Mini-Open Approach to Lateral Transpsoatic Interbody Fusion: Clinical Update at 9,000 Levels

Gary A Fantini MD, Alexander P Hughes MD,
Federico P Girardi MD, Andrew A Sama MD,
Frank P Cammisa MD

Lateral transpsoatic interbody fusion (LTIF) typically employs a series of tube shaped dilators to traverse the psoas muscle and expose the target disc. These systems rely upon hand held depolarizing technology to avoid damage to the exiting nerve roots and lumbar plexus. Despite this methodology, injury to the neural elements, viscera and vascular structures continue to occur. We theorize that the mini-open technique of LTIF, permitting direct visualization of retroperitoneal and neural structures, will result in a lower incidence of neural, visceral and vascular injuries.

From 2007 through 2025, a patient registry accrued > 4,500 patients undergoing LTIF. At an average of 2.1 levels/patient, > 9,000 levels were done using a mini-open muscle splitting approach, under complete neuromuscular paralysis. A transpsoatic dissection plane ventral to the exiting nerve roots and lumbar plexus was established via direct visualization and palpation of the target disc space. Retraction was maintained by commercially available table mounted self-retaining retractor systems, or by hand held renal vein retractors. Coronal deformities were approached through the concavity of the curve. In cases involving the L4-5 disc space, coronal angulation of the L4-5 disc was the principal factor determining choice of operative side.

There have been no instances of peritoneal violation or permanent motor deficit. Incidence of minor sensory deficit at one year was < 5%. Segmental vessel injury was easily handled, as were various venous anomalies. A single aortic injury was repaired following conversion to midline laparotomy.

Mini-open technique of LTIF obviates the need for complex and unreliable neuro-monitoring systems, thus simplifying the procedure and facilitating safe localization of the target disc. Direct visualization of the retroperitoneum and palpation of the disc space places control in the hands of the surgeon. Complete neuromuscular paralysis facilitates dissection and reduces operative time. Injury to the neural elements, viscera and vascular structures is thus minimized.

Dr Gary A Fantini is a Vascular Surgeon and Associate Professor of Surgery at Weill Cornell Medicine in New York City. Clinical practice is limited to spinal access surgery, at the Hospital for Special Surgery.

Email:
FantiniG@HSS.EDU