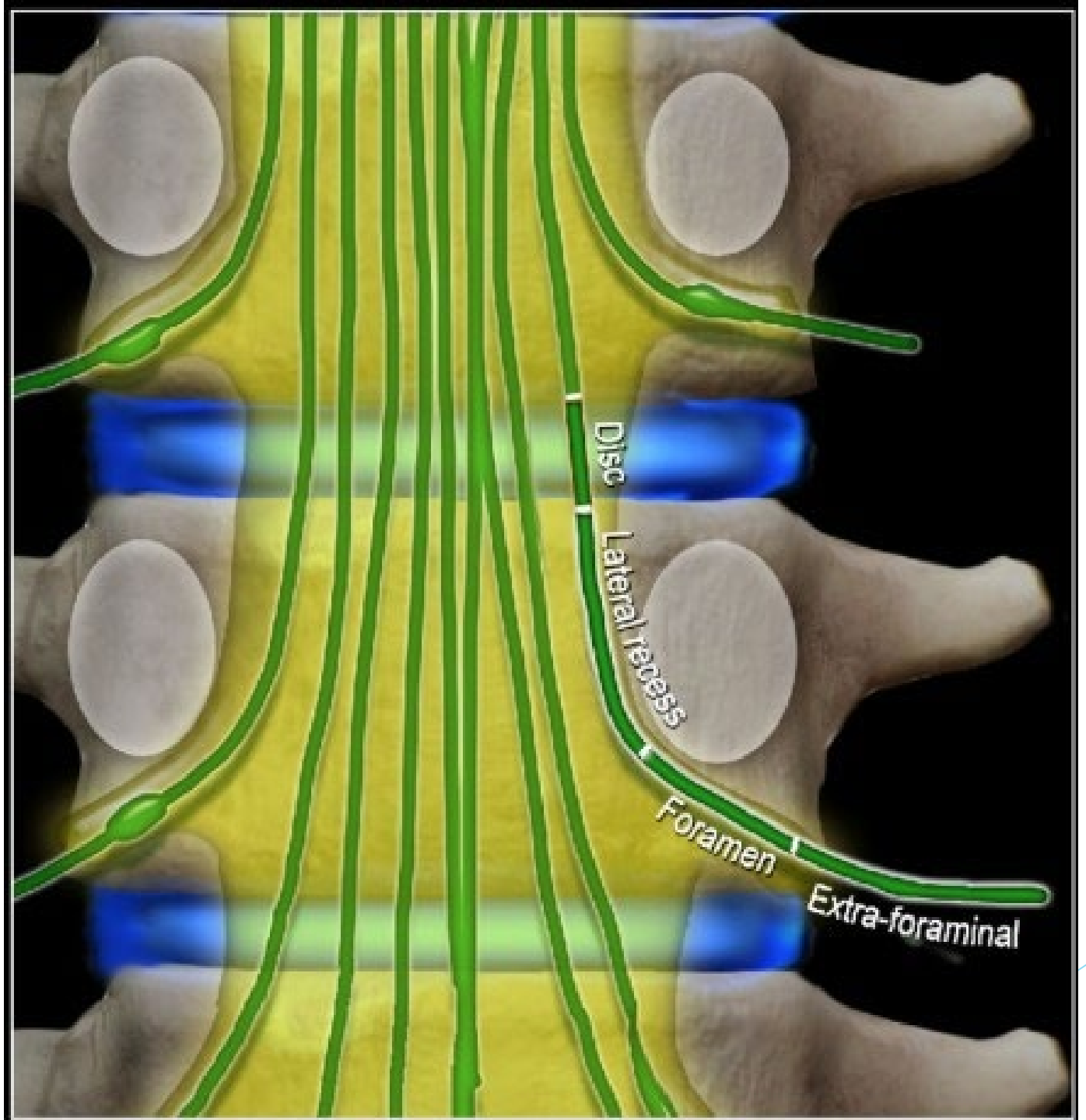
Four levels of lumbar nerve root compression

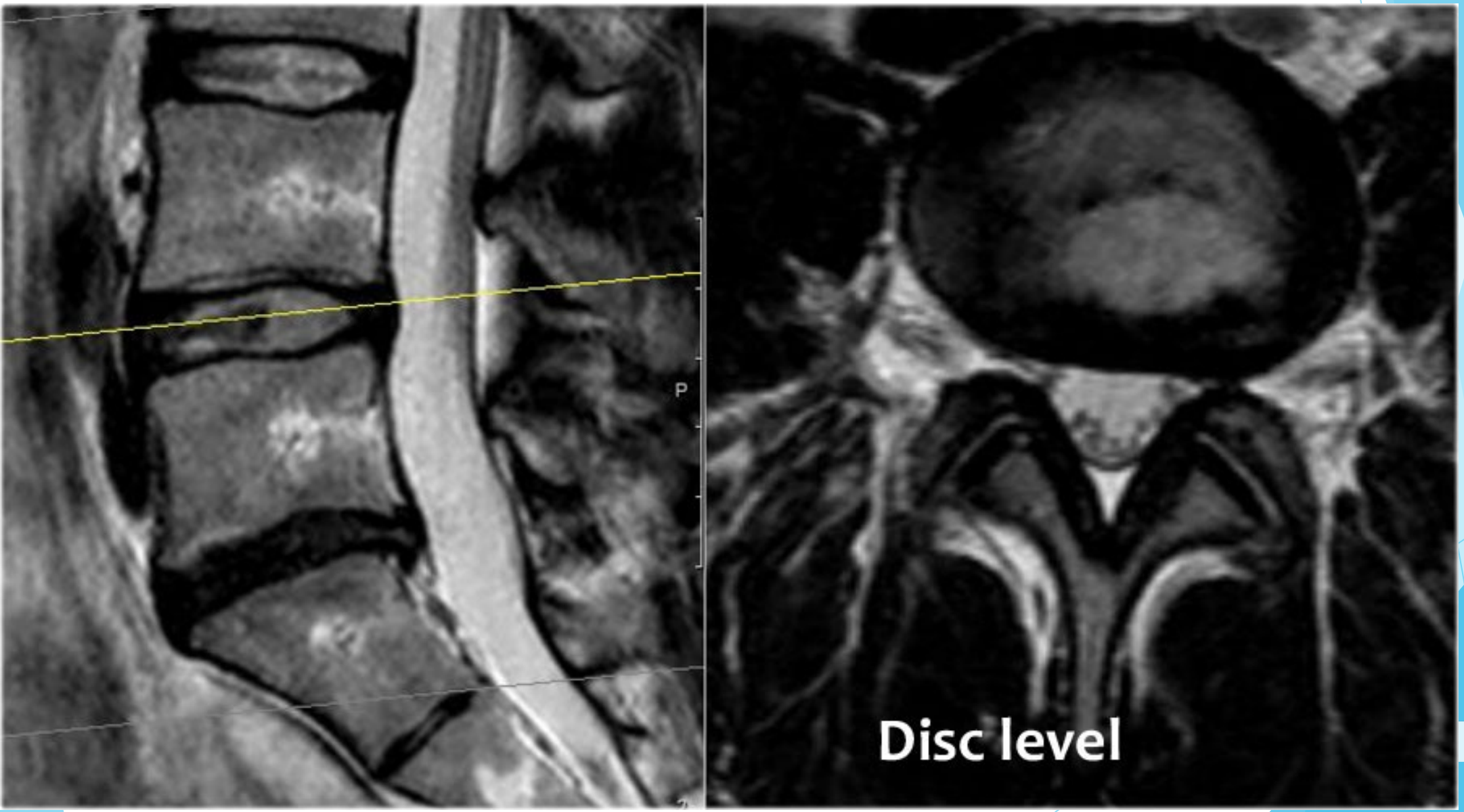
Systematic approach

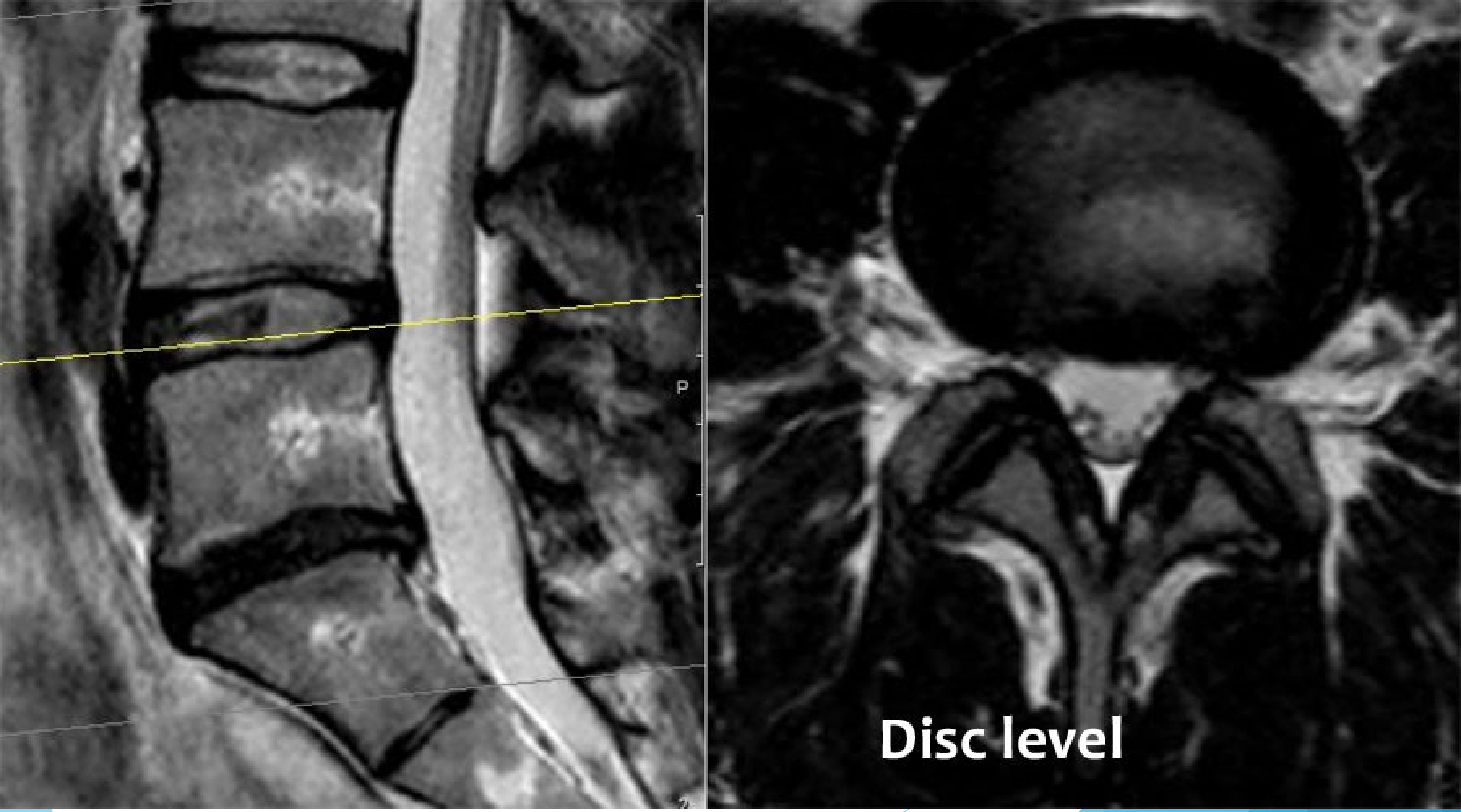
In patients with symptoms of nerve root compression, there are four levels that need to be studied:

- **Disc level.**
- This is the most common area where nerves are compressed.
- Mostly by herniated discs and less frequently due to spinal stenosis.
- **Level of lateral recess.**
- This is the area below the disc where the nerve runs more laterally towards the foramen.
- Narrowing of the lateral recess is caused by facet arthrosis, usually in combination with hypertrophy of the flavum ligament and bulging of the disc.
- **Foramen.**
- This is the area between two pedicles, where the nerve leaves the spinal canal.
- Narrowing of the foramen is seen in facet arthrosis, spondylolisthesis and foraminal disc herniation - usually a migrated disc from a lower level.
- **Extra-foraminal.**
- This is the area lateral to the foramen.
- Nerve compression in this area is uncommon, but is sometimes caused by a laterally herniated disc.


Disc
Lateral recess
Foramen
Extra-foraminal

Different levels

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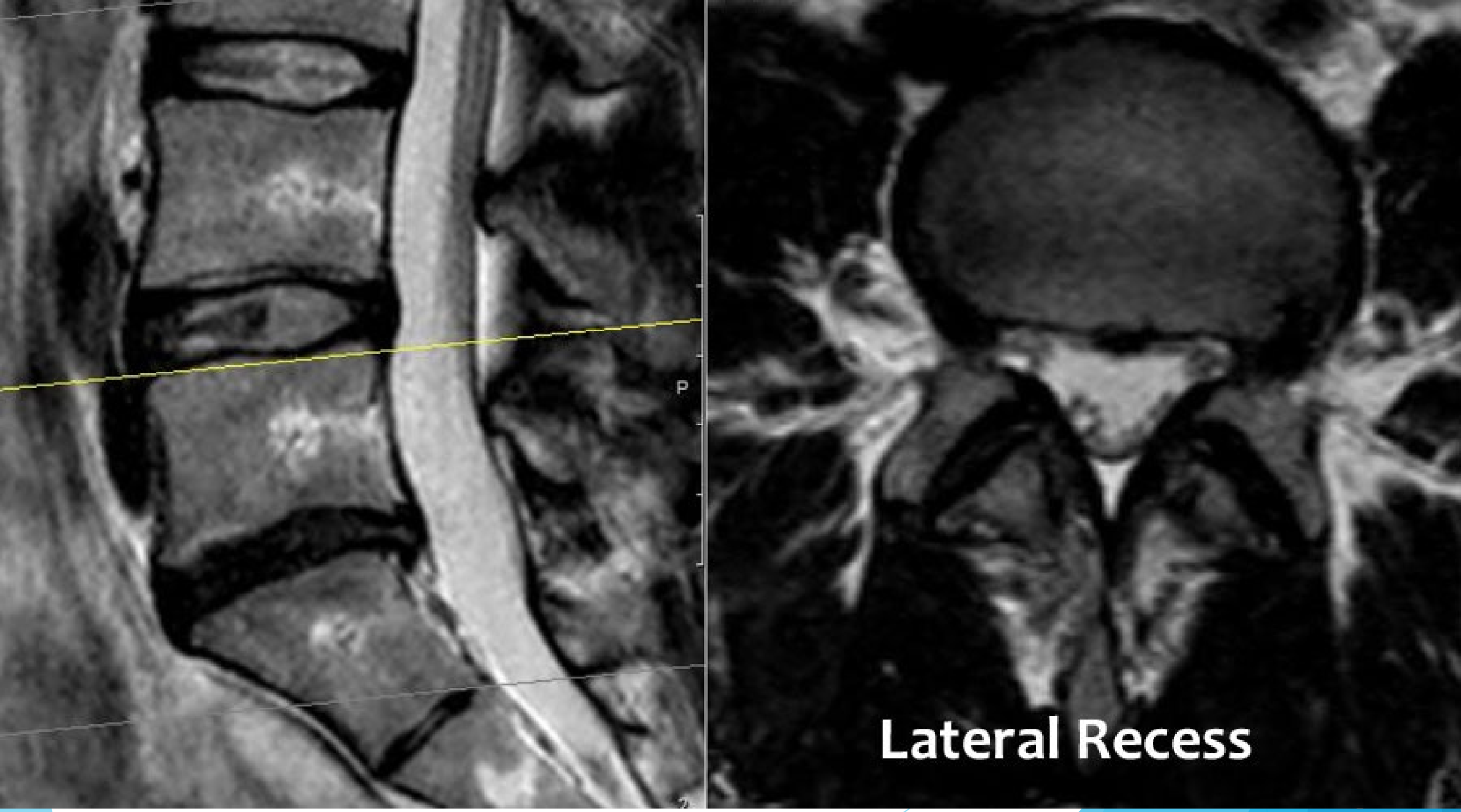
Disc level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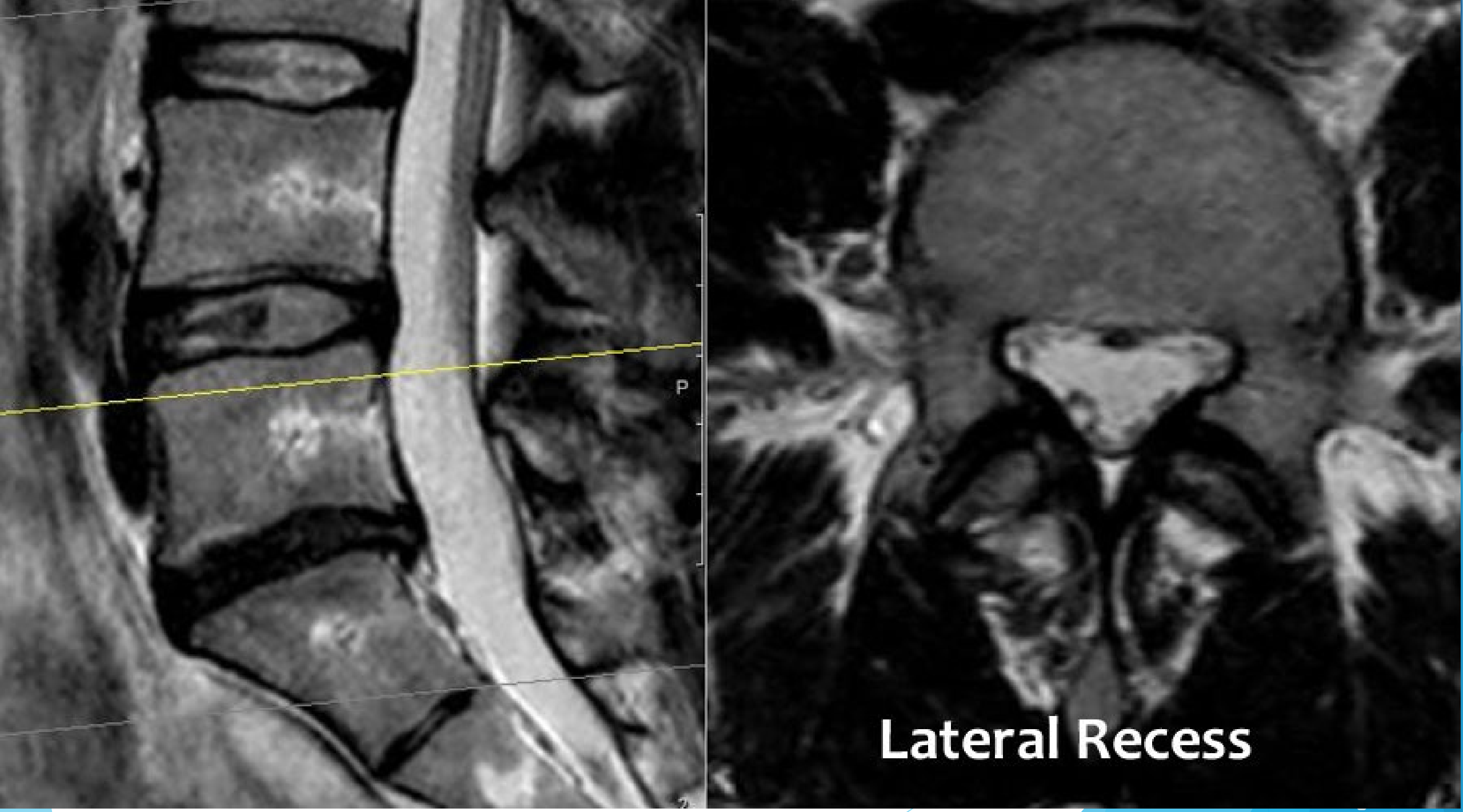
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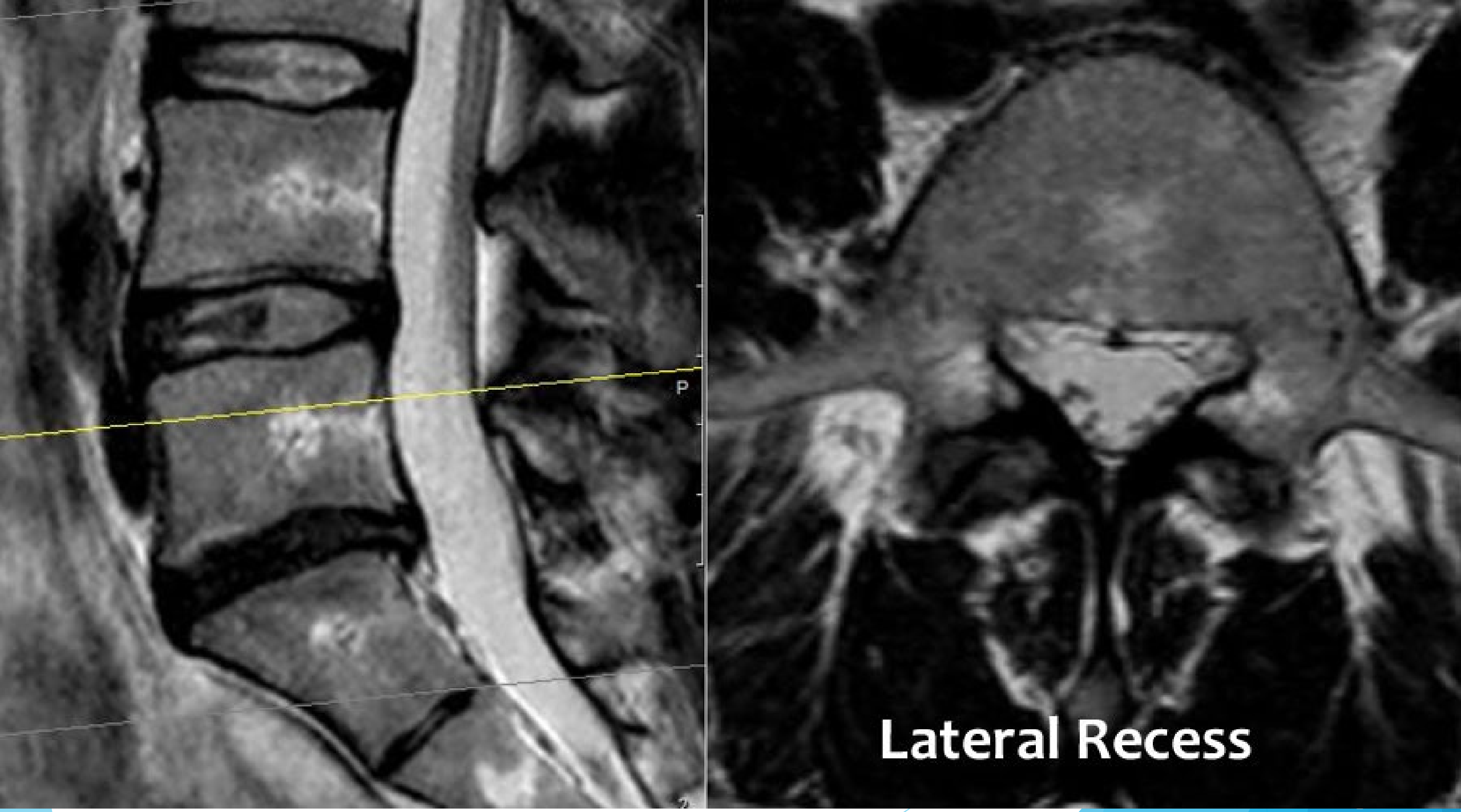
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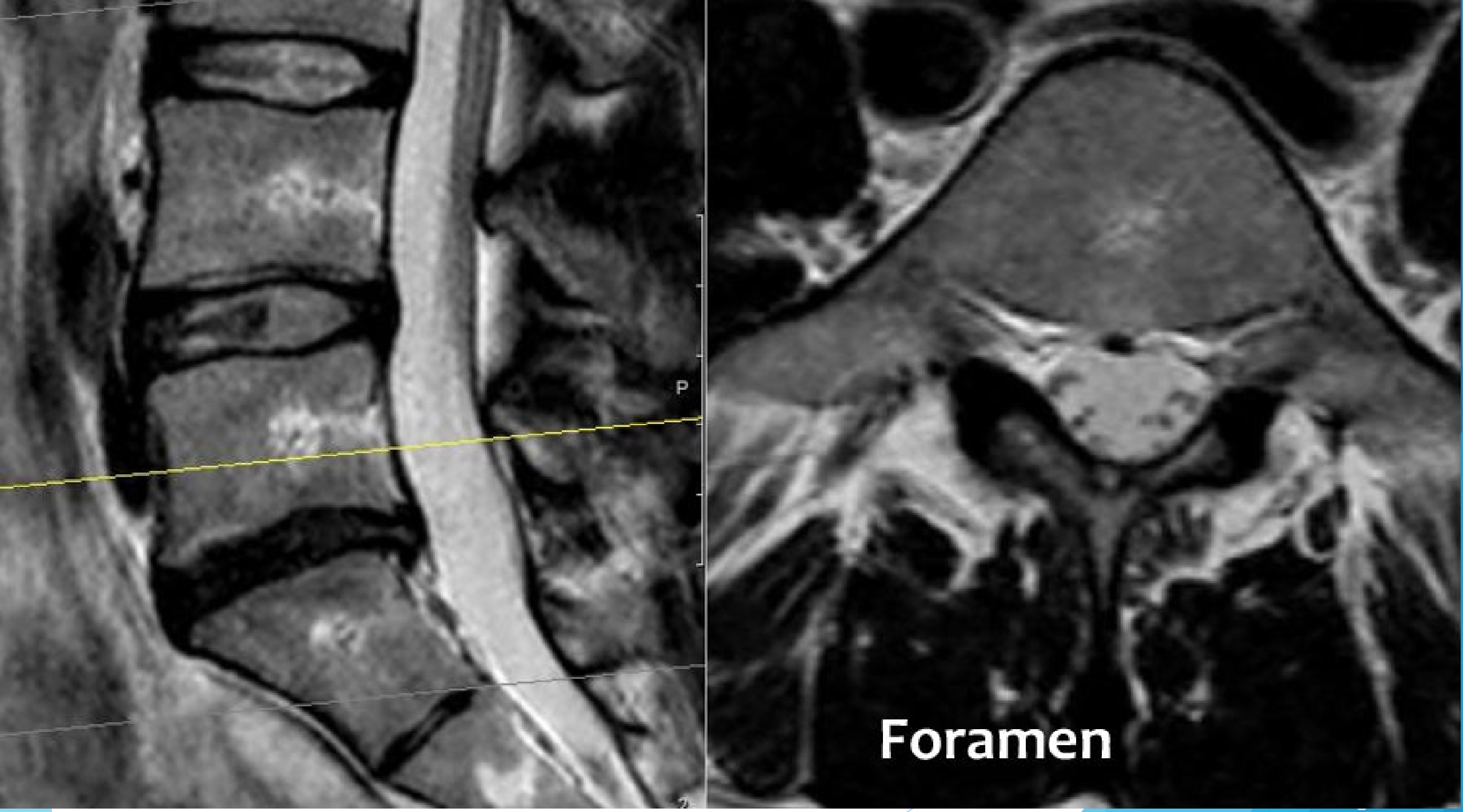
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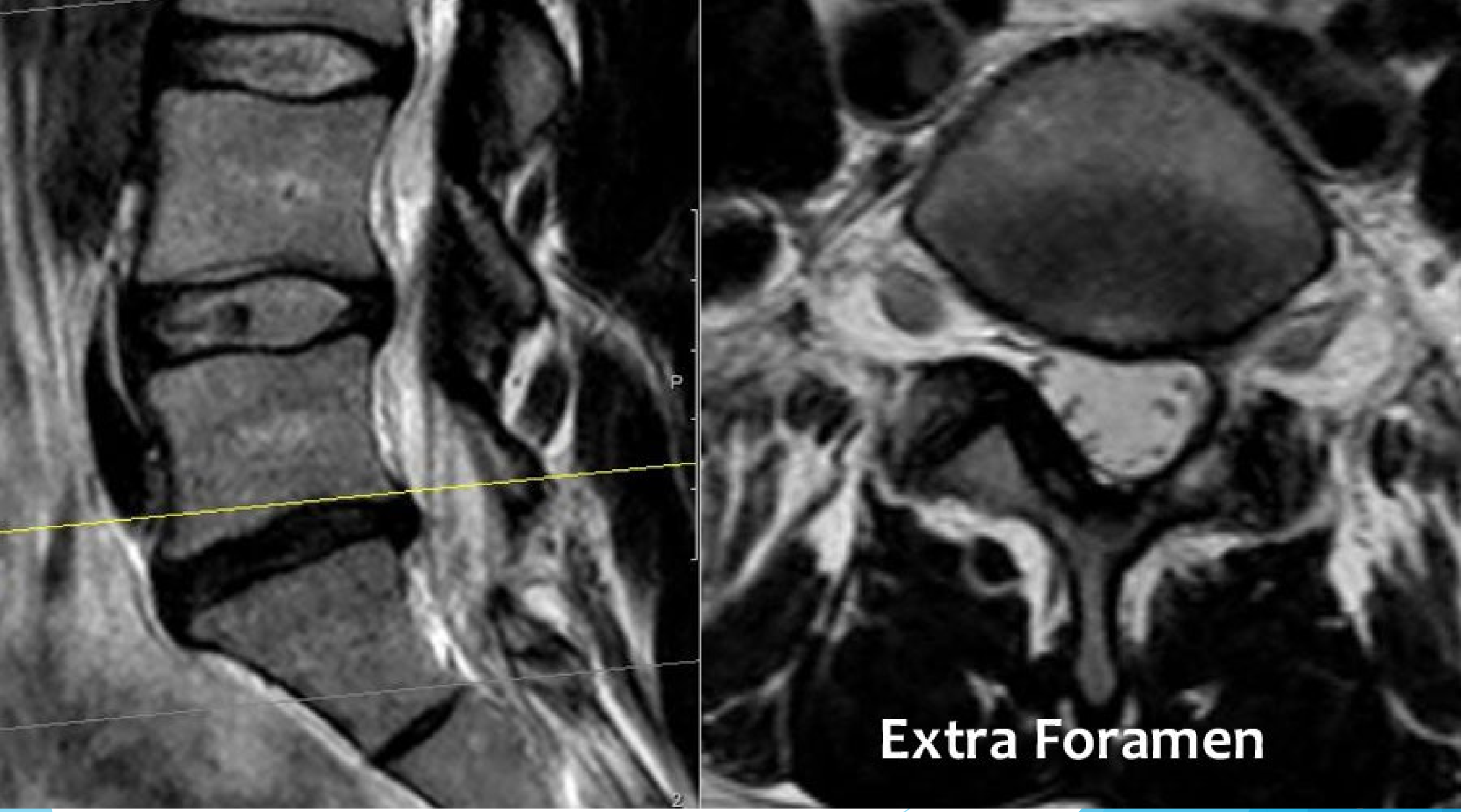
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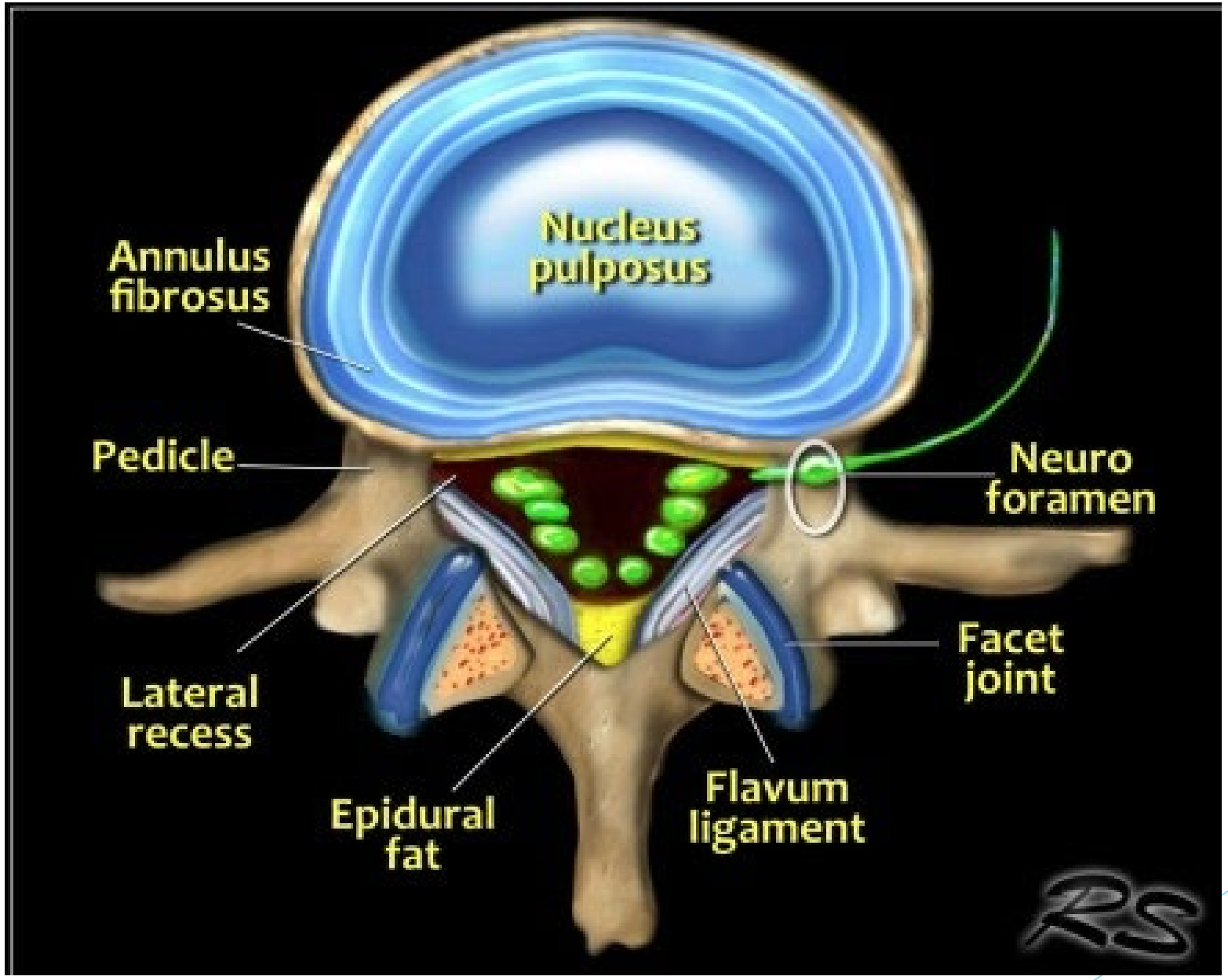
Extra Foramen


Annulus fibrosus
Nucleus pulposus
Pedicle
Neuro foramen
Facet joint
Lateral recess
Epidural fat
Flavum ligament
RS

Anatomy

- The illustration demonstrates the structures that surround the nerves within the spinal canal.

- **Flavum ligament**
- The flavum ligament is a strong ligament on the interior posterior side of the vertebral canal that connects the laminae of adjacent vertebrae.
- As a result of aging and instability of the vertebral column due to facet arthrosis there will be more stress on the flavum ligament resulting in hypertrophy and fibrosis.

- Hypertrophy of the flavum ligament is usually seen in combination with facet arthrosis and both result in stenosis of the lateral recess or when it is bilateral, in spinal stenosis.

- **Epidural fat**
- This is the fat that surrounds the dural sac, that contains the nerves.
- Abundant fat can be seen in steroid therapy, extreme obesitas and rarely idiopathic.
- Abundant epidural fat can contribute to stenosis of the spinal canal.

