

## Surgical Outcome of Neglected Cauda Equina Syndrome

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**Abstract: objective:** Cauda equina syndrome (CES) is a rare but important neurosurgical emergency. Despite being a recognized clinical entity since 1934, there remains significant uncertainty in the literature regarding the urgency for surgical intervention. The past decade has seen the emergence of the much-referred-to 48-hour limit as a possible window of safety. The ramifications of this time point are significant for early patients who may subsequently have urgent treatment delayed, and for litigation cases, after which adverse decisions are more likely to occur. cauda equina syndrome is an urgent surgery even if delayed or neglected. **Aim of study:** The aim of this study was to analyze the relationship between timing of surgical intervention and outcome in patients with delayed CES caused by lumbar disc herniation. **Methods:** Retrospectively, the presenting features and management of patients treated for delayed or neglected CES over a 2-year period were reviewed. **Results:** There was significant difference between preoperative and postoperative neurologic functions recovery was found. A significant 40 patients were operated, 12 (30%) patients were complete (CESR), 8 (65%) patients had bladder and bowel recovery after surgery, 4 (35 %) of them not improved, the other 28 (70%) patients were incomplete (CESI) 6 (22%) of them presented with complete foot drop 4 (66%) improved after surgery and 2(34%) not improved and 22 (78%) patients presented with partial foot drop all (100%) improved with Significant complete recovery of muscle strength and complete sensory recovery was noted. In most patients early surgery was associated with better outcome. **Conclusion:** This research showed that early decompression correlated with better outcome. Patients with delayed or neglected cauda equina syndrome must be cleared for surgery in optimal conditions and, if it possible within optimal timing for recovery. [Hamdy Mohammed Behery, Islam Mohammed Alaghory and Ali Moneer Mohammed Shokr. **Surgical Outcome of Neglected Cauda Equina Syndrome.** *Researcher* 2018;10(3):1-6]. ISSN 1553-9865 (print); ISSN 2163-8950 (online). <http://www.sciencepub.net/researcher>. 1. doi: [10.7537/marsrsj100318.01](https://doi.org/10.7537/marsrsj100318.01).

**Keywords:** Surgical; Outcome; Neglect; Cauda Equina; Syndrome

### 1. Introduction:

Cauda equina syndrome (CES) is a rare, but devastating neurological condition. The incidence of CES secondary to lumbar disc herniation is 2–6% (1). In 1929 Dandy first described CES caused by lumbar disc herniation (2). Etiologies of CES include lumbar disc herniation, trauma, hematomas, spinal anesthesia, metastatic invasion or other tumors, inflammatory neuropathy, etc. (3, 4). CES is a clinical diagnosis based on patient history and neurological examination. The radiological studies, especially magnetic resonance imaging (MRI), are used to confirm the diagnosis, nature and location of a lesion (5). The signs and symptoms of CES include low back pain, unilateral or bilateral sciatica, motor weakness of the lower extremities, sensory disturbances, and loss of bowel or bladder function (6). CES is an indication for emergent surgical decompression. Reportedly, early decompression, within 48hours, is associated with a better outcome. (7)

### 2. Patients and methods:

The clinical study included all patients with neglected and delayed cauda equina syndrome (CES) caused by lumbar disc herniation. All patients were operated at the Department of Neurosurgery, in Al-

Azhar University Hospitals during 2015, 2016 & 2017. All patients were operated within 24 hours after hospitalization, 20 (80%) of whom were males and three (15%) were females; patient age was ranging from 29 to 65 years (median 45.5). All patients were evaluated before surgery on the basis of complete history, neurological examination, neuroimaging evaluations including computerized tomography (CT), MRI urodynamic study and JOA score.

#### Patient and study design:

1. Group A Sphincteric complete cauda equina syndrome with sphincter involvement.
2. Group B Non sphincteric incomplete cauda equina syndrome with no sphincter involvement. with partial B1 or complete foot drop B2.

**Inclusion criteria:** Descogenic cauda equine syndrome.

**Exclusion criteria:** Non descogenic cauda equine syndrome.

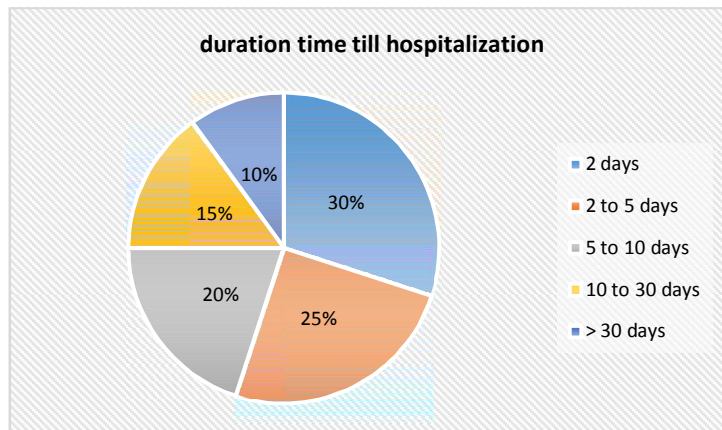
**Clinical characteristics** Low back pain, bilateral or unilateral sciatica were initial manifestations in all patients before the cauda equina syndrome formation. Duration of radicular and low back pain before the cauda equine symptoms varies from less than one month to more than one year. Duration time from the occurrence of cauda equina symptoms, and

