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SPINAL ANATOMY

The spinal column or backbone supports the body weight and contains the spinal cord and nerves. It is composed of 24 vertebrae stacked upon the sacrum. The vertebrae are separated by spinal discs and linked to each other by facet joints at the back of the spinal column (Fig 1). Strong ligaments, joint capsules and muscle bundles provide support and flexibility to the vertebral column.

Fig1. Side view of Spinal Column showing vertebrae, discs, facet joints and existing nerve roots



SPINAL DISC

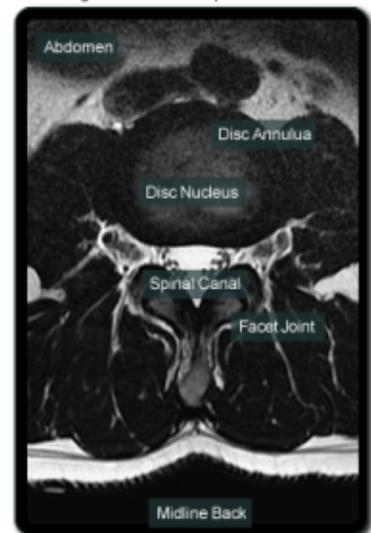
Spinal discs are tough elastic 'cushions' found between vertebrae to which they are bonded. They consist of a very strong outer wall called the annulus and a soft spongy centre called the nucleus (Fig 2). Spinal discs act as shock absorbers and provide flexibility and some rotation between adjacent vertebrae.

SPINAL CANAL & FORAMINAE

The spinal canal is a bony tunnel formed by the ring-shaped openings in the column of vertebrae. It contains a watertight tubular sack (dural tube) filled with clear fluid called CSF (cerebro-spinal fluid). The spinal cord and nerves are suspended within the CSF column. Spinal nerves exit the spinal canal sideways through small holes between the vertebrae called foraminae (Fig 1). They supply various structures including muscles, skin, joints of the limbs, and also internal organs such as the bowel and bladder.

The spinal cord and nerves lie very close to the spinal discs and facet joints. Therefore, spinal conditions such as disc prolapse or spinal stenosis (due to thickened facet joints) can easily cause nerve compression leading to symptoms such as limb pain, weakness, numbness or tingling.

Fig2. Cross Section Spinal MRI Scan



FACET JOINTS

Facet joints link each vertebra to the next at the back of the spinal column (Fig 1 & Fig 2). The facet joints are important load-bearing structures that provide spinal stability and flexibility. Arthritic wear and tear in these joints can cause back pain. Thickening of the joints over time can cause narrowing of the spinal canal (lumbar spinal stenosis) leading to nerve compression symptoms.

SPINAL CORD AND CAUDA EQUINA

The spinal cord extends from the bottom of the skull, through the spinal canal to the L1 vertebra at which point it splits into many individual nerves known as the cauda equina ('horse's tail'). The nerves of the cauda equina supply the legs, and pelvic organs including the lower bowel, bladder and sexual organs.

Fig3. Osteophyte compression of nerve root (Foraminal Stenosis)

