68th SOUTHERN NEUROSURGICAL SOCIETY ANNUAL MEETING
FEBRUARY 22-25, 2017
THE FOUR SEASONS RESORT ORLANDO AT WALT DISNEY WORLD | ORLANDO, FL

Control/Tracking Number: 16-GA-40-SNS
Activity: General Abstract
Current Date/Time: 11/9/2016 10:16:12 AM

A Minimally Invasive Lumbar Fusion Technique Utilizing a Midline Approach and Navigation in an Outpatient Setting

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Abstract:

Introduction: Midline Image Guided Lumbar Interbody Fusion (MIG™ LIF) is a new minimally invasive surgical technique developed to treat patients with lumbar stenosis and instability. This technique utilizes image guidance through a single midline incision (<2cm) to achieve direct decompression, fusion, and instrumentation. Such keyhole access surgery allows for less tissue disruption while still allowing sufficient access to relevant spinal anatomy. Screw placement is done in a cortical bone trajectory which may also increase screw purchase. In our clinic, this technique permits single level fusions in patients with low comorbidities to be performed on an outpatient basis.

Methods: A retrospective chart review of a consecutive series of 73 adults treated with the MIG™ LIF technique (January to November, 2015) was performed. Forty patients were treated in an ambulatory surgery center (ASC) and 33 patients were treated in a hospital setting. All surgeries were performed by a single surgeon. Charts were reviewed for demographics, diagnosis, medical history, surgical parameters, and complications. Radiographic and clinical outcomes are also being collected. This study is performed under IRB approval.

Results: All patients were diagnosed with one- or two- level degenerative disease positive for radicular pain and segmental instability. The 40 ASC patients were all single level procedures (24 males, 16 females) with an average age of 52.1±8.6 years. The 33 patients treated at the hospital (15 males, 18 females) were treated at either one (n=28) or two levels (n=5) with an average age of 62.4±17.0. Average OR time was 204±51 minutes for the ASC patients and 221±61 for the hospital patients (**Table 1**). Average estimated blood loss was 345cc±198 for the ASC patients and 298cc±217 for the hospital patients. No blood transfusions were required.

Intra-operative complications are also shown in **Table 1**. There were no unanticipated complications or trends observed. All surgical incisions were <2cm. All 40 ASC patients were successfully discharged on the same day. Average stay for the hospital patients was 2.5±2.6 days.

Conclusion: Surgical outcomes in this series of fusions performed in an ASC or hospital setting demonstrate the initial benefits of the MIG™ LIF technique. Navigation, cortical bone trajectory, and a keyhole incision allows for direct decompression and instrumentation, optimizing MIS in the lumbar spine. Patients who are candidates for an ASC setting also benefit from same day discharge. Long-term, prospective clinical studies may further demonstrate the advantages of this technique.

Table 1. Surgical Parameters and Intra-Operative Complications

	Surgery Center (n=40)	Hospital (n=33)	Total (n=73)
****Surgical Parameters**			
OR Time (Minutes)	204 ± 51	221 ± 61	212 ± 56
Est. Blood Loss (CC)	345 ± 198	298 ± 217	324 ± 206
Hospital Stay (days)	Same Day	2.5 ± 2.6	1.1 ± 2.1
****Intra-Op Complications (n)**			

Intra-Op Durotomy	2	3	5
Dural Fistula	1	0	1
Cardiac Issue	0	1	1
Urinary Stasis	1	1	2
Psuedomemingocele Repair (From prior fusion surgery)	0	1	1

References:

Author Disclosure Information:

S. Schlesinger: C; Spine Wave. F; Spine Wave. I; Spine Wave.
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