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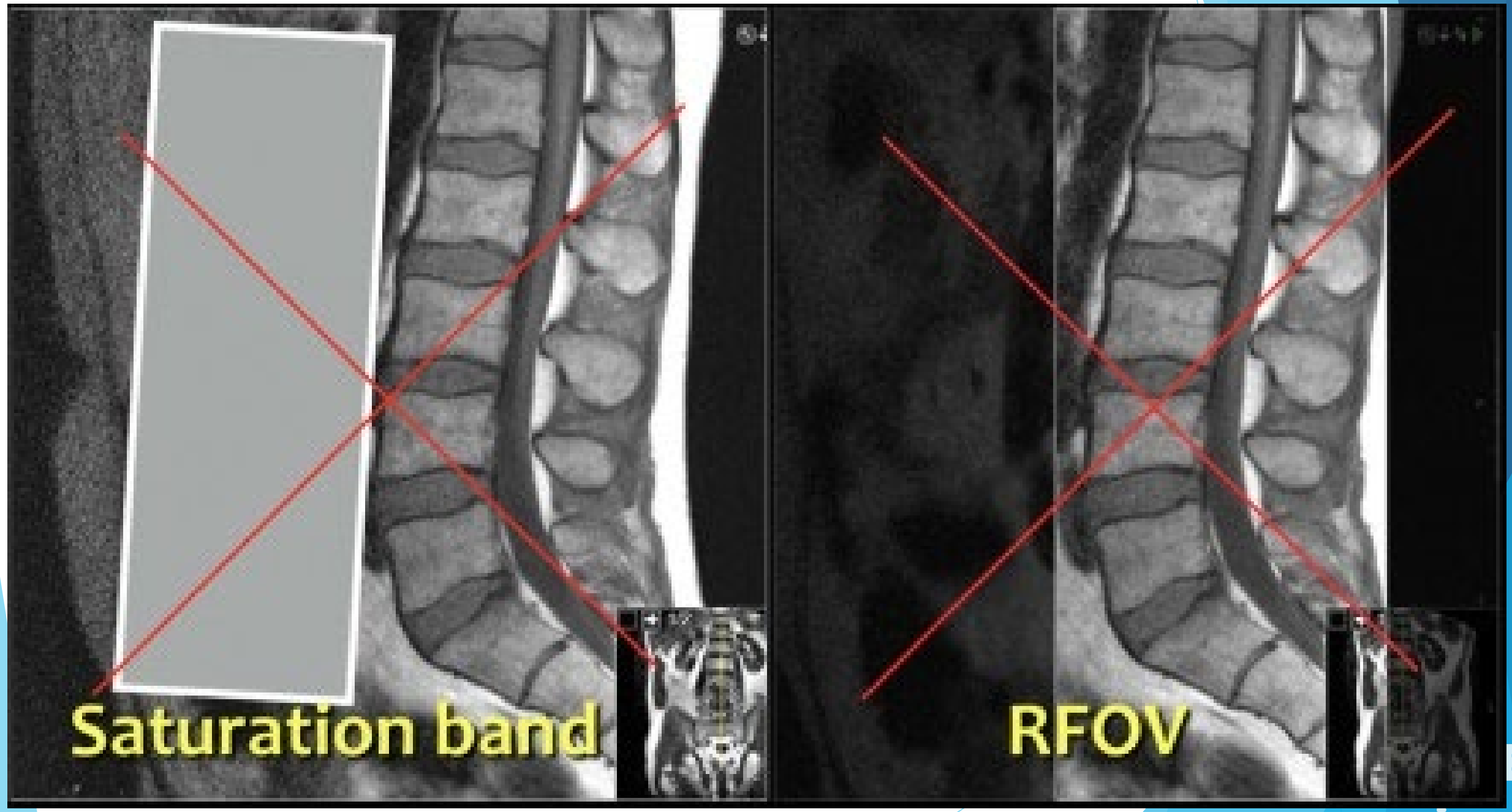
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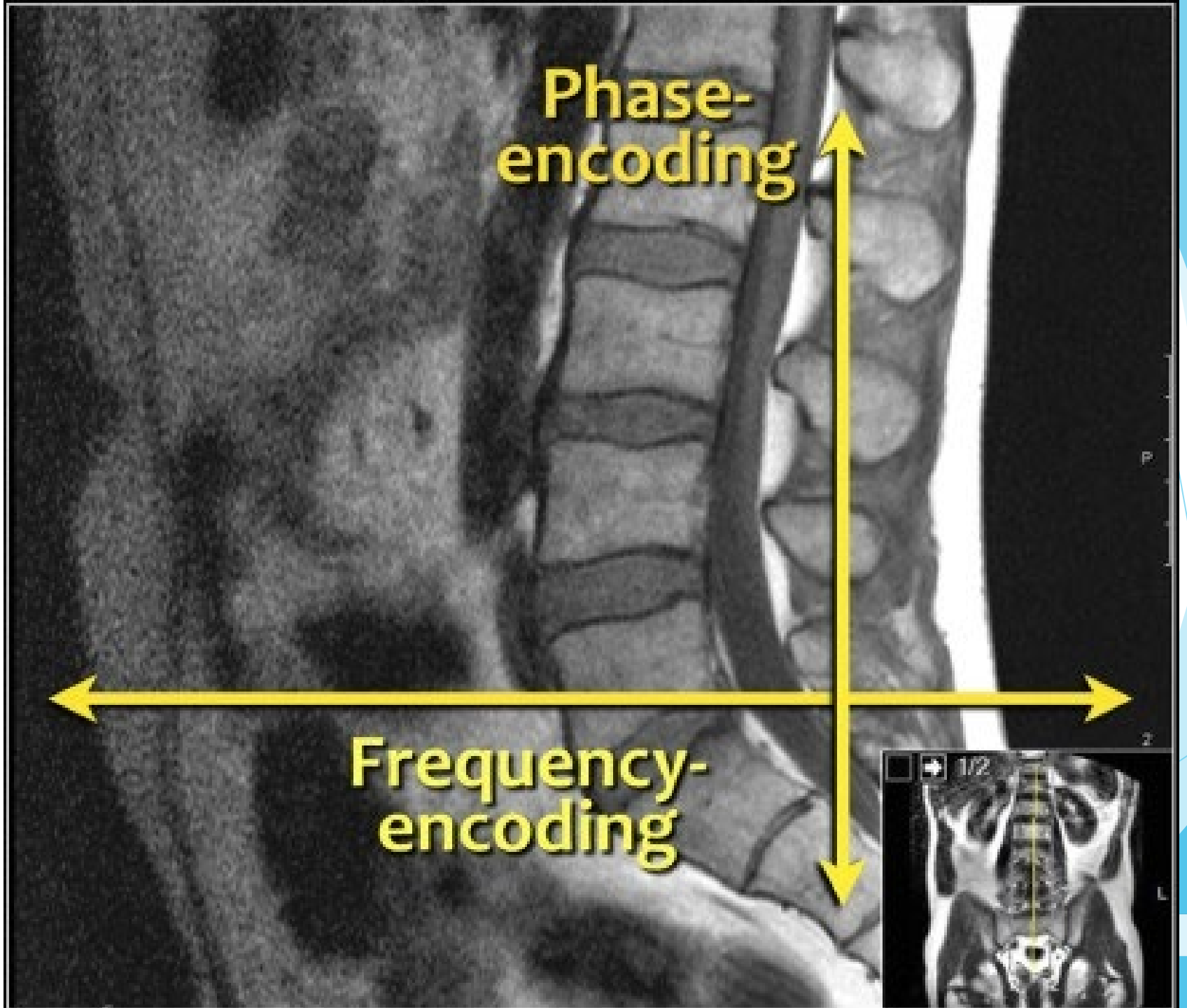
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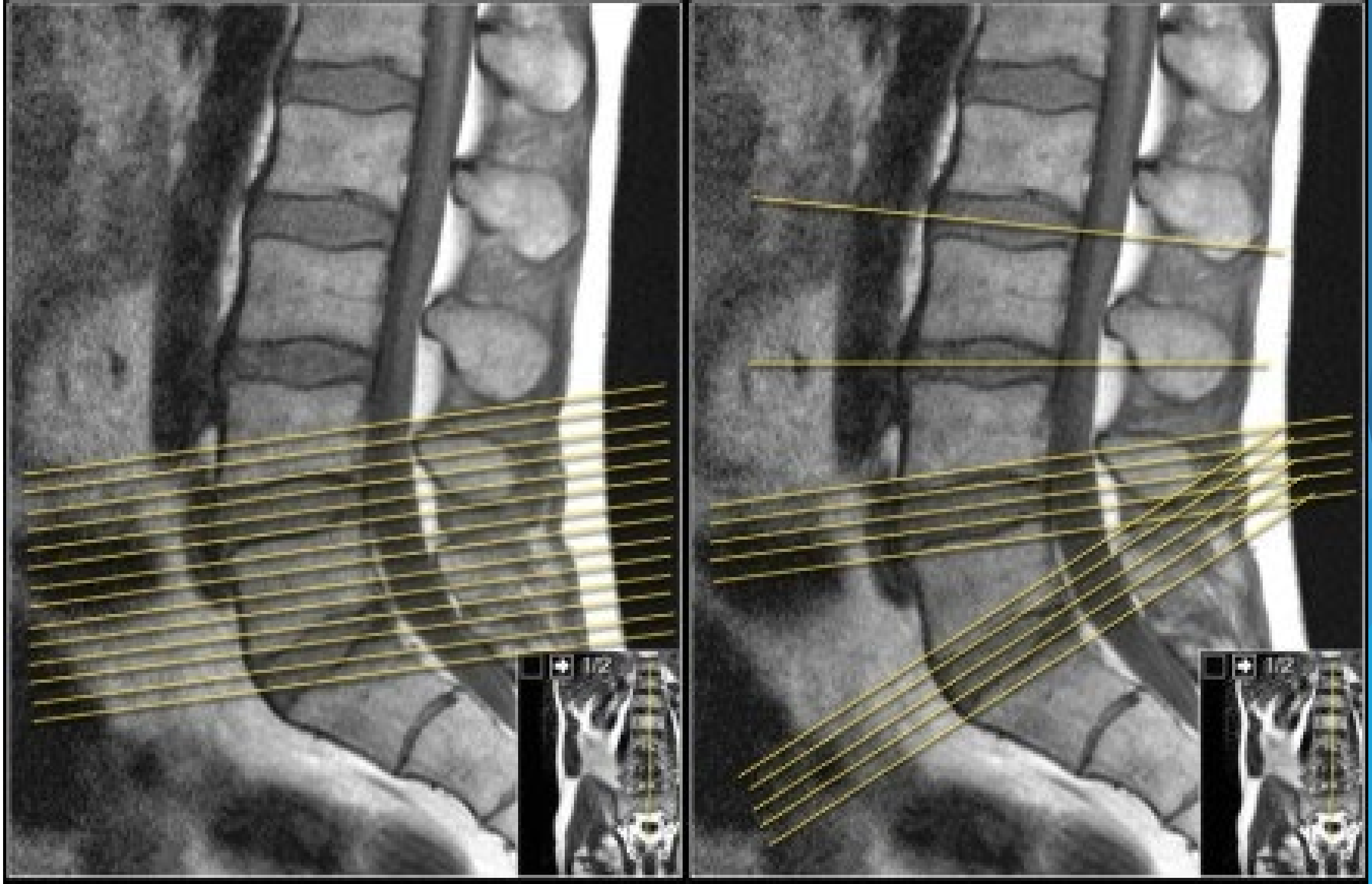
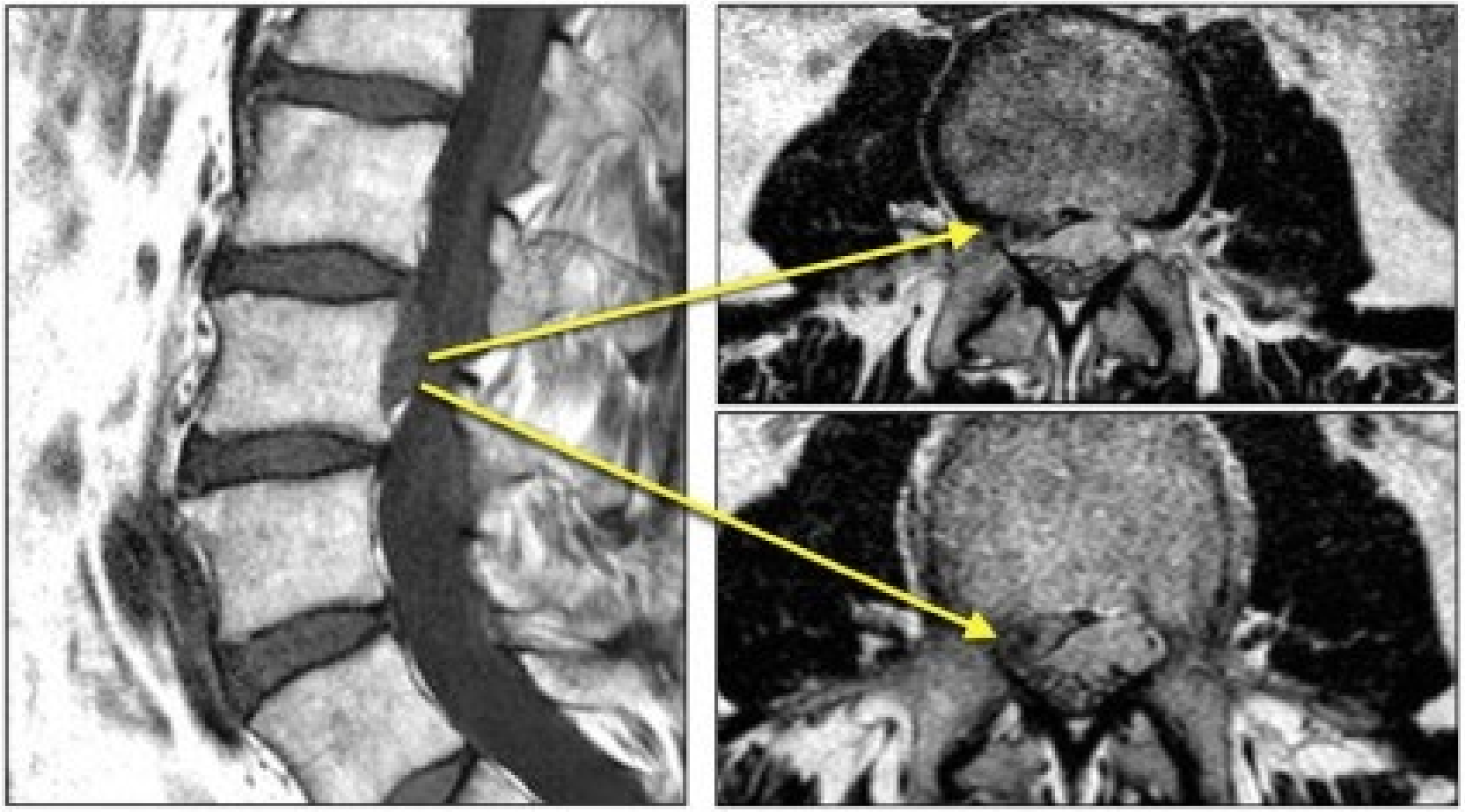
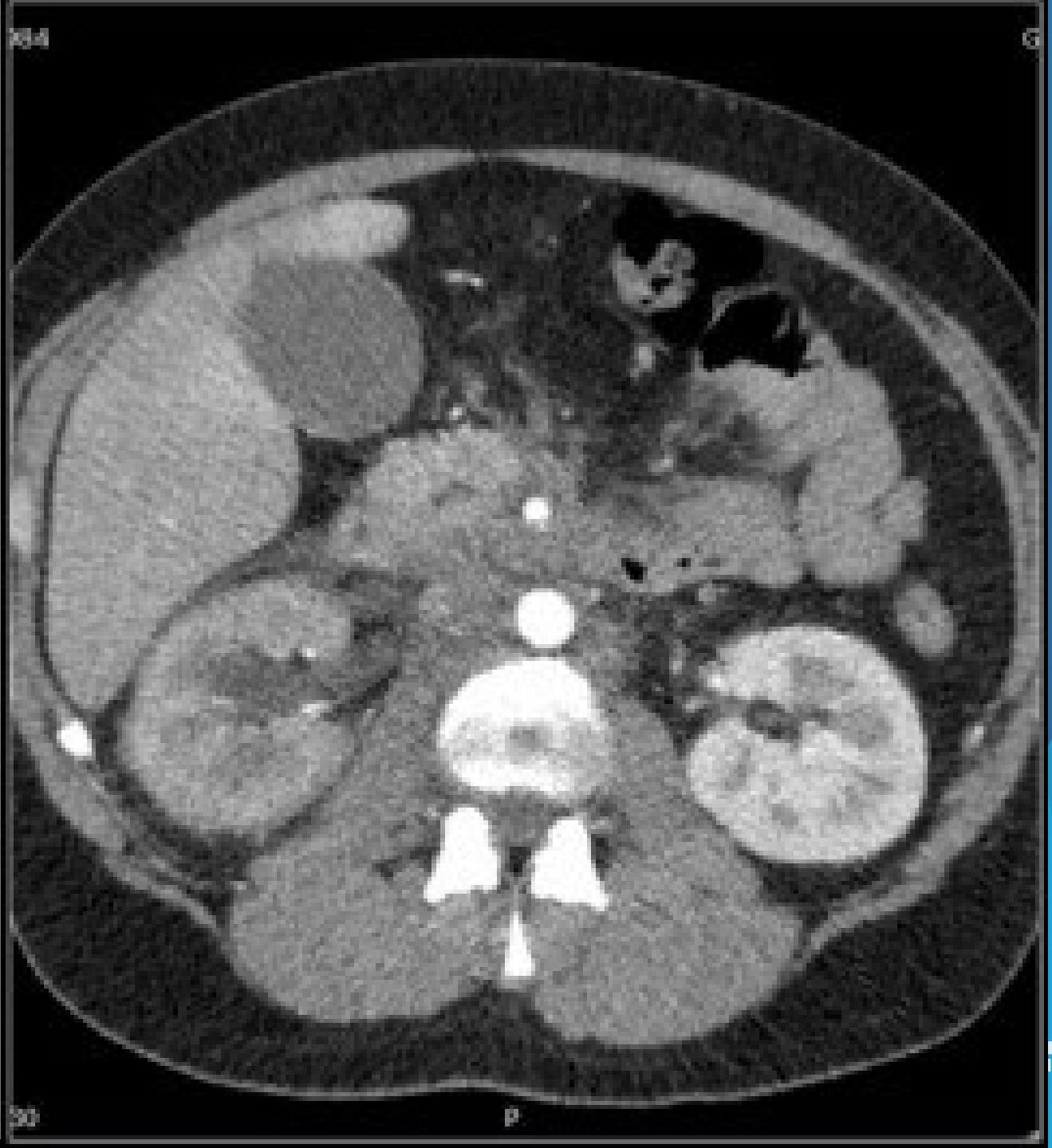

T2
T2
FE

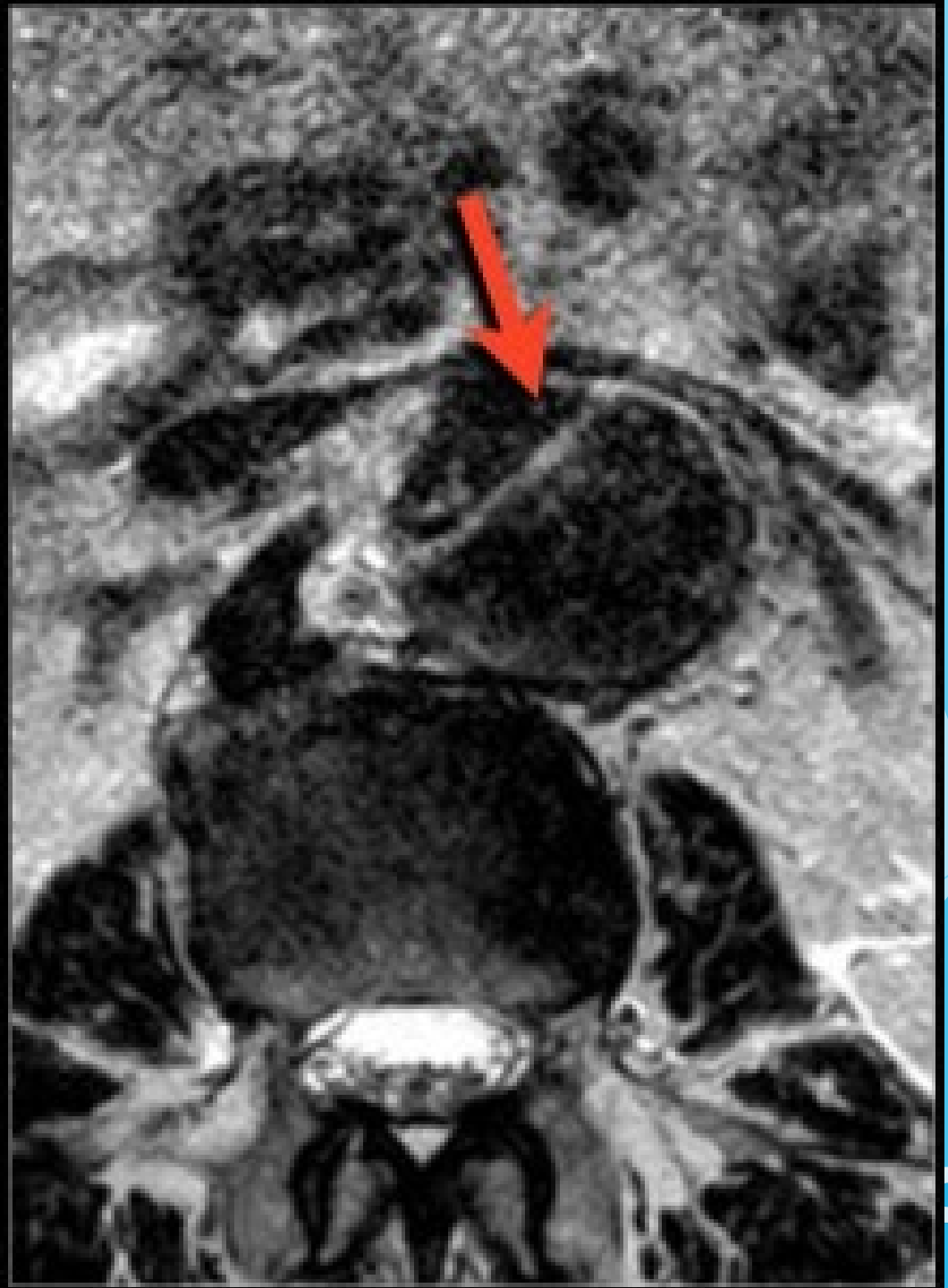
Interpretation

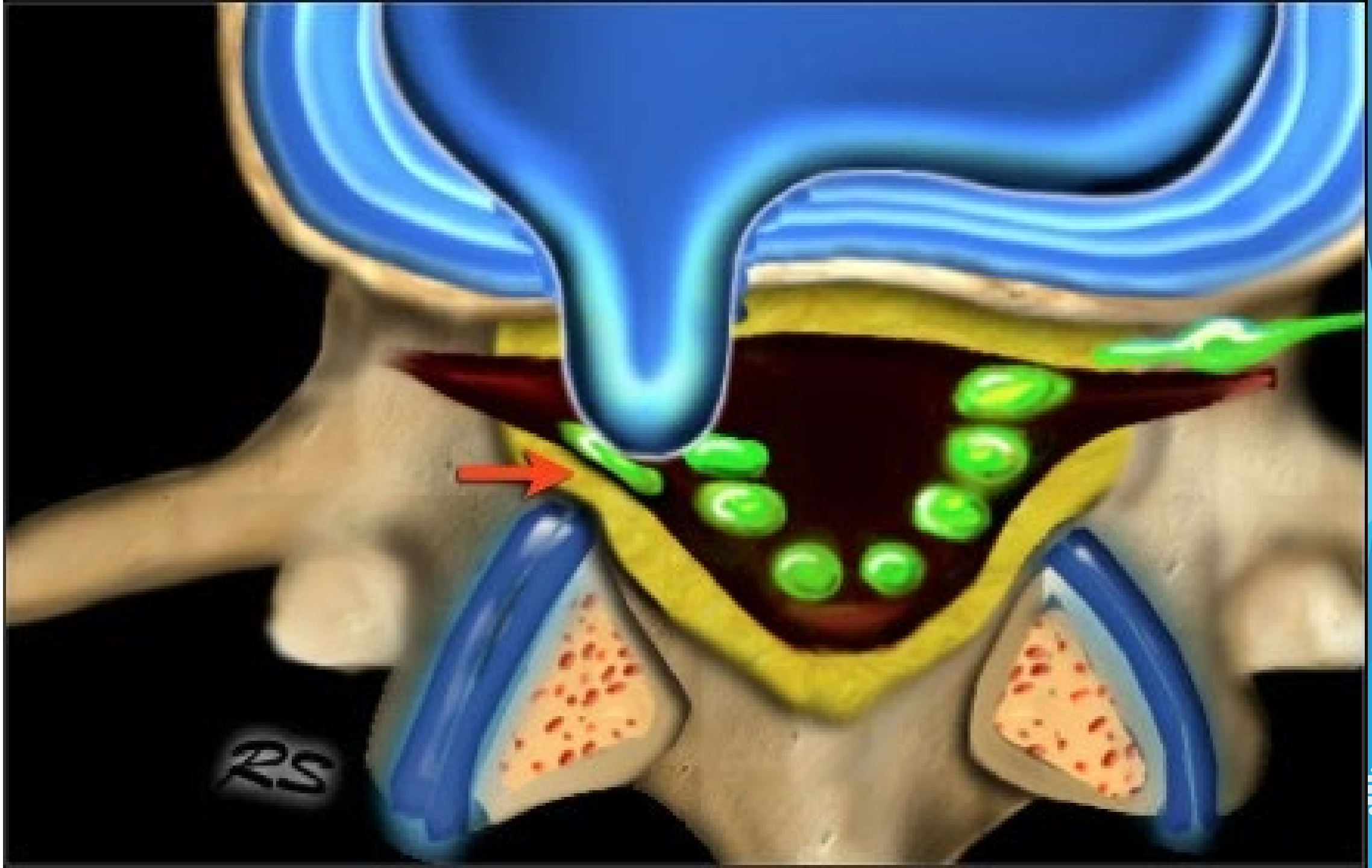
1. **First study the sag T1W**
   - Prevertebral soft tissues (aorta)
   - Bone marrow / end plates
   - Four levels of compression

2. **Correlate with tra T2W** (and sag T2W)





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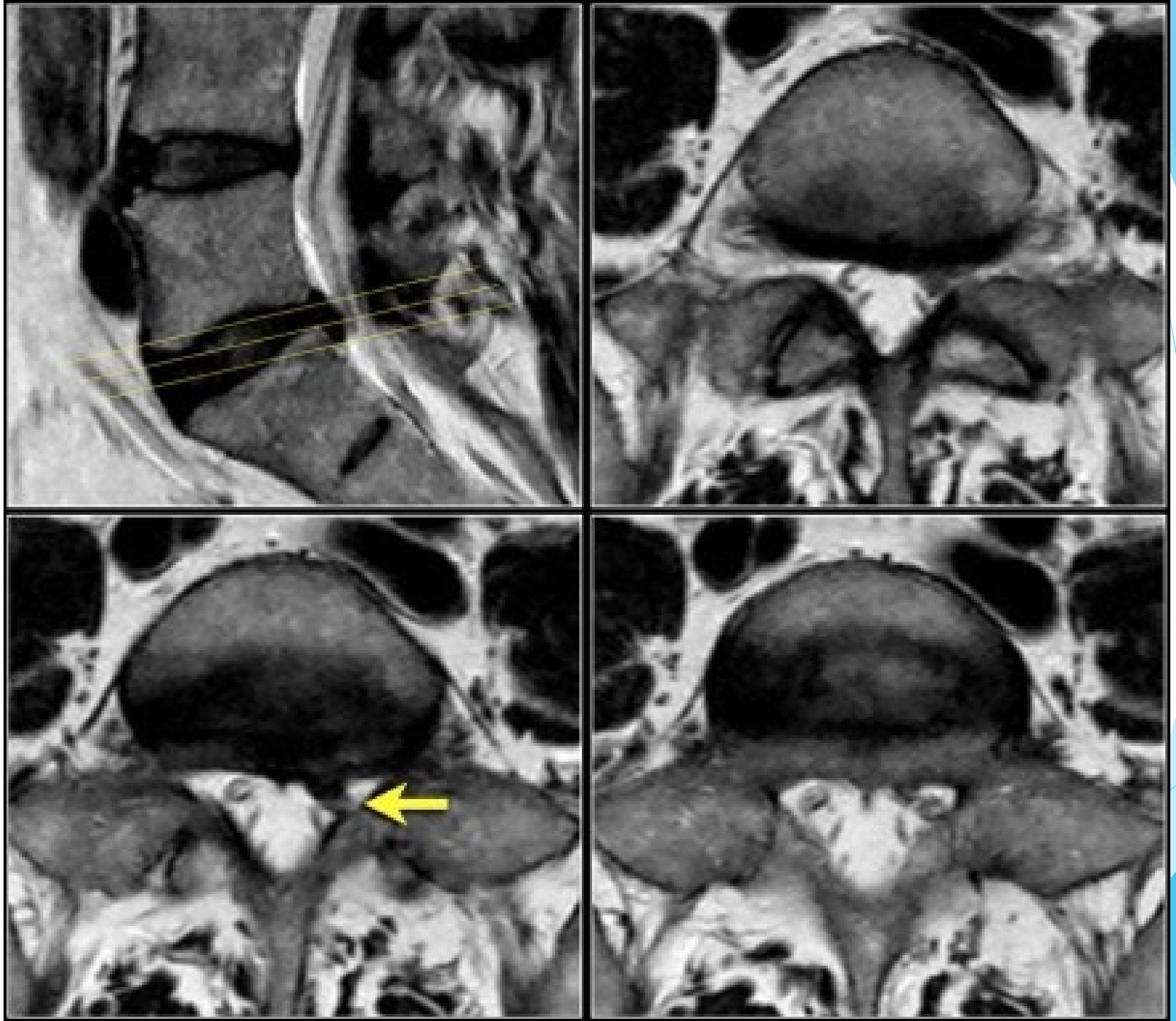

