

Evaluation of Outcome of Timing of Surgical Intervention on Cauda Equina Syndrome

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ABSTRACT

Introduction: Cauda equina syndrome (CES) is a rare clinical entity caused by compression of lumbar and sacral nerve roots resulting in various neurological dysfunctions. Early diagnosis of the syndrome and timely intervention is required to prevent permanent disability.

Methods: This is a retrospective study conducted from January 2013 to December 2017 in a tertiary care centre in Kathmandu, Nepal. All the cases meeting the inclusion criteria were included in the study. Patients were operated using posterior open discectomy and the outcome was evaluated at two weeks, one month, three months, six months and one year.

Result: Total number of patients meeting the inclusion criteria was 10, two females and eight males with a mean age of 40.30 ± 6.58 years. The mean time for onset of symptom to timing of surgery was 142 hrs. VAS for leg improved from 5.90 ± 0.738 to 0.70 ± 0.483 and VAS for back pain improved from 3.20 ± 1.476 to 0.5 ± 0.572 post operatively. There was improvement in sensory and motor function in all the cases. Bowel and bladder function improved in all the cases postoperatively at the time of final follow up. Sexual function was impaired in six patients preoperatively but postoperatively four had improved and two patients had poor result at the time of final follow up.

Conclusions: Timing of surgery may not be the most important determining factor for the outcome of the CES. Surgical decompression in delayed presentation have good clinical outcome in CES.

Key words: Back pain; Cauda Equina Syndrome; Disability; VAS

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DOI: 10.3126/mjsbh.v20i1.26686

Submitted on: 2019-12-09

Accepted on: 2020-03-10



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INTRODUCTION

Cauda Equina syndrome (CES) is a rare and serious clinical manifestation of lumbar and sacral nerve roots caused due to compression of conus medullaris.^{1,2} There are various causes for compression of nerve roots amongst them lumbar disc herniation (LDH) is the commonest.³⁻⁵ Presenting symptoms may be back ache, unilateral or bilateral radiating leg pain, sensory or motor impairment, absent Achille's tendon reflex, loss of perianal sensation and sphincter dysfunction which may result in permanent disability if left untreated.⁶⁻⁸

In spite of various causes of cauda equina syndrome, removal of the compression by surgical decompression is the only treatment of choice. However, the role of timing to surgery for decompression as a prediction for prognostic factor is controversial. Various authors have supported early intervention as a better outcome⁹⁻¹² while others have found no correlation between timing of surgery and its outcomes.¹³⁻¹⁵

This study was done to find out the influence of timing from onset of symptom to surgery and to evaluate the outcome of improvement in symptoms after the surgery.

METHODS

This is a retrospective study conducted in Shree Birendra Hospital, Chhauni, Kathmandu, Nepal from January 2013 to December 2017. Ethical Clearance was taken from Institution Review Committee. The data of patients were collected from the medical record books from the record department. The patients diagnosed as CES from history, clinical investigations and positive MRI findings were included in the study. The exclusion criteria were patients with previous history of any kind of spine surgery and the patients who did not give consent. The variables such as age, sex,

clinical symptoms, topographic compression level, duration of symptoms, time from onset of symptoms to definitive treatment and duration of reversal of symptoms after definitive treatment were studied. All the cases were operated under general anaesthesia using posterior open discectomy. No posterior instrumentation was done as all the cases had bilateral partial facetectomy. Postoperatively, patients were allowed to ambulate as pain tolerated. The dressing was done on fourth postoperative day and stitches were removed on 14th postoperative day. The clinical outcome was studied at two weeks, one month, three months, six months and one year. The data was analysed using SPSS version 21. The study was approved by ethical committee of our institute.

RESULTS

Sample size meeting the inclusion criteria was 10 (n = 10), out of which there were eight males and two females with mean age of 40.30 +/- 6.58 years. All the cases in our study had lumbar disc herniation with L4 - L5 disc being the most frequently involved followed by L5 - S1 and there was only one case with LDH of L3 - L4 (Table 1).

The mean time for onset of symptom to timing of surgery was 142 hours with only two cases being operated within 48 hours. (Table 2). Similarly pre-operative Visual Analogue Scale (VAS) for leg pain was 5.90 ± 0.738 which improved to 0.70 ± 0.483 and VAS for back pain improved from 3.20 ± 1.476 to 0.5 ± 0.572 at the time of final follow up (Table 3).

