Brief Report
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A Report on Spinal Fusion

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Brief Report

Spinal fusion, also known as spondylodesis or spondylosyndesis, is a type of neurosurgery or orthopedic surgery that unites two or more vertebrae together. This technique can be done at any level of the spine (cervical, thoracic, or lumbar) and stops the fused vertebrae from moving. Each procedure includes employing bone grafting—either from the patient (auto graft), from a donor (allograft), or from artificial bone substitutes—to help the bones mend together. While the graft fuses the two vertebrae together, additional hardware (screws, plates, or cages) is frequently utilized to keep the bones in place. Fluoroscopy, navigation systems, and robotics can all be used to guide the placement of devices. When a disc (cartilage between two vertebrae) wears out, spinal fusion is most usually used to reduce pain and pressure from mechanical pain in the vertebrae or on the spinal cord (degenerative disc disease). Spinal stenosis, spondylolisthesis, spondylitis, spinal fractures, scoliosis, and kyphosis are all prevalent pathological disorders treated by spinal fusion.

Degenerative disc degeneration is the most prevalent source of pressure on the spinal cord and nerves. Disc herniation, spinal stenosis, trauma, and spinal malignancies are all prevalent causes. Bony growths (osteophytes) or thickened ligaments cause the spinal canal to narrow over time, resulting in spinal stenosis. Neurogenic claudication is a condition that causes leg pain as a result of increased activity. Radiculopathy is caused by pressure on the nerves when they escape the spinal cord, causing discomfort in the location where the nerves originated (leg for lumbar pathology, arm for cervical pathology). This pressure can produce neurologic impairments such as numbness, tingling, bowel/bladder malfunction, and paralysis in severe cases. [1-3]

Spinal fusion procedures come in a variety of shapes and sizes. Depending on the level of the spine and the location of the compressed spinal cord/nerves, each treatment differs. Bone graft or artificial bone replacement is put between the vertebrae after the spine has been decompressed to help them mend together. Fusions are performed on the anterior (stomach), posterior (back), or both sides of the spine in general. Hardware (screws, plates, and rods) are now used in most fusions since they have been demonstrated to have higher union rates than non-instrumented fusions. Invasive procedures are also gaining popularity. Advanced imaging guiding systems are used to introduce rods/screws into the spine through smaller incisions, resulting in less muscle injury, blood loss, infections, pain, and hospital stay. The followings are the different techniques:

Cervical spine: Discectomy and fusion of the anterior cervical discs (ACDF), posterior cervical decompression and fusion, anterior cervical corpectomy and fusion.

Thoracic spine: Decompression and fusion of the anterior cranium, Posterior instrumentation and fusion — Sub laminar wiring, pedicle and transverse process hooks, pedicle screw-rod systems, and vertebral body plate systems are all examples of hardware that can be utilized to help fuse the thoracic spine.

Lumbar Spine: A bone graft between the transverse processes in the back of the spine is known as posterolateral fusion. The vertebrae are then secured in place using screws or wire that pass through the pedicles of each vertebra and connect to a metal rod on each side.

The entire intervertebral disc between the vertebrae is removed and a bone graft is implanted in the gap between the vertebrae in an interbody fusion graft. To preserve spine alignment and disc height, a plastic or titanium device may be implanted between the vertebrae. The following are the several types of interbody fusion:

- The disc is accessible through an anterior abdominal incision in anterior lumbar interbody fusion (ALIF).
- The disc is reached through a posterior incision in posterior lumbar interbody fusion (PLIF).
- The disc is accessible through a posterior incision on one side of the spine in transforaminal lumbar interbody fusion (TLIF).
- Transpsoas interbody fusion (DLIF or XLIF) - the disc is reached through surgical incision on one side of the spine through the psoas muscle.
- OLLIF (oblique lateral lumbar interbody fusion) — the disc is reached through an oblique incision in the psoas muscle. [4,5].

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