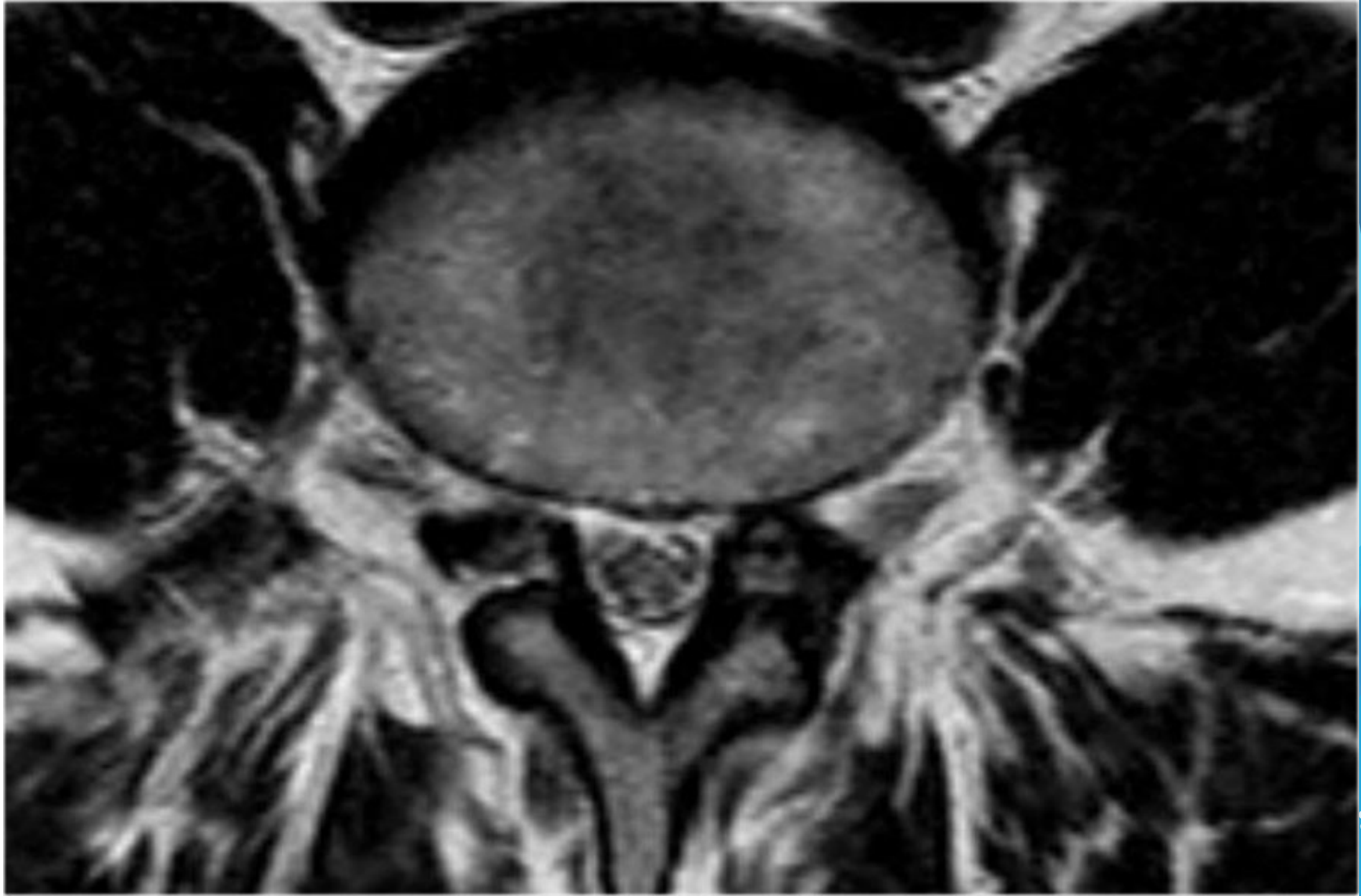

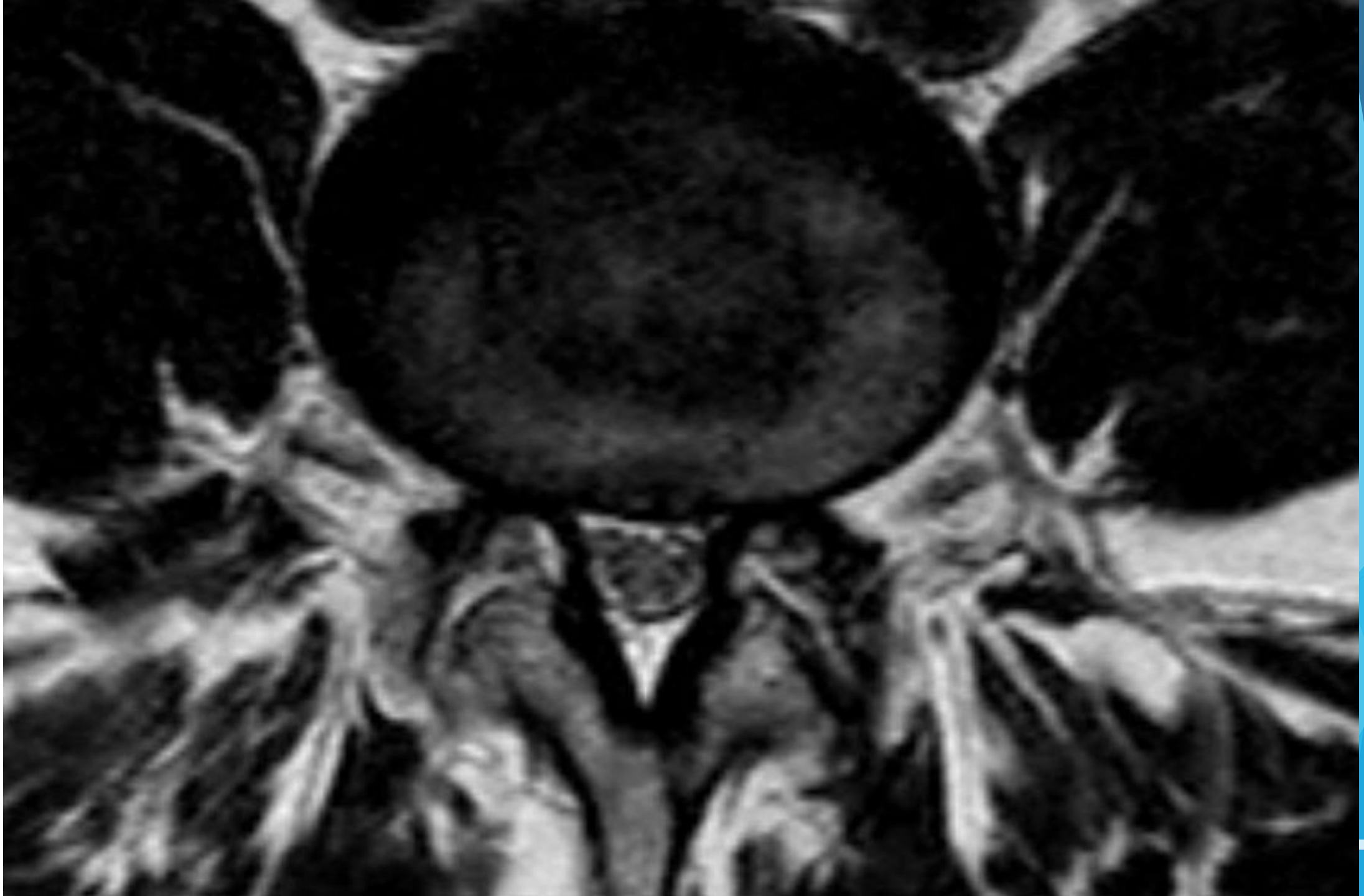

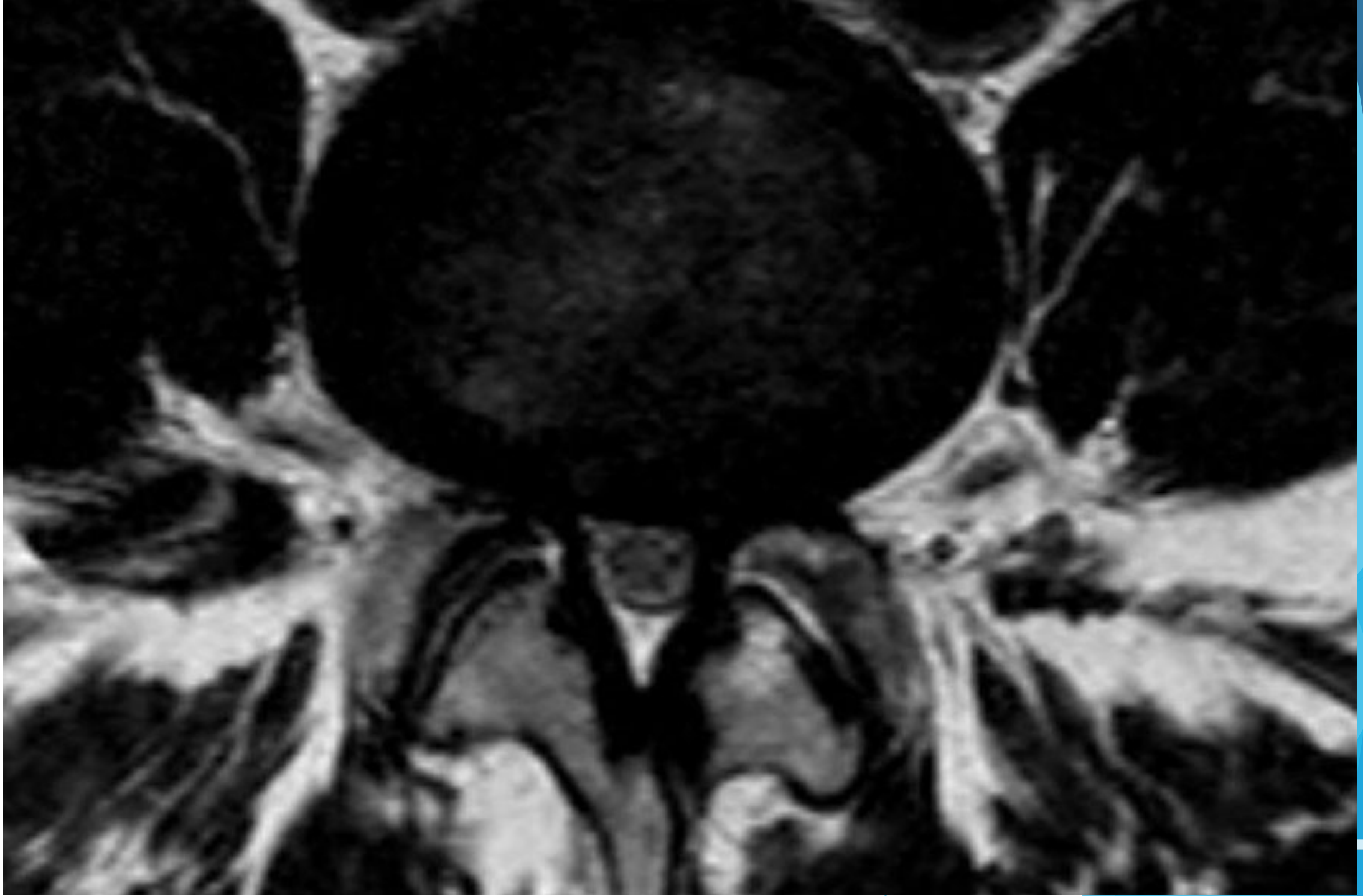

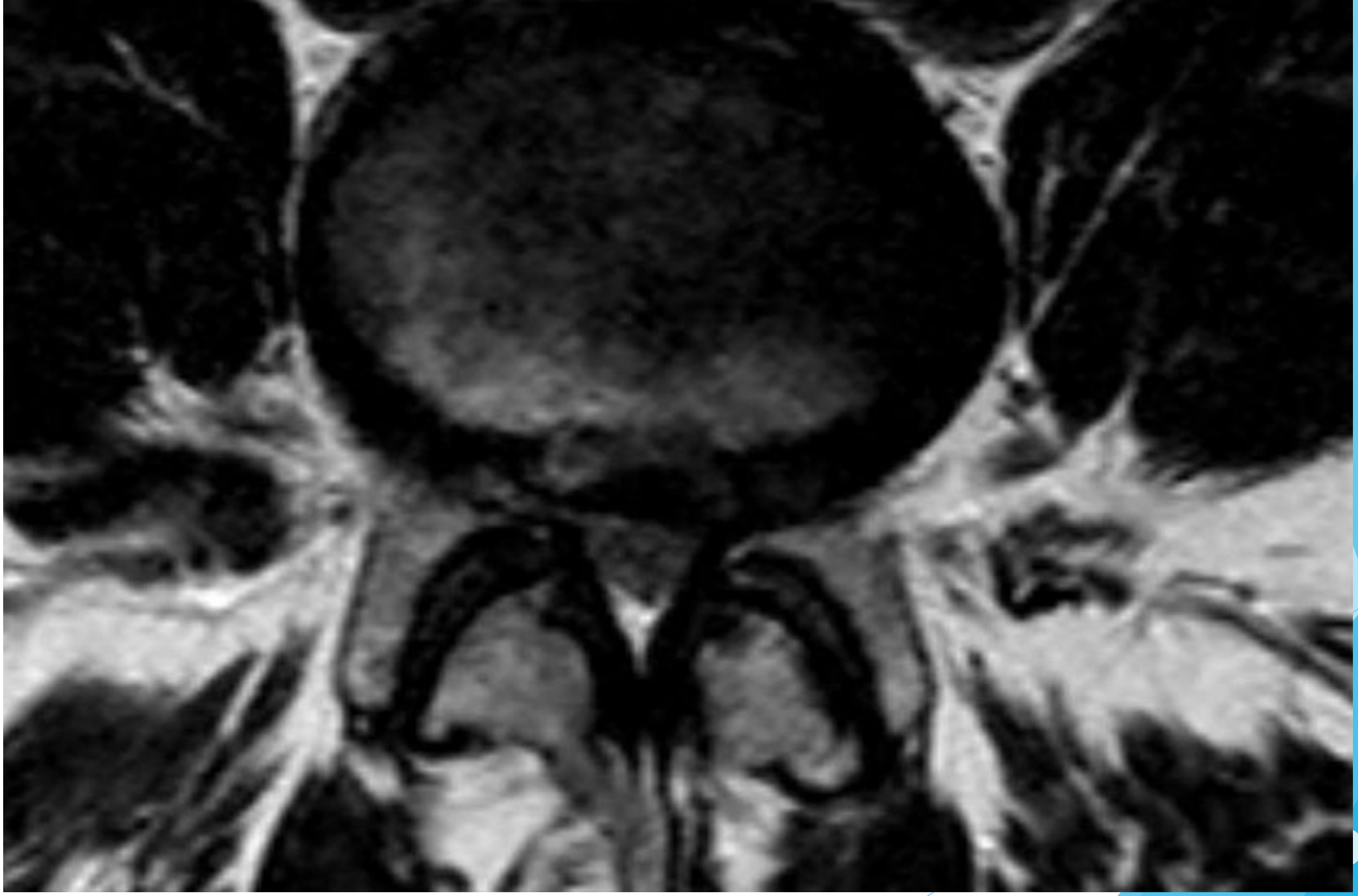

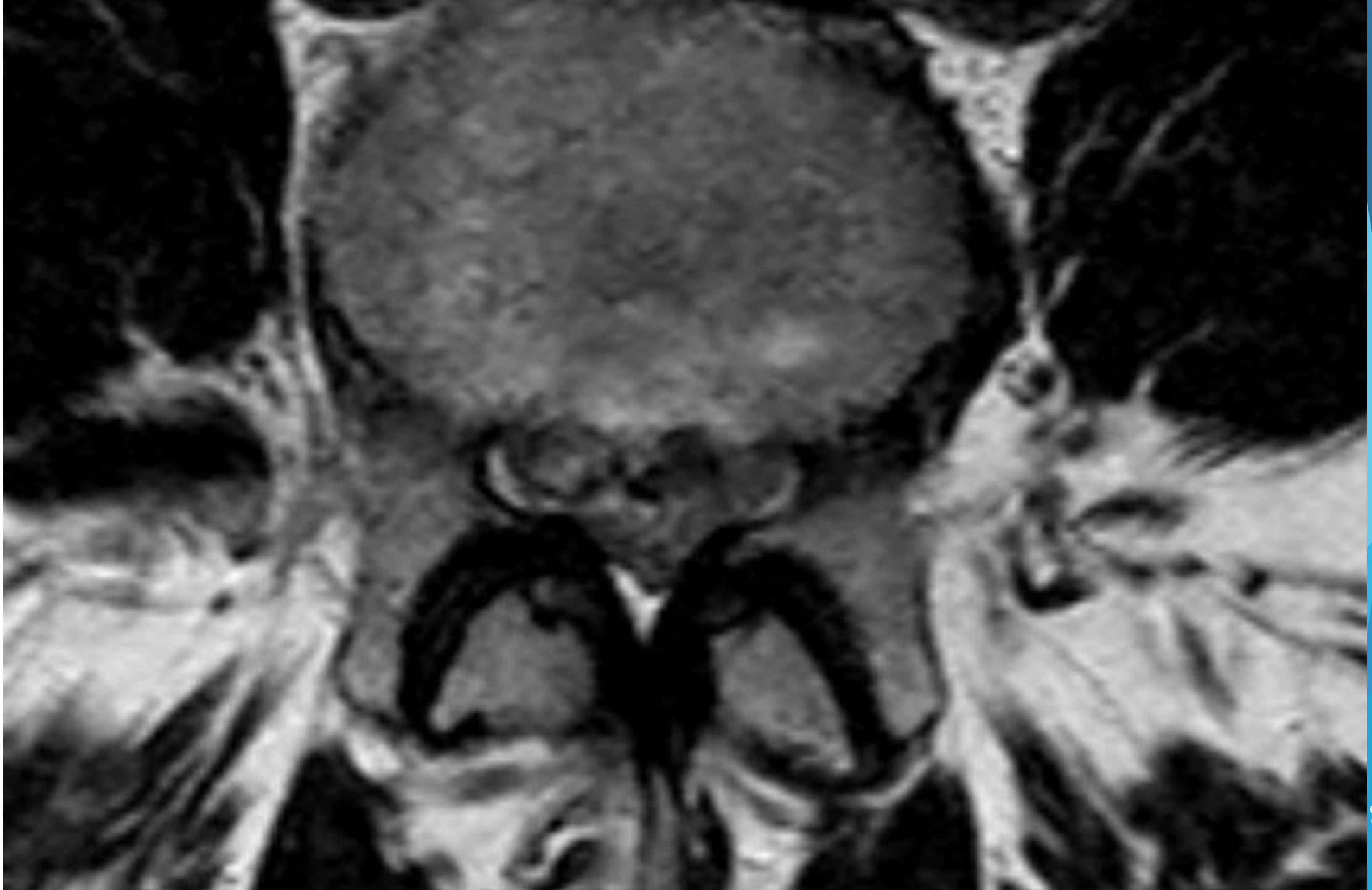

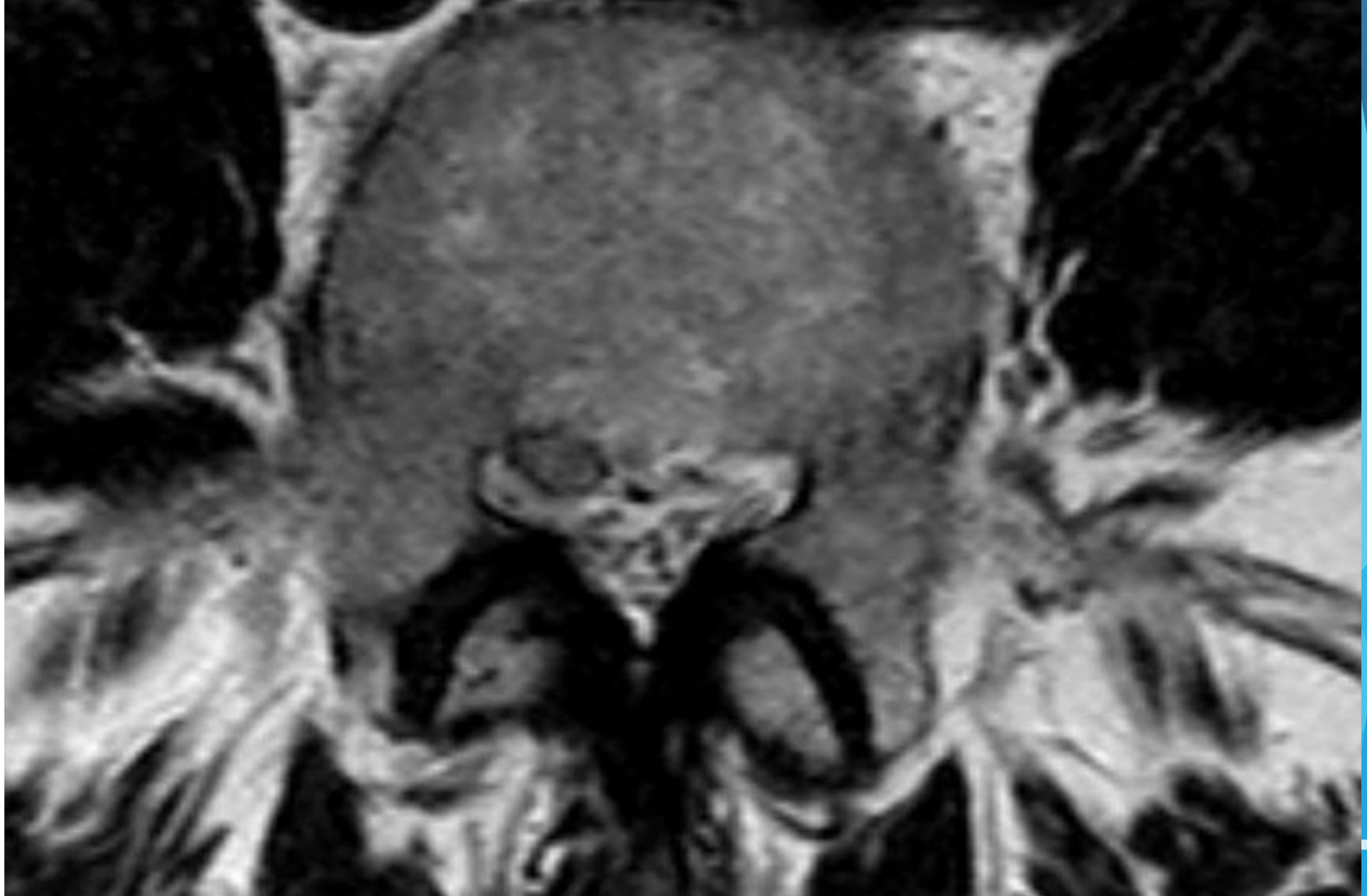

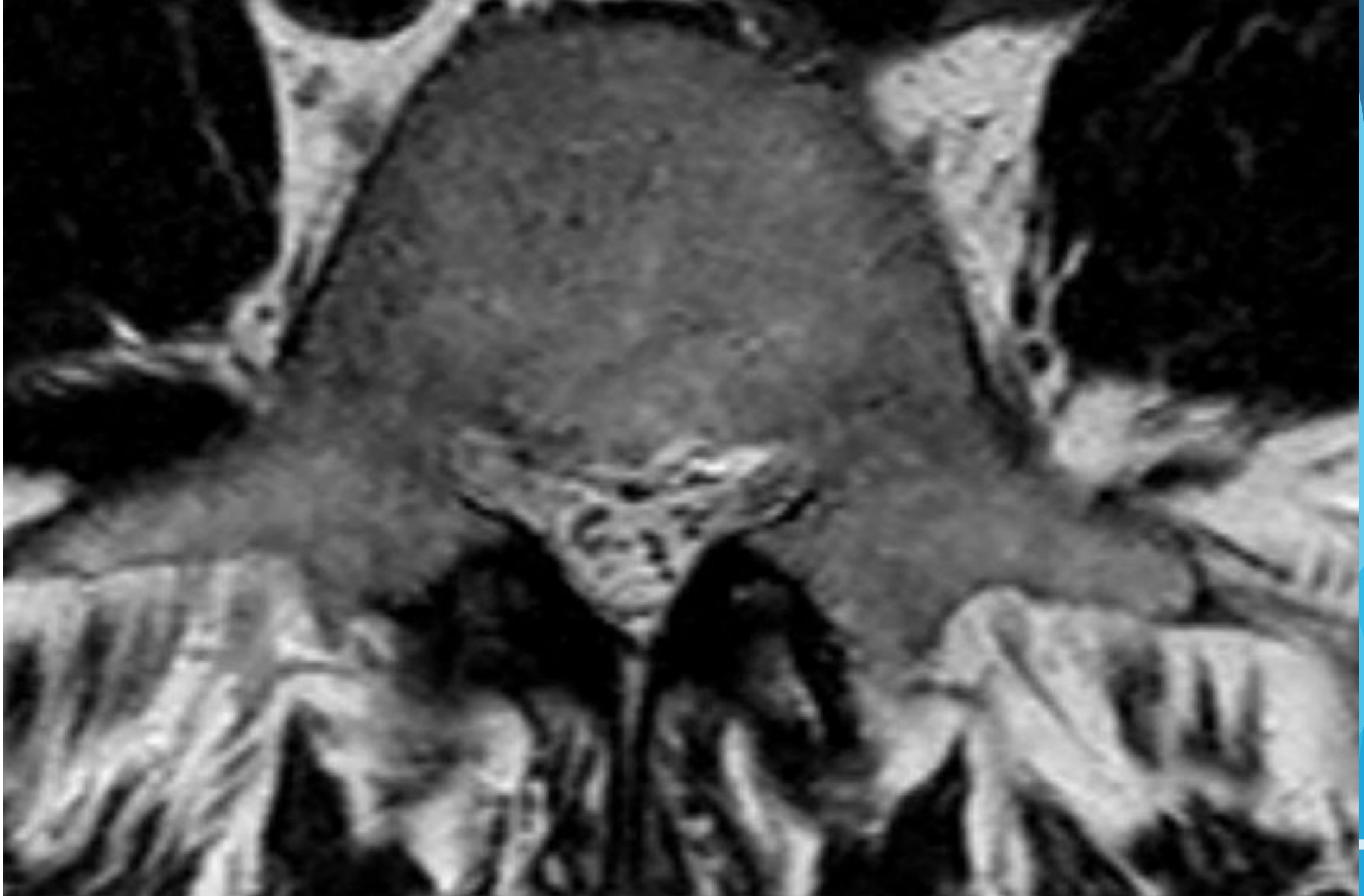

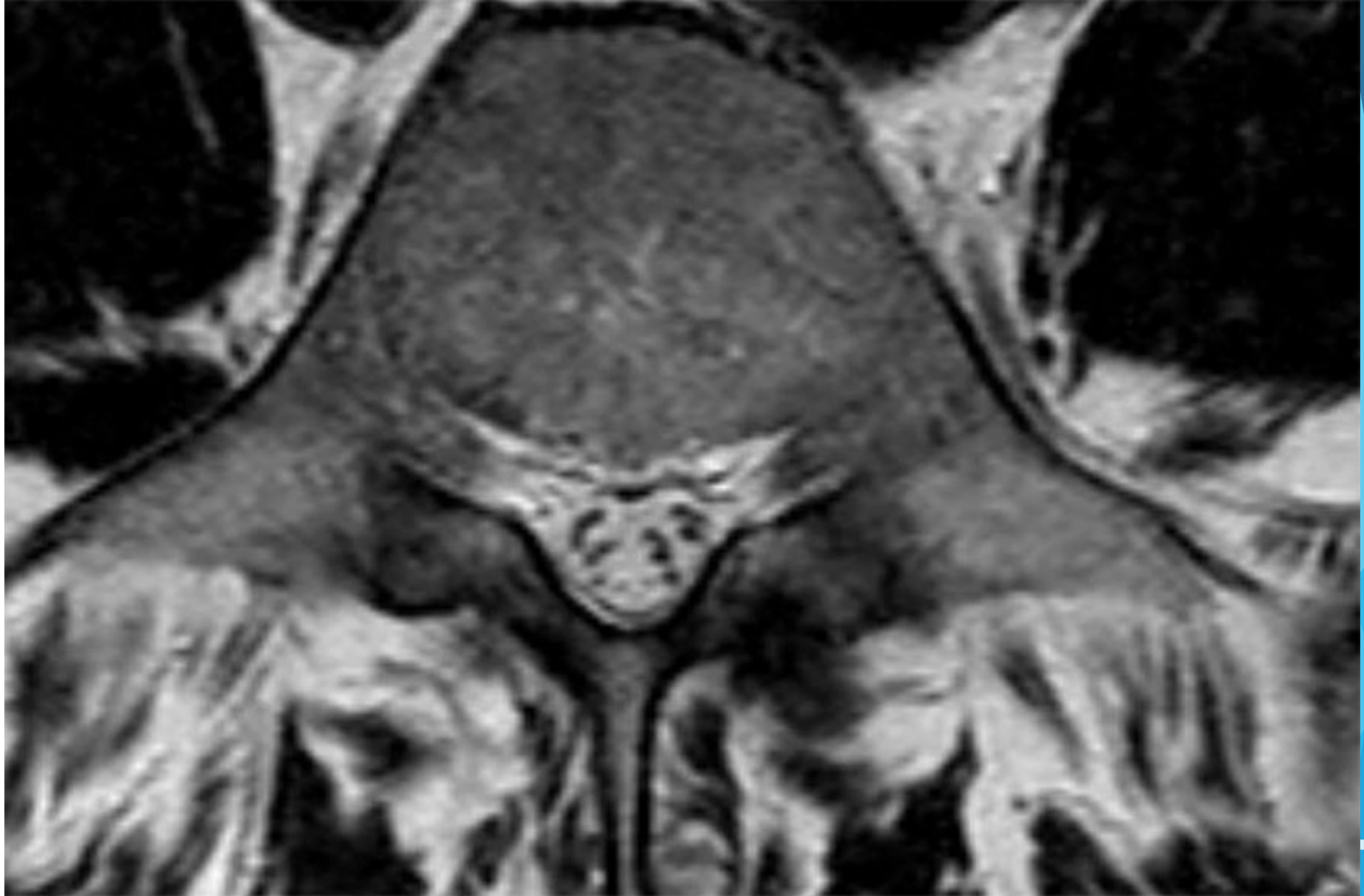

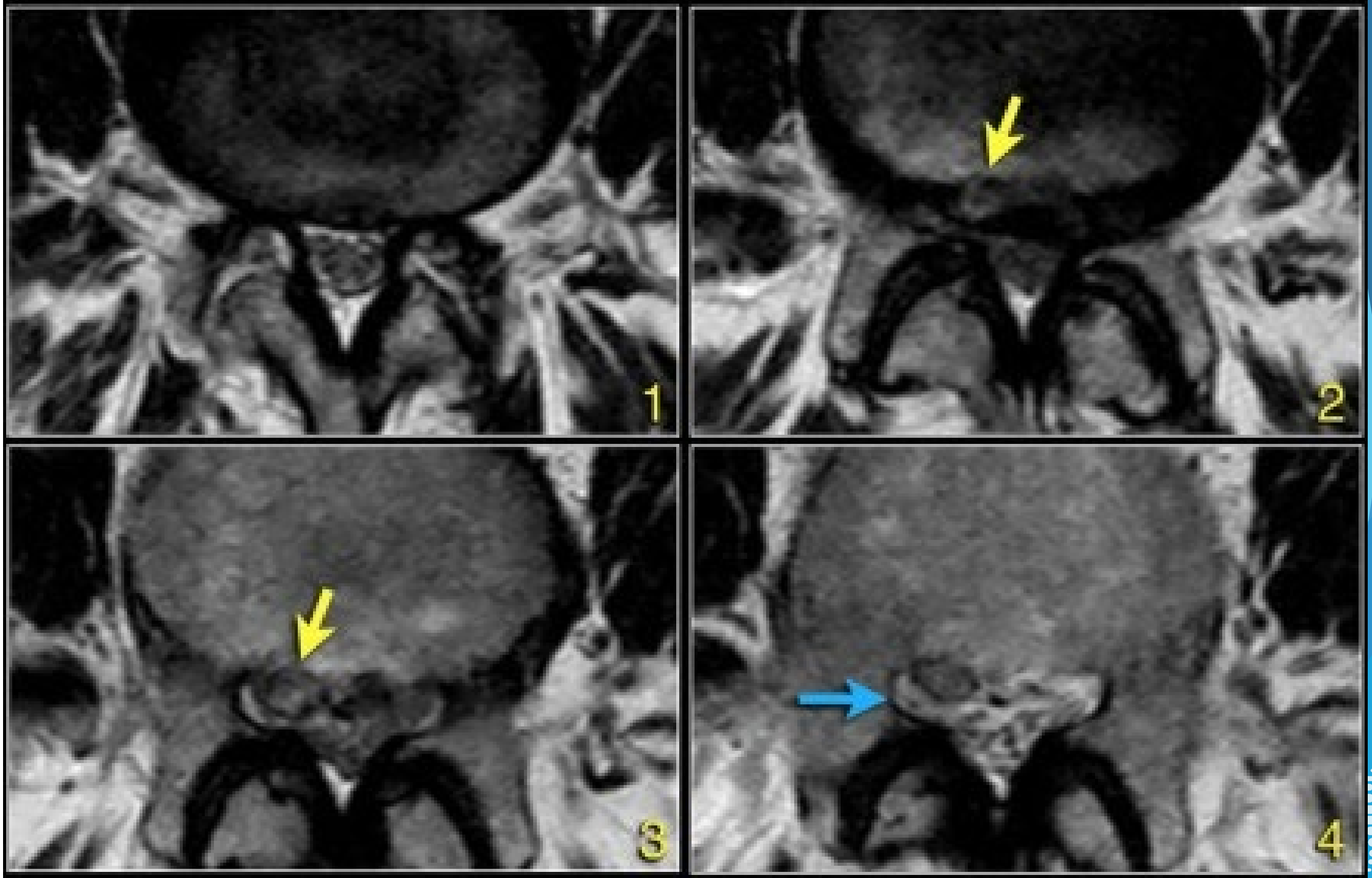
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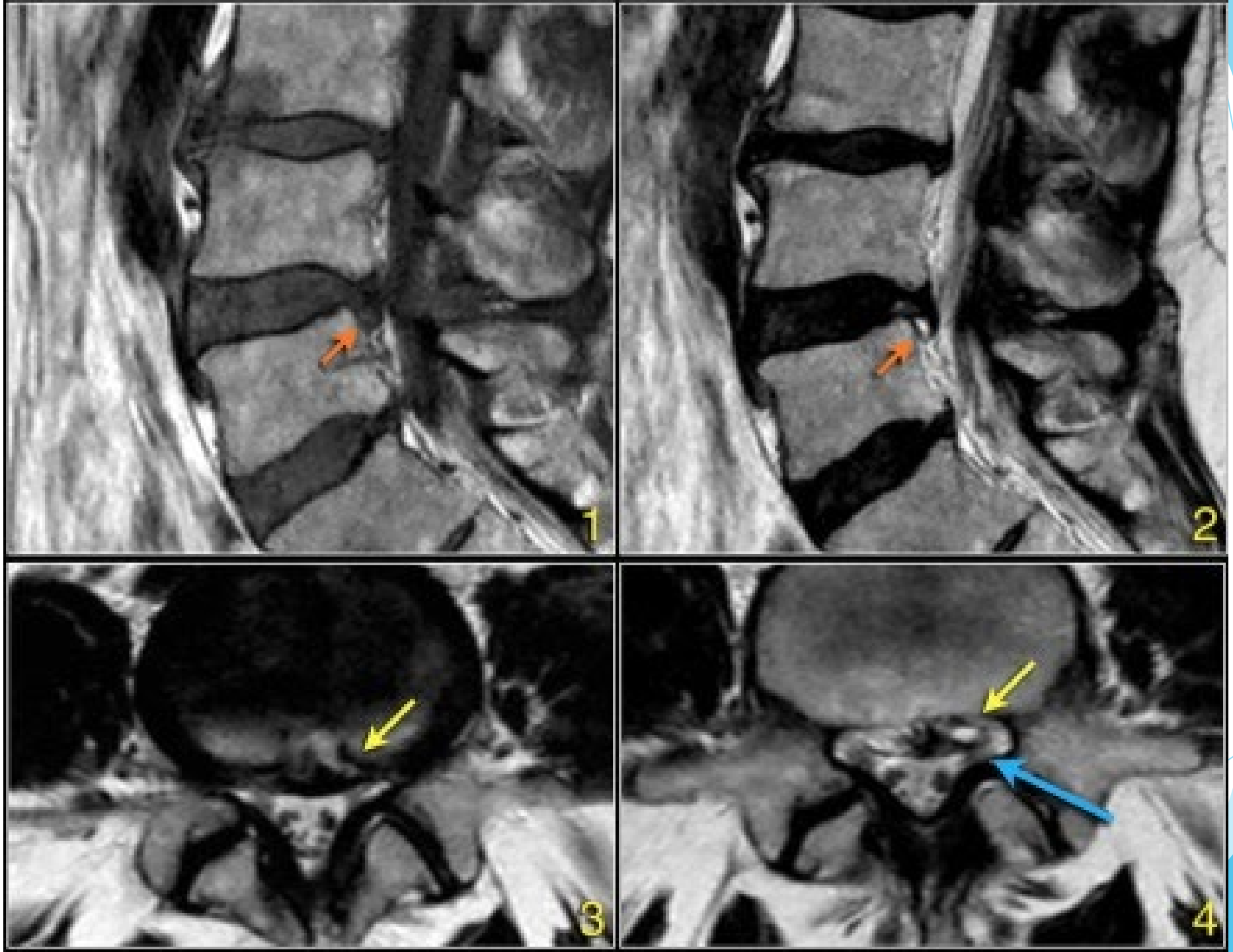
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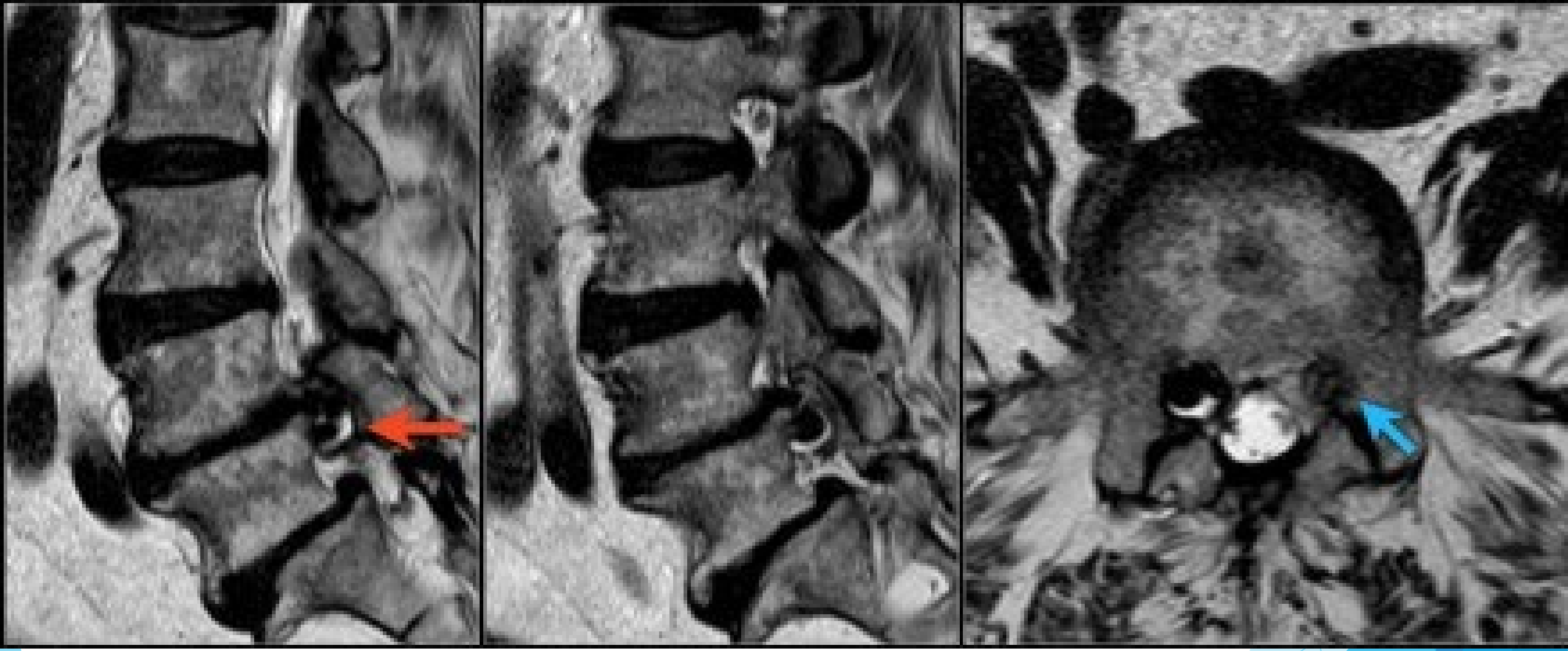


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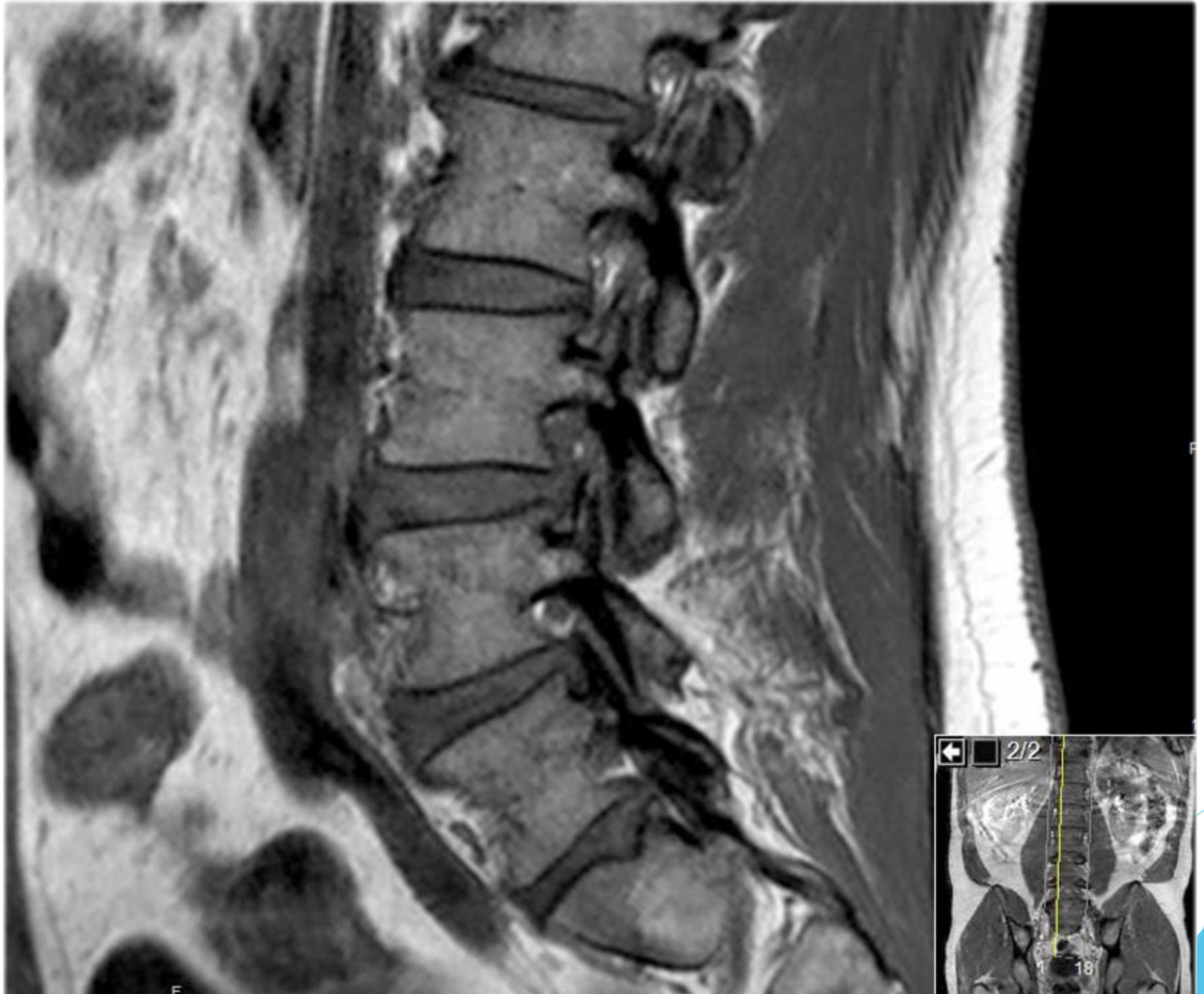
