

Outcome of Surgical Decompression of Cauda Equina Syndrome by Laminectomy and Discectomy

Apel Chandra Saha¹, Liton Kumar Roy², Md. Rafiqul Alam Talukder³

Abstract

Background: Cauda equina syndrome (CES) is a relatively uncommon condition typically associated with a large, space occupying lesion within the canal of lumbo-sacral spines. This syndrome is characterized by varying pattern of low back pain, sciatica, lower extremity sensorimotor loss, saddle anaesthesia and bowel and bladder dysfunction. **Objective:** The objective of this study was to evaluate clinical and functional outcome and operative complications in case of CES who underwent surgical decompression by laminectomy and discectomy. **Materials and method:** This prospective interventional study was carried out at National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR) and different private hospitals in Dhaka from January 2017 to December 2019. Patients were selected on the basis of history, clinical examinations and Magnetic Resonance Imaging (MRI) findings. Patients with fracture and compression due to other than disc prolapse were excluded from the study. **Results:** Out of 23 patients, 18 patients (78%) were male and 5 patients (22%) were female, age ranged from 20-60 years, with the average age 37.5 years. Twenty one patients (91%) had single level and 2 patients (9%) had two level disc herniation. The mean follow up duration was 9 months (range 6-12 months). Patients were evaluated with respect to age, time to surgery and scoring system for CES before and after operation. Those who were treated within 48 hours and those after 48 hours showed significant difference in outcome ($p < 0.05$). Complete recovery was documented in 12 patients (52%). There was infection in 01 case (4%), 03 patient (13%) had persistent low back pain, 02 patients (9%) had sciatica, 01 patients (4%) had bowel and bladder dysfunction and 01 patients (4%) had saddle anaesthesia in delayed operative group. Evaluation of final outcome was satisfactory in 17 patients (74%). **Conclusion:** Laminectomy and discectomy is an effective, safe and acceptable modality of treatment in CES.

Keywords: Cauda Equina Syndrome; Surgical Decompression; Laminectomy; Discectomy.

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Introduction

Cauda equina syndrome (CES) is a relatively uncommon condition typically associated with a large, space occupying lesion within the canal of lumbo-sacral spines. This syndrome is characterized by varying pattern of low back pain,

sciatica, lower extremity sensorimotor loss, saddle anaesthesia and bowel and bladder dysfunction and loss of tendon reflexes.¹ It is an orthopaedic emergency condition. Imaging of Cauda equina and decompression is urgently

Author information

1. Apel Chandra Saha, Assistant Professor, Department of Ortho-Surgery, Comilla Medical College, Cumilla, Bangladesh.
2. Liton Kumar Roy, Associate Professor, Department of Ortho-Surgery, Comilla Medical College, Cumilla, Bangladesh.
3. Assistant Professor, Department of Anaesthesia, Sheikh Hasina Medical College, Tangail, Bangladesh.

Correspondence: Dr. Apel Chandra Saha. e-mail: dr.apel@yahoo.com

needed if large central disc is revealed. Decompression by laminectomy and discectomy provides full relief of pressure on cauda equina.²

The objective of this study was to evaluate clinical and functional outcome and operative complications in cases of CES who underwent surgical decompression by laminectomy and discectomy.

Materials and method

This prospective interventional study was carried out at National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR) and different private hospitals in Dhaka from January 2017 to December 2019. Total number of patients were 23 who underwent surgical decompression by laminectomy and discectomy with a follow up period of six months to one year. Patients were selected on the basis of history, clinical examinations and MRI findings. Patients with fracture, compression due to other than disc prolapse were excluded from the study.

Patients were evaluated with respect to age, time of surgery, and cauda equina syndrome score before and after operation. Decompression by laminectomy and discectomy were performed in all the cases. Approach was posterior midline. Intravenous antibiotic was given pre and postoperatively for three days. Third generation cephalosporin was given. Scoring System for Cauda Equina Syndrome (SSCES) was applied.³ Statistical analysis was made using a computer software programme, the Statistical Package for the Social Sciences (SPSS). A value of $p < 0.05$ was accepted to indicate statistical significance.

Results

Among the 23 patients, 18(78%) were male and 5(22%) were female, age ranged from 20-60 years. At average 9 months, 21 patients (91%) had single level and two patients (9%) had two level lesion. The final clinical outcome was excellent in 12 patients (52%), good in 5 patients (22%), fair in

4 patients (17%) and poor in 2 patients (9%). The overall result was analyzed by categorizing satisfactory (excellent and good) in 17 patients (74%) and unsatisfactory (fair and poor) in 06 patients (26%).