hospitalization was just after two days in seven (35%), two to five days in five (25%), five to 10 days in four (20%), 10 to 30 days in three (15%), and more

than 30 days in two patients (10%). (Table 1 & chart 1).

**Table 1**

Number of patient	Hospitalization time (day)
12	2 days
10	2-5
8	5-10
6	10-30
4	<30



**Figure 1**

**Surgery and follow up of patients:** All patients were urgently evaluated (neurological examination according to JOA SCORE, also laboratory, CT and/or MRI) and they underwent surgery within 24 hours of hospitalization. In most cases surgery was performed on the level L4/L5 by intralaminar discectomy, hemelaminectomy and discectomy, total laminectomy and discectomy, or microdiscectomy according to the disc size and compression on the cauda equina. there was no complications noticed.

Urodynamic studies was useful to evaluate the degree and cause of sphincter.

dysfunction, as well as to monitor recovery of bladder function following decompression surgery of **Sphincteric complete cauda equina syndrome.**

Six patients with pre-operative bladder dysfunction Urological symptoms were present in those patients in the form of urgency, overflow dribbling, straining with incomplete evacuation.

**Post voiding residual urine (PVR) assessment:**

Preoperative residual urine volume ranged from 60- 180 ml., Post-operative (PVR) change was a significant parameter in the improvement of patients (table 2).

**Table 2**

Post Voiding Residual P V R (ml)	Number of patient Pre-operative	Number of patient post-operative
0-30	0	7
31-60	5	2
61-90	3	1
91-120	2	1
120-180	2	0

**Preoperative and postoperative urodynamic studies:**

**Maximum urinary flow rate (Q.max.):**

Pre-operative the Q.max among 6 patients ranged from 3 to 14 ml/sec with two patient only in the equivocal range while other sixteen were below accepted rate.

Post-operative (Q.max.) change among 6 patients was significant parameter in the improvement of the patients as a post-operative range was 6-20 ml/sec, with marked improvement of the pre op.values (table 3).

**Table 3**

Q.MAX (ml /SEC)	Number of patient Pre-operative	Number of patient post-operative
0< 10	0	0
11 <15	7	2
16<20	5	5
21<25	0	5

There was significant difference between preoperative and postoperative neurologic functions recovery was found. A significant 40 patients were operated, 12 (30%) Sphincteric complete cauda equina syndrome, 8 (65%) patients had bladder and bowel recovery after surgery, 4 (35 %) of them not improved, the other 28 (70%) patients were Non sphincteric incomplete cauda equina 6 (22%) of them presented

with complete foot drop 4(66%) improved after surgery and 2(34%) not improved and 22 (78%) patients presented with partial foot drop all (100%) improved with Significant complete recovery of muscle strength and complete sensory recovery was noted. In most patients early surgery was associated with better outcome. (Table 4 & chart 2).

Table 4

Type of CES	CESR	CESI	
		Partial foot drop	Complete foot drop
Number of patients	12	22	6
Neurologic function recovery after surgery	8	22	4

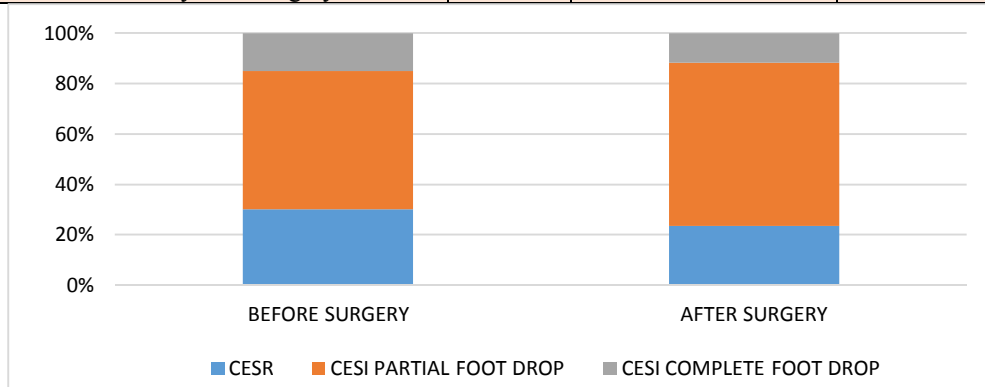


Figure 2.