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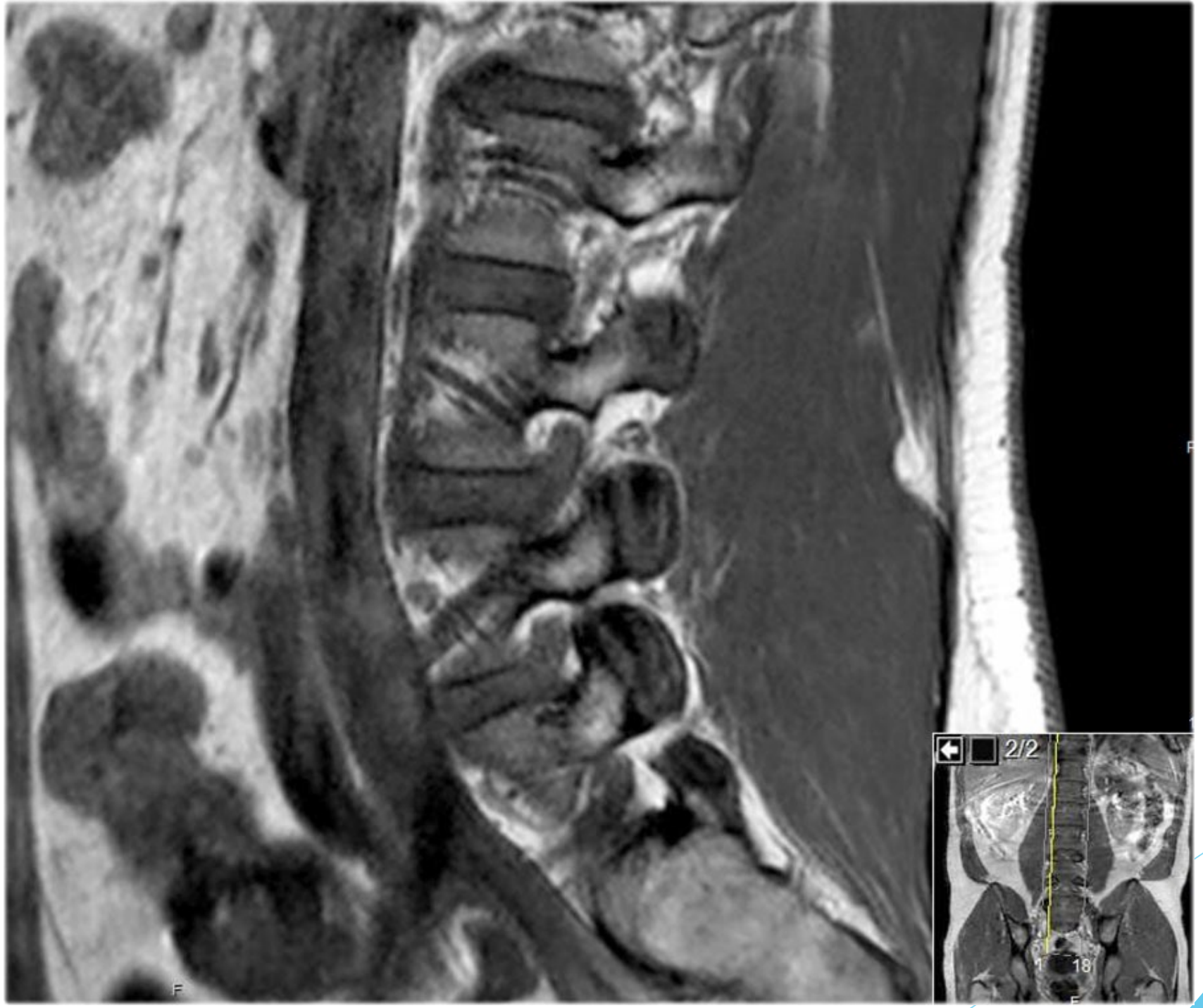
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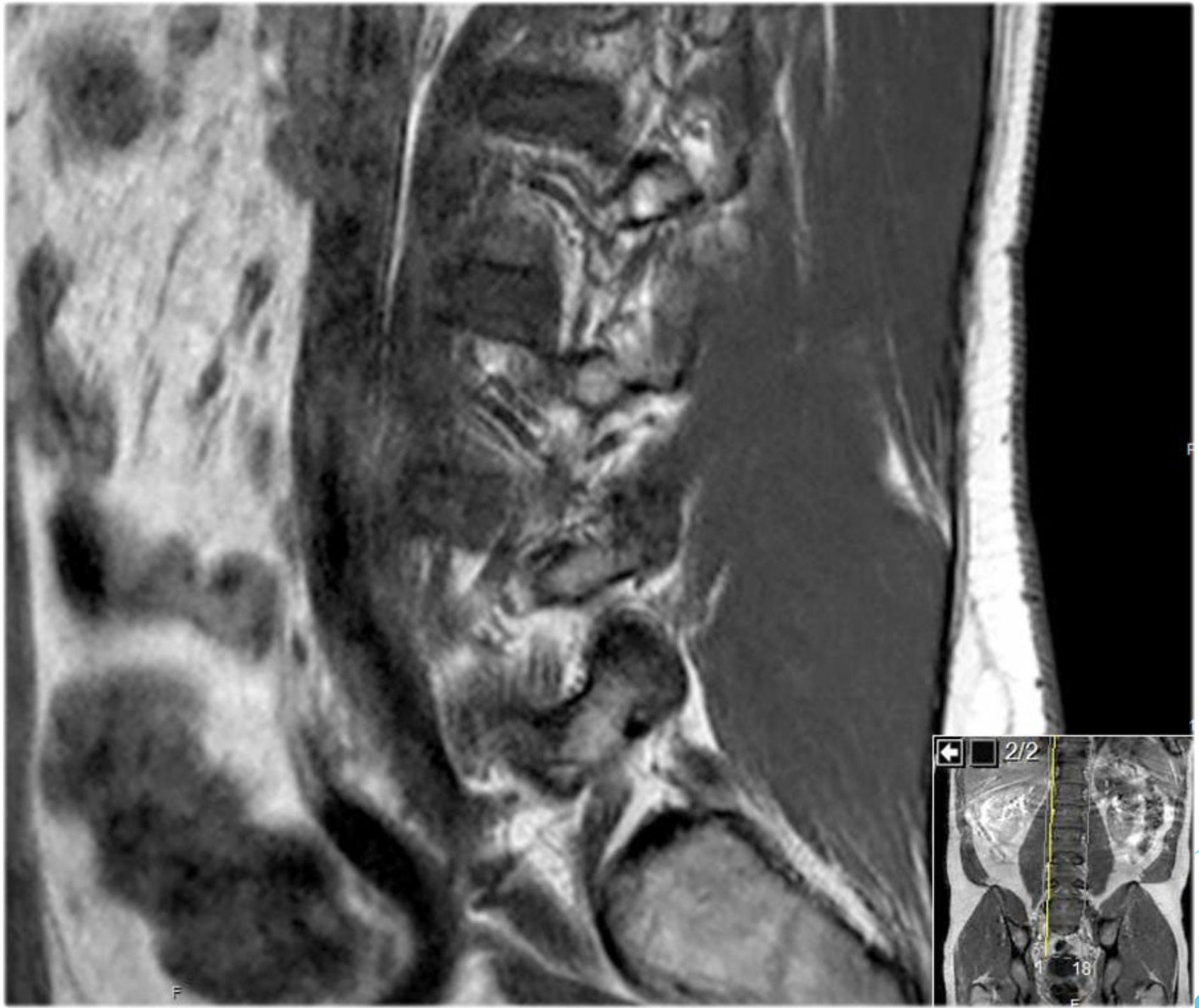
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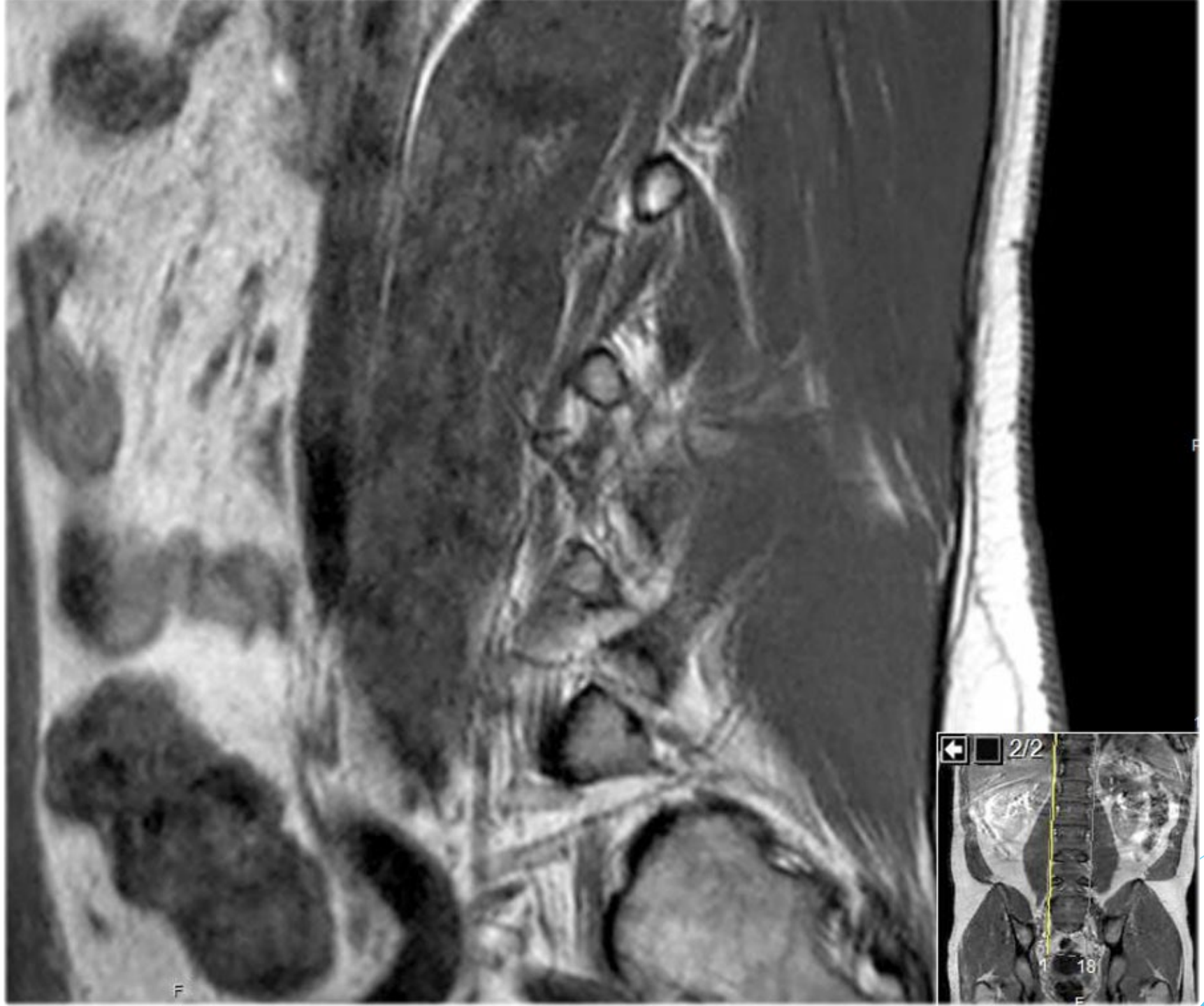
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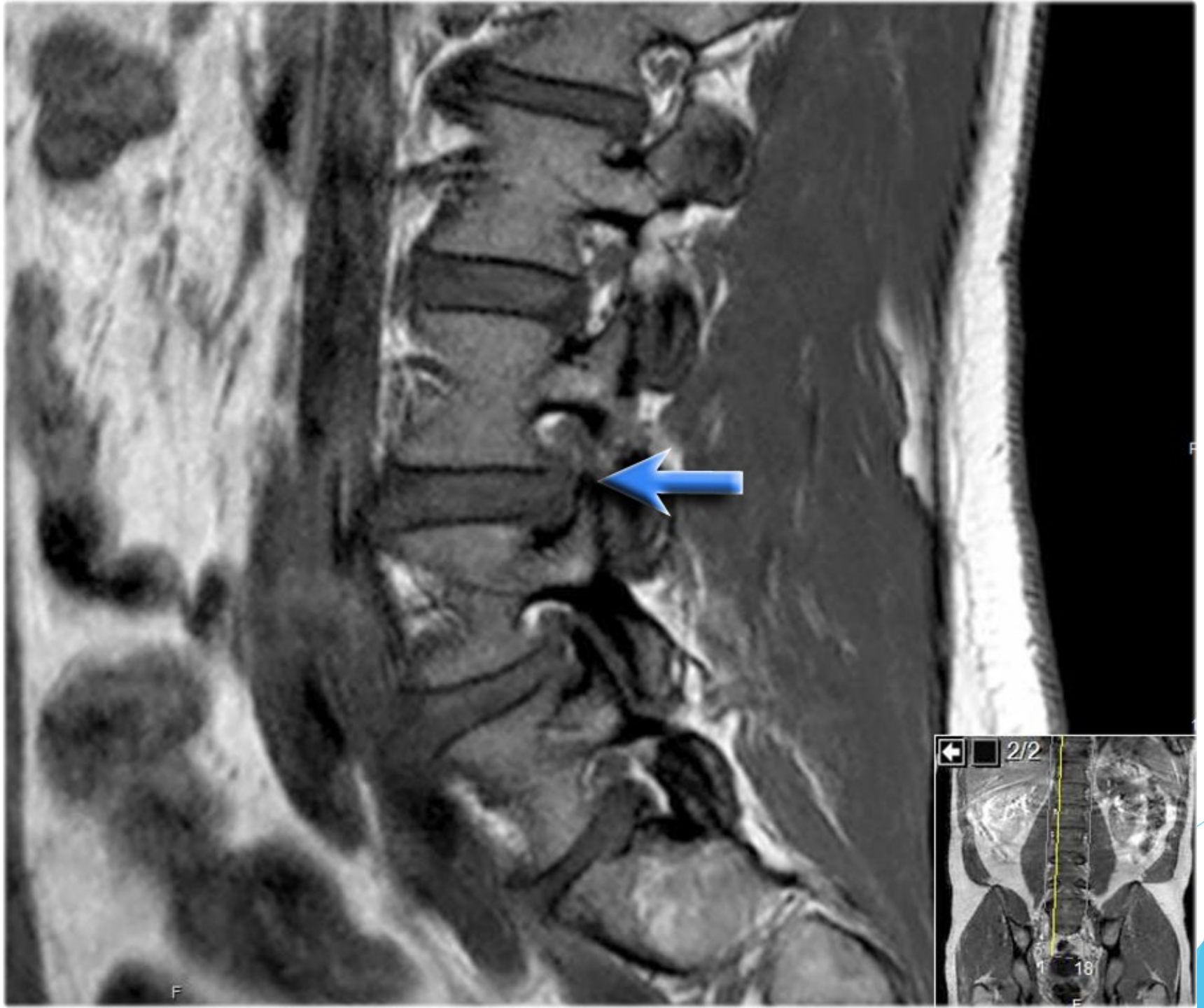
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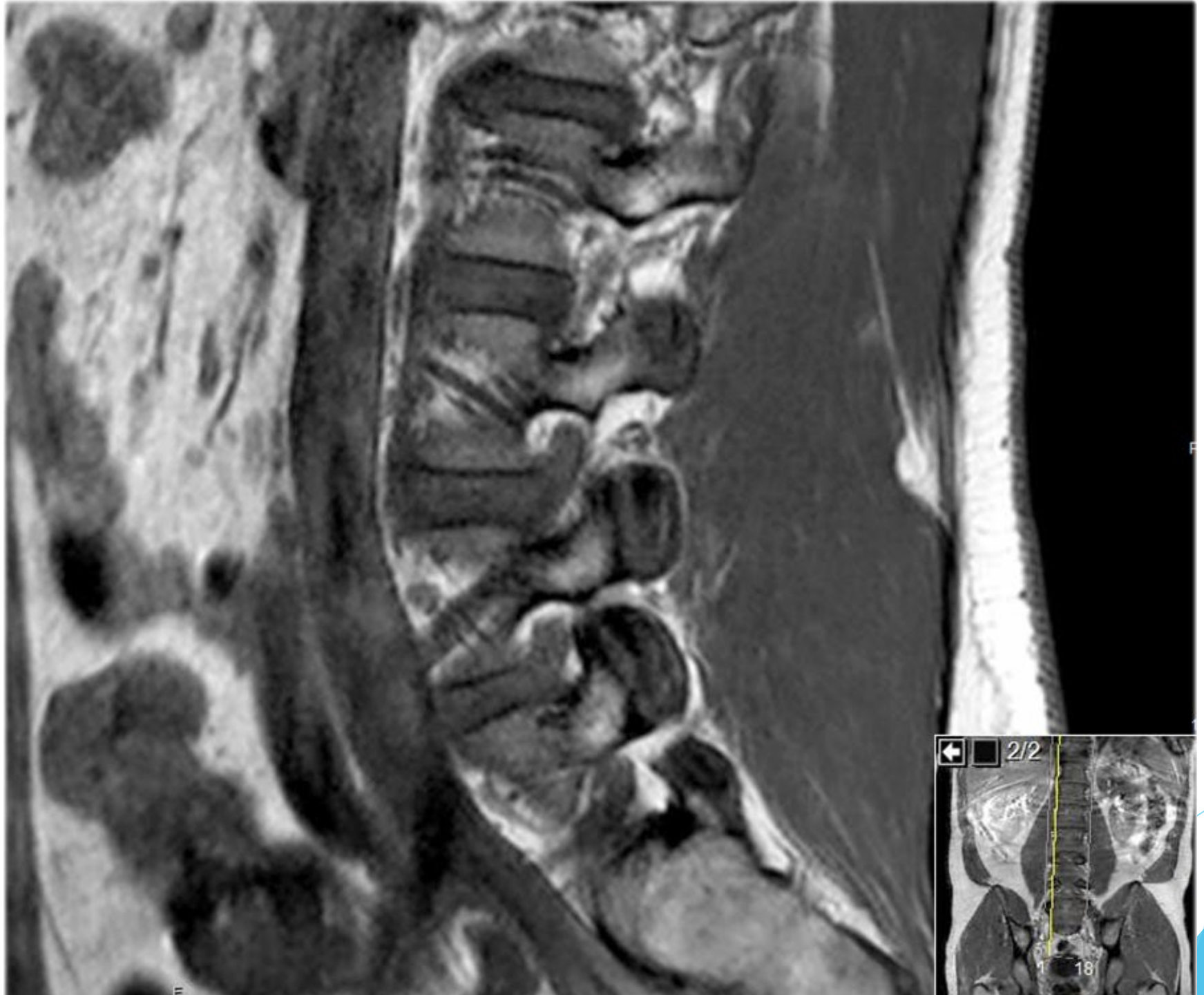
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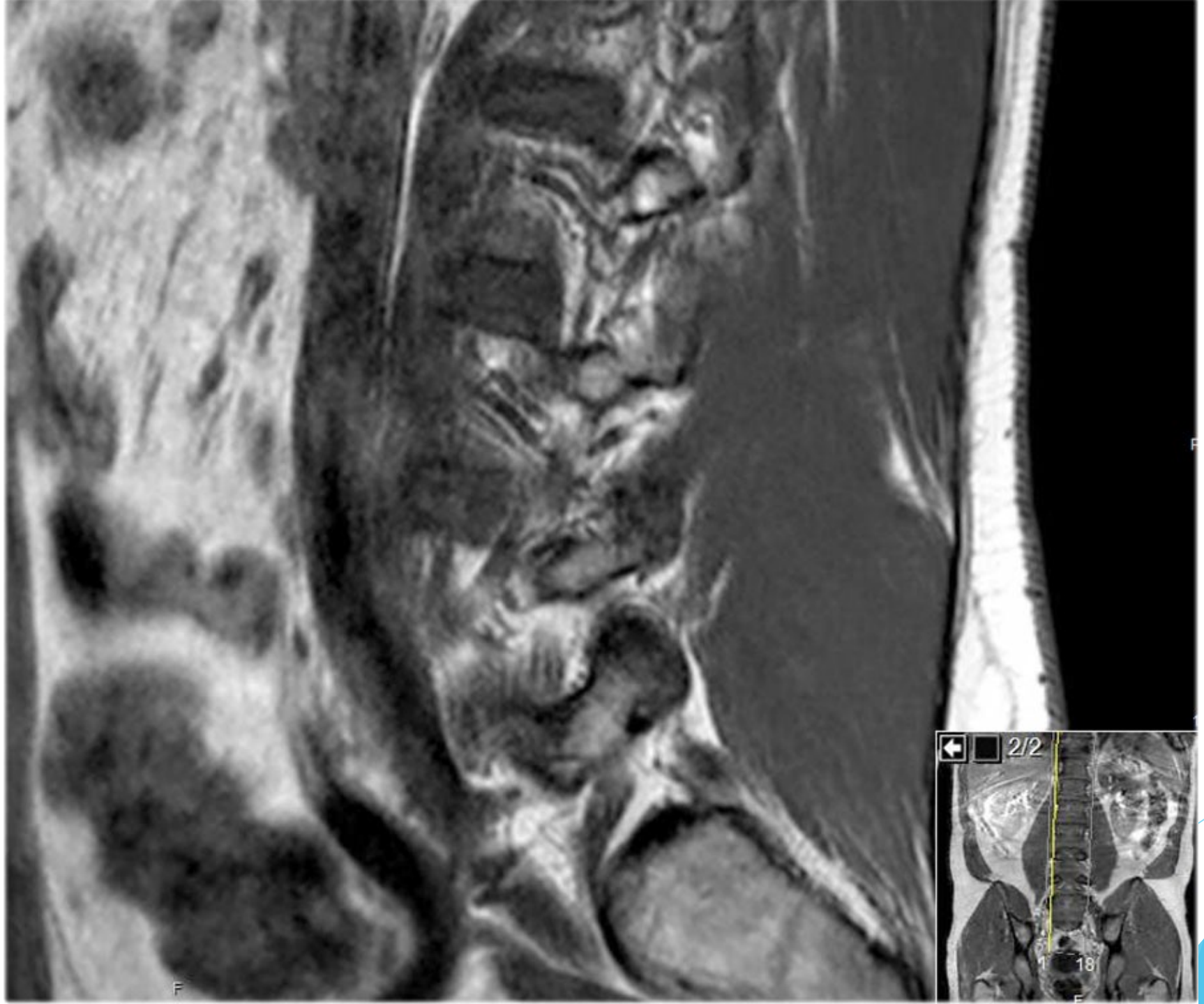
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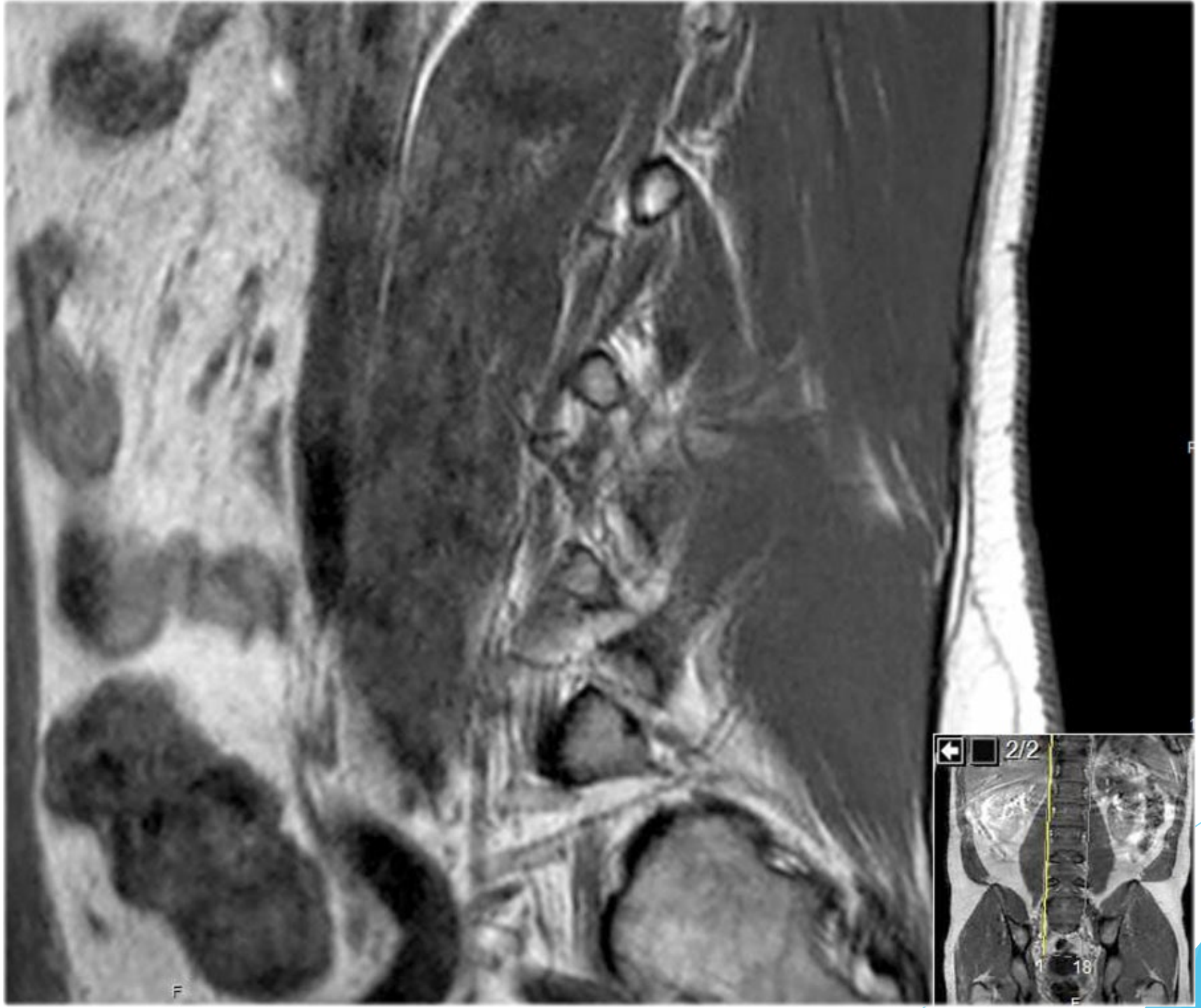
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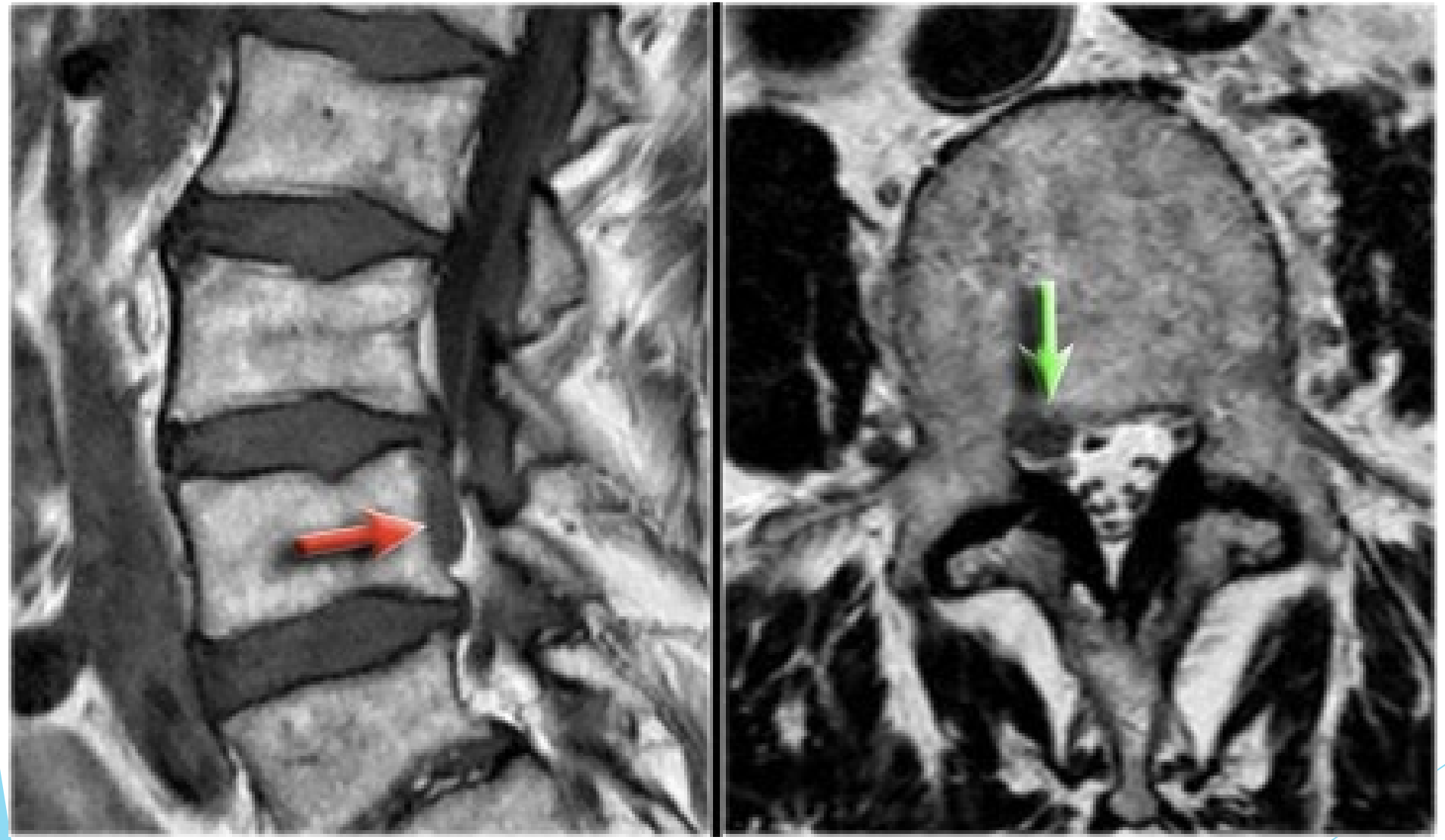