The mean preoperative scoring system for cauda equina syndrome (SSCES) was 12.7 ± 2.8 (7-16) and the mean final follow up score was 7.6 ± 3.4 (2-13) at 12 month. The 17 patients (74%) that had a mean preoperative SSCES of 13 or below, showed satisfactory clinical results with a mean SSCES of 7.9 ± 5.1 (5-9) on the final follow up at 12 month. Six patients (26%) with a mean preoperative SSCES of 14 or above showed unsatisfactory clinical results with a mean SSCES of 14.9 ± 1.9 (7-13) at final follow up at 12 month.

Table I: Age distribution of patients (N=23)

Age in years	Number of patients	Percentage
21-30	3	13 %
31-40	10	43 %
41-50	7	30 %
51-60	3	13 %

Table II: Sex distribution of patients (N=23)

Sex	Number of patients	Percentage
Male	18	78 %
Female	5	22 %

Table III: Time of surgery of patients (N=23)

Time of surgery	Number of patients	Percentage
More than 48 hours	9	39 %
Less than 48 hours	14	61 %

Table IV: Neurological sign of patients (N=23)

Neurological sign	Number of patients	Percentage
Low back pain	7	30 %
Unilateral or Bilateral sciatica	5	22 %
Saddle or perineal hypoesthesia on anaesthesia	3	13 %
Bowel or bladder dysfunction	4	17 %
Lower extremity motor weakness and sensory deficits	2	9 %
Reduced or absent lower extremity reflexes	1	4 %
Loss of sphincter tone	1	4 %

Table V: Level of lesions of patients (N=23)

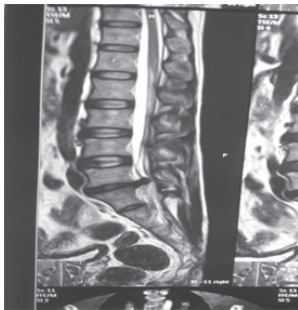
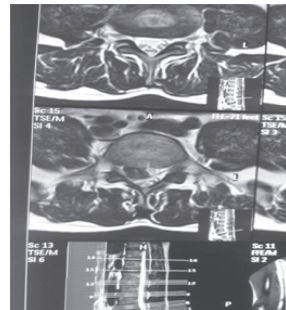
Level of lesions	Number of patients	Percentage
L 3-L 4	3	13 %
L 4-L 5	10	43 %
L 4-L 5, L 5-S ₁	2	9 %
L 5-S ₁	8	35 %

Table VI: Functional outcome of patients (N=23)

Results	Number of patients	Percentage
Complete recovery	12	52 %
Persistent low back pain	3	13 %
Sciatica	2	9 %
Saddle Anaesthesia	1	4 %
Bowel or bladder dysfunction	1	4 %
Lower extremity weakness	1	4 %
Loss of reflexes	0	0 %
Loss of sphincter tone	0	0 %

Table VII: Final outcome of patients (N=23)

Results	Number of patients	Percentage
Satisfactory	17	74 %
Unsatisfactory	6	26 %

**Fig. 1: Sagittal view of lumbo-sacral spines showing extruded disc at L5-S1 level****Fig. 2: Axial view of lumbo-sacral spines showing extruded disc compressing over S1 nerve root**

Discussion

It is incorrect to believe that there is a clear clinical picture of CES. There is no combination of clinical symptoms and signs that reliably predict CES.¹ Surgical decompression should be performed if the patient is medically stable and able to undergo the procedure.^{2,4,5}

The timing of surgical decompression is controversial with immediate, early and late showing varying results.² In acute CES, patients need to be operated within 6 hours⁶, but several authors have argued over the clarity of the data supporting this practice.^{3,4,7} Hussain et al.² reported no differences at 16 months follow up among patients who underwent surgery within 24 hours.

We found better results in those who were operated within 48 hours than those who were operated later. In this series, young patients had

better results than the older group. Single level disc prolapse showed better results than multilevel disc prolapse.

In our series, among 23 Patients complete recovery was in 12 Patients (52%). There was infection in 1 case (4%), persistent low back pain in 3 cases (13%), sciatica in 2 cases (9%), saddle anaesthesia in 1 case (4%), bowel and bladder dysfunction in 1 case (4%) and lower extremity weakness in 1 case (4%) who were operated later but none in early cases.

Conclusion

With the discussion mentioned above it was concluded that surgical decompression by laminectomy and discectomy is an effective, safe and acceptable modality of treatment of CES. It relieves the mechanical pressure over cauda equina and improves the symptoms and quality of life of the patients.

References

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