After the decompression there was improvement in sensory and motor function in all patients. The bowel and bladder function were impaired in all the patients and all of them showed improvement postoperatively at the time of final follow up. Sexual function was impaired in six patients amongst them four had improvement and two

Table 1. level of lesion

| Level | No | Percentage |
|---------|----|------------|
| L3 - L4 | 1 | 10 |
| L4 - L5 | 5 | 50 |
| L5 - S1 | 4 | 40 |

Table 2. Time to onset of symptom

| Time | No of patients | Percentage |
|----------|----------------|------------|
| < 48 hrs | 2 | 20 |
| > 48 hrs | 8 | 80 |

Table 3. Per-op and post-op VAS

| Symptoms | Pre op | Post op |
|-----------|----------------|----------------|
| Leg pain | 5.90 +/- 0.738 | 0.70 +/- 0.483 |
| Back pain | 3.20 +/- 1.476 | 0.5 +/- 0.572 |

patients had poor result at the time of final follow up.

DISCUSSION

CES is caused by compression on cauda equina which results in severe neurological impairment along with bowel and bladder dysfunction. It is a rare clinical syndrome and may result in permanent disability if left untreated.^{6,8} Compression to lumbosacral nerve roots can be due to degenerative, infective, inflammatory, neoplastic and traumatic causes. Among them LDH is the most common cause in developing countries.^{4,5,16} All the case of cauda equina syndrome in our study were caused by lumbar disc herniation. The mean age of patients was 40.30 +/- 6.58 years which is similar to the findings of various authors. Male patients were predominant in this study. This could be because of small sample size and lumbar disc herniation being the only cause for CES in this study. The compression level resulting in CES was L4 - L5 being the most common followed by L5 - S1 and L3 - L4 which were similar in the study done by Fuso and Shapiro et al.^{1,17} The patient diagnosed with CES had herniated disc occupying more than 50% of the spinal canal causing compression to the nerve roots in our study. In a developmentally narrow canal, even a prolapsed of one third of disc can lead to CES.¹⁸

Out of 10 only two cases were operated within 48 hours. The mean time for patient to receive definitive surgery after the development of symptom was 142 hours ranging from 1.5 day to 14 days. There was delay of 11 +/- 24 days in study conducted by Fernando and delay of 1 to 14 days in the study done by Jason Busse.^{1,19} All the patients of cauda equina syndrome, presented in our hospital were operated within 24 hours of presentation.

The delay in presentation could be because of ignorance and lack of knowledge. In periphery

many patients receive treatment for low back ache and manage conservatively for long time period and present to hospital only if the symptoms gets worsen. Further delay could be because of lack of diagnostic tool and prompt referral system. The health care centre of periphery has limited diagnostic resources, more over the low socioeconomic conditions of several patients could be the reason for delay in receiving medical assistance. More over the terrain of the country and inaccessibility to centre for the appropriate treatment makes it delayed further.

The VAS score for leg pain and back pain improved significantly after the posterior mid line decompression during 2nd and 3rd follow up. Similarly, there was improvement in the sensory and motor function after the surgery in all the patients which was similar to the other studies.^{16,17,20} There were three patients with MRC grade 4 who had improved immediately after the surgery. Three patients with MRC grade 3 had delayed recovery. Patients with longer duration of symptoms were the one in delayed recovery. However all the patient recovered by final follow up with physiotherapy management.

The bladder function was impaired in all the patients at the time of presentation. The bladder function impairment were dribbling of urine, retention and overflow incontinence. Some patients presented with impairment of perianal sensation, altered urinary sensation, difficult or strain to void urine or a combination of these symptoms.⁴ Postoperatively all the patients showed improvement in bladder function after physiotherapy during the final follow up. Eight patients out of 10 were operated after 48 hrs and all the patients had improvement in their bladder function. This indicate that there is no significant role of urgent decompression in terms of functional outcome for involvement of bladder function.^{10,21-23} Sexual dysfunction was not mentioned pre operatively but was reported in subsequent follow up. There were six (60%) patients who had sexual dysfunction. Amongst them four patient showed improvement while two patients had poor result at final follow up. The sexual dysfunction was evaluated by questionnaire basis like impotence, erection problem, difficult to obtain orgasm, altered penile or vaginal sensation and incontinence during

inter course.²⁴ There was problem while questioning about the sexual dysfunction because of cultural barrier. It has not been mentioned adequately in literature regarding sexual dysfunction.

The length of justifiable delay is not known in CES. However large number of sample size and long term follow up is still required to set up a guide line to decide the time frame for intervention in CES.

CONCLUSIONS

Though the outcome of CES decompressed within 48 hrs is good, patients with LDH induced CES with delayed presentation can also have good clinical improvements after decompression. The evidence from this study suggests that timing from onset of symptoms to surgical decompression may not only be the most important determining factor.

To cite this article: Shah RP, Thapa BB, Magar SR, Sinha R, Chand P, Maharjan D, et al. Evaluation of Outcome of Timing of Surgical Intervention on Cauda Equina Syndrome,. MJSBH. 2021;20(1):19-23.

Conflict of Interest: None declared

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