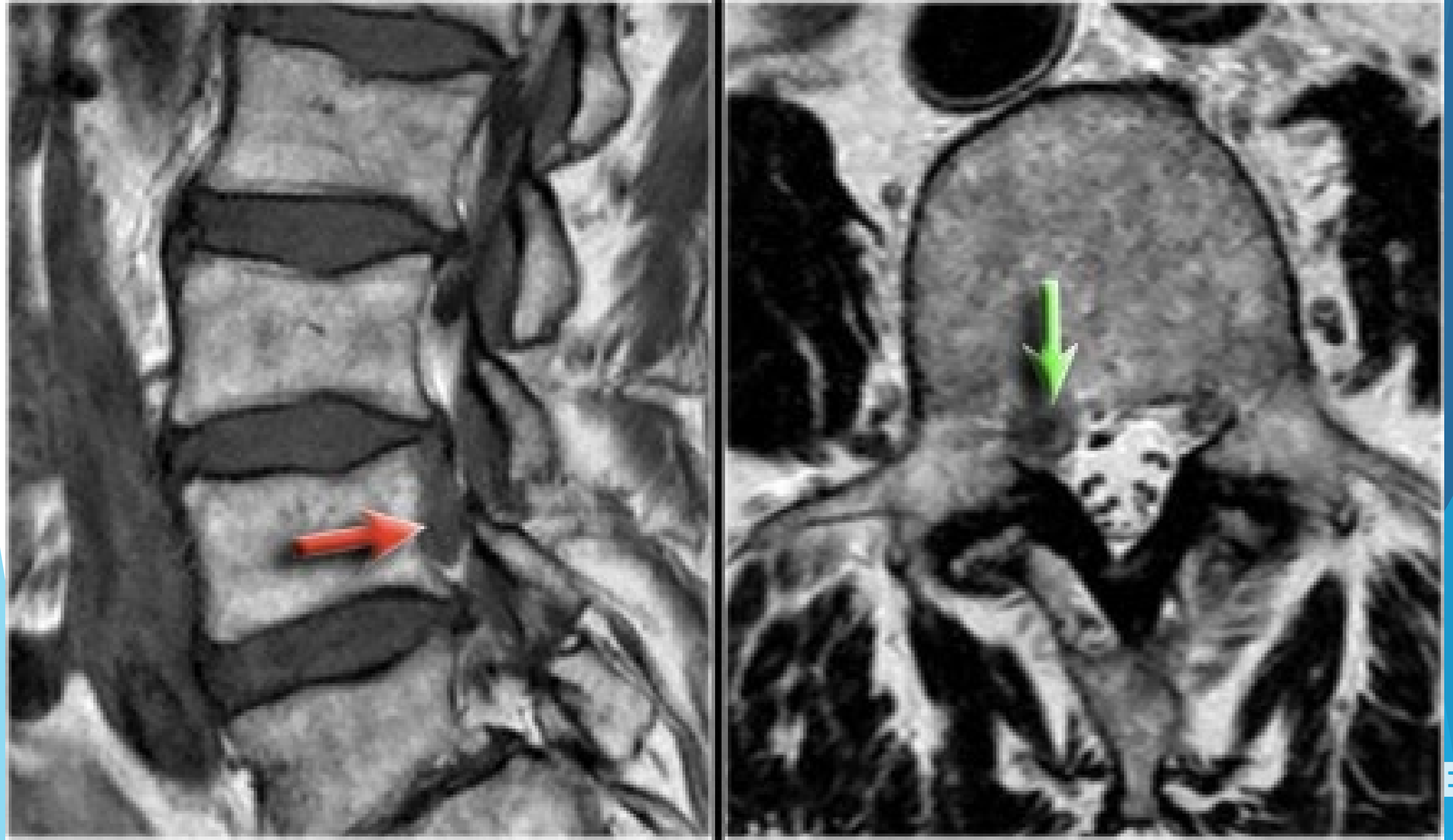

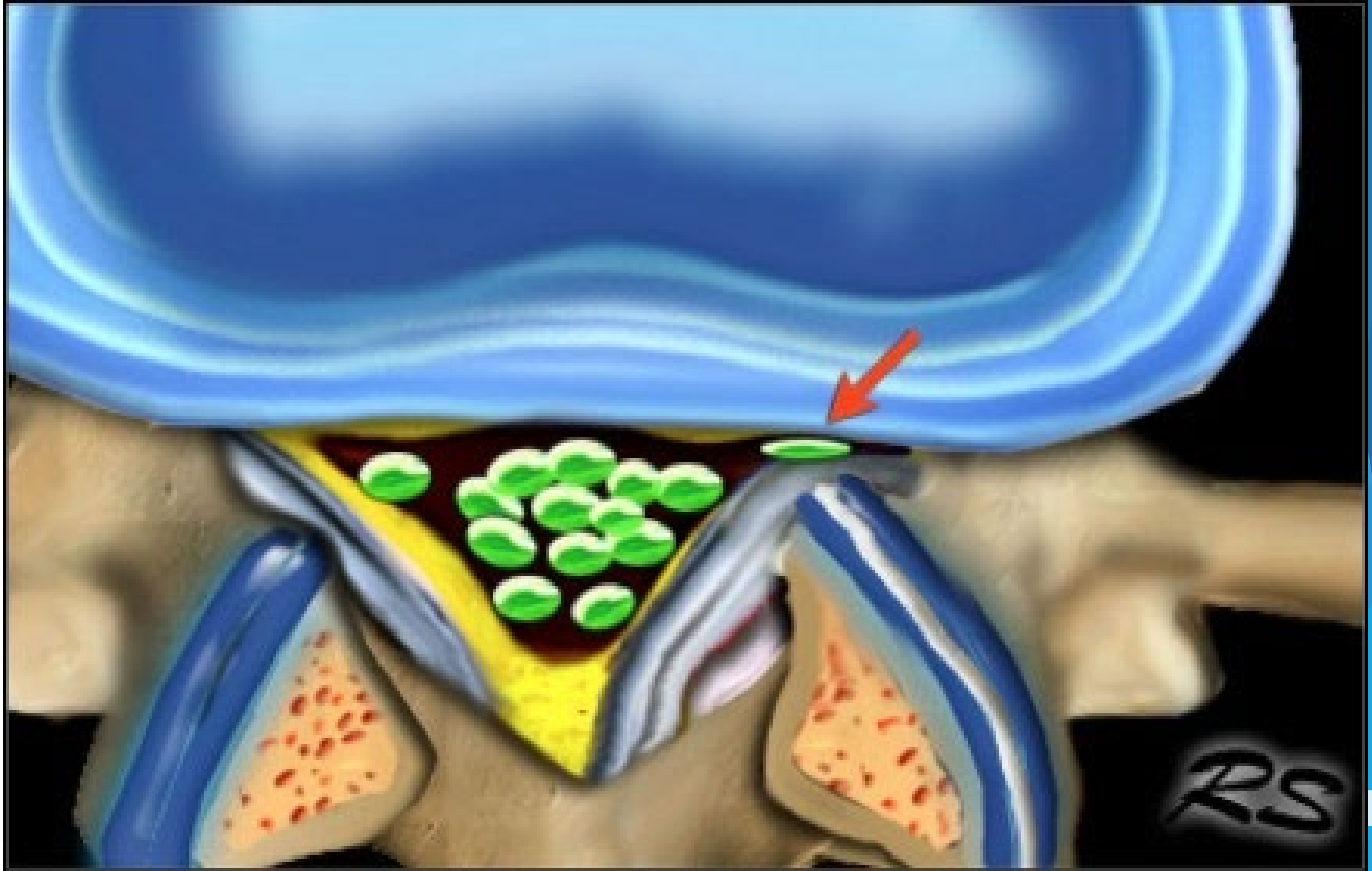
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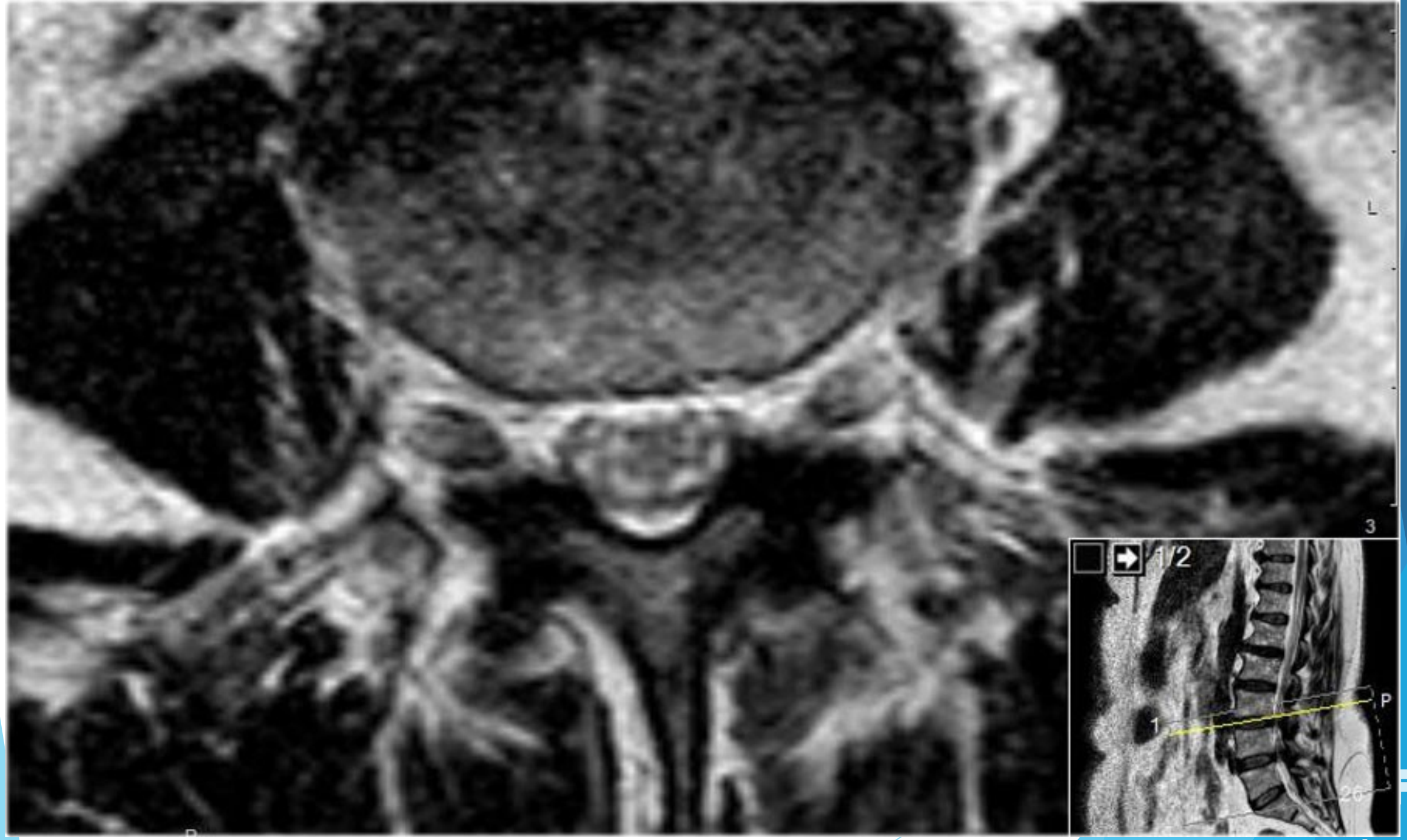
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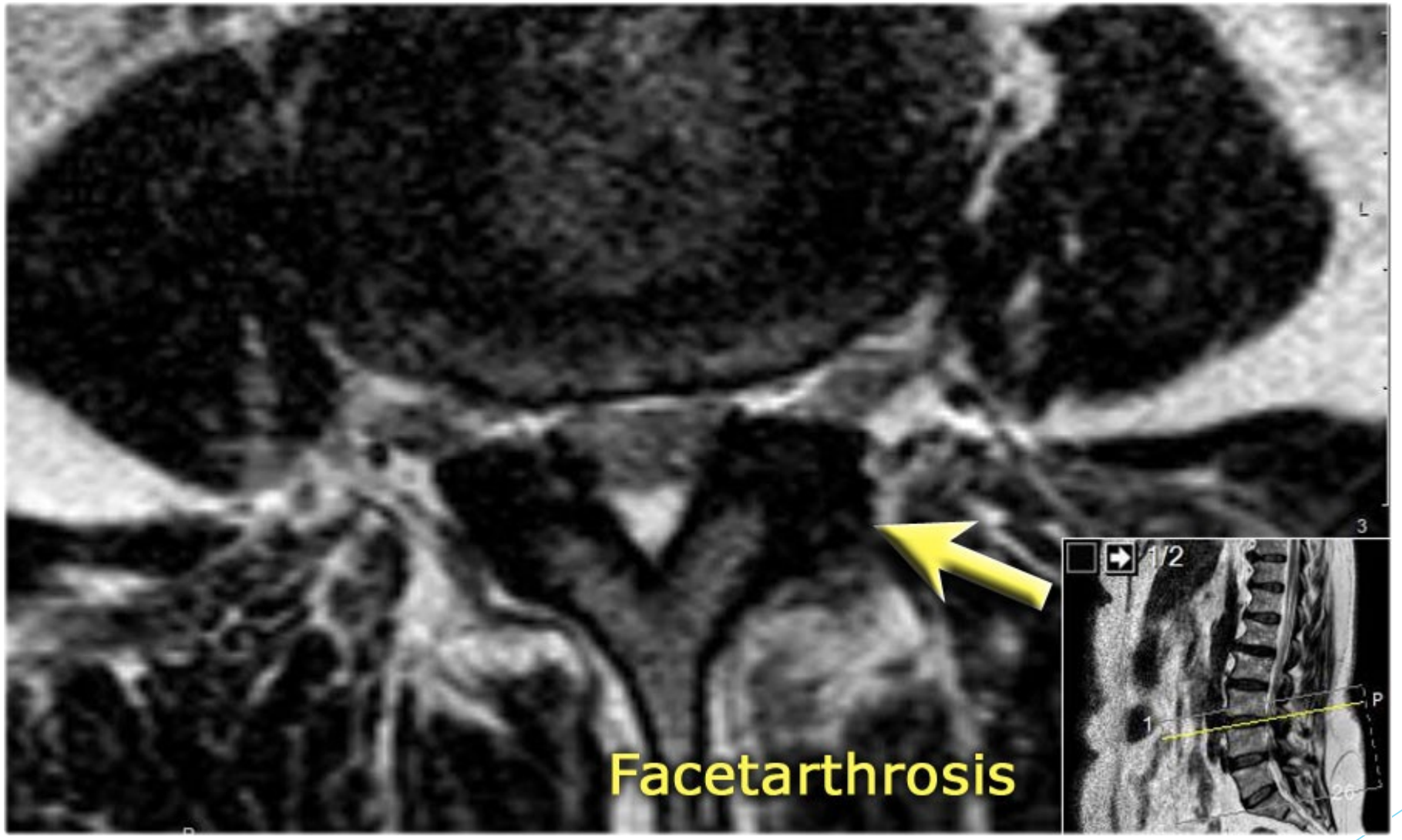
Facetarthrosis
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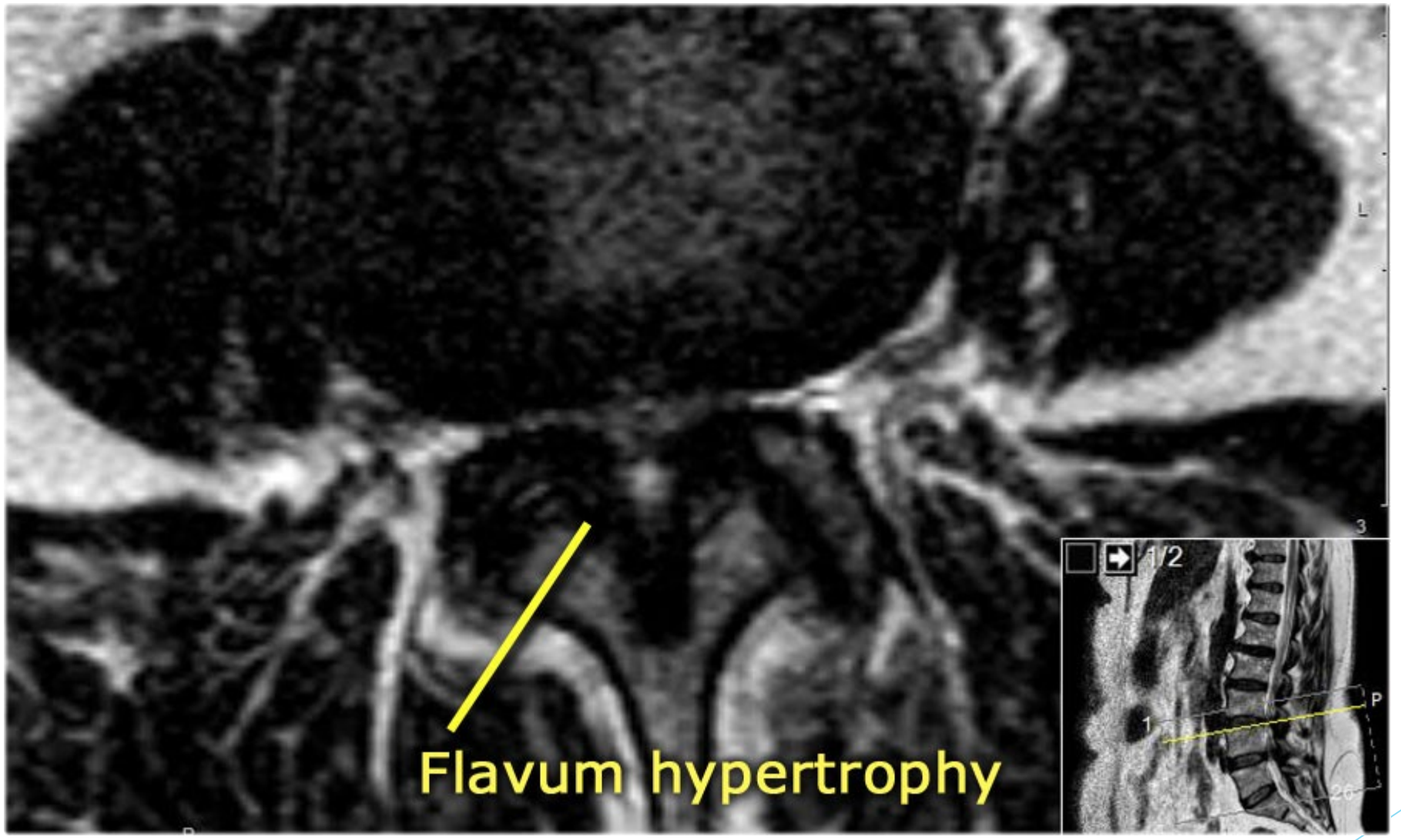
Flavum hypertrophy
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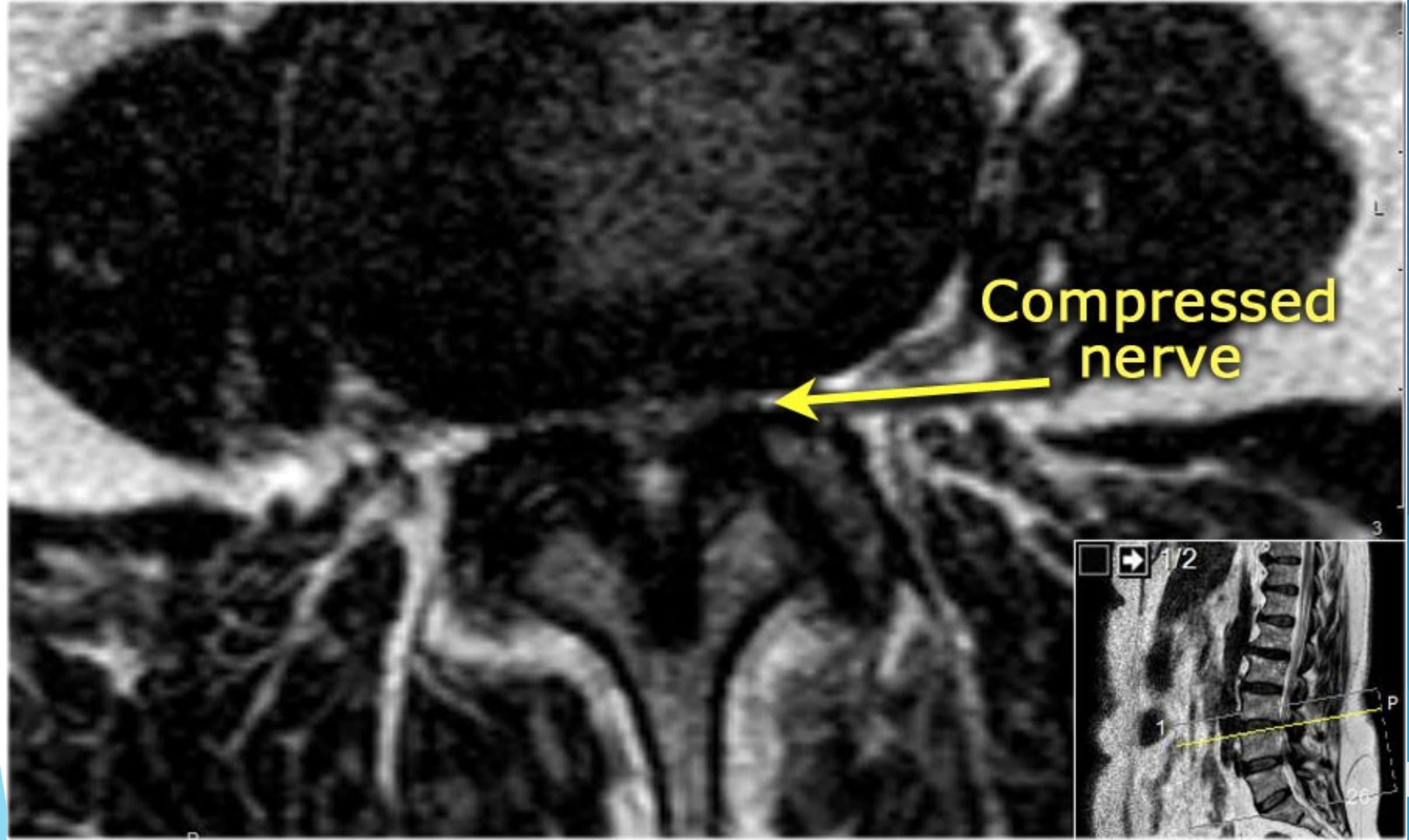
Compressed
nerve
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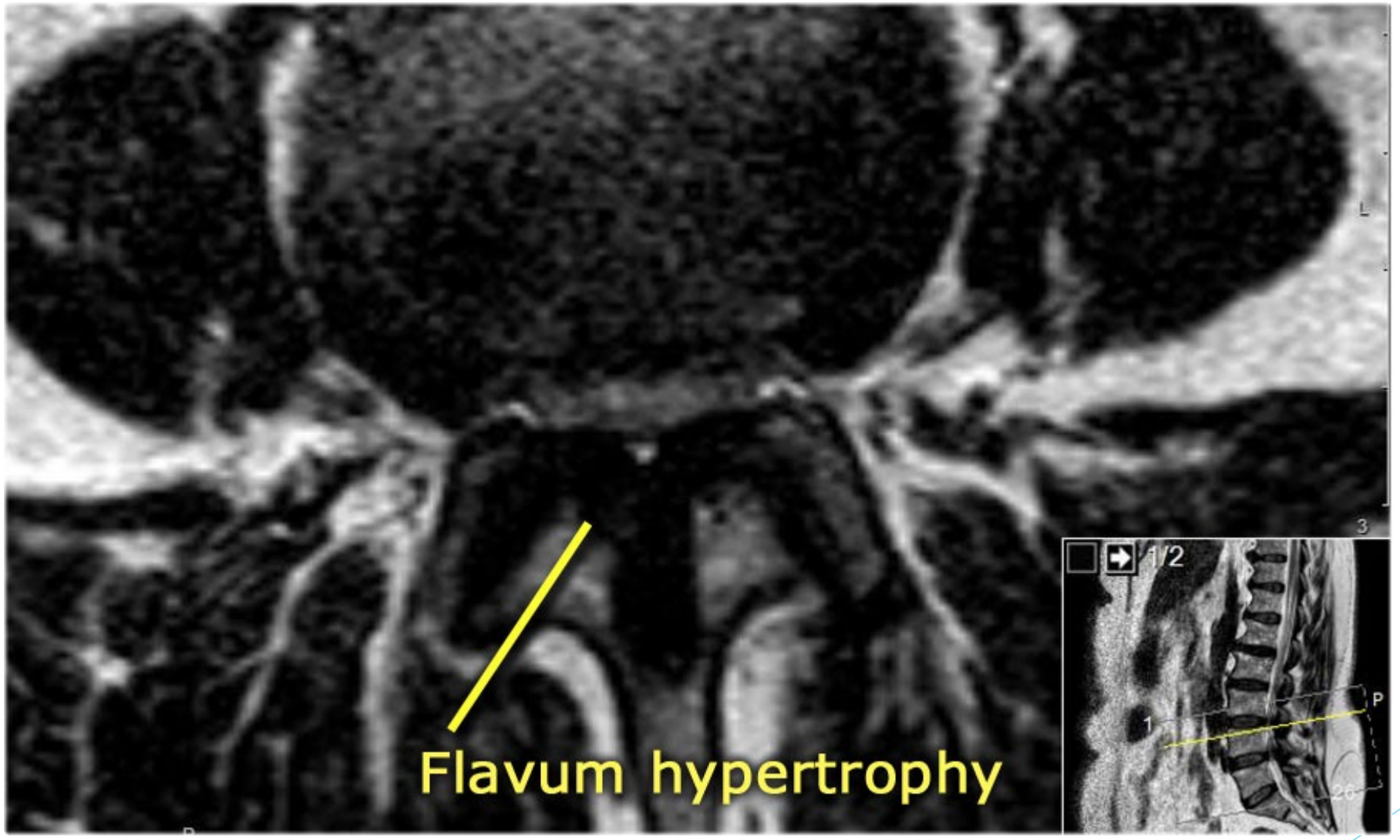
Flavum hypertrophy
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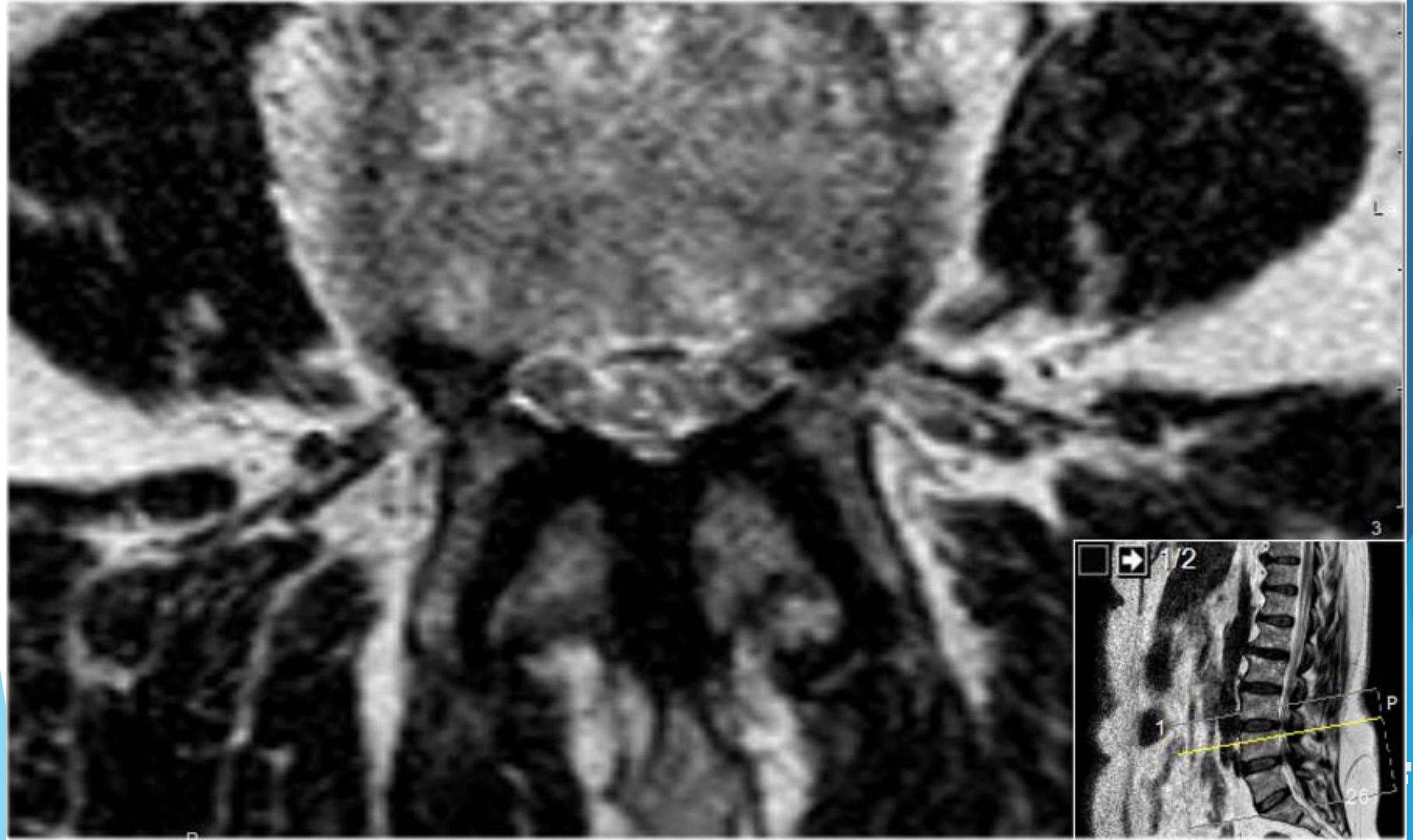
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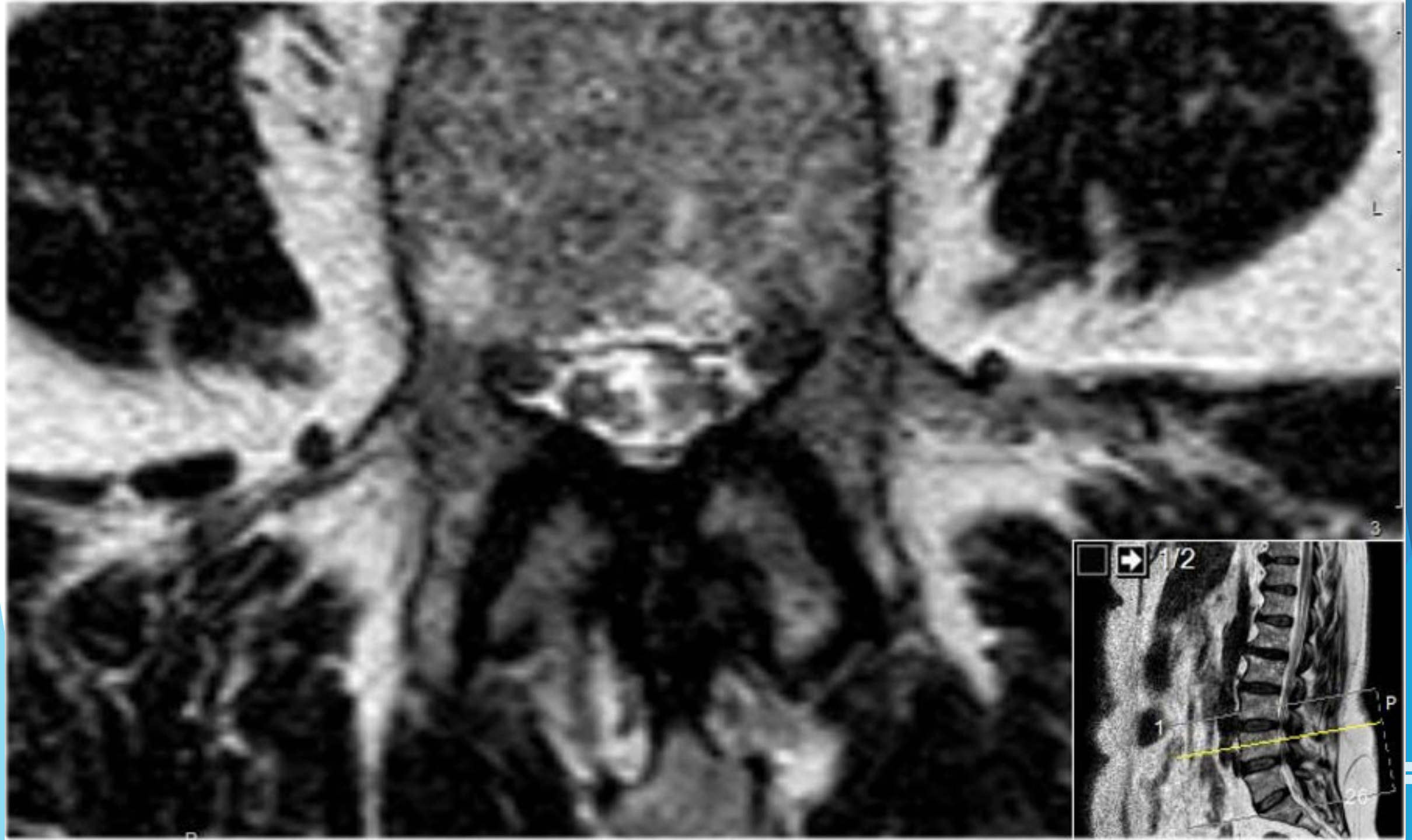
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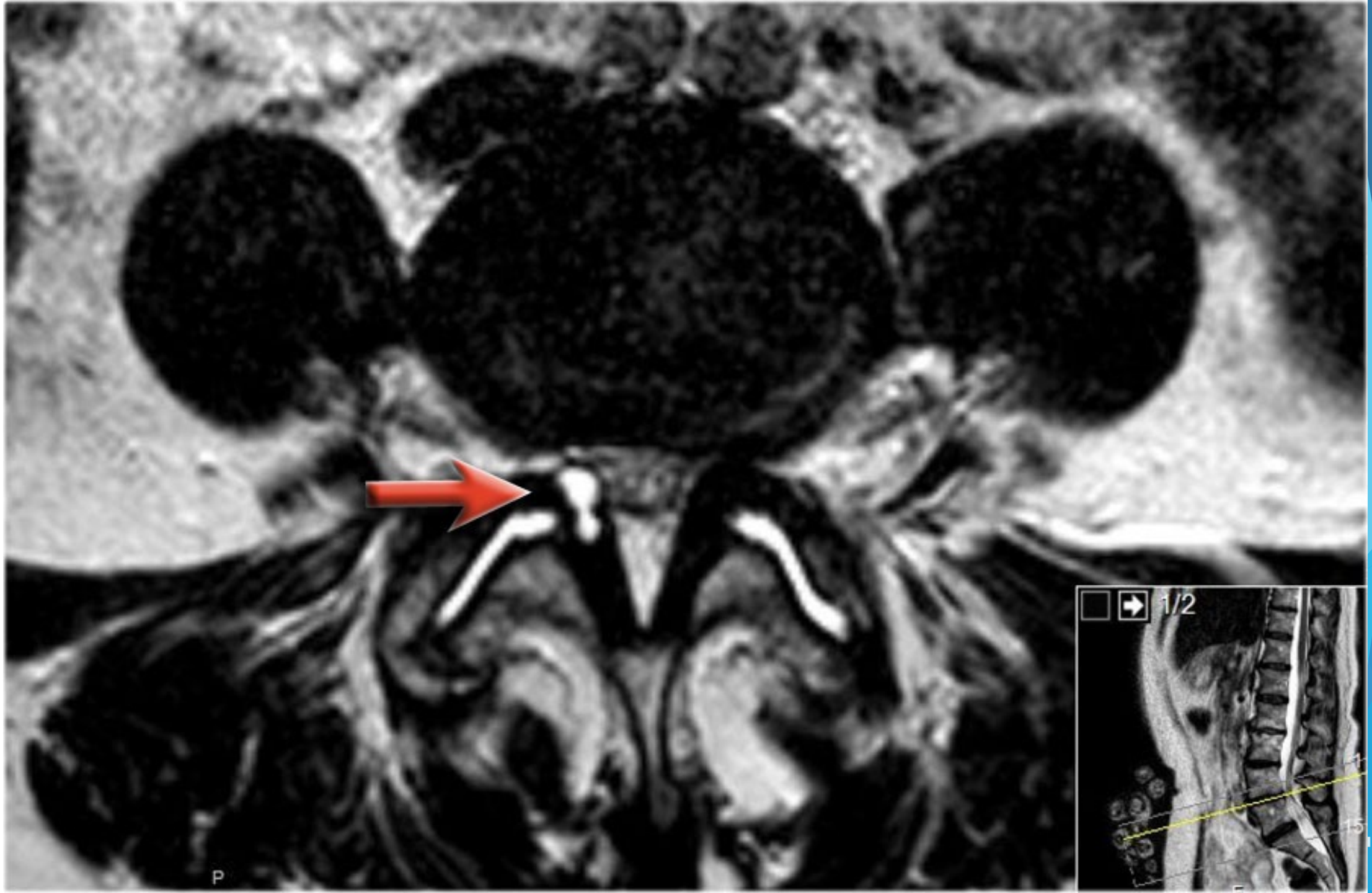
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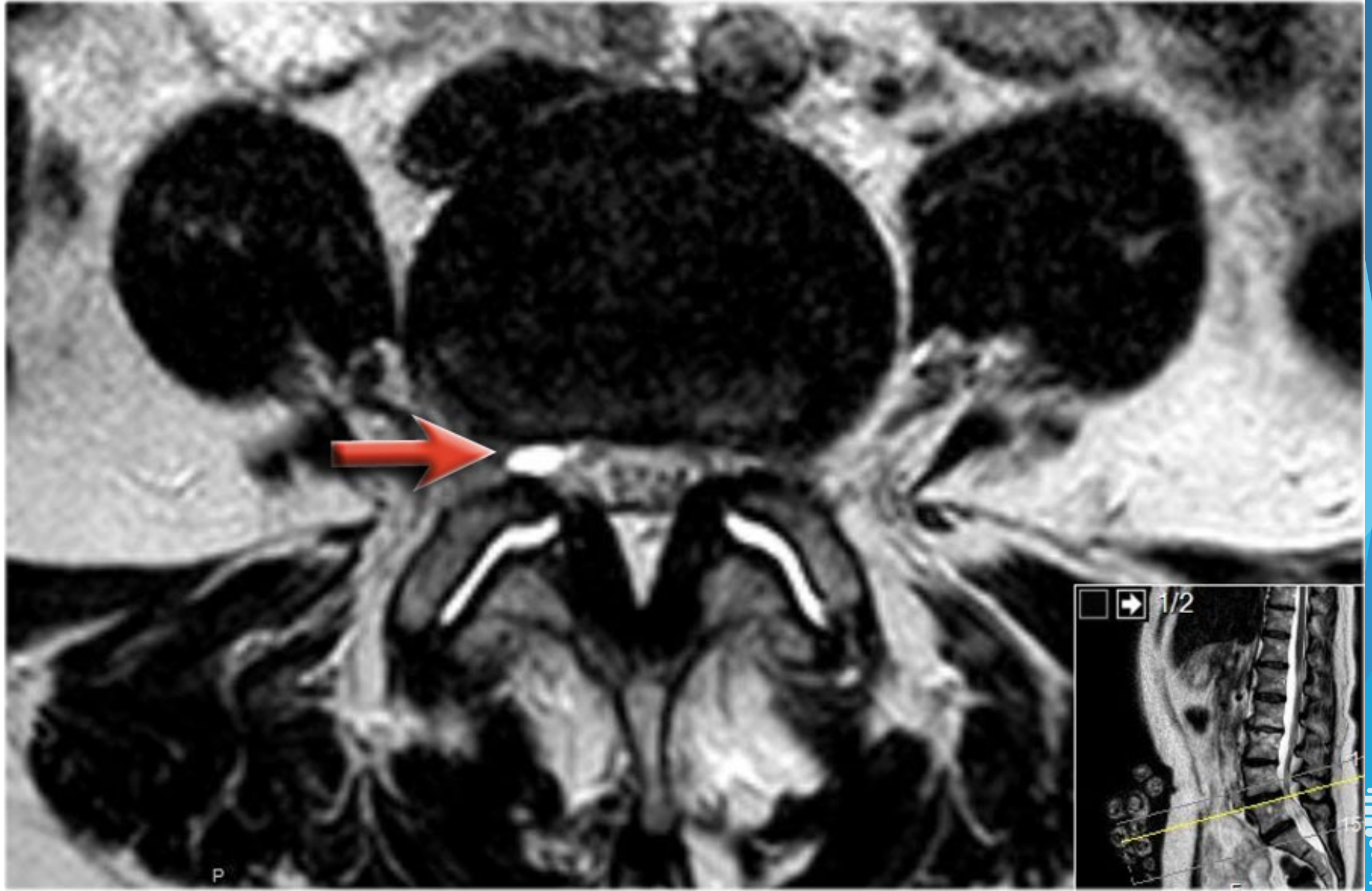
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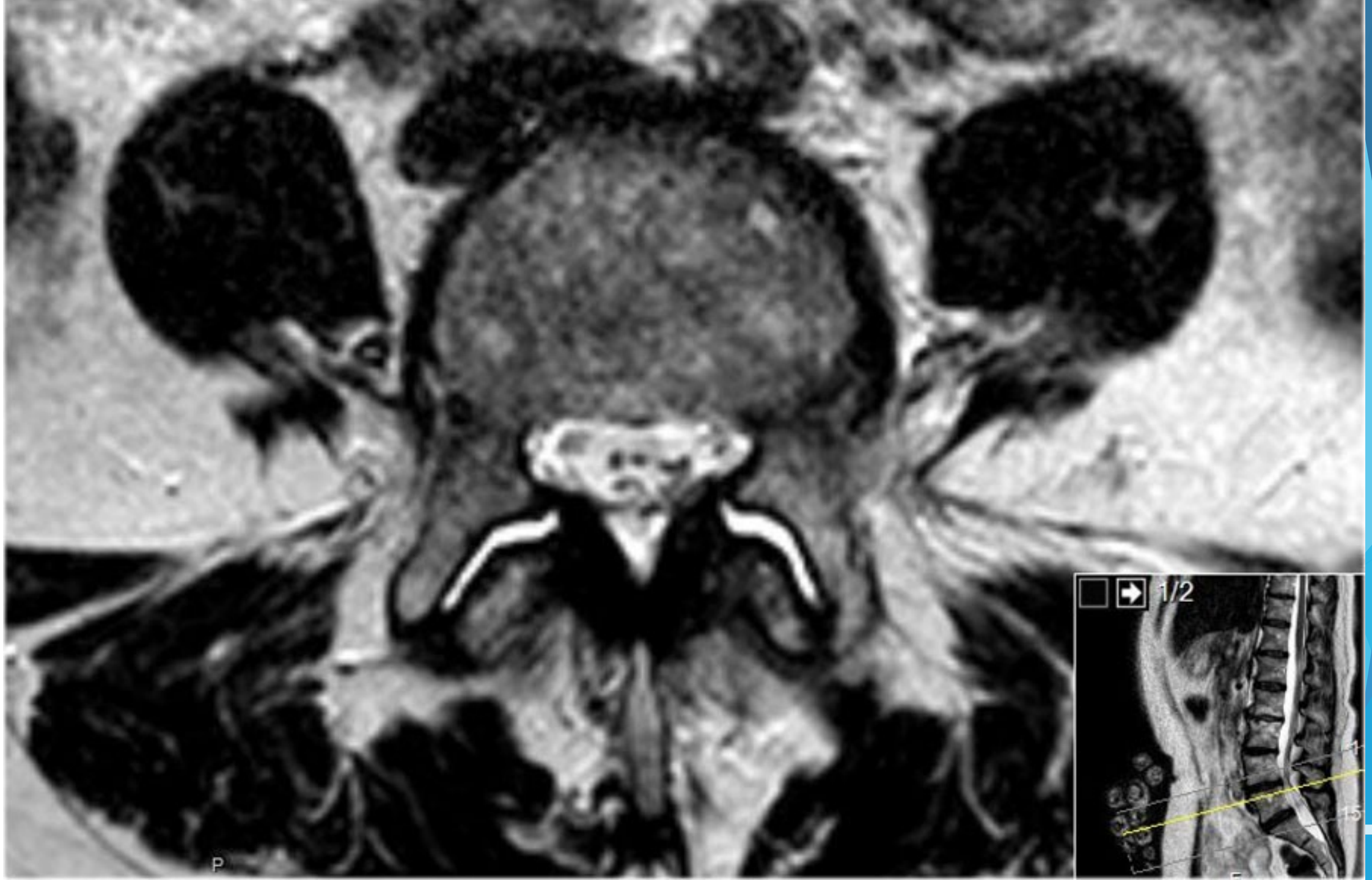
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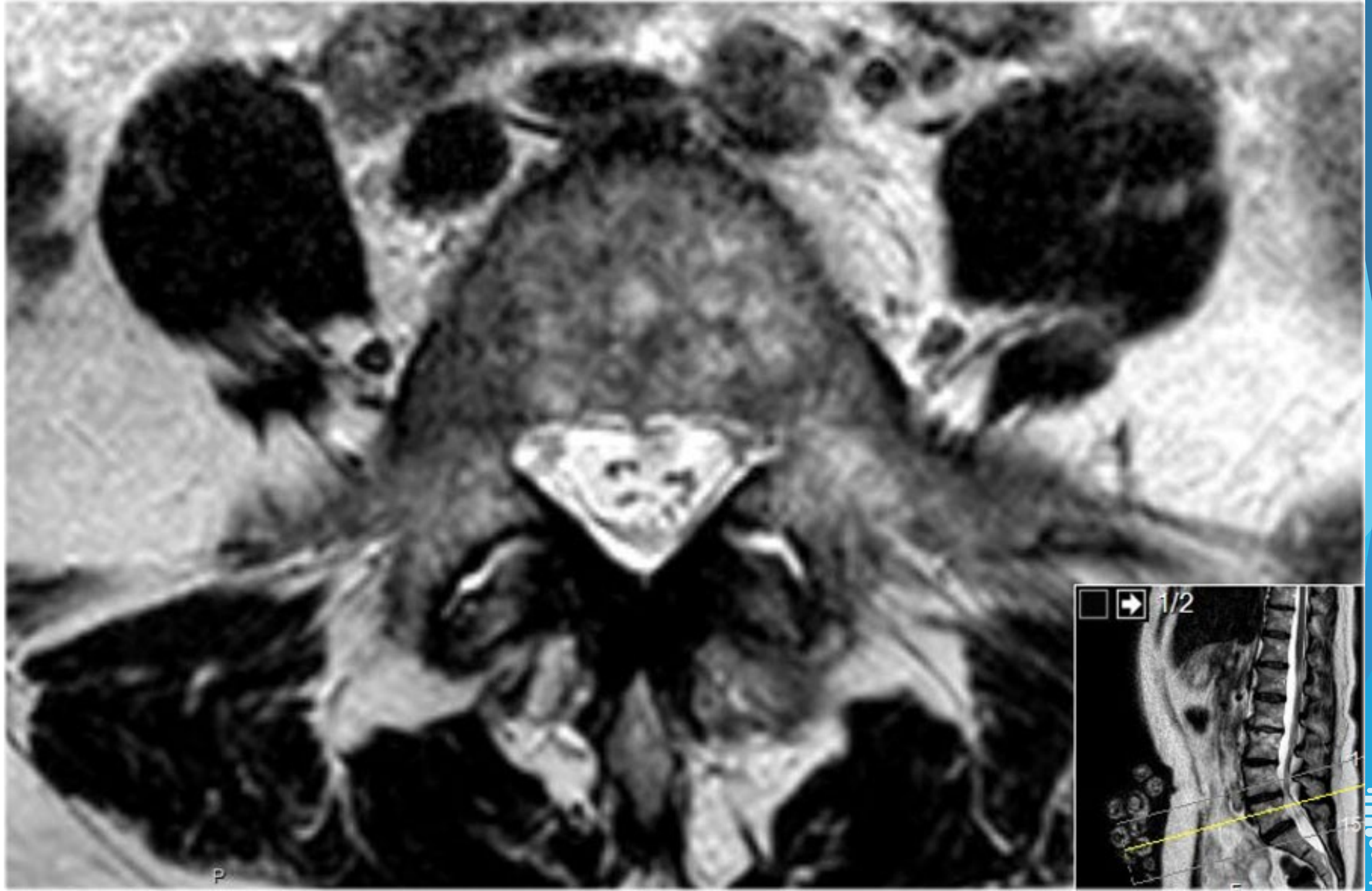
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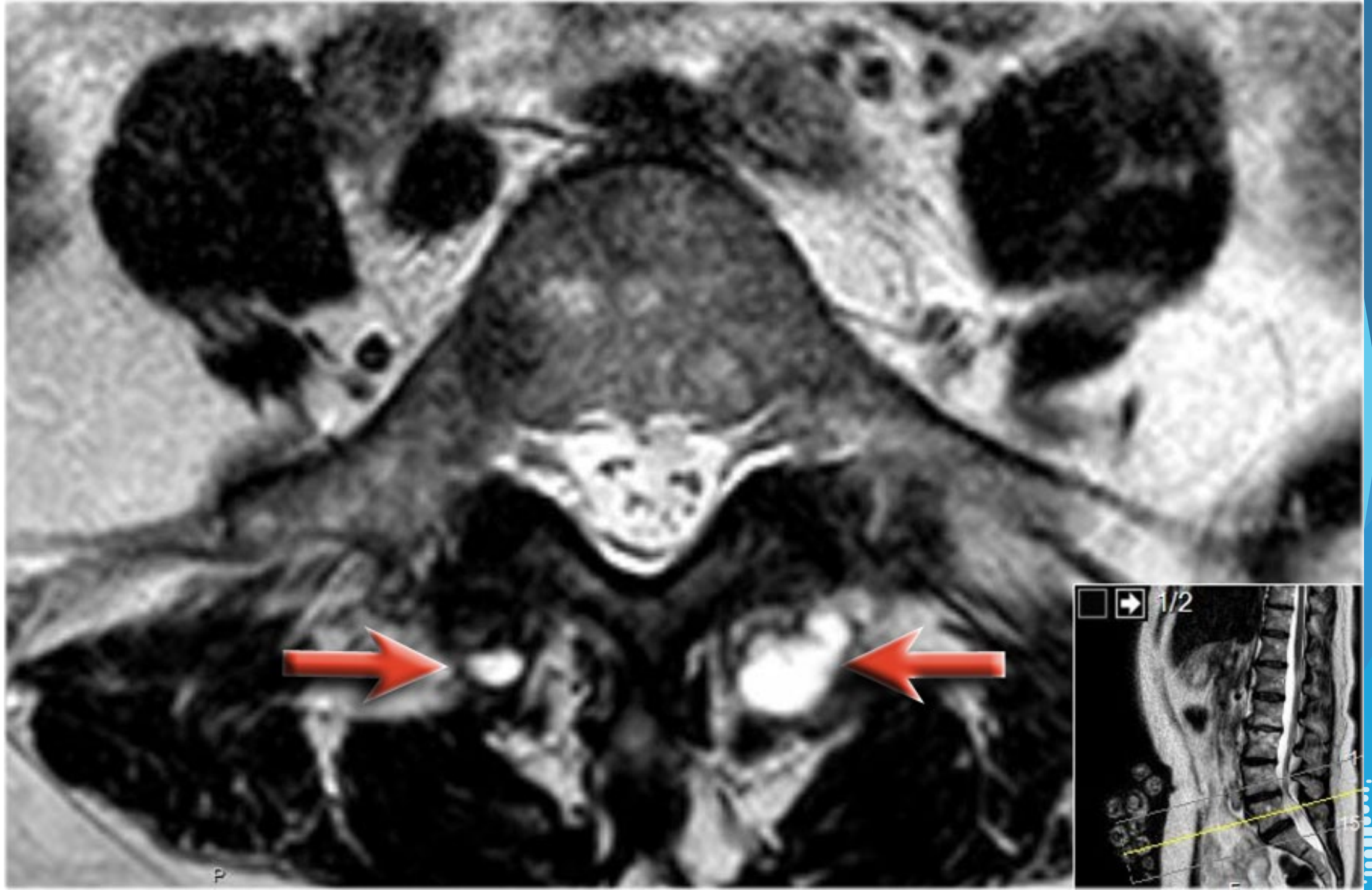
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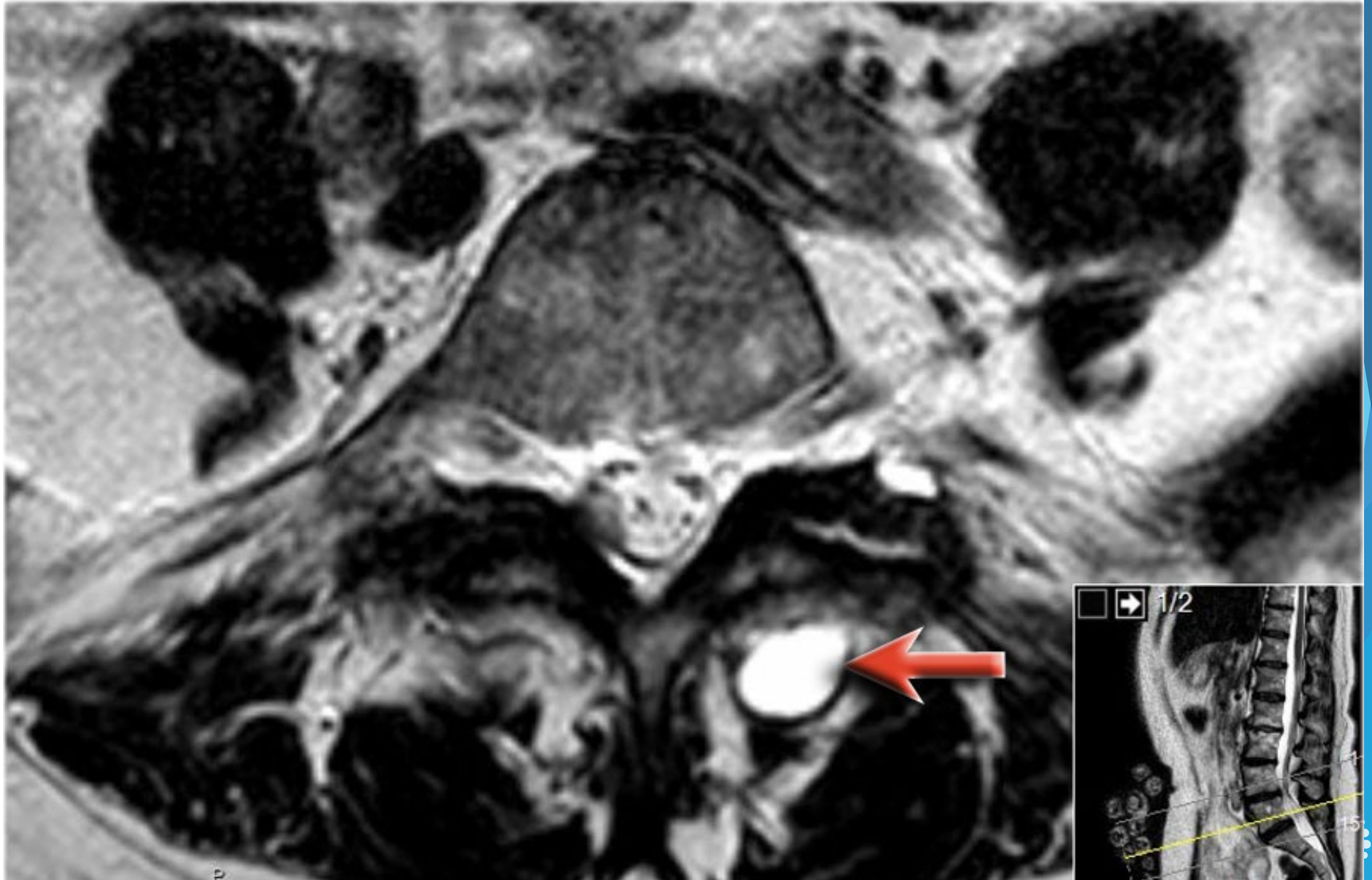
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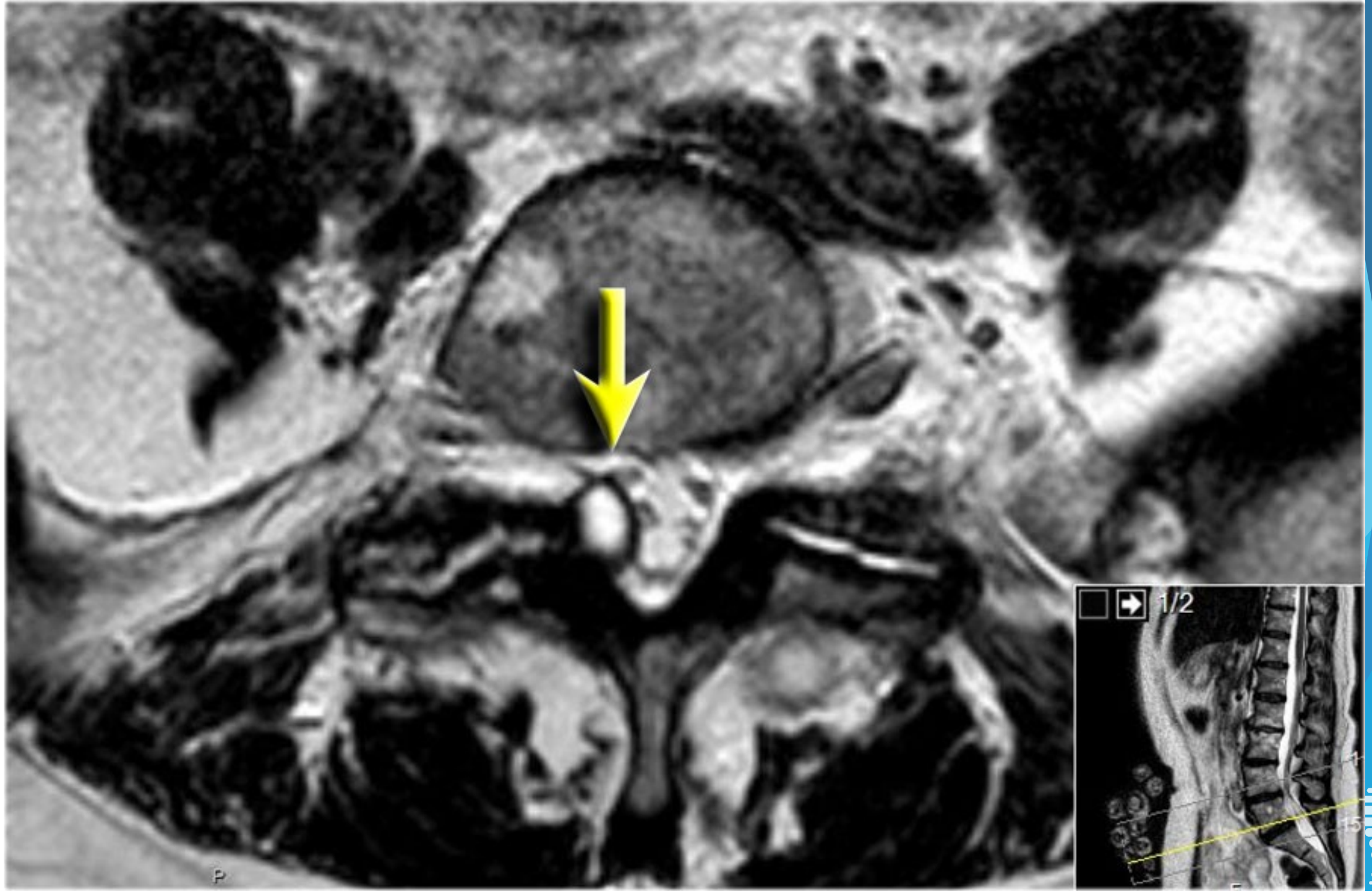
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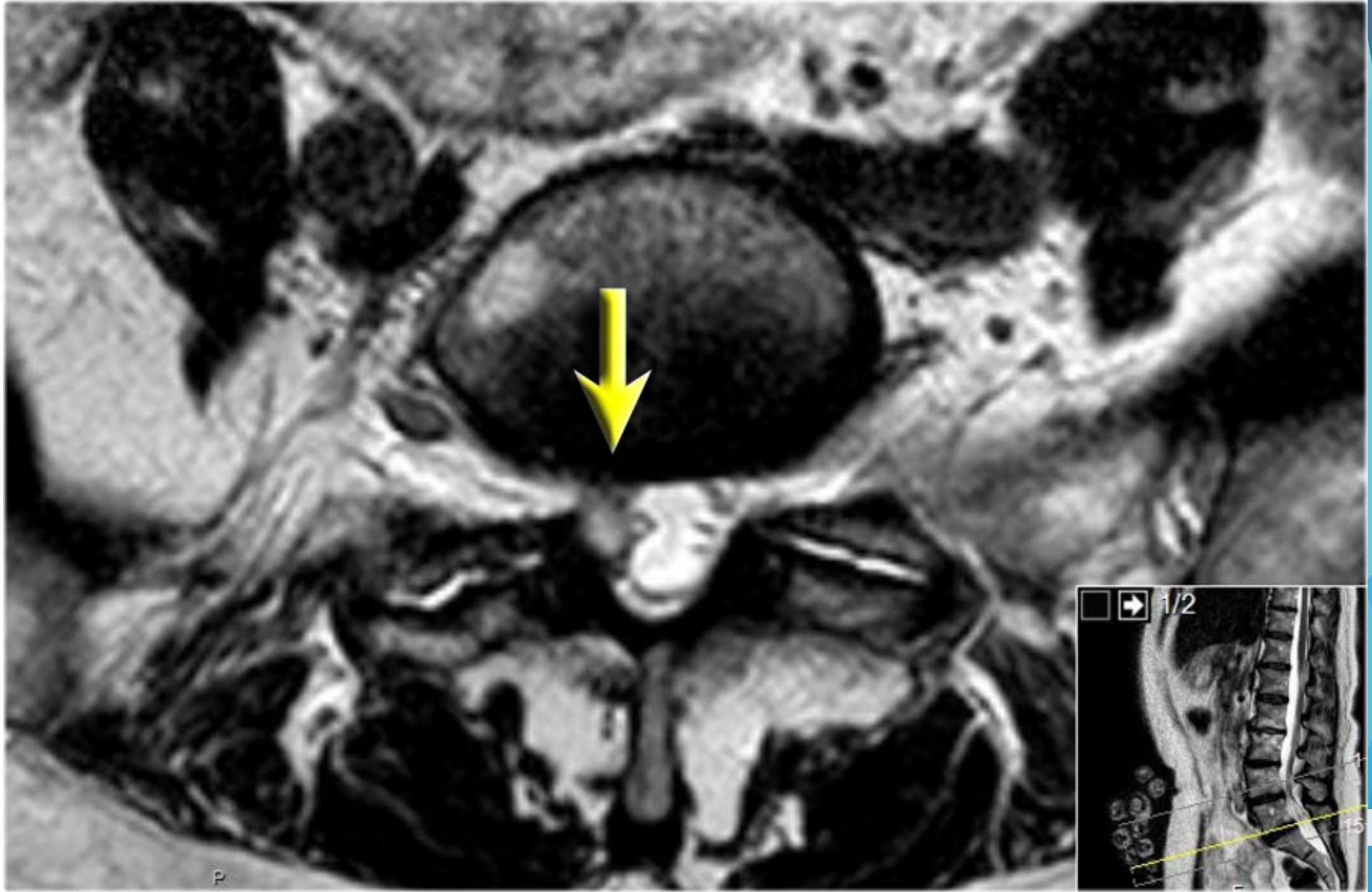
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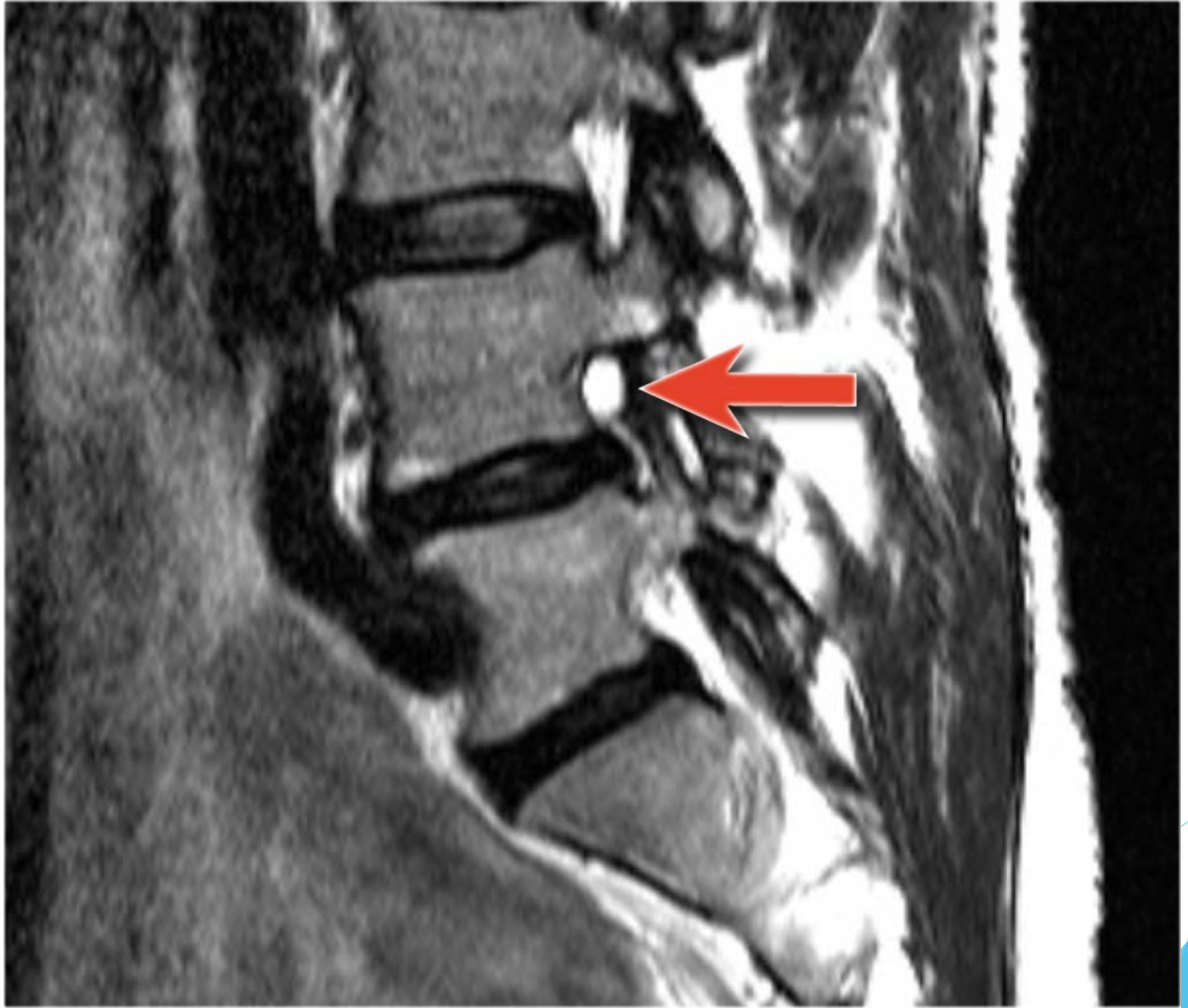

