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Here is a collection of abstracts of published papers related to Spine surgery in the journal *Mini-invasive Surgery* (www.misjournal.net) from Jan 2019 to present, including paper types, titles, full-text links, DOI, abstracts and keywords, which are more convenient for you by clicking the titles in Table of Contents/entering keywords in look-up function to quickly search papers you want to read. We hope this collection is a good assistant for you. Your recommendation of this collection to your friends or colleagues is highly appreciated. If you have any questions in using this collection, please feel free to contact our editorial office.

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Spine surgery

1. Review

Navigation, mixed reality, and robotics in endoscopic spine surgery

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Cite this article: Derman PB, Satin AM. Navigation, mixed reality, and robotics in endoscopic spine surgery. *Mini-invasive Surg* 2022;6:8.

<http://dx.doi.org/10.20517/2574-1225.2021.111>

Abstract

Endoscopic spine surgery (ESS) is an ultra-minimally invasive technique through which spinal pathology can be addressed via sub-centimeter incisions with negligible soft tissue disruption. However, concerns exist regarding the steep learning curve, operative time, and radiation exposure to the surgical team. The use of intraoperative navigation, mixed reality, and robotics in the setting of ESS is currently being explored, and the early evidence suggests that such technologies may help mitigate these issues. The application of these technologies in ESS as well as the associated literature is reviewed herein.

2. Original Article

Single position lateral lumbar interbody fusion and pedicle screw fixation: preliminary experience and perioperative results

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Cite this article: Choi J, Rhee I, Sakar M, Park I, Maalouly J. Single position lateral lumbar interbody fusion and pedicle screw fixation: preliminary experience and perioperative results. *Mini-invasive Surg* 2021;5:43.

<http://dx.doi.org/10.20517/2574-1225.2021.73>

Abstract

Aim: The purpose of this study was to review a single surgeon's preliminary experiences with minimally invasive single lateral position anterior-to-psoas lumbar interbody fusion with multiple techniques of percutaneous pedicle screws and present perioperative results and complication rates.

Methods: After obtaining Institutional Review Board approval, thirty-five consecutive patients undergoing, in 2018-2020, single position lateral interbody fusion with posterior fixation after obtaining written informed consent. Pedicle screw accuracy, screw-related complications, overall and segmental lumbar lordosis, intraoperative data, perioperative complications, and Visual Analog Pain Scale (VAS) at 6 months follow-up were collected.

Results: One hundred sixty-nine pedicle screws were placed in 35 patients with a 95.3% accuracy rate. 6/7 breaches measured < 2 mm. No complications or reoperations were performed in relation to screw malposition. Mean preoperative overall lumbar lordosis was $45.6^{\circ} \pm 12.5^{\circ}$ (range, 19° - 71°), and $50.3^{\circ} \pm 9.6^{\circ}$ (range, 25° - 67°) at 6 months follow up. Mean preoperative VAS scores were 7.3 ± 1.2 (range, 5-10) and 7.3 ± 1.3 (range, 5-10) for the back and leg, respectively and at 6 months follow up, 2.6 ± 2.3 (range, 0-7) and 2.6 ± 2.2 (range, 0-7) for the back and leg, respectively. The mean total operative time was 152.2 ± 54.8 min (range, 80-320 min).

Conclusion: Single lateral position antepsoas lumbar interbody fusion with bilateral percutaneous pedicle screws and rod fixation report comparable screw accuracy rates, operative times, and lordosis correction with the published literature. This modified technique eliminates the resources and time related to intraoperative prone repositioning and may lead to significant cost savings.

3. Original Article

Retrospective study assessing the learning curve and the accuracy of minimally invasive robot-assisted pedicle screw placement during the first 41 robot-assisted

spinal fusion surgeries

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Cite this article: Maalouly J, Sarkar M, Choi J. Retrospective study assessing the learning curve and the accuracy of minimally invasive robot-assisted pedicle screw placement during the first 41 robot-assisted spinal fusion surgeries. *Mini-invasive Surg* 2021;5:35. <http://dx.doi.org/10.20517/2574-1225.2021.57>

Abstract

Aim: The purpose of this study was to assess the learning curve and the accuracy of robot-assisted pedicle screw placement in the first 41 cases.

