

EFFICIENCY, SAFETY AND LEARNING CURVE OF 3D4K DIGITAL MICROSCOPY IN TRANSTUBULAR LUMBAR MICROSURGICAL DECOMPRESSION SURGERY

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Background:

Digital microscope differs from traditional microscope that surgeon uses digital image rather than optics from the eyepiece to operate. A 3D4K (ultra-high definition) microscope reduces image pixellation, allowing visualization of intricate detail with higher contrast. The value of solely depending on a 3D4K monitor during microsurgical work remains to be proven.

Objectives:

1. To assess the efficiency of target site treatment (symptomatic improvement).
2. To observe the complications associated with digital microsurgery.
3. To assess the learning curve (operating time).

Methods:

Sixty-eight patients (84 levels) underwent the procedure between March 2018 to January 2019. Sixty-three patients were analysed for operating time, blood loss and intra operative complications. The learning curve graph was plotted based on the operating time. Five patients were excluded from analysis (pyogenic discitis, 2 revisions, 2 trans-tubular transoral).

Results:

The operating time became plateau after 6 cases for tubular microdiscectomy and 9 for tubular decompression (ipsilateral with over the top) and MIS TLIF (ipsilateral decompression +/- over the top decompression). The mean operating time was significantly reduced after the plateau. Four dural tear were seen. All patients improved symptomatically, and no neurological deficit were observed.

Conclusion:

Procedure using digital microscopy is associated with short learning curve. The complications were comparable to using traditional surgical microscope. The 3D4K monitors provide excellent visualization, depth perception, clarity and possible precision target site treatment. The surgeons may benefit from ergonomic posture during the surgery.