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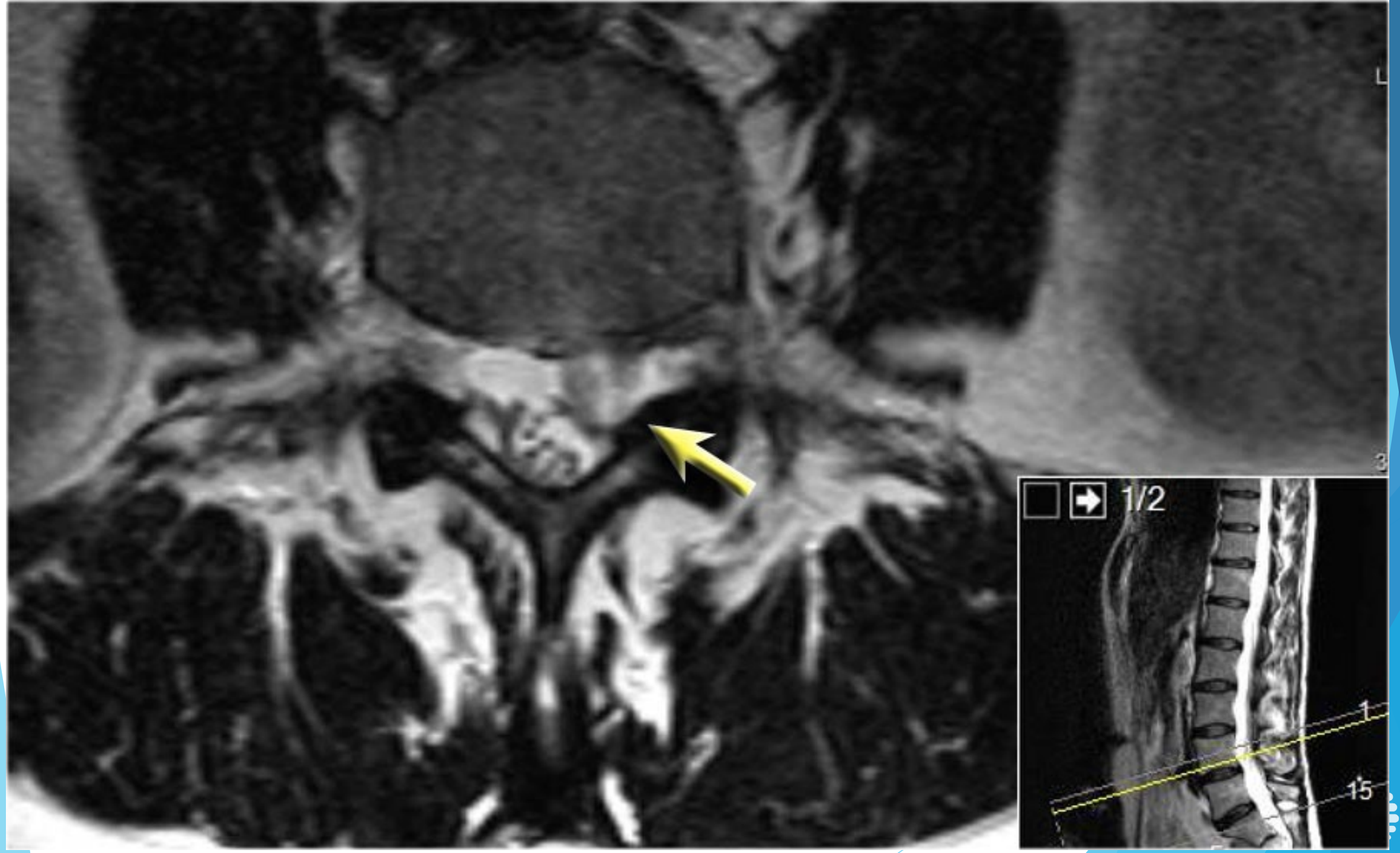
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1/2
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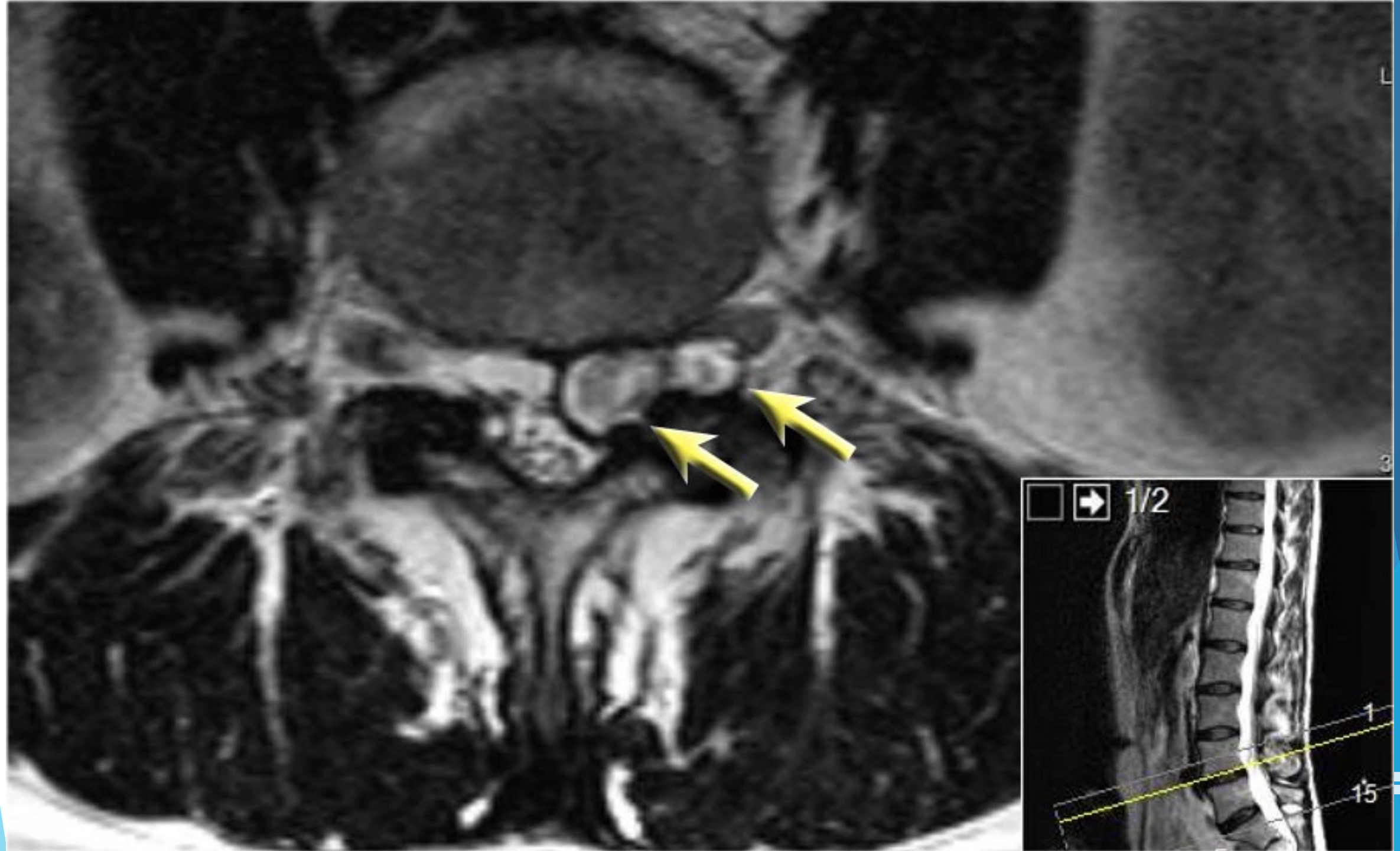
L
3
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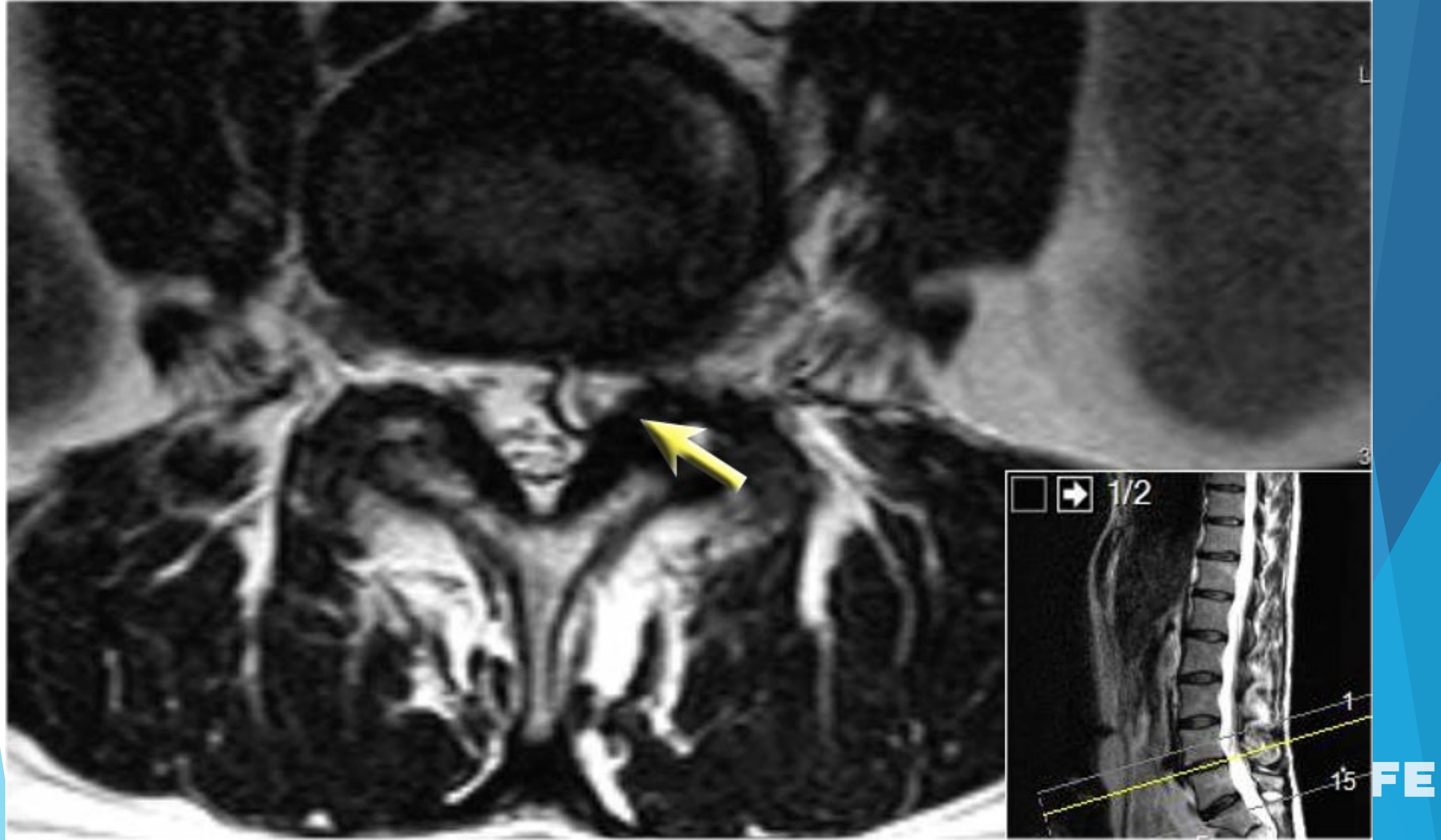
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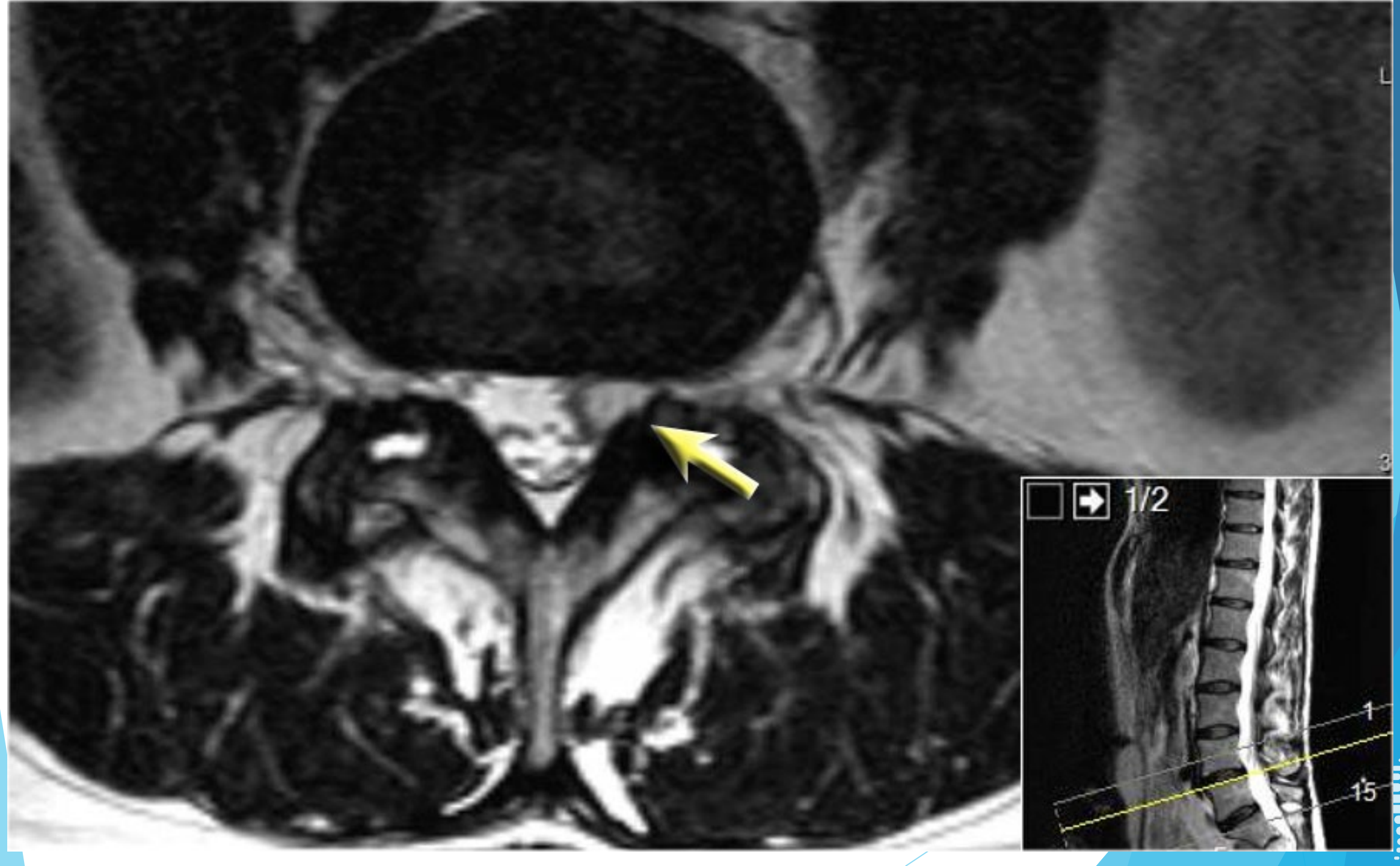
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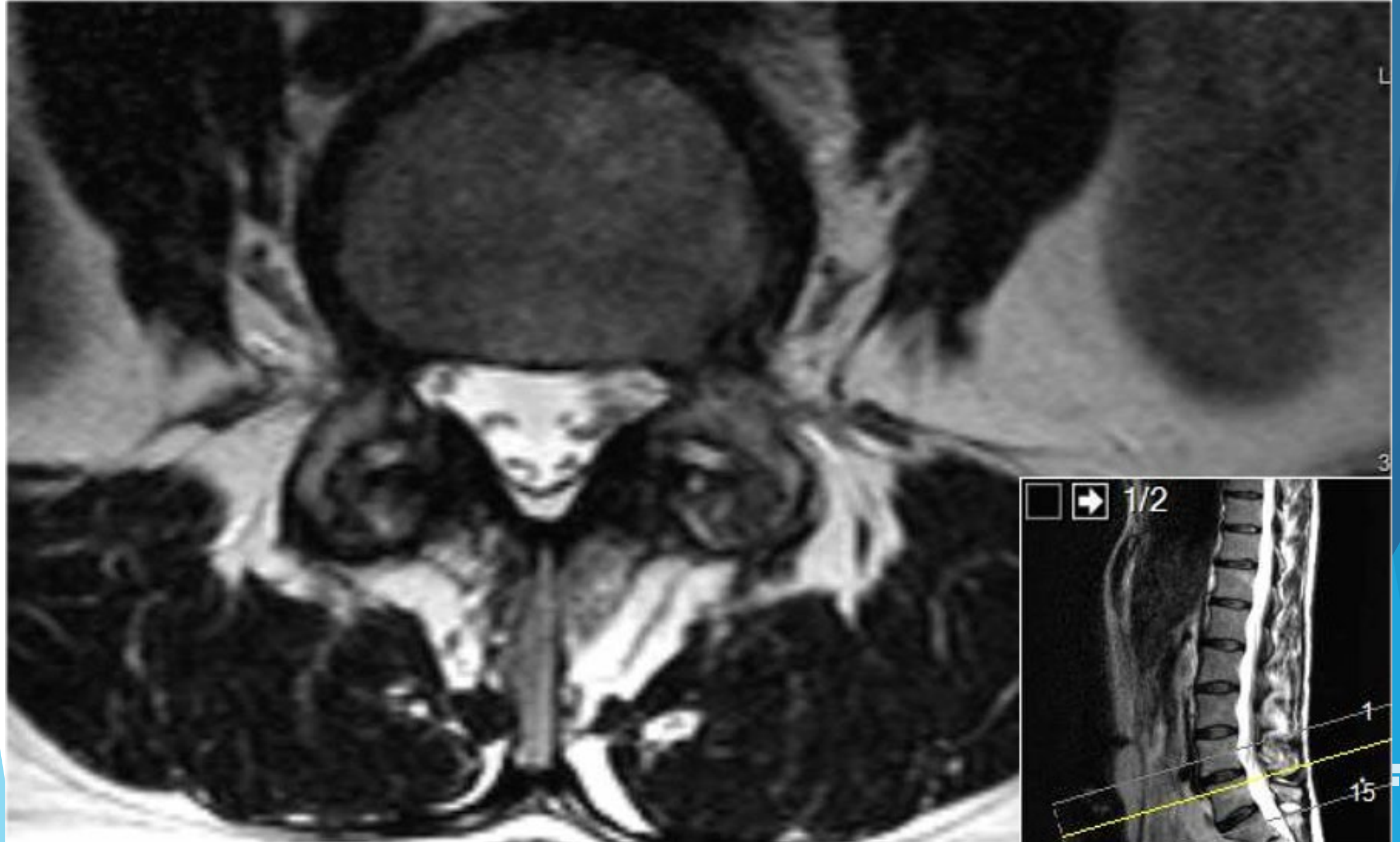
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3
1/2
1
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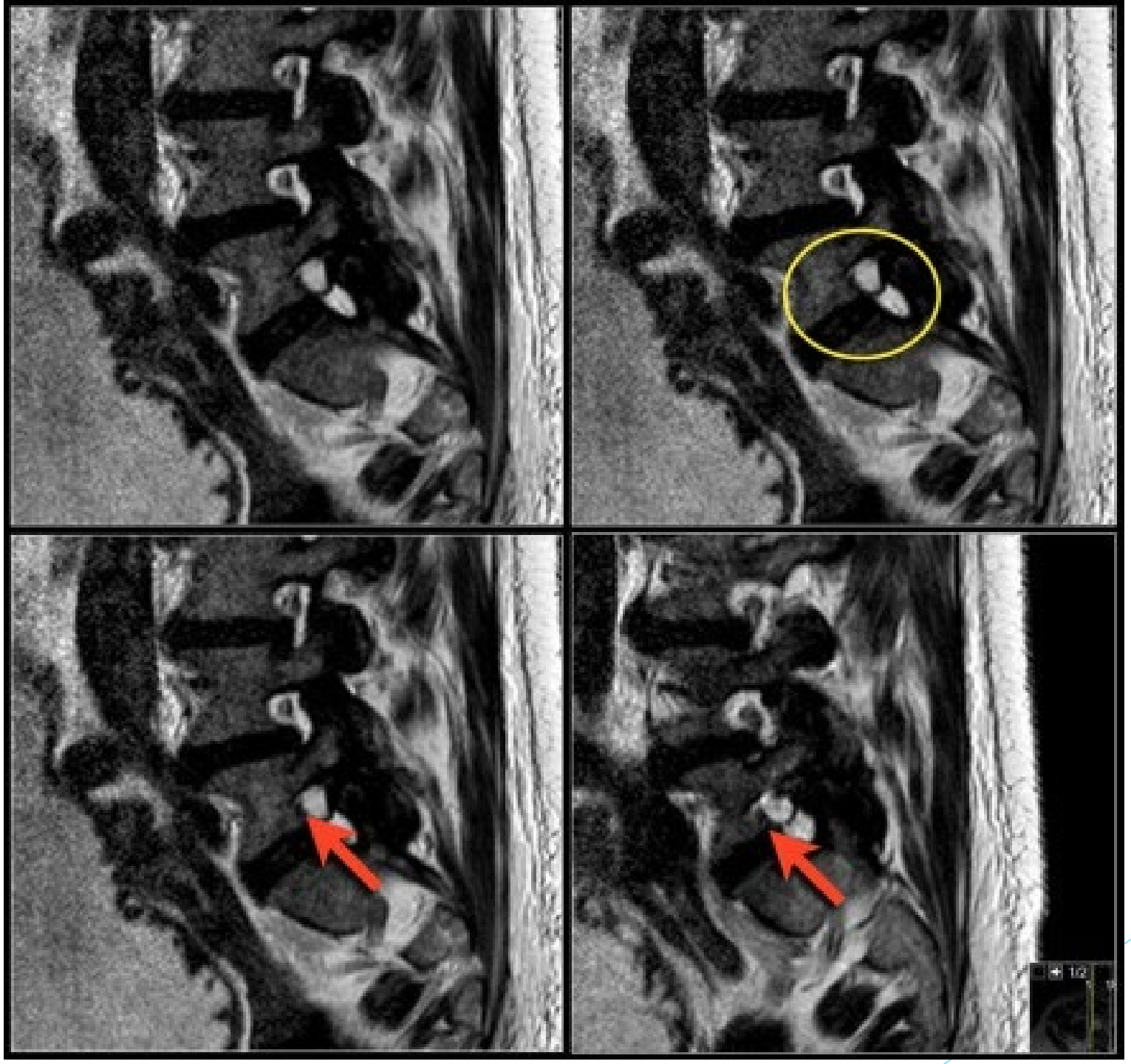

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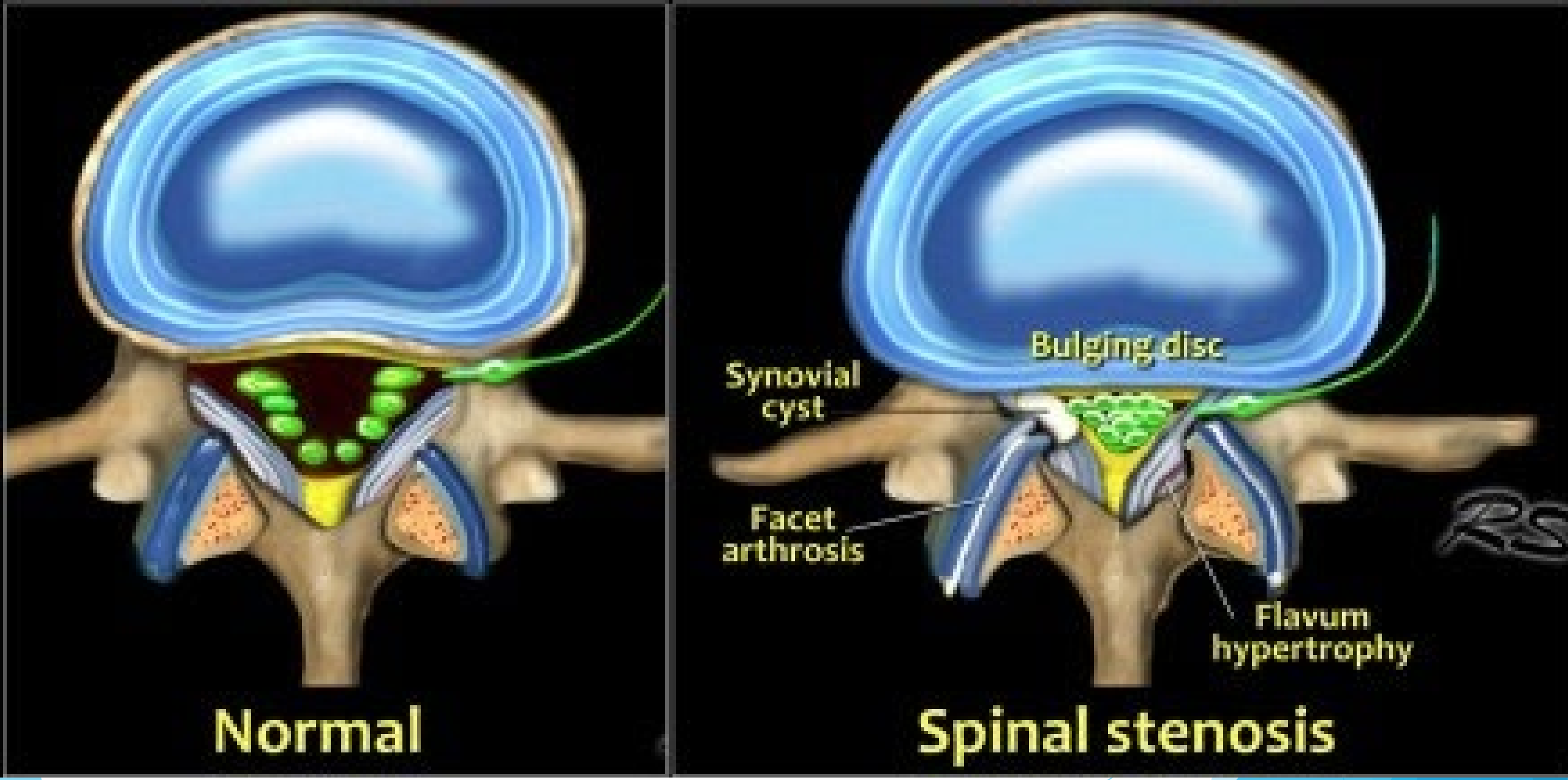
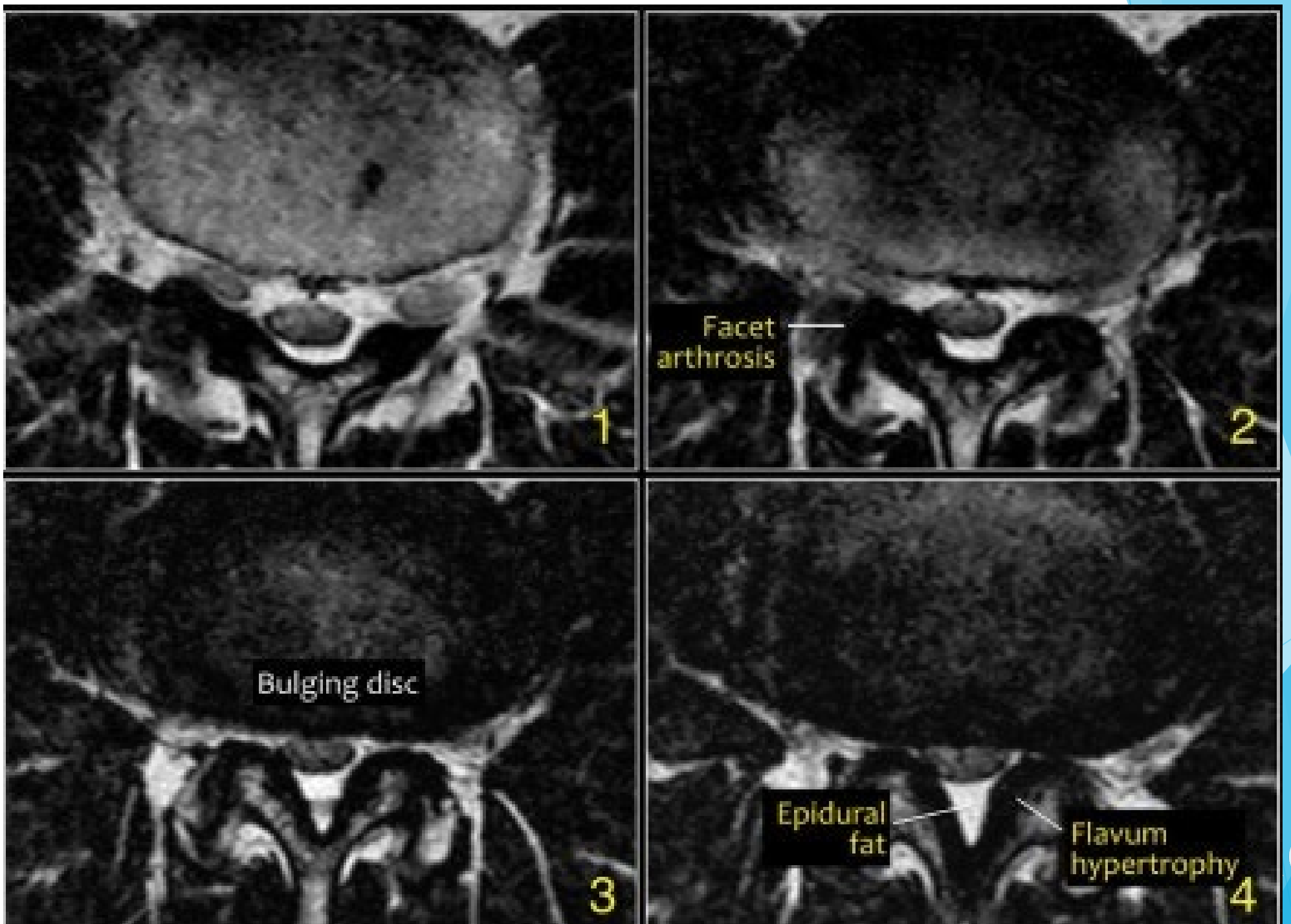
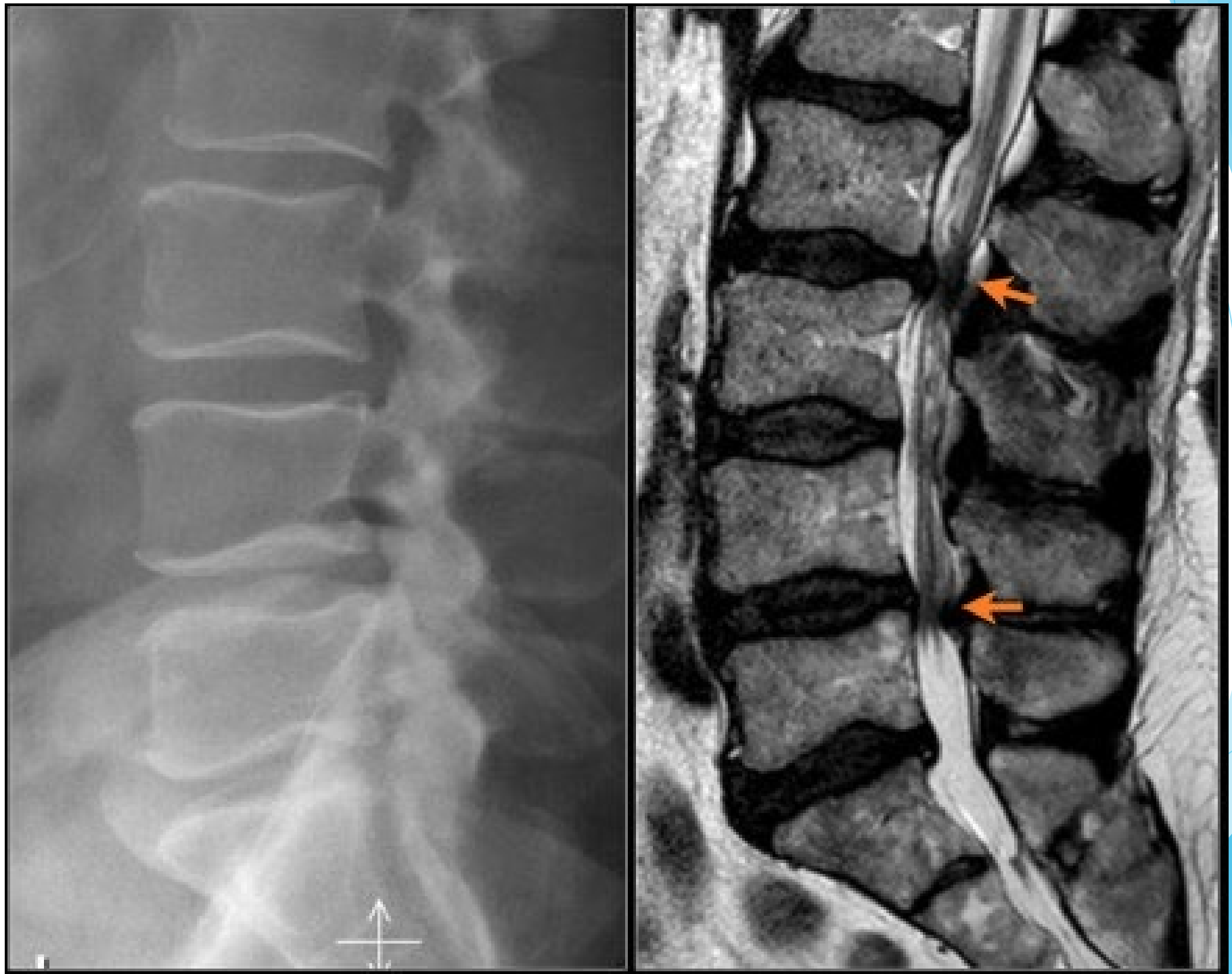
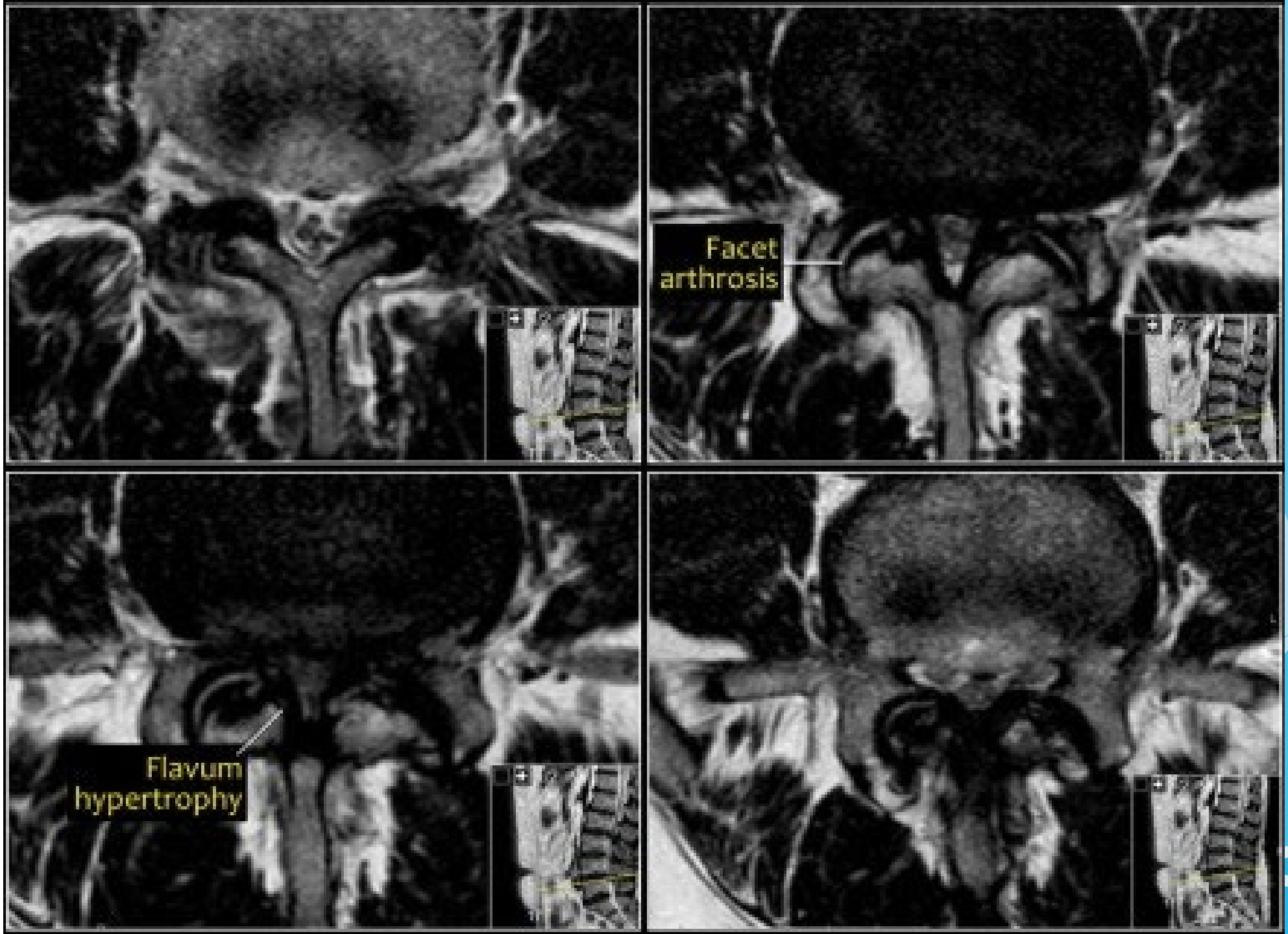
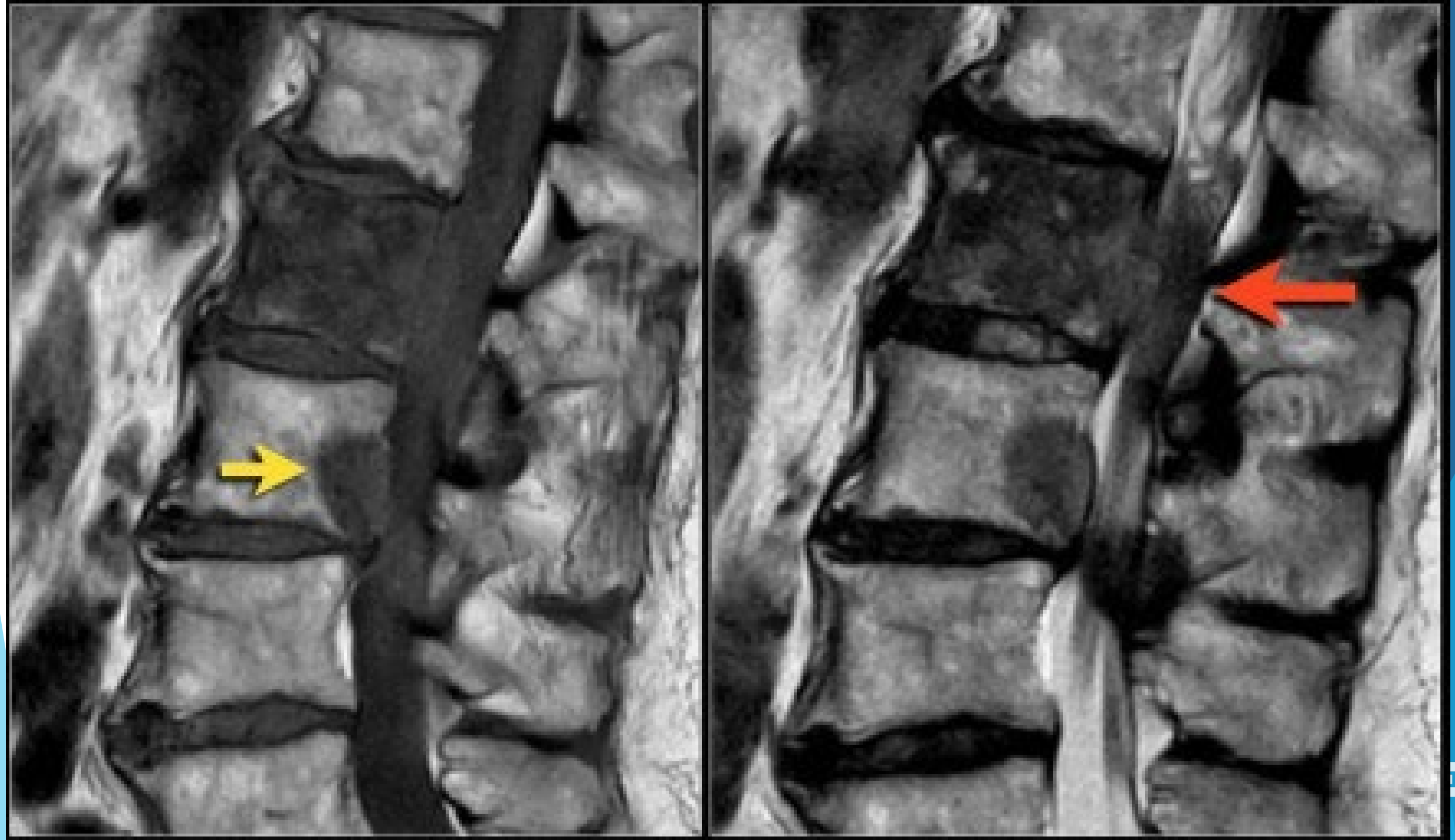
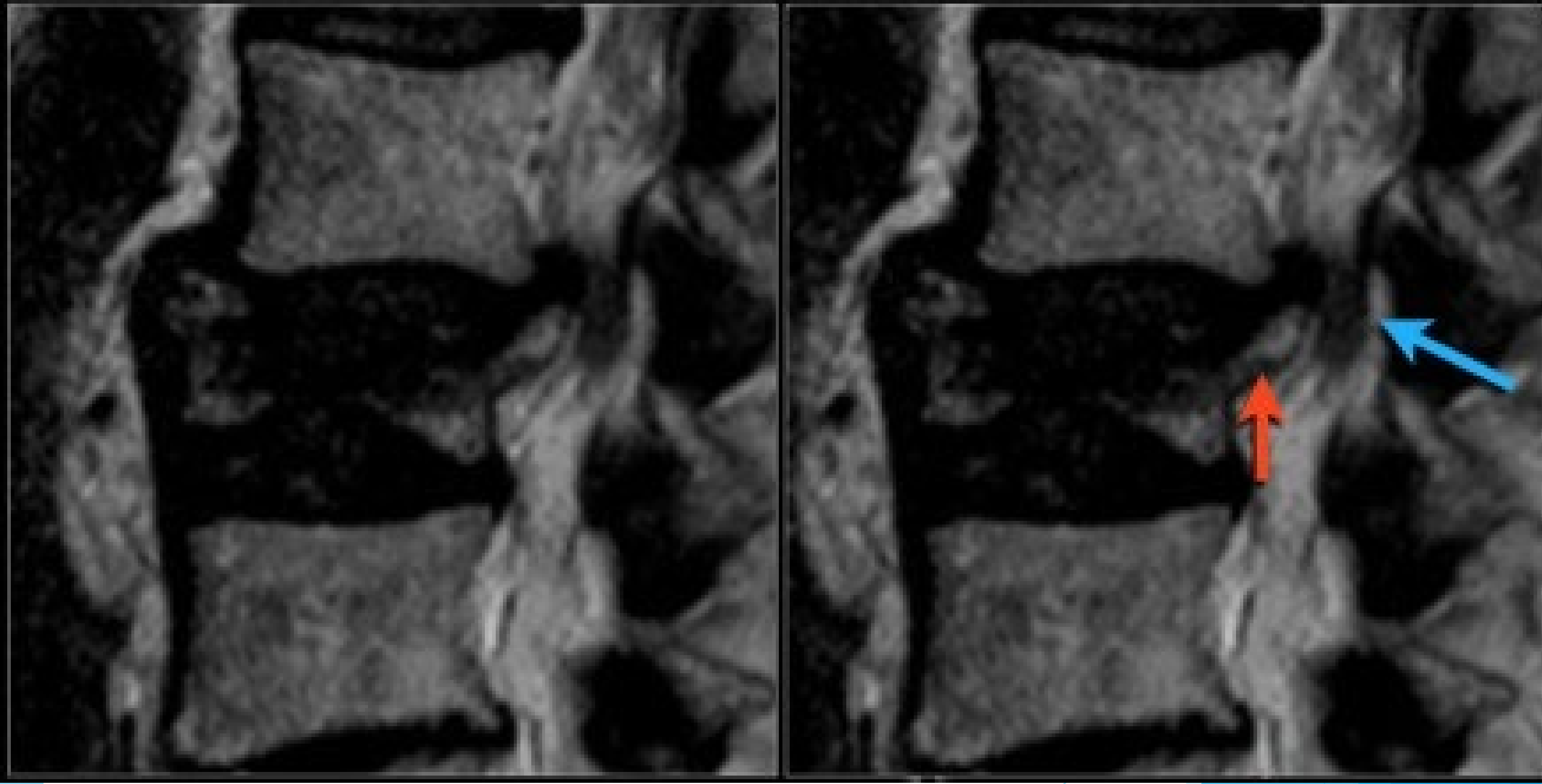