Methods: This retrospective study investigated the first 41 patients undergoing spinal fusion, whereby 250 pedicle screws were inserted with robotic assistance in a private hospital by a single surgeon. The pedicle screw accuracy was evaluated by computed tomography scan by an orthopedic surgeon according to the Gertzbein and Robbins classification. Planning time and screw placement time were noted. In addition, data about any screw malposition, a return to the operating theatre, and intraoperative repositioning were collected. The data were analyzed with Microsoft Excel.

Results: The results show a high degree of accuracy (98%) of pedicle screw placement with a minimally invasive robot-assisted spinal fusion with no screw malposition requiring a return to the operating theatre. The learning curve improved with time, reaching a plateau at around 25 cases.

Conclusion: This study shows a high degree of accuracy of pedicle screw placement with the robot and it shows a surgeon's improved experience with the robot with time. Further comparative studies are needed to better assess the robot's accuracy and its future in spine surgery.

4. Original Article

The difference of intraoperative free-run electromyography monitoring between percutaneous endoscopic lumbar discectomy via a transforaminal and via an

interlaminar

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Cite this article: Nakamura JI, Setoue T, Hara J. The difference of intraoperative free-run electromyography monitoring between percutaneous endoscopic lumbar discectomy via a transforaminal and via an interlaminar. *Mini-invasive Surg* 2019;3:29. <http://dx.doi.org/10.20517/2574-1225.2019.28>

Abstract

Aim: Transforaminal percutaneous endoscopic lumbar discectomy (TF-PELD) is usually performed under local anesthesia because the patient should be conscious to prevent nerve root injury. However, some patients cannot tolerate intraoperative pain and require intravenous analgesia, or must be converted to surgery under general anesthesia (GA). If PELD under GA can be performed safely, it is more convenient and comfortable for both the patient and surgeon.

Methods: A total of 49 cases (mean age, 53 years) were examined. PELD was performed under GA with free-run electromyography (f-EMG) monitoring. Clinical outcomes were assessed according to the visual analogue scale score (VAS) and the Oswestry disability index (ODI). All patients were monitored with f-EMG.

Results: VAS decreased from 7.7 to 1.1 and ODI from 62.3% to 20.5%. A true-positive was observed in one of 27 TF-PELD cases. Care during the procedure is necessary to avoid the risk of severe neurological injury. A false-negative was observed in one of 22 interlaminar (IL)-PELD cases. This patient complained of aggravated numbness for 6 months after surgery. False-positives were recorded in 2 cases of IL-PELD with a train wave just after removal of the herniated discs.

Conclusion: F-EMG monitoring during PELD under GA was useful to identify nerve root damage. TF-PELD under GA requires f-EMG to ensure safety. On the contrary, IL-PELD does not necessitate f-EMG.

5. Case Report

Intradural lumbar disc herniation after full-endoscopic lumbar discectomy using the interlaminar approach: case report

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Cite this Article: Hori T, Ohmori K, Ono K. Intradural lumbar disc herniation after full-endoscopic lumbar discectomy using the interlaminar approach: case report.

Mini-invasive Surg 2019;3:21. <http://dx.doi.org/10.20517/2574-1225.2019.15>

Abstract

A 67-year-old man complained of the sudden onset of disabling pain in his right leg. He had already undergone full-endoscopic lumbar discectomy, interlaminar (FELD-IL) approach twice for lumbar disc herniation (LDH) at the L4/5 level. MRI showed recurrence of LDH at L4/5 level. Intradural masses were also suspected at the L4 vertebral level. Discography at the L4/5 disc showed contrast medium leakage from the disc to the subarachnoid space. Operation was performed and fragments of the herniated disc were carefully removed under a surgical microscope. The ventral dura mater could be seen adhering to the L4/5 disc. This report is the first documentation of intradural LDH after FELD-IL. Although FELD is less invasive than previous procedures, adhesion between dura mater and surrounding tissues may occur. It is most important to apply discography to confirm the presence of a hole between the intradural space and the disc.