Minimally invasive lateral retroperitoneal transpsoas interbody fusion

Transpsoas approach and tubular retractor placement is achieved using sequential tubular dilators that are placed under the guidance of fluoroscopic imaging (or navigation) and using directional EMG monitoring (NeurovisionTM, NuVasive, San Diego, CA) allowing the dilator placed anterior to the main lumbar plexus.

A variety of surgical approaches have been described to treat low grade lumbar degenerative spondylolisthesis (DS). Minimally invasive spinal fusion techniques were first introduced to minimize morbidities associated with invasive surgical treatments. Minimally invasive lateral transpsoas interbody fusion, also known as lateral lumbar interbody fusion (LLIF).

Minimally invasive lateral retroperitoneal transpsoas interbody fusion was first introduced by Luiz Pimenta in 2001 [1) 2)], as an adaptation of an endoscopic lateral transpsoas approach to lumbar fusion described by Bergey et al. [3)]

Trademarked names include “extreme-lateral” (XLIFTM, NuVasive, San Diego, CA) or “direct-lateral” lumbar interbody fusion (DLIFTM, Medtronic, Memphis, TN); the generic term lateral lumbar interbody fusion (LLIF) will be used here. Variants to the approach include the oblique lumbar interbody fusion (OLIFTM, Medtronic, Memphis, TN) which utilizes a pre-psoas approach (at L5-S1 the OLIF is halfway between an ALIF and a LLIF). A retroperitoneal approach. Indirectly decompresses nerves by distracting the disc space and fuses the spine with an interbody cage having a large cross-sectional area. Access is best from L1–5. For L1–2, one can retract the 12th rib, or go between 11th & 12th rib, or excise the 12th rib. Iliac crest prevents access to L5-S1 (axial-LIF may be used here) and occasionally to L4–5

A similar retro- pleural approach may be employed in the thoracic spine up to T4. With thoracic lateral interbody fusions, DO NOT penetrate the contralateral anulus. Intra-operative EMG monitoring is critical, so the anesthesiologist needs to use only short-acting neuromuscular blockade at beginning of case. In males, implants are typically 55-60 mm in length (oriented along patient’s lateral axis) if placed in the midposition of the VB, or 45 mm in the anterior portion (lengths are 10%shorter in females) [4)].

Potential advantages include less tissue trauma, minimal blood loss, shorter operation time, less wound issues, placement of a larger cage, early patient mobilization [5) 6)] , no risk of durotomy with CSF leak.

Robotic-guided prone transpsoas approach

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