Normal
Synovial cyst
Bulging disc
Facet arthrosis
Flavum hypertrophy
Spinal stenosis


1
Facet arthrosis
2
Bulging disc
3
Epidural fat
Flavum hypertrophy
4




Facet
arthrosis
Flavum
hypertrophy



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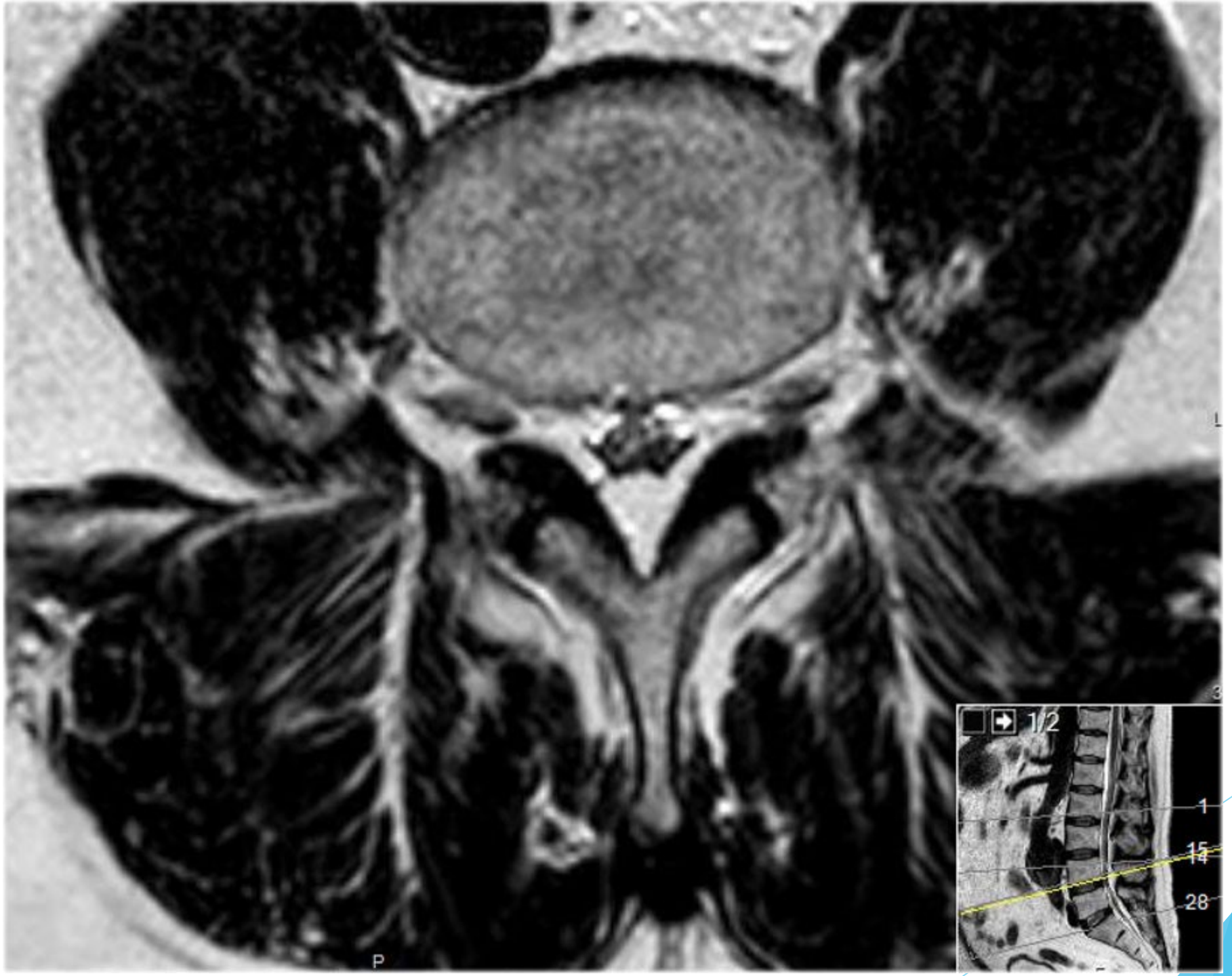
L
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14
28


L
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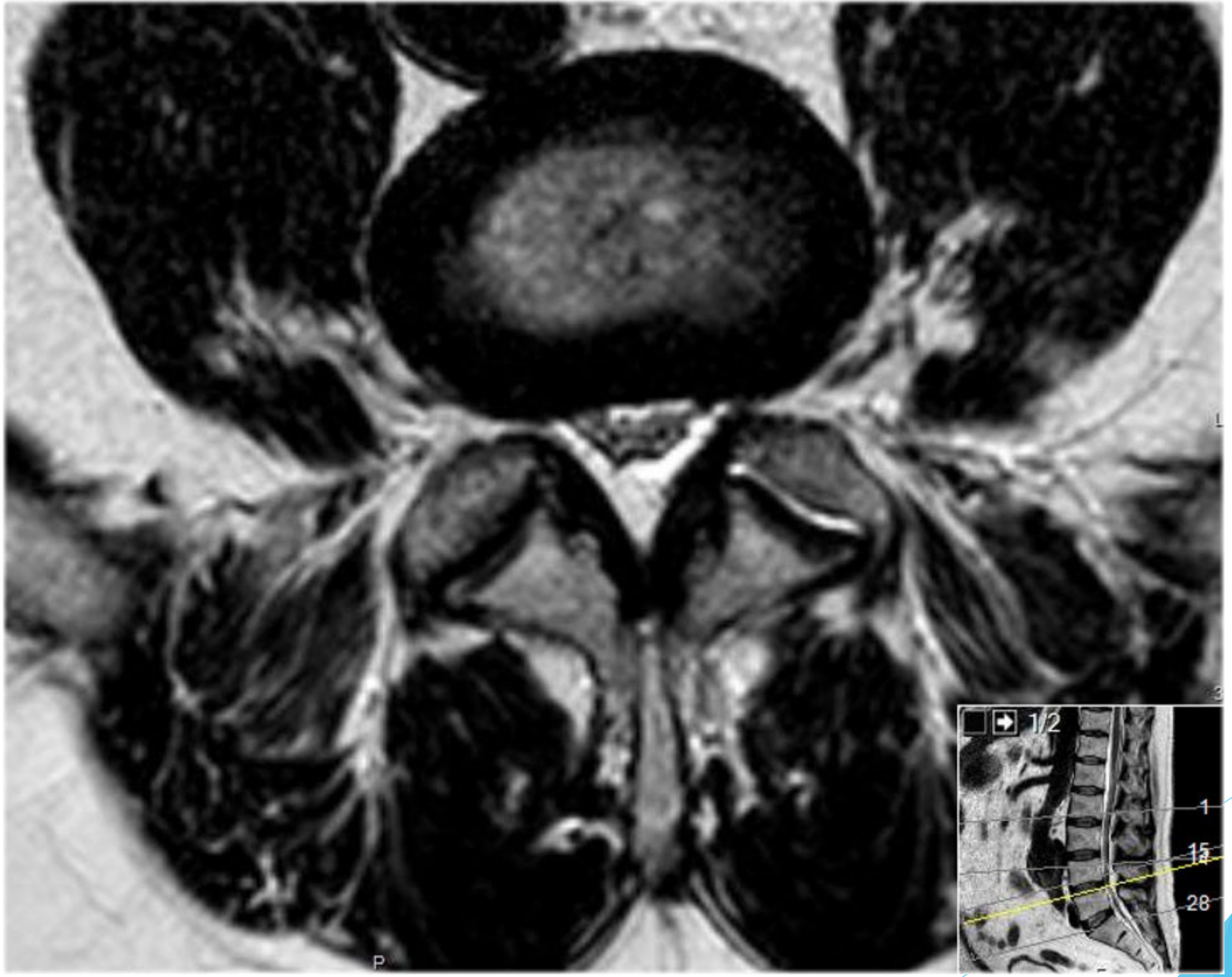

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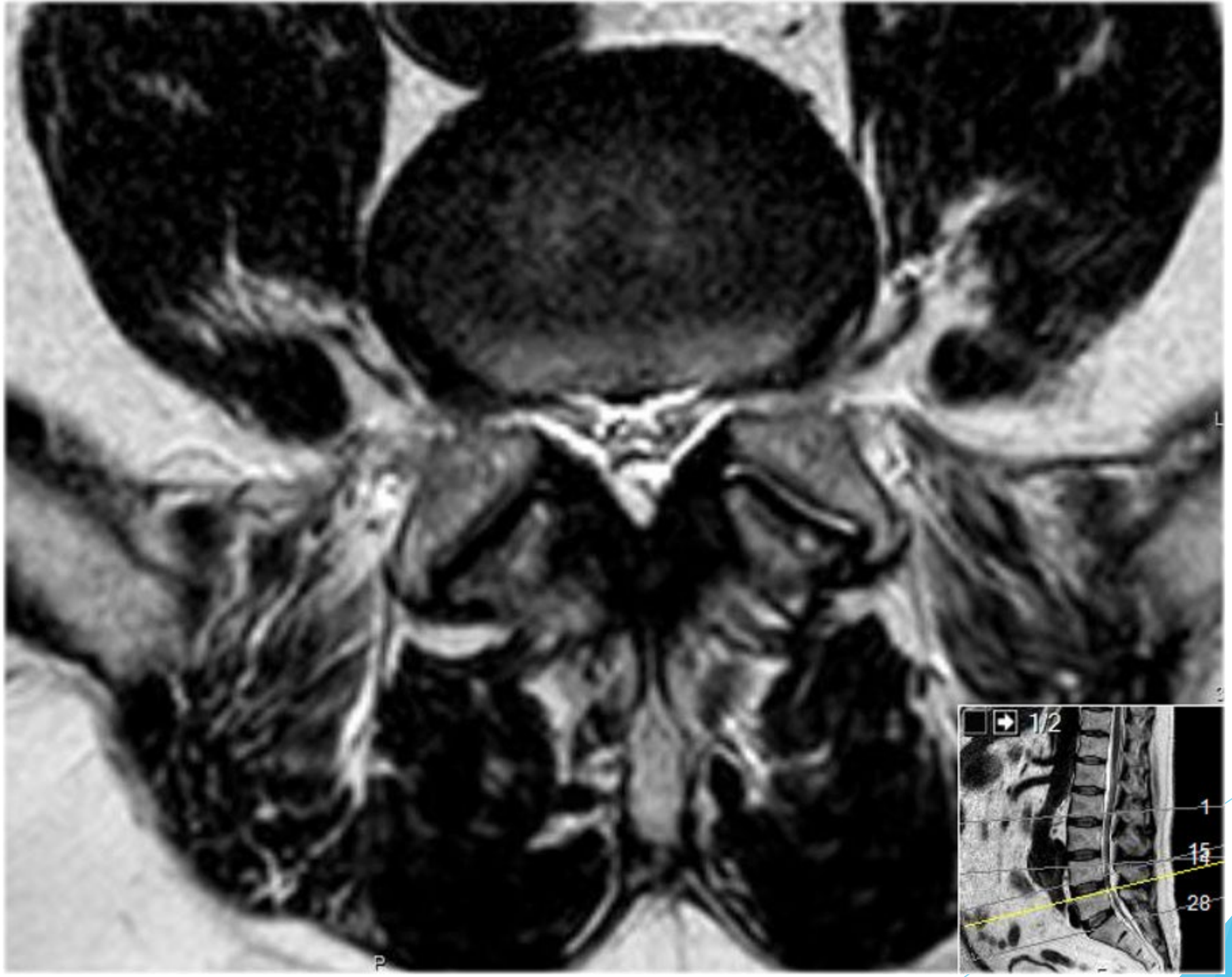
L
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PROLIFE


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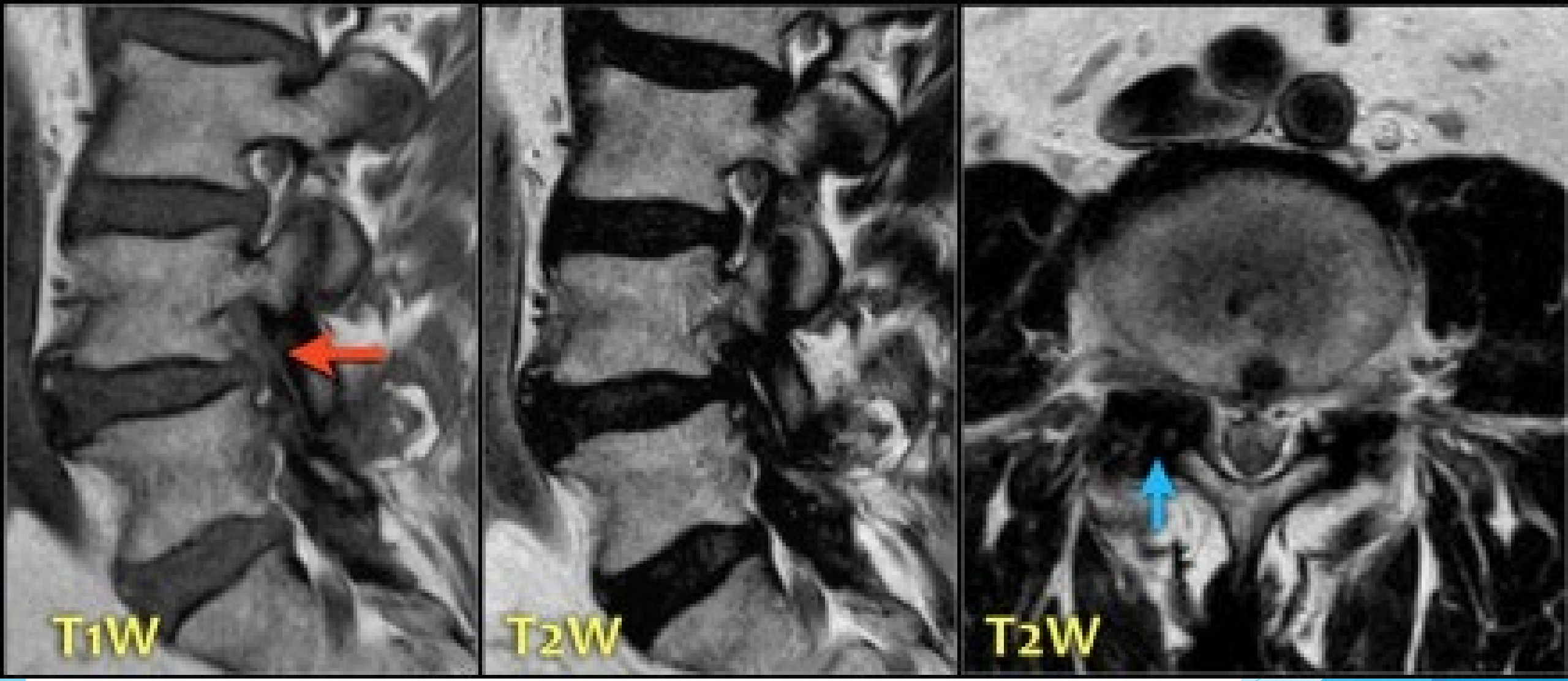

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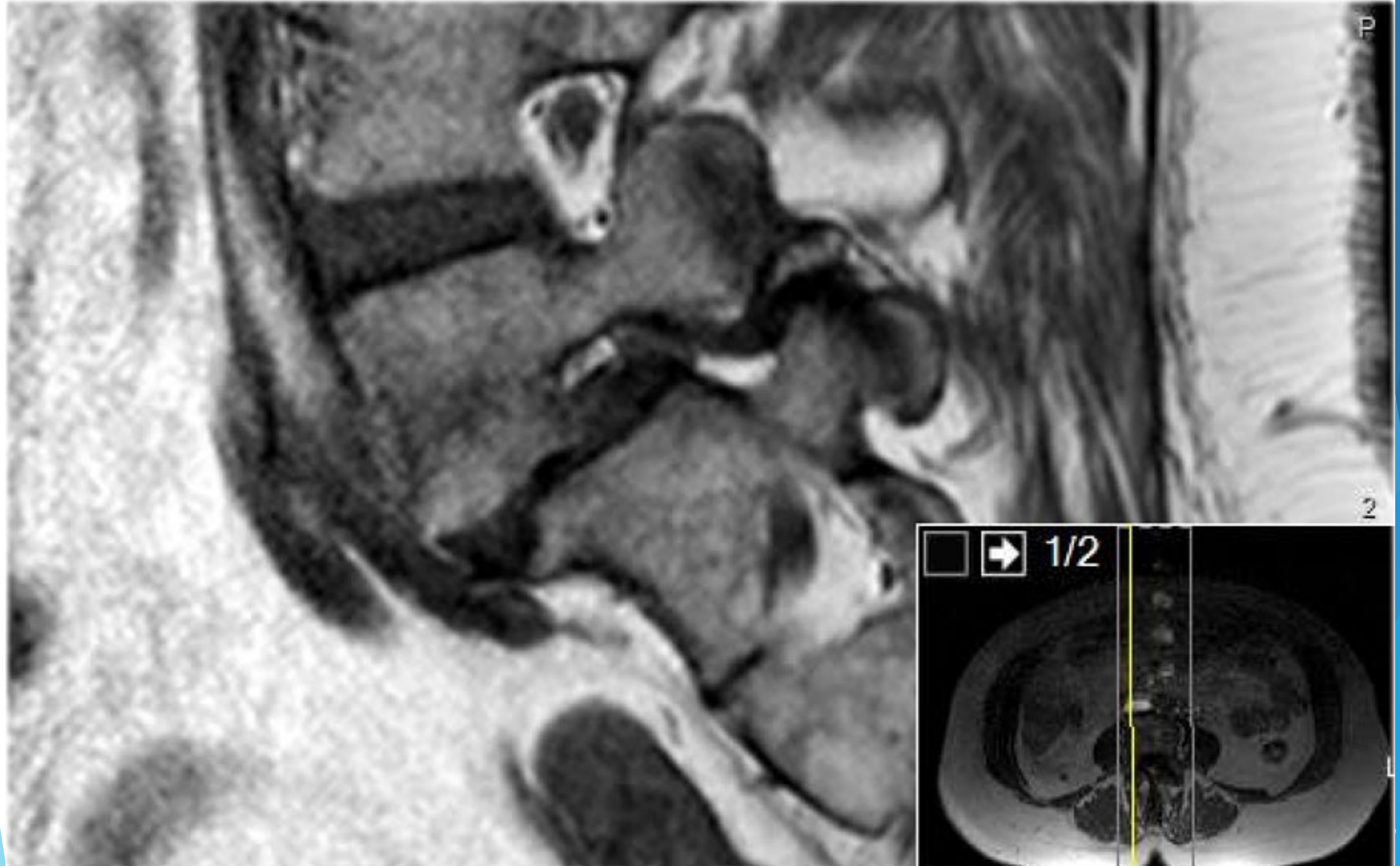
P
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1/2
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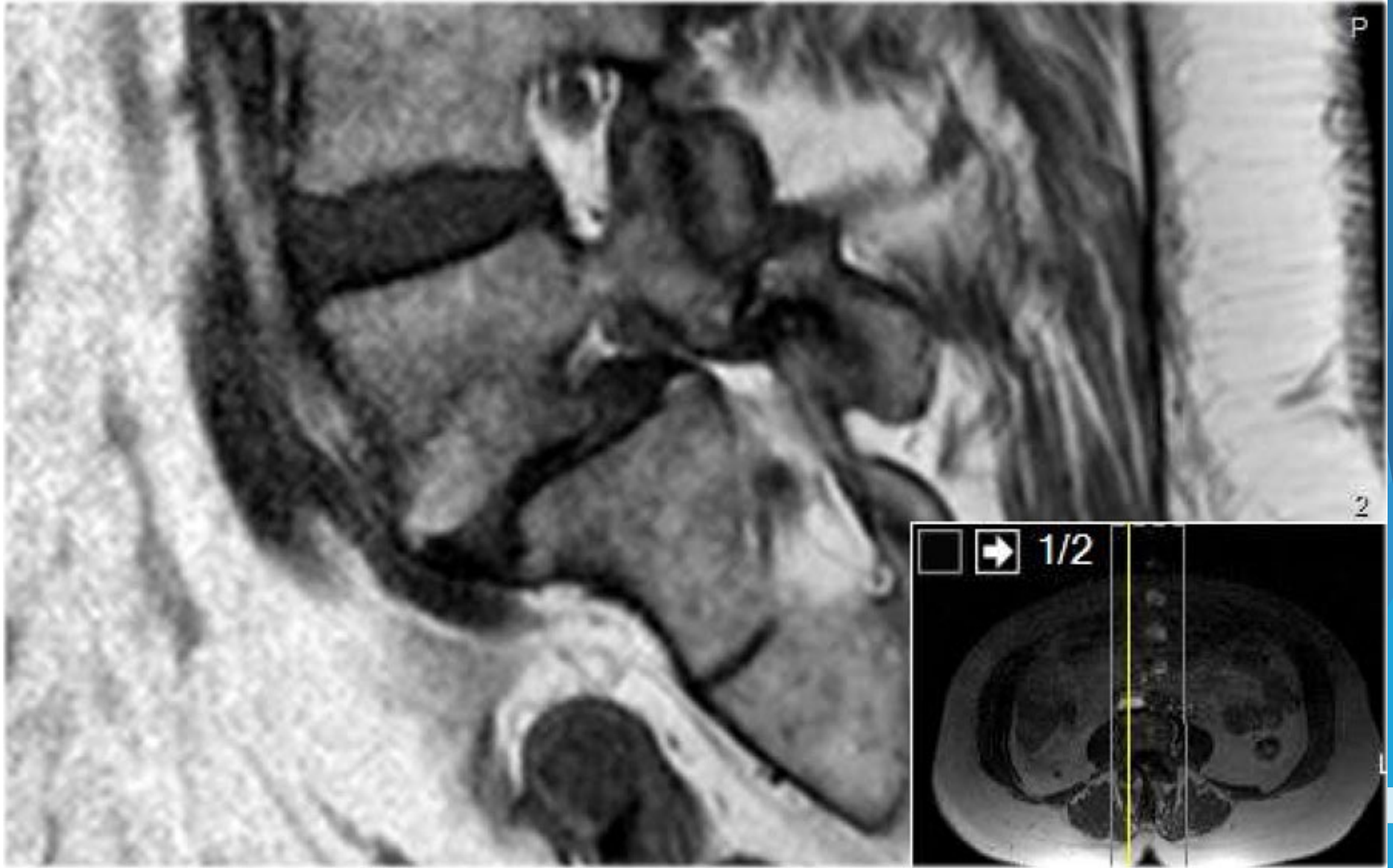
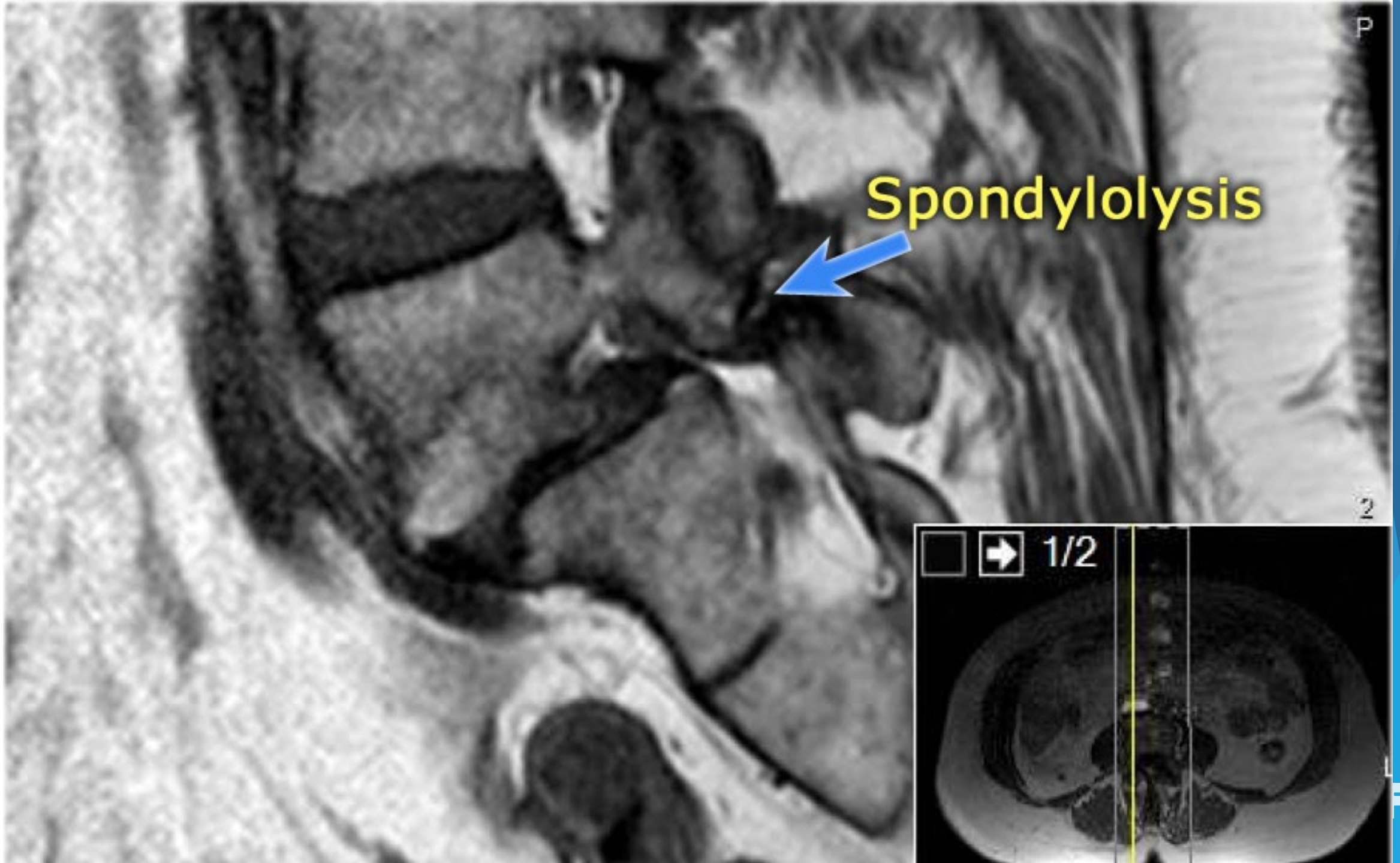
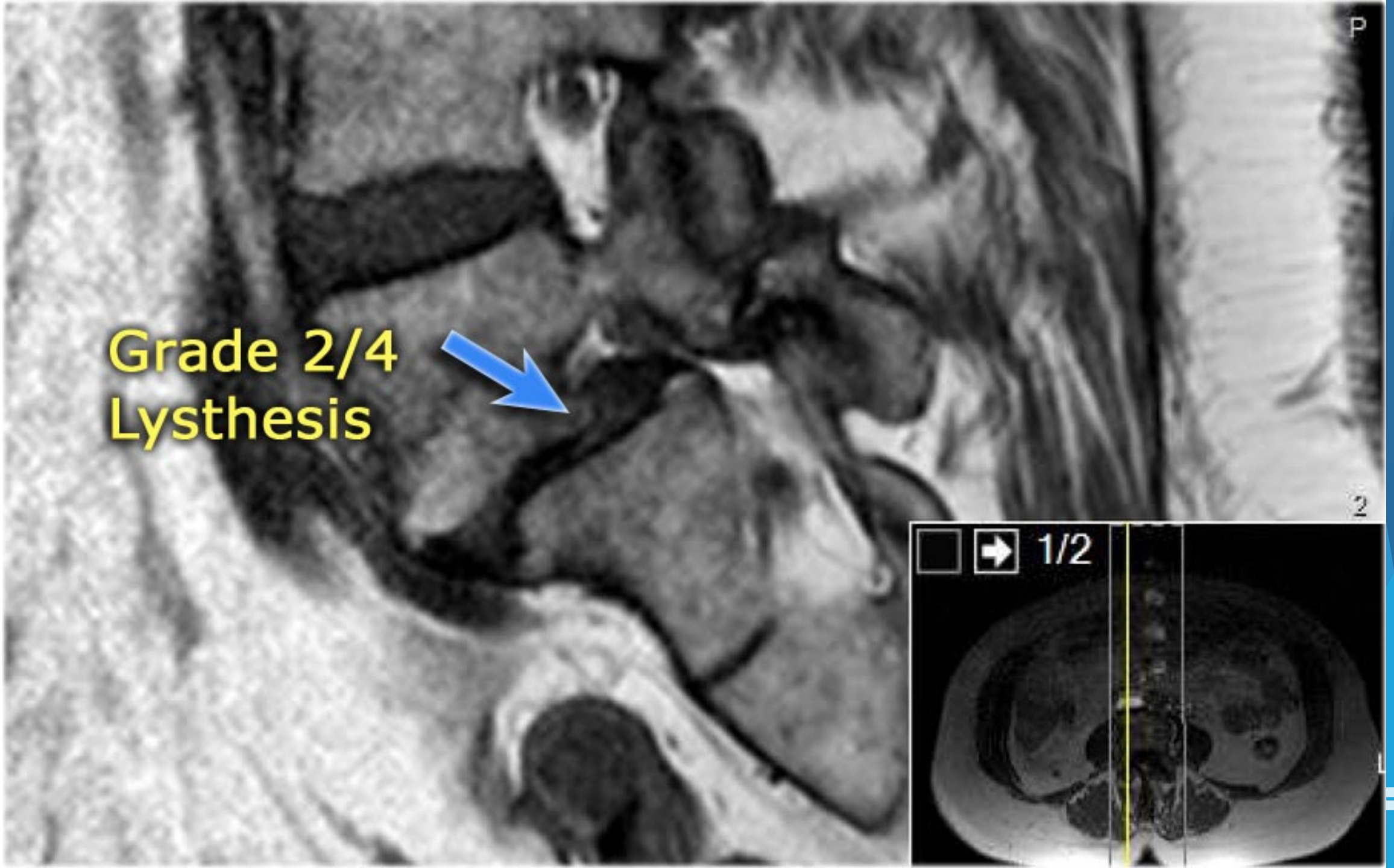
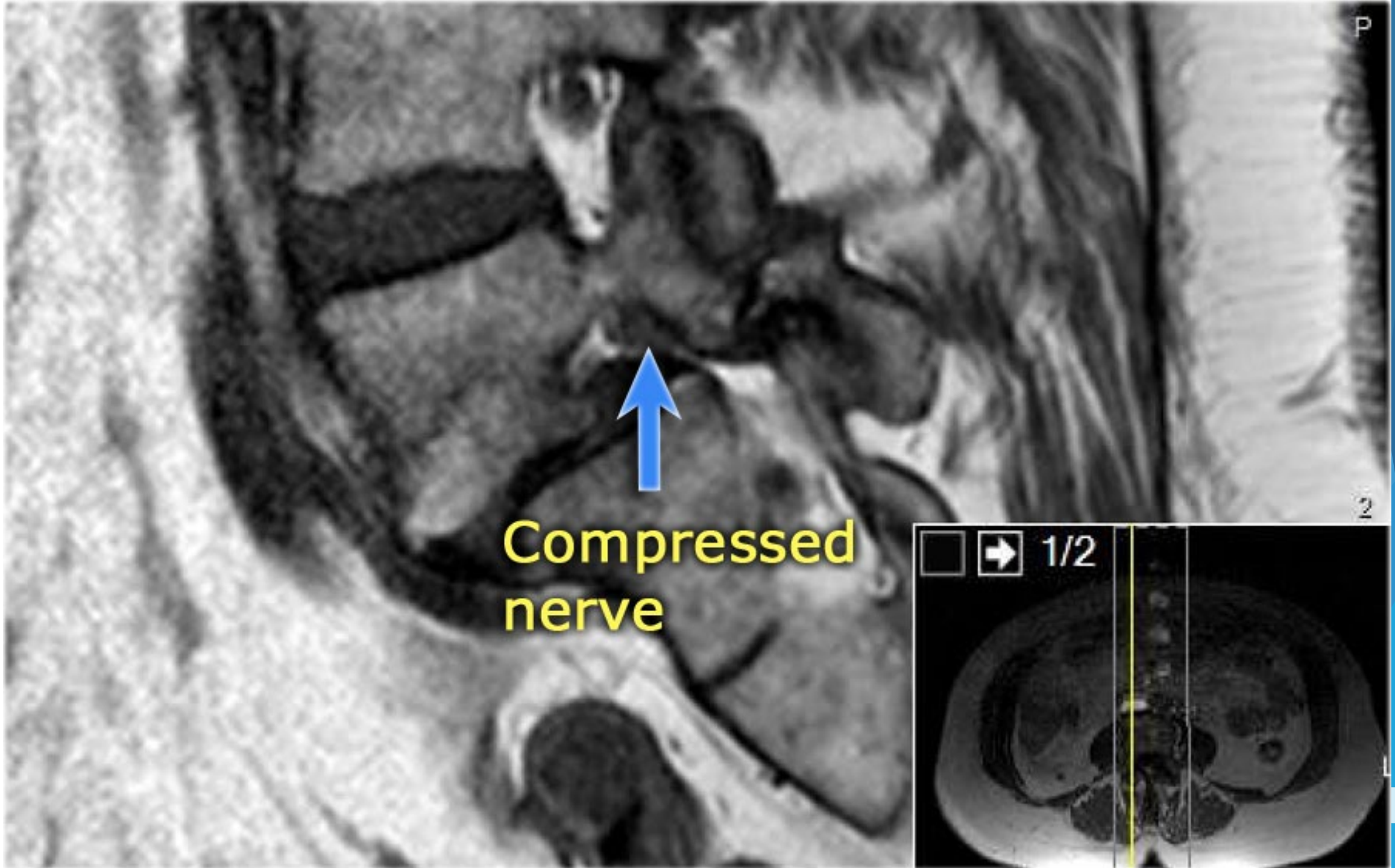
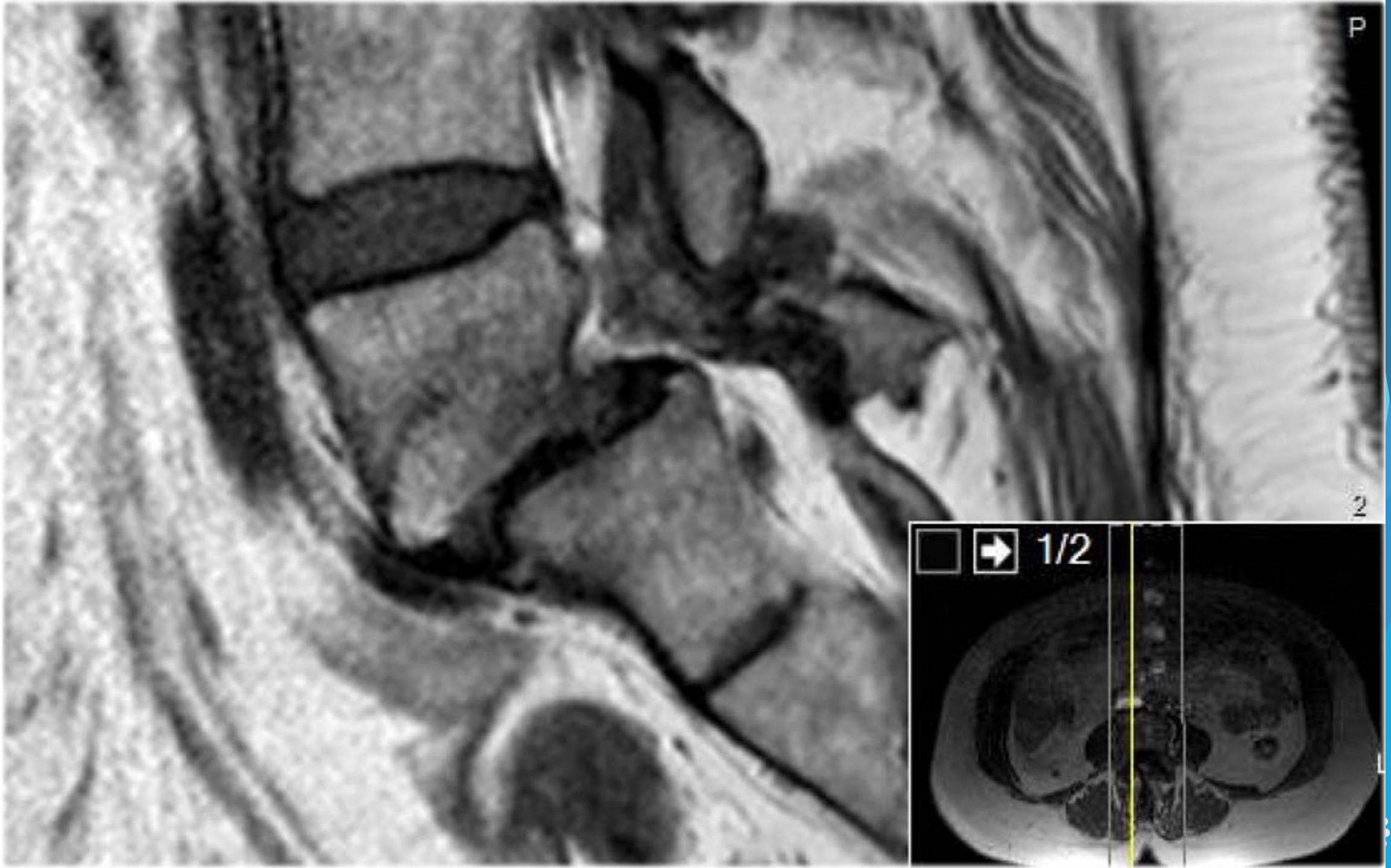
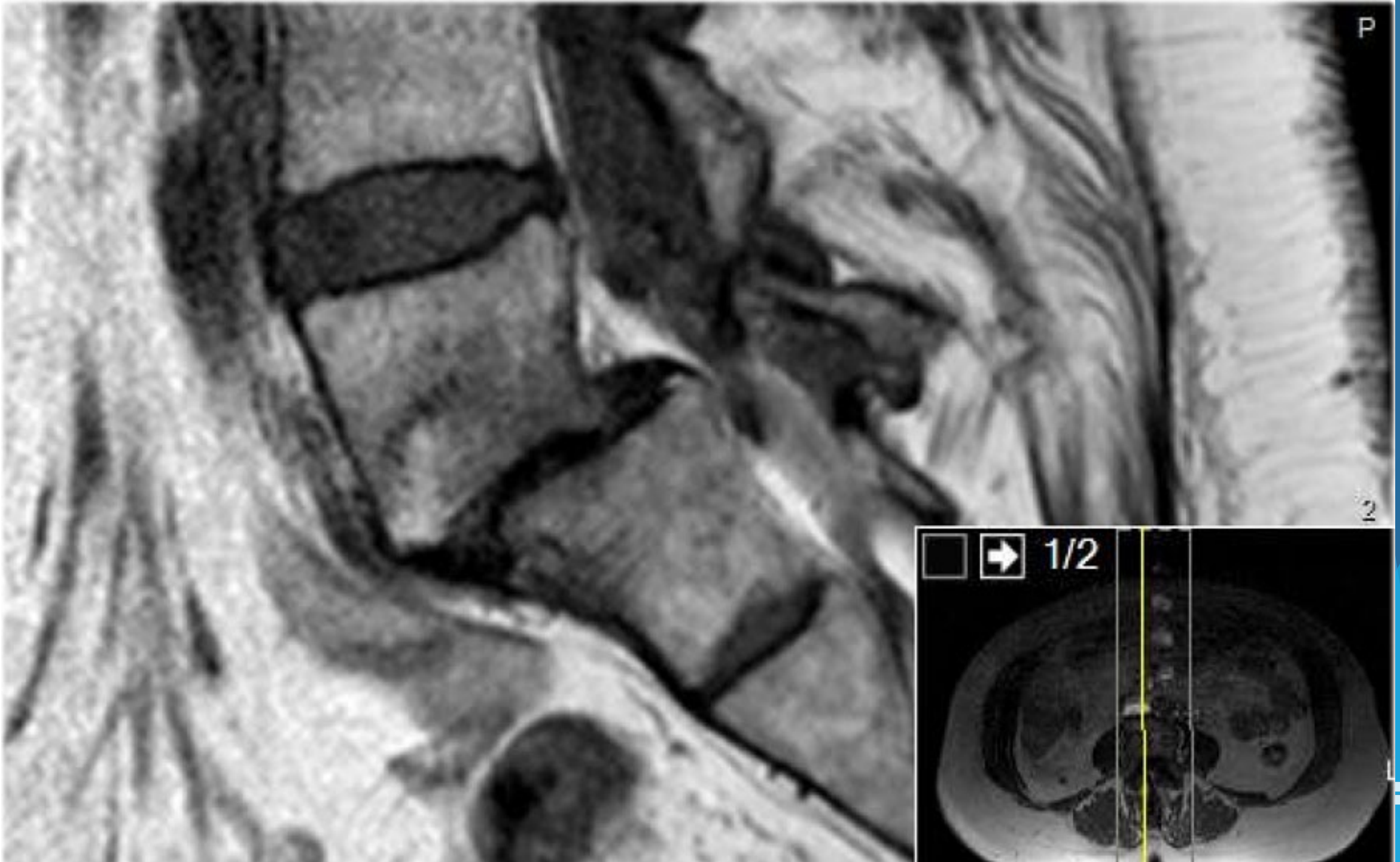

