Fully Navigated Minimally Invasive Transforaminal Lumbar Interbody Fusion

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Introduction

Minimally invasive (MIS) transforaminal lumbar interbody fusion (TLIF) allows lumbar interbody fusion with minimal blood loss and less hospital days. Fully navigated MIS TLIF allows for decreased radiation exposure to patients, OR staff and surgeon alike, while increasing surgeon comfort during the procedure.

Methods

546 consecutive 1 and 2 level MIS TLIF patients were analyzed over a 10 year span from 2004-2014 with a minimum of 1 year follow up. We analyzed screw position, fusion rates, resolution of symptoms, radiation dosing, operative time, and complications rates from one senior surgeon.

Results

Mean operative length was 81.3 minutes, with mean blood loss of 158 mililiters. Hospital stay on average was 2.4 days, and visual analog scores decreased from 8.2 to 3.1 at 1 year follow up. Mean dose length product for a full surgical procedure was 313 mGy.cm^2 while similar procedures done ranged from an average of 1981 mGy.cm^2 for 1 level surgeries and 3016 mGy.cm^2 for 2 level surgeries. Operating room staff was exposed to minimal radiation during this time period as they leave the room during acquisition and because of the fully navigated nature, the surgeon does not have to wear lead increasing surgeon comfort. Fusion rates and screw positions are similar to MIS procedures done using fluoroscopy with no revisions needed and fusion rates similar to open TLIFs at one year.

Conclusions

Fully navigated MIS TLIF provides a unique method of decreasing radiation exposure to patient, surgeon, and operating room staff, while increasing surgeon comfort with at the very least, similar results to that cited in the literature.

Learning Objectives

Assess fully navigated transformainal lumbar interbody fusion in terms of radiation exposure, blood loss, operative time, and patient pain outcomes.