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Relationship between grade of lumbar central canal stenosis and catheter advancement in neuroplasty

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Introduction

Percutaneous epidural neuroplasty (PEN) is a minimally invasive intervention in chronic back pain that is refractory to other coventional block. The procedure is performed with coccygeal approach or transforaminal approach. In this retrospective study, we aim to investigate whether catheter advancement can be affected by the grade of lumbar central canal steosis in coccygeal approach.

Methods

Fourteen patients treated by PEN with coccygeal approach were enrolled in this study. We reviewed lumbar spinal magnetic resonance imaging to evaluate the grade of central canal stenosis (grade 0=none, grade 1=mild, grade 2=moderate, grade 3=severe) on every level of lumbar discs. We also reviwed fluorosocpy recordings of the procedure to confirm whether a catheter was able to be advanced up to the most stenotic lumbar level. Receiver operating characteristics curves were used to determine the cutoff values, and the area under the curve (AUC) was used to obtain the maximal degree of lumbar central canal stenosis of patients whose catheter was able to be advanced up to the most stenotic lumbar level with coccygeal approach.

Results

Each grade (i.e grade 1,2 and 3) of the most stenotic lesion was composed of 3, 4 and 7 patitents, respectively. Catheter advancement was feasible in 3 patients of grade 1. Among 4 patients of grade 2, the catheter was reachable only 2 of them. Finally, among 7 patients of grade 3, the catheter was able to be advanced in only 2 patients. The cut-off value of catheter advancement was grade 2 of lumbar central canal stenosis (sensitivity=62.5%, specificity=83.3%, AUC=0.760) during PEN with coccygeal approach.

Conclusions

We founded that it may be more difficult when the central canal stenosis is more severe (above grade 2). Althought further study is needed, we suggest that it could be acceptable to perform PEN with transforaminal approach rather than coccygeal approach when a patient has moderate or more central canal stenosis.