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GANGA OPERATIVE SPINE COURSE

Minimal invasive anterior lumbar interbody fusion (mini ALIF)

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Max Aebi MD, Srinivasan Parthasarathy MD, Ashwin Avadhani MD and S. Rajasekaran MD

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Introduction

Surgical management for degenerative lumbar instability is necessary when the patient has symptoms either due to instability or neurological compression. In patients with neurological compression, decompression is the crux of the surgery and can only be done adequately from posterior. However, if a patient has pure instability features with mechanical backache, an anterior interbody fusion is an elegant procedure to restore disc height, achieve fusion and preserve the posterior stabilizing soft tissues thus preventing iatrogenic adjacent segment degeneration.

It was, however, found that stand-alone anterior graft for fusions had high failure rates due to graft slippage as well as subsidence [1–3]. This led to innovations in the form of additional implants like cages and anterior instrumentation. The Synfix-L is a stand-alone anterior cage for lumbar interbody fusion. It has a radiolucent PEEK cage with an anterior titanium plate that has four locking screws two into the upper body and two into the lower body. It comes in varying heights and lordosis.

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Case description

A 37-year-old gentleman with chronic low back pain due to L4–5 degenerative disc disease, who failed to respond to extensive conservative treatment. He had no radicular pain or neurological impairment. Due to a chronic, intolerable functional impairment, this patient was selected to undergo L4–5 anterior lumbar fusion with a stand-alone cage.

Surgical procedure

The patient is positioned supine with a roll underneath the lumbar spine to exaggerate the lumbar lordosis. This can be done better with a table that breaks at the level of the lumbar spine. This is important to allow easy exposure of the disc and then to capture the cage in compression after insertion by decreasing the lumbar lordosis. Following positioning, the field is painted and draped as in routine intra abdominal procedures. The incision is an oblique incision at the level of the disc space as visualised under Image Intensifier. The incision is placed towards the left of the midline just crossing the midline. The surgeon stands may stand initially on the right of the patient and then switch to the left to prepare the disc space and to deliver the cage. The rectus sheath is identified and split transversely. The midline is identified and the left rectus abdominis is retracted laterally. Dissection is carried laterally underneath the rectus to enter the retroperitoneal space at the linea arcuata. The entire peritoneum and its

contents are pushed to the right side till a clear view of the left psoas muscle is obtained. The Synframe retractor system [4] aids in keeping the peritoneal contents away from the operative field. The surgeon now moves to the right of the patient and dissects the interval between the great vessels and the psoas to identify the vertebral bone. At this point a level confirmation is carried out using image intensifier. The dissection is now gently carried out by mobilizing the great vessels to the right side by blunt dissection using a dissector and Hohmann's bone levers to keep them retractor. The exposure is over when the entire anterior surface of the lumbar disc is exposed. The discectomy is first done by cutting the annulus and the entire disc is then detached from the bony endplate using a sharp Cobb elevator. This allows entire and neat preparation of the disc endplate without damaging the bone. Posterior osteophytes are removed using a Kerrison's Rongeur. The end point of preparation is achieved by spreading the disc space using an interbody spreader. The disc space is now sized using the standard trial cages. The appropriate size cage is then selected filled with auto/allograft or bone substitute and inserted over the provided interbody spreader. The cage is then fixed into place after removing the roll or unbreaking the table to decrease the lordosis. Four titanium screws are used to hold the cage. Closure is routine. The rectus sheath is repaired carefully to prevent hernias.

Post-op procedure

The patient is mobilized the next day. An elastic lumbosacral orthosis can be given for a short while postoperatively.

Discussion and conclusion

The ALIF technique with a stand-alone cage allows the surgeon to prevent graft related complications like slippage and preserves the posterior elements. In view of the minimal dissection, the post-operative pain is easily managed and can thus be done as a day care procedure.

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