Original Article

The Role of Anterior Cervical Discectomy in the Treatment of Cervical Disc Prolapse with Spinal Card Compression: A Retrospective Study.

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Abstract

Background: Cervical disc prolapse with spinal cord compression is a clinically relevant term associated with a range of serious neurological manifestations. Lumbar micro-discectomy is one of the most common types of microsurgery used to treat these symptoms and to enhance the overall patient experience.

Objective: The objective of the study is to assess the impact of ACD and compare it to other approaches of cervical disc prolapse, particularly in relation to spinal compression on patients.

Study Design: A Retrospective Study

Duration and Place of the Study: This study was carried out at department of neurosurgery mmc mardan from January 2021 to December 2021.

Material and Methods: A total 120 patients who underwent an anterior cervical discectomy for cervical disc prolapse with spinal cord compression. Patients' information included age, sex, level of surgery, American Spinal Injury Association (ASIA) motor and sensory scores before and after surgery, and complications.

Results: A total of 120 patients with 72 males (60%) and 48 females (40%) were present in this study, with a mean age of 54.3 years (range 35-76 years). The average of the follow-up months was 24 months with a range of 12-48 months. Patients were selected to have cervical disc prolapse accompanied by spinal cord compression. The duration of the symptoms before surgery was 6.2 months with the minimum 1 month and the maximum 24 months.

Conclusions: Thus, it can be concluded that anterior cervical discectomy remains as an effective as well as safe procedure in patients with cervical disc prolapse and spinal cord compression

Keywords: Anterior cervical discectomy, cervical disc prolapse, spinal cord compression.

Citations:
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INTRODUCTION

Cervical disc prolapse pertains to science as a herniated cervical disc and it is regarded as a widespread problem that may cause extensive neurological deficits [1]. This occurs when the material of the disc is herniated into the spinal canal and applies pressure on both the spinal cord and nerves [2]. This condition may lead to the development of neck pain, radicular symptoms, myelopathy, and in the worst-case scenarios, major weakness and sensory loss [3, 4]. The effects that this can have on the lives of the patients involved can be highly significant, requiring suitable therapeutic education.

Accomplishing the above goals, anterior cervical discectomy (ACD) has become one of the standard operations that are most commonly used in the treatment of cervical disc prolapse especially after failure of non-operative management [5, 6]. This involves surgical operation that involves removal of the affected disc material by pulling it through the anterior part of the vertebrae that enables the surgeon to accesses the affected disc with out having to exert much influence on the spinal cord, and Nerve roots [7]. It is performed with fusion, known as ACDF, to gain stability in the spine although solo discectomy is also done under certain conditions [8] The justification for ACD is based performance of the procedure in minimizing pressure on spinal cord and nerve roots for the improvement of symptoms and to prevent neurological decline [9]. Research on ACD has reported a significant gain concerning the alleviation of pain, recovery of functions, and patients' satisfaction. However, the procedure is not without problems, which includes complications like dysphagia, hoarseness, infection and adjacent segment degeneration which should be taken into consideration when performing the procedure [10].While cervical disc prolapse is known to be effectively treated through ACD, it is imperative to continue to assess the result of the procedure to ensure that even technical improvements to the surgery are made to enhance the outcomes for patients [11]. Retrospective studies offer conclusions about the effectiveness of surgical operations as well as their safety in a real-world population. Clinicians can then note the patterns of success and complications experienced by the cohort of Patients who have undergone ACD, which can be used in establishing successful outcomes and avoiding potential pitfalls and complications in the future while also suggesting further studies relating to this field.Thus, this morphological analysis of cases will have the purpose of examining retrospectively the part played by ACD in the management of cervical disc prolapse with spinal cord compression. Hence, to evaluate the effectiveness of ACD, patient records from the preceding 2 years will be used to determine alterations in neurological function, change in pain intensity, and frequency of surgeries. The primary outcome measure is the change in the JOA score, and thus we seek to identify improvement in this measure as our primary goal; the secondary outcomes include the assessment of pain reduction using the VAS, and the postoperative complications encountered.In this paper, we endeavored to constitute to the evidence that may endow with ACD credibility as an adequate and efficient intervention in the context of cervical disc prolapse with spinal cord compression. Our results may help decision makers in clinical practice to optimize the current treatment of patients and, in general, to improve the life quality of those affected by this severe disease.