**Case presentation:**

**Case (1):** Male patient 60 years old presented with acute onset bilateral foot drop and urine retention 3 days ago and history of low back pain, with femoralgia at the distribution of L3-4 associated with sciatica at distribution of L3,4,5, S1 one month ago. On examination of the lower limb motor power ankle 1/5 knee 3/5 hip 4+ others full motor power, sensation intact, normal muscle state, hypotonia and hyporeflexia,

SLRT was limited at the Rt. lower limb JOA SCORE for the patient preoperative was 6 & -6 the pt urgently operated within 24 hours after admission post operative he improved gradually started by pain & motor power finally he discharged with little difficulty of micturation which improved completely in the 2<sup>nd</sup> follow up after 6 weeks with JOA SCORE 15. (Figure 3).



Figure 3: MRI lumbar spine axial and siggital views shows L3-4 DISC Herniation Compressing The Cauda.

**Case: 2** Male patient 46 years old, history of bilateral lower limb pain followed by weakness 21 days ago with no history of sphenctic affection. On examination of the lower limb motor power ankle 2/5 knee 4+/5 hip 5/5, others intact, sensation hypothesia of S1 distribution bilateral, intact saddle sensation with mild anaesthesia, normal muscle state, hypotonia, absent ankle and planter reflexes bilateral, SLRT was

limited at the Rt. lower limb JOA SCORE for the patient preoperative was 6 & 0 the pt urgently operated within 24 hours after admission post-operative he improved gradually started by pain, on discharge motor power improved ankle 5/5 in the Rt. side, 4+ in the Lt. side, knee 5/5 bilateral after 3 months on physiotherapy he improved totally with JOA SCORE 15. (Figure 4).



**Figure 4: MRI lumbar spine axial and siggital views shows L3-4 DISC Herniation Compressing The Cauda**

**Case: 3** Male patient 37 years old presented to emergency department by acute sudden onset of low back pain and bilateral sciatica 4 days ago followed by Lt. Lower limb weakness 2 day ago. On examination he was neurologically intact except Lt. lower limb he has weak dorsiflxtion of grade 3/5 and saddle

anaesthesia, JOA SCORE was 4/15 the pt surgically operated in the same day of admission within 6 hours, pain and motor power improved after surgery, the pt discharged from the hospital full motor power and neurologically intact with JOA SCORE 15. **Figure 5.**



**Figure 5. MRI lumbar spine axial and siggital views shows L4-5 DISC Herniation Compressing The Cauda**

**4. Discussion**

Cauda equina syndrome (CES) is a rare, but devastating clinical condition that has been described as a complex of symptoms and signs such as low back

pain, unilateral or bilateral sciatica, motor weakness of lower extremities, sensory disturbance in the saddle area, urinary retention or overflow incontinence, constipation or fecal incontinence (5). CES can be

caused by many conditions such as lumbar disc herniation, lumbar spinal canal stenosis, trauma, hematoma, tumors, infection etc. (9). Lumbar disc herniation is the most common cause of CES. CES occurs in approximately 2-6% of cases of herniated lumbar disc and it is one of the few spinal surgical emergencies (12). CES caused by lumbar disc herniation is most common in middle-aged male patients (14-16), which corresponds with our results. In this study patients mostly had previous low back pain and sciatica, which is in concordance with the literature (17, 18). There is controversy about timing of surgical decompression in CES and its influence on outcome. Some studies suggested that early decompression within 48 hours is associated with better outcome (15, 19). A significant improvement in sensory and motor deficits as well as urinary and rectal function occurred in patients who underwent decompression within 48 hours versus after 48 hours (20-22). Some studies suggested that there was no statistically significant difference in outcome between patients who were operated within 48 hours and patients who were operated after 48 hours (23, 24). Most researchers and clinicians now believe that a good outcome can be achieved in patients who undergo surgery within 48 hours of onset of neurological dysfunction, while significantly poorer outcomes are associated with surgical intervention after 48 hours (24).

The results of our study show that early decompression was associated with better outcome even after 48 hours. In practice, CES is a condition that requires immediate surgery. It should not be forgotten that delayed treatment could lead to significant morbidity and potential persistent neurological dysfunction (1,3,15). Following surgery, the extent of recovery is variable. Some patients have pain, problems with the bladder or bowel. Recovery of these functions depends on the duration and severity of symptoms prior to surgery (1-5, 15). CES most commonly occurs in intervertebral disc herniation at the L4/L5 level (5, 11, 15). The results of our research correspond with the literature.

**In conclusion,** although the controversies exist about the timing of surgery in patients with CES, our research showed that surgical decompression correlated with better outcome even after 48 hours of the onset of symptoms of cauda equina syndrome. Delayed surgery could lead to potentially persistent neurological dysfunction. Neglected or delayed cauda equina syndrome is still an urgent surgery.

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