P
2
1/2


Spondylolysis
P
2
1/2


Grade 2/4
Lysthesis
P
1/2


Compressed nerve
1/2


P
2
1/2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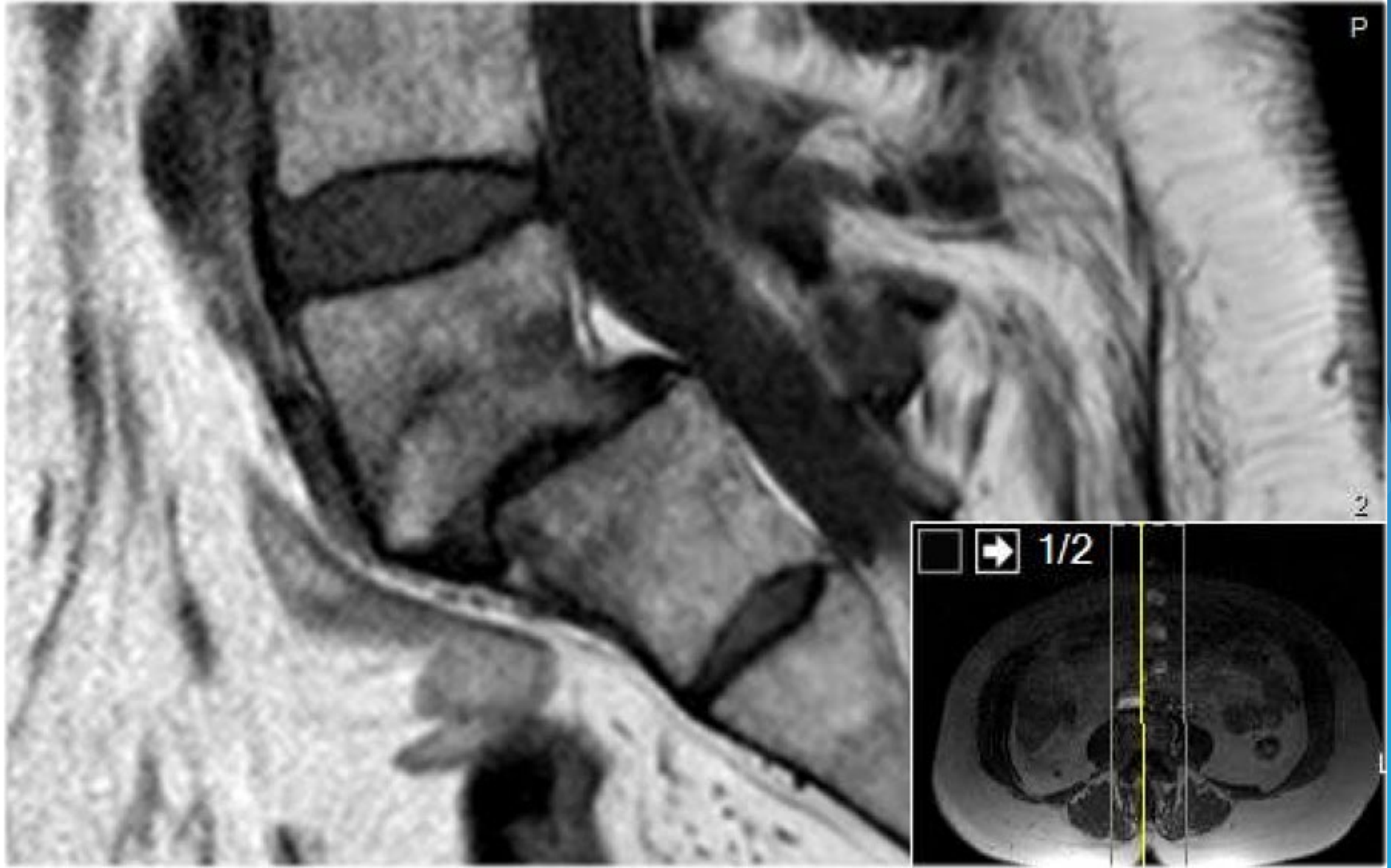
2
1/2


P
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1/2
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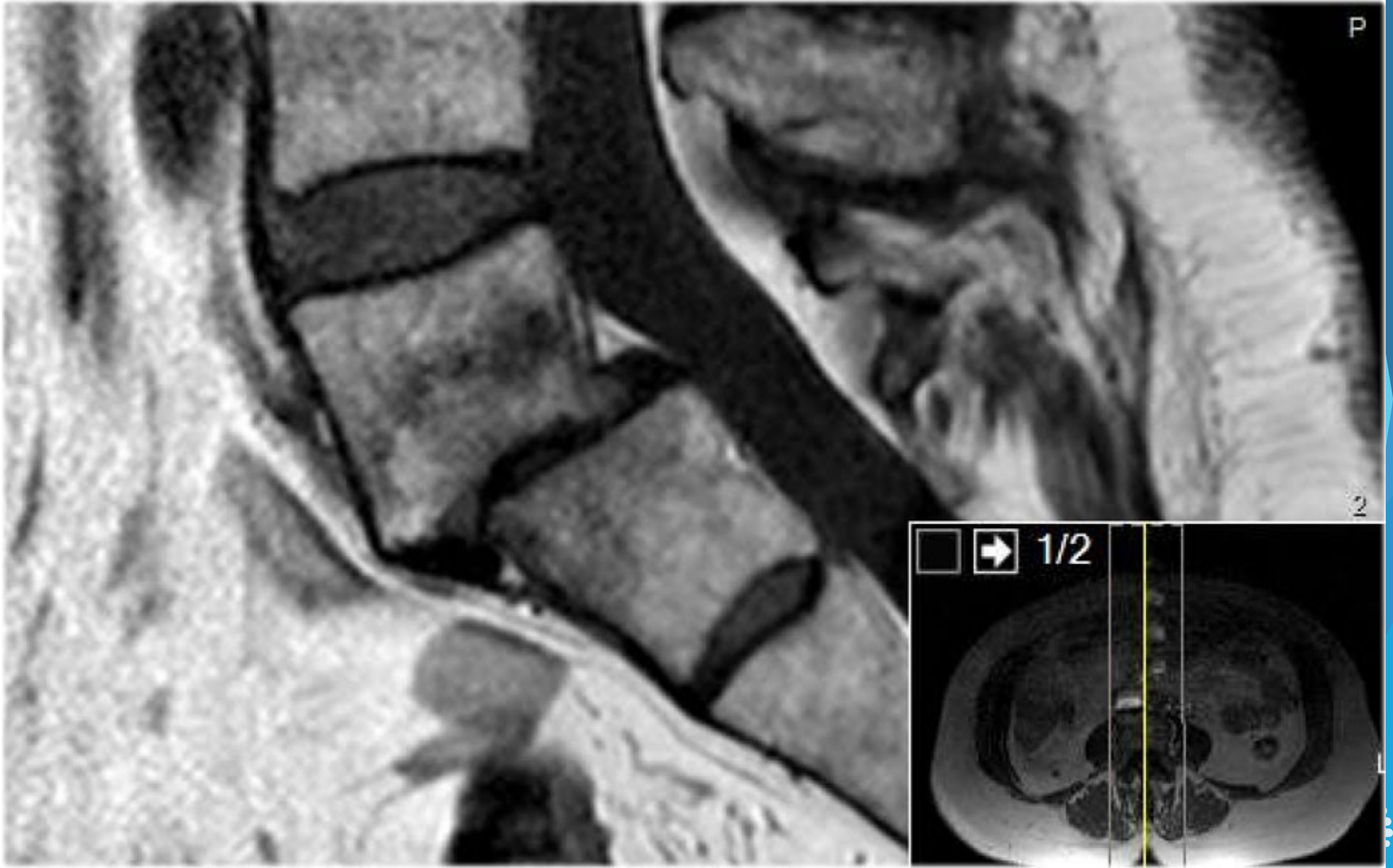
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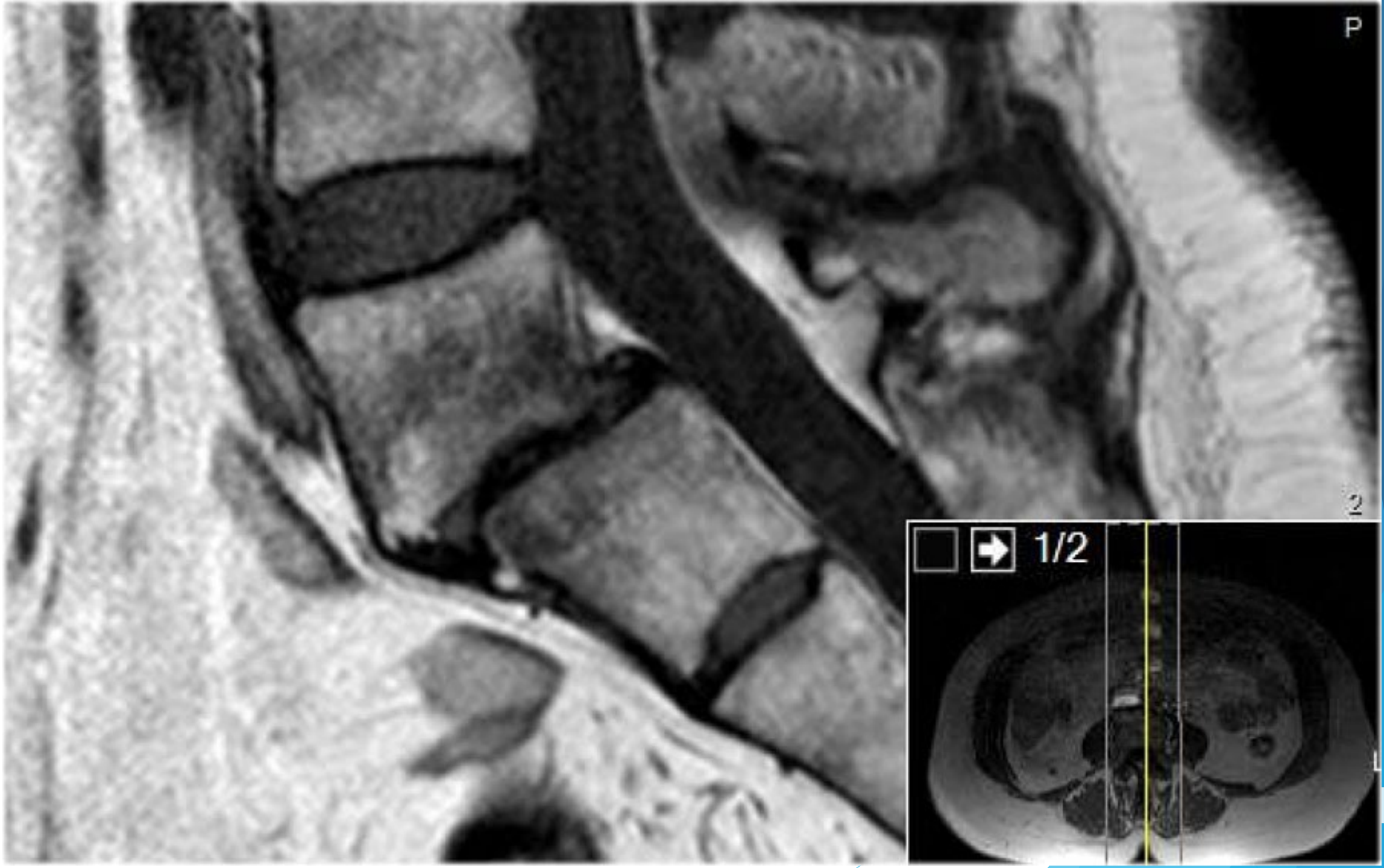
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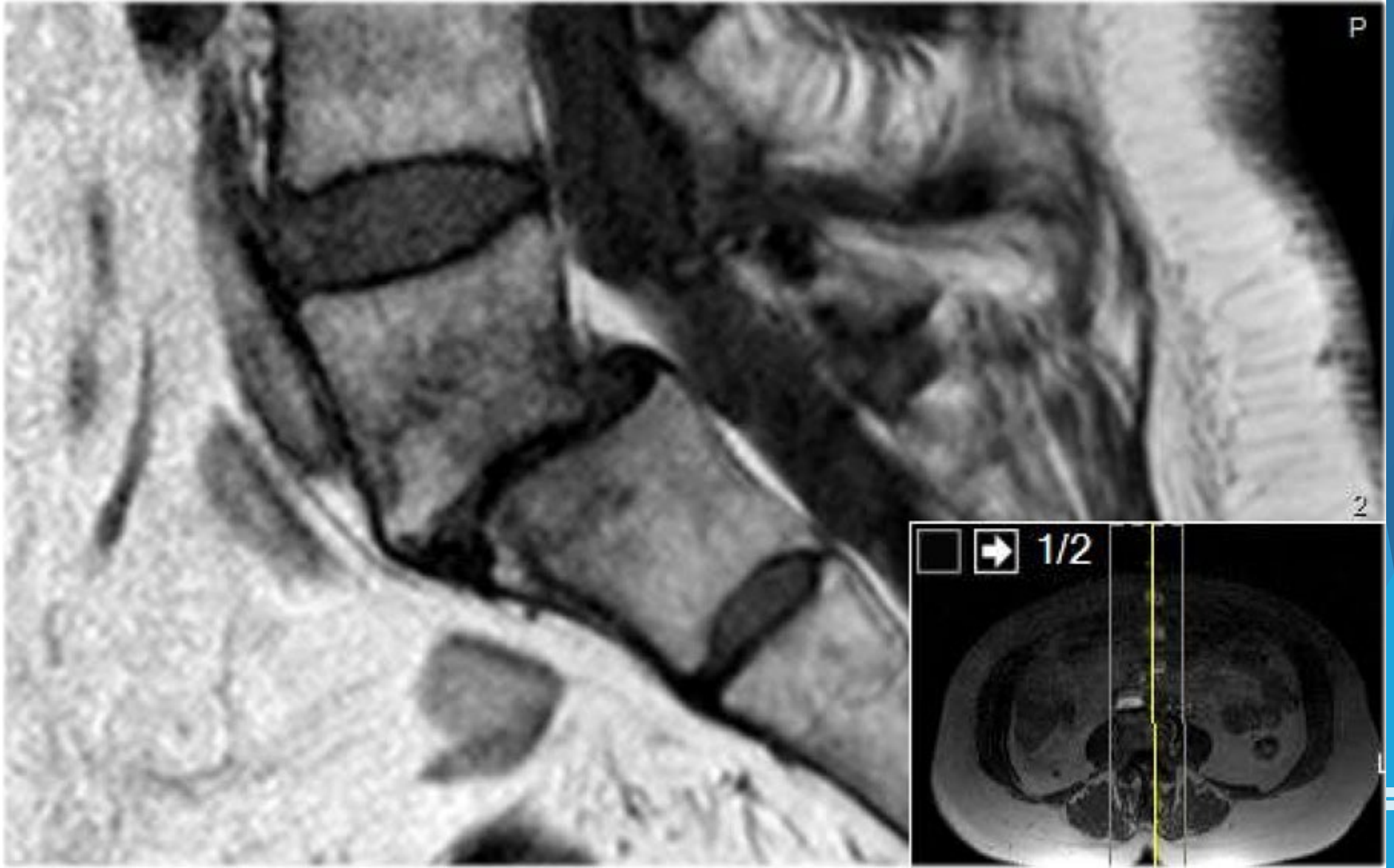
1/2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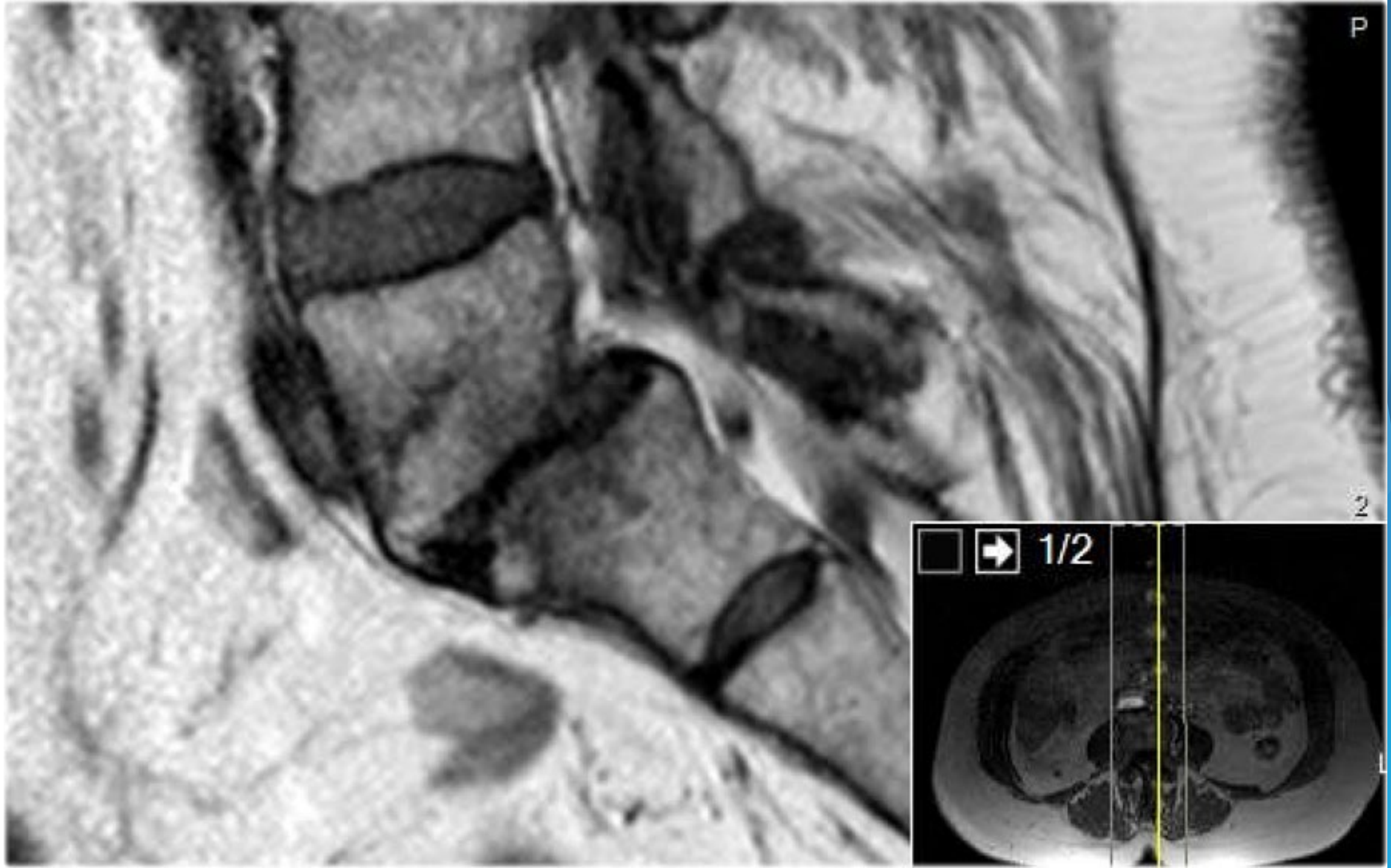
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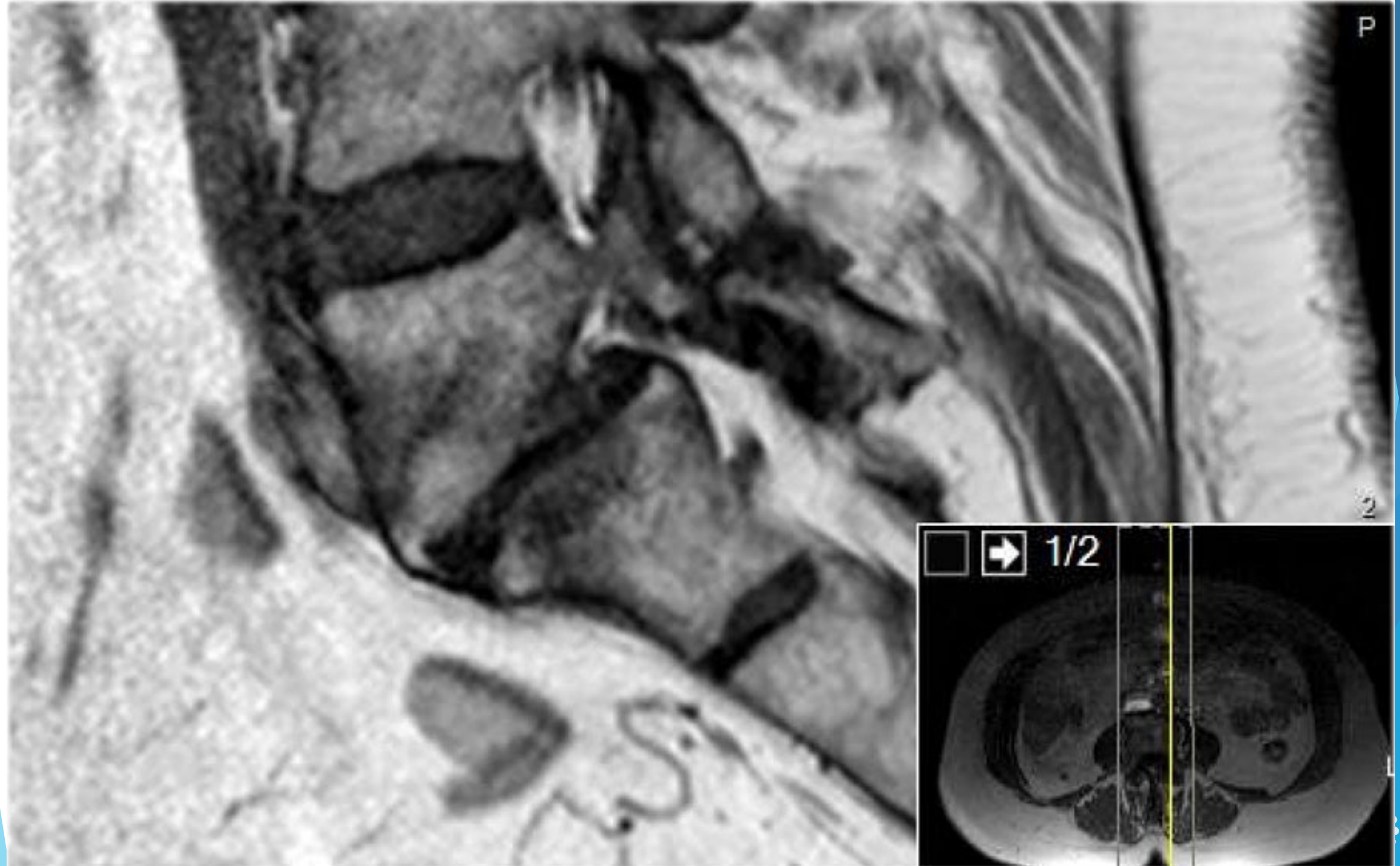
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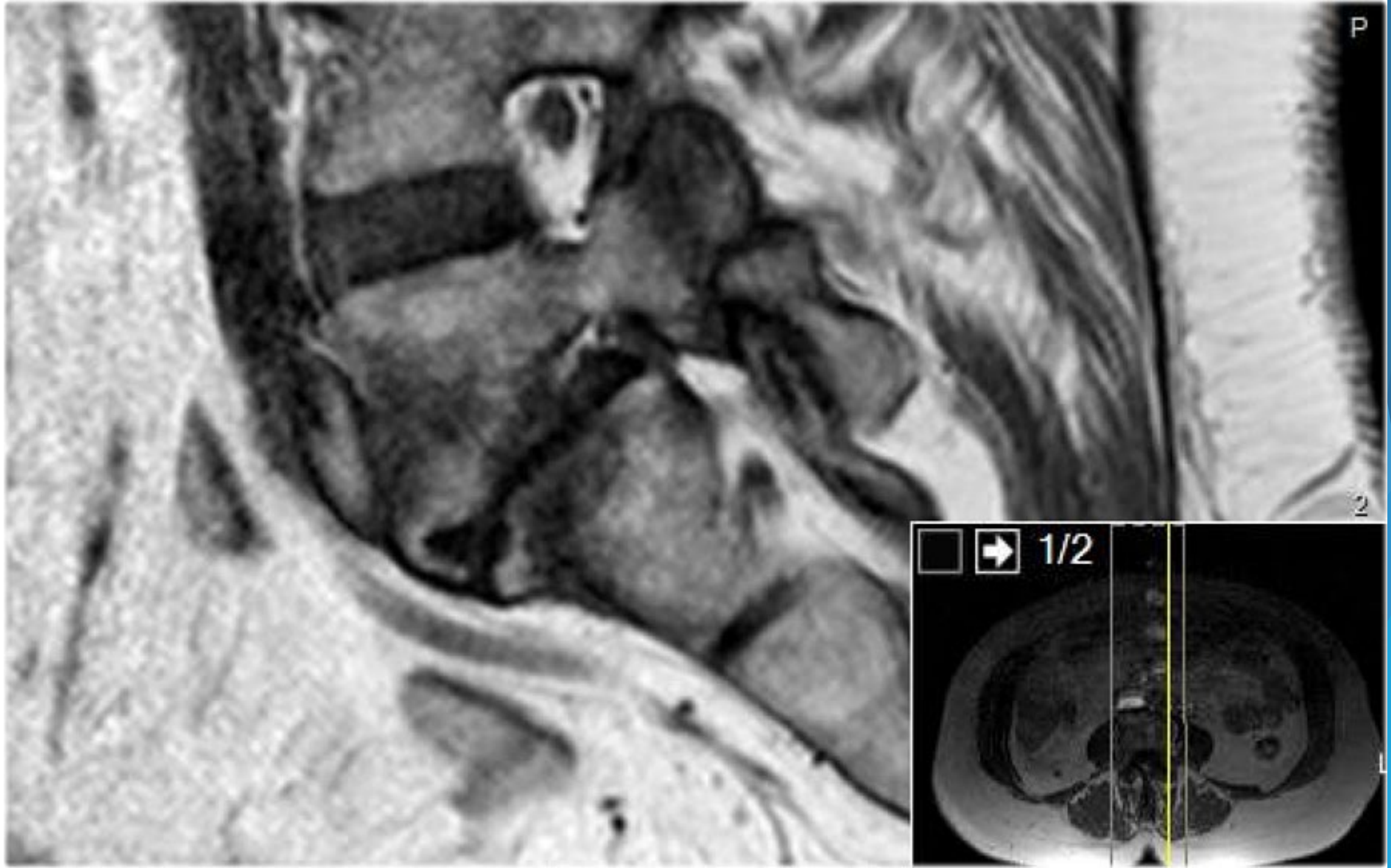
1/2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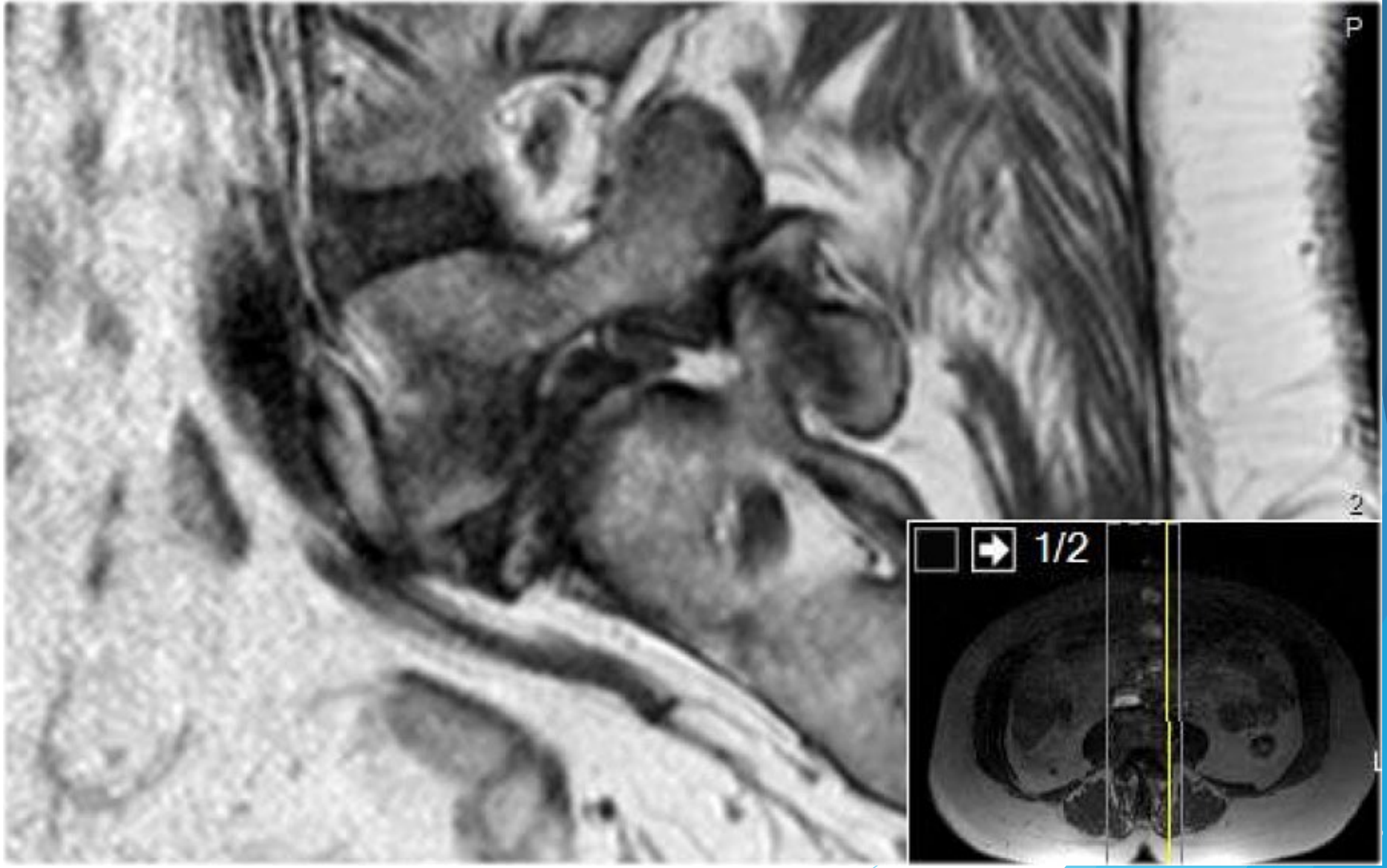
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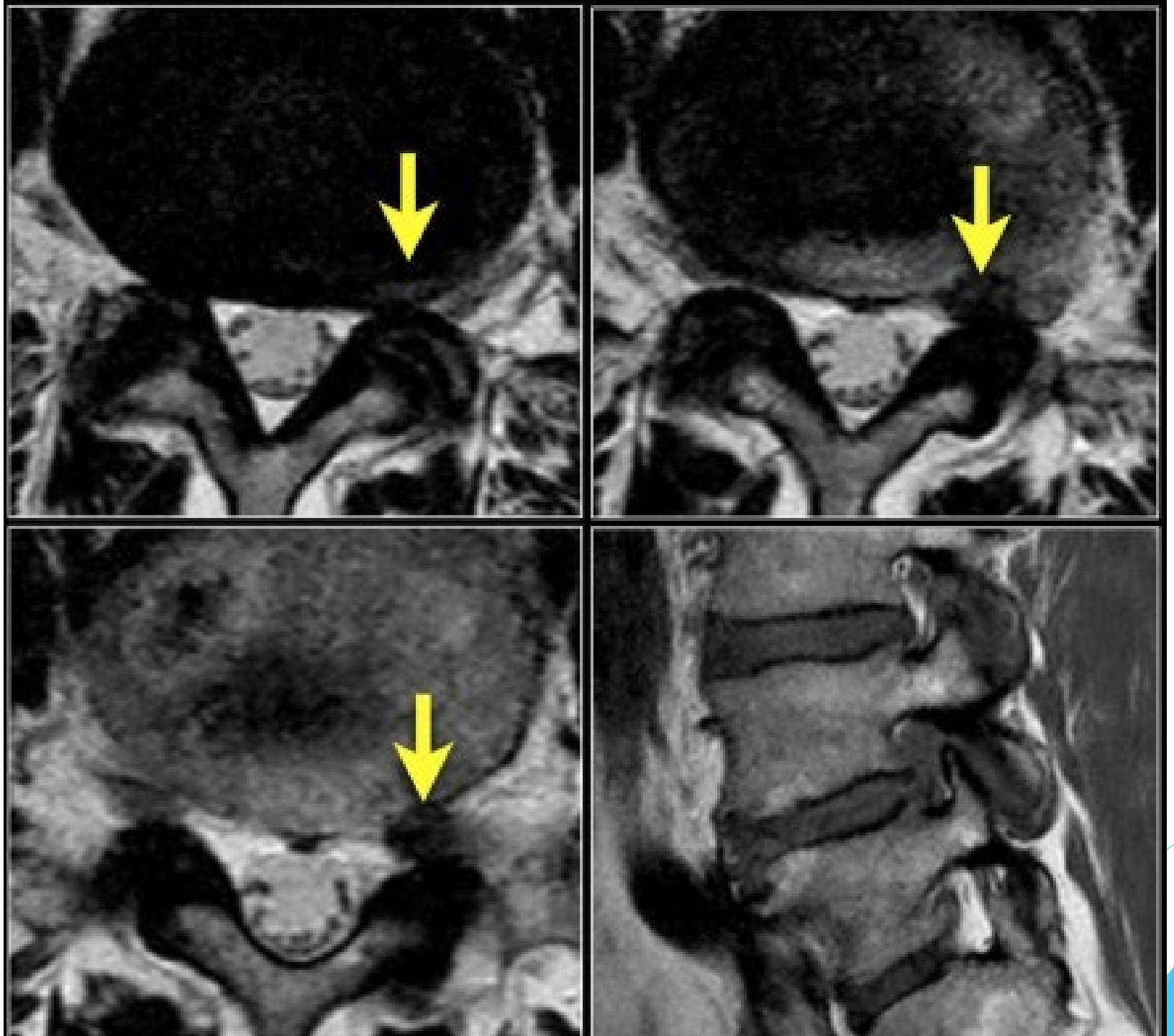
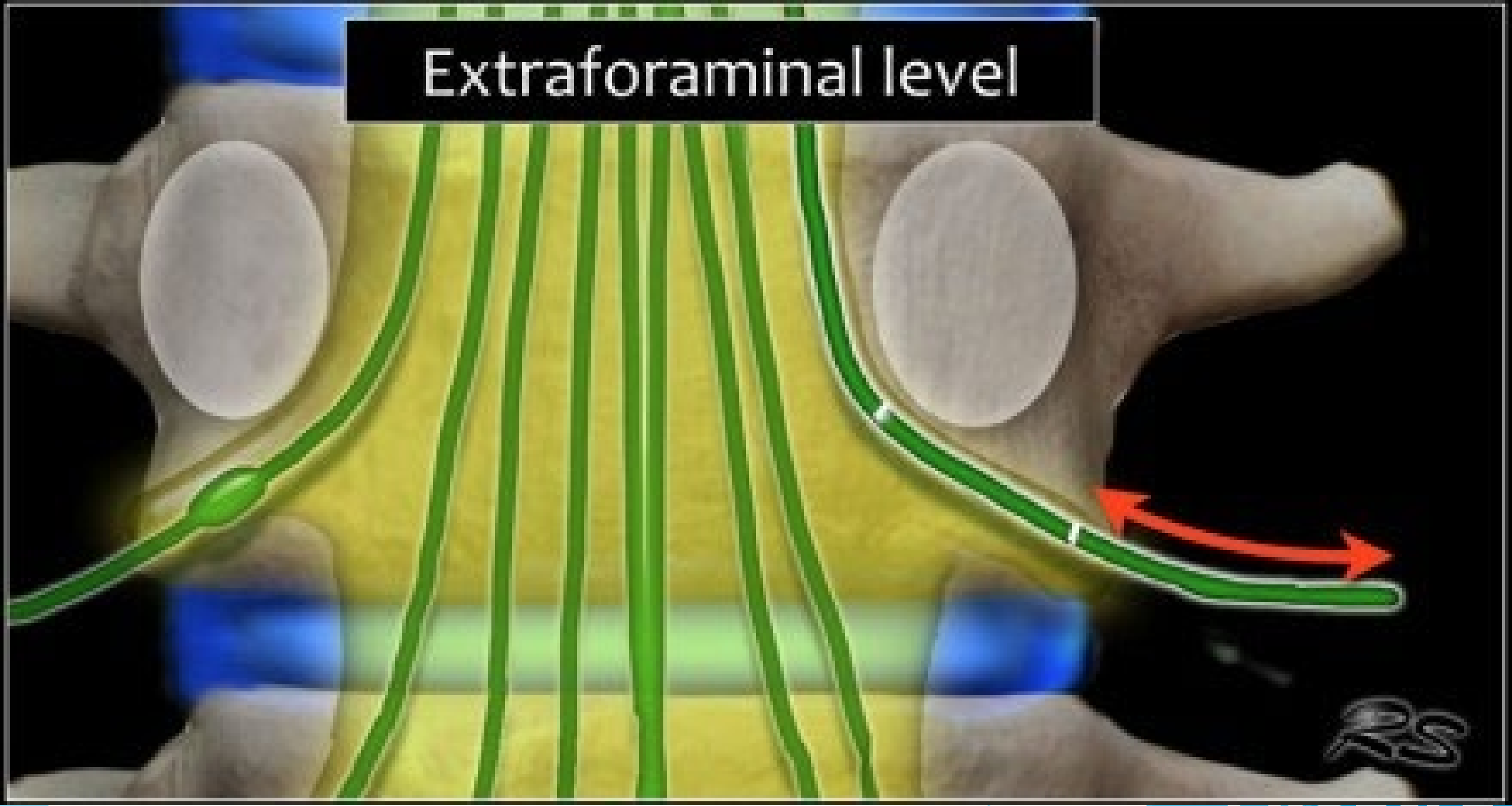
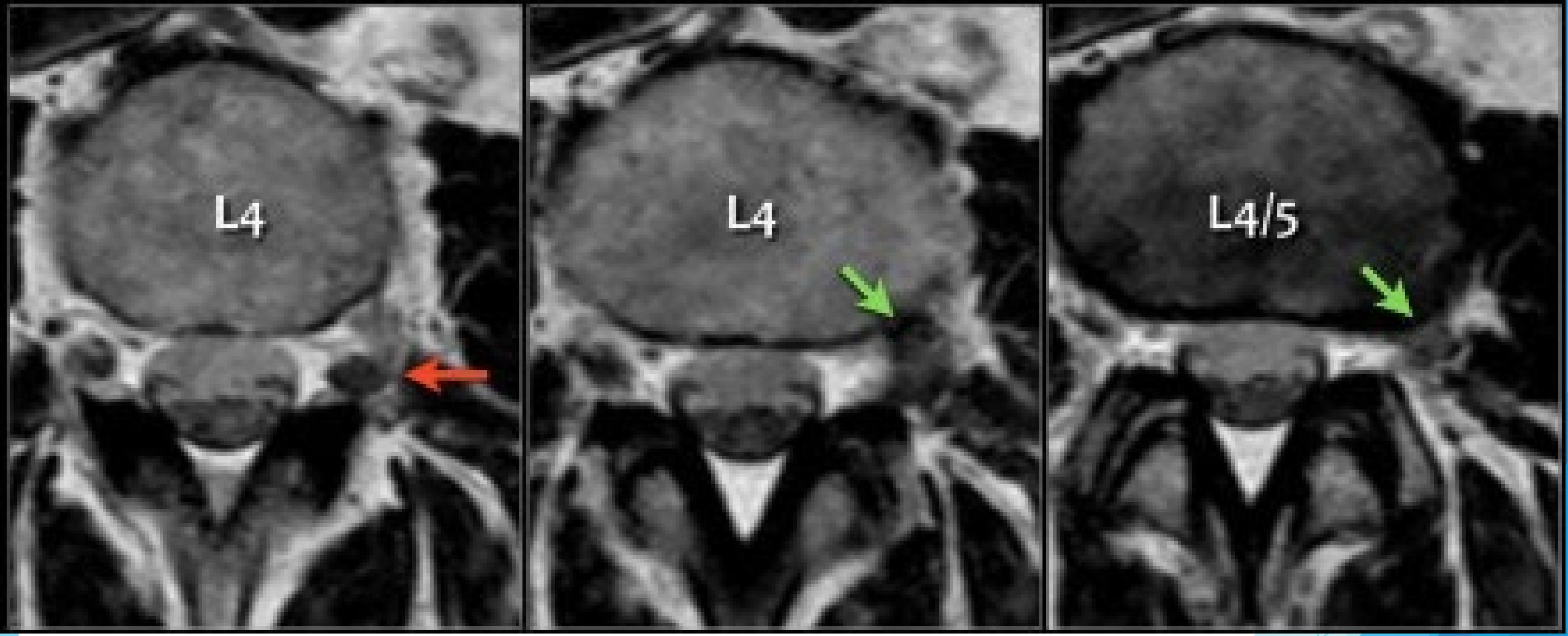
PROLIFE




Extraforaminal level


L4
L4
L4/5