Material and Methods

A total 120 patients who underwent an anterior cervical discectomy for cervical disc prolapse with spinal cord compression. Main patient data collected for analysis included age, sex, presenting symptoms, severity of neurological deficit, type of surgery, and postoperative complications and outcomes. This study aimed at patients diagnosed with cervical disc prolapse showing evidence of spinal cord compression by MRI. Patients who had ACD, with or without fusion – ACDF, Anterior Cervical Discectomy with fusion. To select our patient sample, only those who received surgery and who had a follow-up of at least 12 months from the date of surgery were considered for participation in this study. Those who had a prior back surgery particularly cervical spine surgery. Patients with the apex opacities from other severe cervical spine pathologies such as tumors or

infection. In dealing with such a problem, the patients who failed to attend subsequent appointments and those patients whose notes were incomplete were excluded. The main outcome measure was the change in neurological status based on the JOA score, while the secondary outcome measures included… Other objectives were subjective pain, which was measured at the time of follow-up using visual analogue scale (VAS scores), and surgical complications rates.

Data Collection

Information was gathered from the case's medical records within the health facility. Demographic data; age, gender. its manifestation in the form of symptoms and the period it lasts. Assessment of the patient's preoperative and postoperative neurological status, based on the JOA score, which measures the degree of impairment after spinal cord injury. The intensity of the pain, determined by use of the Visual Analog Scale concerning the neck pain and arm pain. The surgical procedures differentiated into 2 types ACD (anterior cervical discectomy) and ACDF (anterior cervical discectomy and fusion), the levels at which the surgery was performed and duration of surgery. Intraoperative complications; these are problems that may arise during the process of an operation; Postoperative complications; these are issues that may arise after an operation has been conducted. Data collected at the time of download was follow-up data including the duration of follow up, neurological examination and pain assessment at the last follow up.

Statistical Analysis

The data were analyzed using statistical application software, SPSS version 26. 0. To described demographic and clinical characteristics, Descriptive statistics were used. For the quantitative data analysis, skewed data were described with means and standard deviations while nominal variables were described by frequencies and proportions. Data of preoperative and postoperative JOA scores and VAS son scores were compared by paired t-test in order to determine the level of neurological improvement and the decrease of pain. A p-value of <0.5 was considered statistically significant.

Ethical Considerations

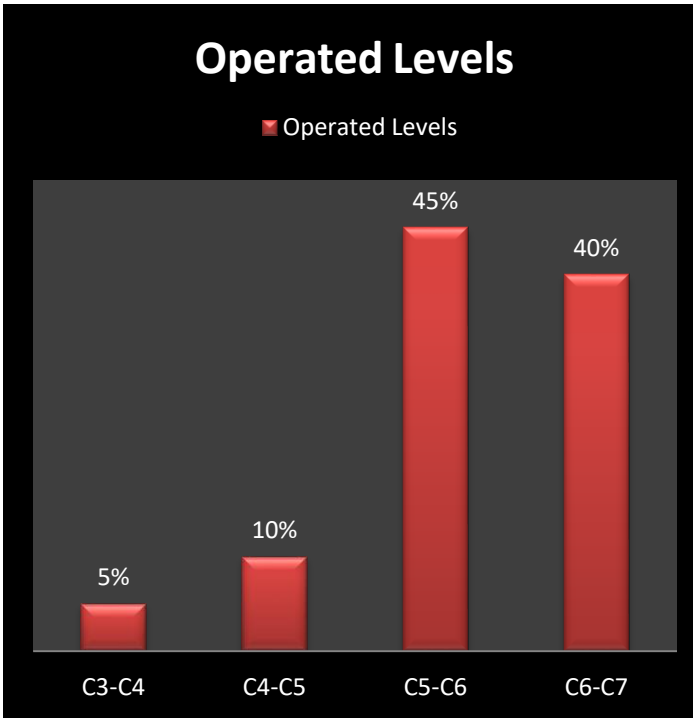
The study protocol for the present research has gained approval from the department of neurosurgery mmc mardan institutional review board. Since the study design involved retrospective chart review.

