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Minimally Invasive TLIF with Pedicle Screws for the Treatment of Degenerative Lumbar Spinal Disorders

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Introduction: TLIF is a procedure indicated primarily for several degenerative processes that culminate with instability involving the Lumbar Spine. The objective of the surgery is to relieve pain and nerve root irritation/compression. The TLIF procedure is currently generally performed in an open fashion. Recently, minimally invasive TLIF procedure is used more routinely and is gaining wider acceptance by spine surgeons because of better outcomes with comparable fusion rates compared to the traditional open technique.

Methods: In order to corroborate the benefits of the MIS technique TLIF procedure; we retrospectively identified 30 patients who underwent the procedure from December 2007 to June 2009 in our institution. Main indications for surgery included Spondylolisthesis Grade I and II, Degenerative Disc Disease, Retrolisthesis, recurrent disc disease, and spine instability. All of our patients had posterior facet arthrodesis with Vitoss. There were no exclusion criteria in this study. The majority of the TLIF procedures were single level with or without single level decompressive laminectomies for adjacent segment disease, primarily stenosis. Out of the 30 patients; 14 (46.6%) involved the L4-L5 interspace with six pts. having concomitant single level decompression, 14 pts. (46.6%) involved the L5-S1 interspace with only one having a decompression, one (3.3%) included the L2-L3 interspace, and one (3.3%) was a two level TLIF. Spondylolisthesis was the main indication for surgery in this series. Grade I spondylolisthesis involved 18 (60%) patients, Grade II, five pts. (16.7%); and recurrent disc disease in four pts. (13.3%) respectively. Other indications included: Retrolisthesis, Degenerative Disc Disease, and Spinal instability one patient (3.3%) each. The majority of the cases were performed using the Stryker *MANTIS* percutaneous spinal system.

Results: To identify the benefits of the minimally invasive TLIF procedure we focused on the average operating time, estimated blood loss, and length of hospital stay. Fusion rates will be assessed once the majority of patients have had adequate follow up. The average operating times were available for 29 patients for an average of 233 minutes, estimated blood loss for 27 patients with an average of 409ml, and the length of hospital stay was 3.6 days. We had four complications in total. Two (50%) involved misplaced pedicle screws, one (25%) was a dural abrasion, and one (25%) involved a full thickness wound infection. This required intra operative debridement without removal of hardware.

Conclusion: Based on these results, the MIS TLIF procedure is just as effective as the standard traditional open technique. We believe it represents shorter operative time, less blood loss, and decreased length of hospital stay. To a vast extent, these factors contribute significantly reducing the potential consequences of prolonged hospital stay, excessive blood loss and operative time. These include but are not limited to increased hospital costs, increase pain, wound infection, deep vein thrombosis, and impaired tissue healing. There was only one wound infection in our series most likely related to prolonged intraoperative time detected. The dural abrasion was observed to occur with concomitant decompressive laminectomy. Hardware misplacement was identified in technically demanding cases. Overall results are promising and evidently demonstrate greater benefit cost ratio.