

ABSTRAK

Latar Belakang:

Herniasi diskus lumbal merupakan penyebab utama nyeri punggung dan disabilitas yang berdampak signifikan terhadap subjek penelitian. *Biportal Endoscopic Spine Surgery* (BESS) sebagai teknik bedah minimal invasif menawarkan dekompresi saraf yang mencukupi dengan trauma jaringan minimal, namun evaluasi luaran BESS yang mengintegrasikan parameter klinis, radiologis, dan biokimia masih terbatas.

Tujuan:

Menilai luaran fungsional subjek penelitian herniasi diskus lumbal pra-pasca BESS berdasarkan parameter klinis, radiologis, dan biokimia.

Metode Penelitian:

Penelitian ini merupakan studi Cohort Prospektif dengan desain pra-pasca pada satu kelompok yang melibatkan 29 subjek penelitian herniasi diskus lumbal yang menjalani BESS. Evaluasi klinis dilakukan menggunakan *Visual Analogue Scale* (VAS), *Oswestry Disability Index* (ODI), Kriteria MacNab, dan *Clinical Global Impression* (CGI). Evaluasi radiologis menggunakan Rasio *Glasgow Lumbar Spine Stenosis* (GLSSR), sedangkan evaluasi biokimia dilakukan melalui pengukuran kadar Interleukin-6 (IL-6) serum. Analisis statistik dilakukan untuk menilai perbedaan sebelum dan sesudah operasi.

Hasil Penelitian:

Skor VAS menurun bermakna dari $6,86 \pm 1,64$ menjadi $2,97 \pm 1,50$ ($p = 0,01$) dan skor ODI menurun dari $32,86 \pm 9,78$ menjadi $20,76 \pm 10,83$ ($p=0,00$). Penilaian MacNab menunjukkan 55,6% subjek penelitian mencapai hasil istimewa dan baik tanpa luaran buruk. Skor CGI menurun signifikan dari $5,41 \pm 1,55$ menjadi $2,79 \pm 1,66$ ($p=0,00$). Nilai GLSSR menurun bermakna dari $38,24 \pm 13,99$ menjadi $19,07 \pm 10,66$ ($p=0,00$). Kadar IL-6 serum menurun bermakna dari $5,35 \pm 8,87$ pg/mL menjadi $2,34 \pm 5,48$ pg/mL ($p=0,00$).

Kesimpulan:

Biportal Endoscopic Spine Surgery (BESS) memberikan perbaikan yang bermakna pada luaran klinis, fungsional, radiologis, dan biokimia pada pasien herniasi diskus lumbal. Temuan ini menunjukkan bahwa BESS merupakan pilihan terapi minimal invasif yang efektif dan dapat dipertimbangkan sebagai salah satu modalitas penatalaksanaan pada pasien herniasi diskus lumbal dengan indikasi yang sesuai

Kata kunci: herniasi diskus lumbal; *Biportal Endoscopic Spine Surgery*; interleukin-6; rasio *Glasgow Lumbar Spine Stenosis*

ABSTRACT

Background:

Lumbar disc herniation is a major cause of *low back pain* and functional disability, leading to significant impairment in patients' quality of life. *Biportal Endoscopic Spine Surgery* (BESS) has emerged as a minimally invasive surgical technique that allows adequate neural decompression with minimal tissue trauma. However, comprehensive evaluation of BESS outcomes integrating clinical, radiological, and biochemical parameters remains limited.

Objective:

To evaluate functional outcomes of patients with lumbar disc herniation before and after *Biportal Endoscopic Spine Surgery* using clinical, radiological, and biochemical parameters.

Methods:

This study was an observational analytic study with a pre–post design conducted on a single group of 29 patients with lumbar disc herniation who underwent BESS. Clinical outcomes were assessed using the *Visual Analogue Scale* (VAS), *Oswestry Disability Index* (ODI), MacNab criteria, and *Clinical Global Impression* (CGI). Radiological outcomes were evaluated using the *Glasgow Lumbar Spine Stenosis Ratio* (GLSSR). Biochemical response was assessed by measuring serum Interleukin-6 (IL-6) levels. Statistical analysis was performed to compare preoperative and postoperative values, with significance set at $p < 0.05$.

Results:

The VAS score decreased significantly from 6.86 ± 1.64 to 2.97 ± 1.50 ($p = 0.01$), and the ODI score declined from 32.86 ± 9.78 to 20.76 ± 10.83 ($p = 0.00$). MacNab evaluation demonstrated that 55.6% of subjects achieved Excellent and Good outcomes, with no Poor results reported. The CGI score showed a significant reduction from 5.41 ± 1.55 to 2.79 ± 1.66 ($p = 0.00$). The GLSSR value decreased significantly from 38.24 ± 13.99 to 19.07 ± 10.66 ($p = 0.00$). Serum IL-6 levels also declined significantly from 5.35 ± 8.87 pg/mL to 2.34 ± 5.48 pg/mL ($p = 0.00$).

Conclusion:

BESS resulted in significant improvements in clinical, functional, radiological, and biochemical outcomes in patients with lumbar disc herniation. These findings suggest that BESS is an effective minimally invasive treatment option and may be considered as one of the therapeutic modalities for the management of lumbar disc herniation in appropriately selected patients

Keywords: lumbar disc herniation; *Biportal Endoscopic Spine Surgery*; functional outcomes; interleukin-6; *Glasgow Lumbar Spine Stenosis ratio*