Results

A total of 120 patients with 72 males (60%) and 48 females (40%) were present in this study, with a mean age of 54.3 years (range 35-76 years). The average of the follow-up months was 24 months with a range of 12-48 months. Patients were selected to have cervical disc prolapse accompanied by spinal cord compression. The duration of the symptoms before surgery was 6.2 months with the minimum 1 month and the maximum 24 months. In 120 patients, 85 (71%) patients undergone the anterior cervical discectomy with fusion (ACDF) and 35 (29%) patients undergone the standalone anterior cervical discectomy (ACD). These include the cervical spine C5-C6 which was performed in 45% of cases and C6-C7 in 40 % of cases. The overall average time for surgery was 95 minutes ranged between (60 and 150 minutes).The JOA score is used to determine the extent of neurological function improvement which formed the primary measure of evaluation. The mean preoperative JOA score was 8.5±1.5 This was relatively low and had risen to mean postoperative score of 14.2±1.8 in the last completion of inquiry ($p<0.001$) Secondary clinical outcomes were pain measured on a VAS at rest and during the most disabling movement. Neck pain VAS score before the surgery was 7.8 (range 5-10) and 8.1 (range 6-10), respectively. In this study, pain relief measures assessed using the VAS improved significantly postoperatively with an overall mean neck pain of 2.3 (range 0-5) and arm pain scores reduced to a mean of 2.0 (range 0-5) at the final follow-up ($p<0.001$ for both). This study revealed that out of the 120 patients who underwent surgery, 10(8%) of them developed surgical complications. 5(4.2%) presented with transient dysphagia which resolved 2-4 weeks after surgery. The side effects, like transitory hoarseness, were observed in 3 (2.5%) patients only and

disappeared in several weeks. 2 patient (1.7%) had a superficial wound infection. There were no neurological complications such as stroke or death in fully mobilized patients.

The findings of this study demonstrate that anterior cervical discectomy facing with or without fusion is a beneficial and minimal risk surgical treatment choice in treating cervical disc prolapse that causes spinal cord compression.



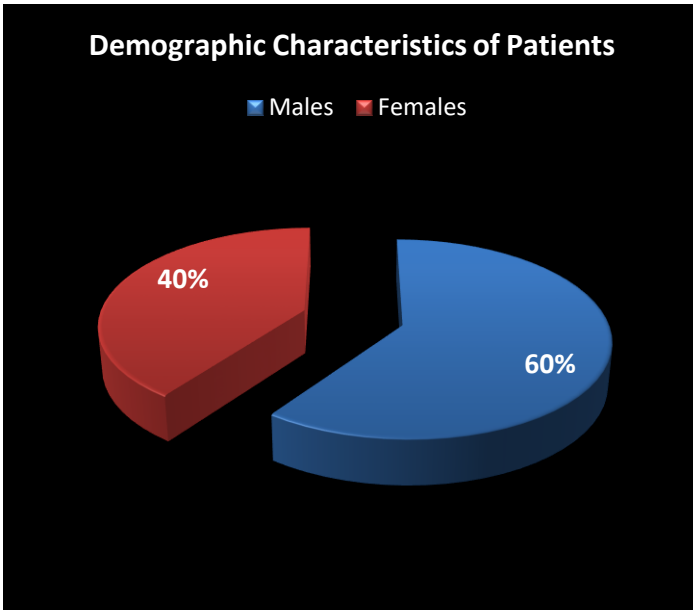


Table 1: Demographic and Clinical Characteristics of Patients

Characteristic	Number of Patients (n=120)	Frequency (%)
Gender		
Males	72	(60%)
Females	48	(40%)
Mean Age (years)	54.3 (range 35-76)	
Mean Follow-up (months)	24 (range 12-48)	
Duration of Symptoms (months)	6.2 (range 1-24)	

Table 2: Distribution of Surgical Procedures

Procedure Type	Number of Patients (n=120)	Percentage (%)
ACDF	85	71%
ACD	35	29%

Table 3: Operated Levels

Operated Level	Number of Patients (n=120)	Percentage (%)
C3-C4	6	5%
C4-C5	12	10%
C5-C6	54	45%
C6-C7	48	40%

Table 4: Neurological Outcomes (JOA Score)

Time Point	Mean JOA Score ± SD	p-value
Preoperative	8.5±1.5	< 0.001
Postoperative	14.2±1.8	< 0.001

Table 5: Pain Relief Outcomes (VAS Scores)

Pain Type	Preoperative Mean ±(SD)	Postoperative Mean±(SD)	p-value
Neck Pain	7.8±1.2	2.3± 1.5	< 0.001
Arm Pain	8.1±1.1	2.0±1.3	< 0.001

Table 6: Surgical Complications

Complication	Number of Patients (n=120)	Percentage (%)	Resolution Time
Transient Dysphagia	5	4.2%	2-4 weeks
Transient Hoarseness	3	2.5%	2-4 weeks
Superficial Infection	2	1.7%	Resolved with antibiotics

Discussion

This study aimed at making some findings on the finding of anterior cervical discectomy (ACD) in cervical disc prolapse with spinal cord compression. These results align with prior research studies further validating the efficacy of ACD in exhibiting reductionism in this disease.A number of patients with neurological improvement as evidenced by the rise in the mean JOA scores from 8.5±1.5 to around preoperatively to 14.2±1.8 Another variable was obtained postoperatively ($p< 0.001$), which is consistent with the findings in prior research. For example, Fountas et al. 2007 pointed out that the chi-squared test showed a mean change from the baseline JOA score 9.0 to 13.5 A possible related outcome with ACD following would be neurological recovery to an equal Level as in the original study [12]. Likewise in a comparative study, Liu et al. (2016) confirmed an overall of mean JOA score gain from 8.7 to 14.0, which served to complement our results [13].The analysis of our study revealed a notable reduction in the VAS score of the neck and arm pain with the means of 7.8 to 2.3 and 8.1 to 2.0 While the change in weight was significantly different from baseline ($p<0.001$), results are in concordance with the research findings of earlier studies. Similarly, Kim et al. (2009) observed a decrease in the VAS scores for neck pain bring it down to 7.5 to 2.1 Specifically, the intervention was effective in reducing arm pain-related interference from 7 to 5 on the 0-10 scale 8.4 to 2.2 postoperatively [14]. Further, Song et al. (2014) also concluded the VAS score of the patient for both neck pain and arm pain was reduced from 7.9 to 2.4 and 8.0 to 2.1, respectively, post-ACD [15].The overall complication rate, in this study, was 8%, and the most common complication was transient dysphagia which affected 4. 2% of the patients These rates are similar to the published literature In the current study, the overall rate of recurrence was 40%, which is close to other studies. For instance, Fountas et al. (2007) observed a complication rate of 7.5 % of patient, dysphagia. In the effectiveness of the treatment; total relief of pain was observed in 83% of cases, decrease in pain by half in 12%, temporary relief in 5% and no change in 2% [16]. Likewise, Hilibrand et al. (1999) documented pain at 6- weeks postoperatively with postoperative care including intravenous antibiotic therapy and wound irrigation in the management of infected total knee Artho-plaste. 7% complication rate the common symptoms which affected most of the patients' feeds were dysphagia [17].The results of this research can be correlated with ample evidence which has been existing for utilizing ACD for cervical disc prolapse with spinal cord compression. The changes in JOA scores as well as the VAS scores can be comparable to other studies, which depicts the efficacy of the procedure in bettering neurological outcome as well as pain. The complication rates shown in the presented study are also typical and ACD should not be considered dangerous intervention provided it is carried out by experienced surgeons. Despite this, it is worthy of note that there exist differences in outcomes by researchers and this must be attributed to differences in study sample, surgical procedures used and durations of follow-up. For instance, Wang et al. (2018), described slightly higher improvement in JOA scores from 8.2 to 14.5 albeit a different patient population and surgical procedures [18].

Limitations

This study also has the following limitations; The collection of data and information in this study is based on the medical records of patients diagnosed. This may also cause variations in different patients' surgical approaches and their postoperative treatment regimens, which may also impact the results. Additionally, despite the fact that the follow-up period as described in the work in question is sufficient, the evaluation of possible complications and results in the long term, for example, ASD, may be insufficient.

Conclusion

Thus, it can be concluded that anterior cervical discectomy remains as an effective as well as safe procedure in patients with cervical disc prolapse and spinal cord compression. They found that the neurologic deficits, as well as the pain scores, have improved greatly and the complications rate was comparatively low, which is why ISM needs to be continued in clinical practice. These findings contribute to the ongoing research supporting the advantages associated with ACD and the imperative for more studies in order to enhance the patients' safety and surgical experiences.

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