

EARLY COMPLICATIONS OF SIMPLE ANTERIOR CERVICAL DISCECTOMY

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ABSTRACT

Objective: To analyze early complications after simple anterior cervical discectomy.

Methodology: This descriptive study was conducted at the department of Neurosurgery, Post-graduate medical institute, Lady Reading Hospital Peshawar from January 2009 to December, 2010. Ninety five (95) consecutive patients who underwent single level anterior cervical discectomy without bone grafting for degenerative cervical disc herniation were included in the study irrespective of their age and gender. The patients were observed for post-operative complications for a period of 8 weeks after surgery. The patients were observed for complications during hospital stay, 1st follow up at 2 weeks and 2nd follow up after 8 weeks of surgery.

Results: Out of 95 cases, 67.4% (n=64) were males and 32.6% (31) females. Majority (n=29, 30.5%) patients were in the age range of 41-50 years, 24.2% (n=23) in the age group of 31-40 years and 20% (n=19) in the age range of 21-30 years. Almost 70.5% (n=67) of the patients presented within 6 months of onset of their symptoms. The commonest complication after surgery was transient hoarseness in 3.2% (n=3) cases. We had post-op dysphagia and discitis each in 2.1% (n=2) patients. The overall morbidity was 8.5% (n=8). One patient died because of anesthesia complication and not because of surgery complications.

Key Words: Cervical disc herniation, Cervical discectomy complications, Magnetic Resonance Imaging of cervical spine, Anterior cervical discectomy.

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INTRODUCTION

Cervical disc herniation is a common neurological entity in neurosurgical practice. Most of the patients with cervical disc herniation are managed conservatively. Surgical intervention is needed in those not responding to medical treatment or having neurodeficit¹.

Anterior cervical discectomy and fusion of the cervical spine was first reported by Robinson and Smith^{2, 3} and is considered to be the surgical treatment of choice for cervical disc herniation. Anterior fusion achieves the goal of spinal cord decompression and bone union and postoperative

stability resulting in excellent treatment outcomes³⁻⁷. However this treatment option is associated with certain complications which are related to donor site (pain, bleeding, and infection) and dislodgement of graft⁸. Because of simplicity of the procedure and absence of the above mentioned complications, simple anterior cervical discectomy without bone grafting (fusion) is a safe alternative.

The anatomy of the cervical spine is delicate and complex and a number of perioperative complications are expected after anterior spine approach. These complications are cord injury, wound infection, hematoma formation, recurrent laryngeal nerve injury, Horner's syndrome, respiratory insufficiency, nerve root injury, carotid or vertebral vessels injury, tracheal and esophageal injury, dural tear and cerebrospinal fluid leak⁹⁻¹¹. It is estimated that in 0.2 to 12% of the patients such complications occur¹².

As there is limited local research work, this study of early complications after anterior cervical discectomy without bone grafting (simple discectomy) will help us to know about frequency of these complications and will provide a base for future studies to decrease these complications.

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METHODOLOGY

This descriptive study was conducted at the Department of Neurosurgery, Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from January 2009 to December 2010. We included patients of both genders who undergone single level anterior cervical discectomy without bone grafting for degenerative disc herniation and excluded patients who had traumatic disc herniation, multiple level degenerative disc herniation, recurrent disc herniation and/or discectomy with bone grafting. After getting approval from the hospital ethical committee to conduct the study and taking informed consent, the medical record of patients who underwent simple anterior cervical discectomy was evaluated. The patients were observed for early complications for a period of 8 weeks after surgery. The patients were observed for these complications during hospital stay, 1st follow up after 2 weeks and 2nd follow up after 8 weeks of surgery. The frequency of early complications was calculated among the total cases operated with anterior cervical discectomy without bone graft. All information was entered into a proforma especially designed for this purpose. The data was analyzed

by statistical program SPSS version 11.

RESULTS

We had total of 95 patients out of which 64 (67.4%) were men and 31 (32.6%) women with male to female ratio of 2.1:1 (Table 1).

The age of patients ranged from 16 to 70 years. The mean age was 40.69 ± 13.25 years. Majority of patients 29 (30.5%) were in the age range of 41-50 years, followed by 23 (24.2%) patients in age group of 31-40 years (Table 1).

We had 67 (70.5%) with duration of symptoms less than six months and 28 (29.5%) with symptoms more than 6 months.

We observed Post-operative transient hoarseness in 3 (3.2%) patients and dysphagia in 2 (2.1%).only one patient (1.1%) had superficial wound infection and postoperative discitis was found in 2 (2.1%) cases. One of our patients died post-operatively because of anesthesia complication. The overall morbidity was 8.5% (8 patients) and mortality 1.1% (1 patient) but no mortality because of surgery complication (Table 2 and 3).

Table 1: Demographic Characteristics of Patients (n=95)

Age (in years)	No. of Cases	Percentage	Gender
11-20 years	08	8.4%	Male = 03 Female = 05
21 –30 years	19	20%	Male = 06 Female = 13
31-40 years	23	24.2%	Male = 06 Female = 17
41-50 years	29	30.5%	Male = 10 Female = 19
51-60 years	11	11.6%	Male = 04 Female = 07
61-70 years	05	5.3%	Male = 02 Female = 03

Table 2: Postoperative Complications

Complication	No of Cases	%age
Hoarseness	03	3.2%
Dysphagia	02	2.1%
Superficial wound infection	01	1.1%
Discitis	02	2.1%
Total morbidity	08	8.5%

Table 3: Follow up Visits: n= 8

Follow up visit	Complications	No of patients
During hospital stay (2-3 days)	Hoarseness	03
	Dysphagia	01
2 Weeks postoperative	Dysphagia	01
	Superficial wound infection	01
8 weeks postoperative	Discitis	02

DISCUSSION

Anterior cervical discectomy is an accepted technique for the treatment of symptomatic disc disease at the cervical spine¹³. We studied 95 patients operated for cervical disc herniation through anterior approach. There were 64 (67.4%) men and 31 (32.6%) women in our study.

Cervical disc herniation is more common in men. This could be because men, being dominant part of the society and are more prone to spine abuse to full fill the family needs. They bring heavy weights on their heads and so prone themselves to early degenerative changes of the cervical spine¹⁴. The second reason might be because of more smoking, which is more common in men. These facts were also reflected in other studies^{15,16}. However some studies, conducted in developed countries published that disc herniation is more common in women^{17,18}. The difference in life style and habit of smoking in females may be the reason that cervical disc herniation is more common in female in some developed countries.

Degenerative disc herniation is more common in people during 3rd, 4th and 5th decades of life in cervical spine. This may be because of more degenerative changes of spine in these age groups^{17,19}. This was also reflected in our study. We operated on patients with the age range from 16-70 years with mean age 40.69 years. There were 24.2% patients in the 4th and 30.5% in the 5th decade of life. So, most of our patients (54.7%) were in these two decades. In one of the studies, mean age of the patients was 36 (range 24-76 years)²⁰.

In surgery for lumbar disc degeneration, symptom duration > 6 months is regarded as a negative prognostic factor. This is also reported to be true for cervical disc surgery²¹. Kwon JW and colleagues²² studied the relation of duration of symptoms due to cervical disc herniation and their response to treatment. They concluded that patients who had duration of symptoms less than six months had better response to treatment than those who had more than six month of symptoms. In our

study, 70.5 % (67) of the patients had duration of symptoms less than six months. Although, we did not include the response to treatment but it means that most of our patients would have better results.

Injury to recurrent laryngeal nerve resulting in hoarseness is one of the established adverse events after anterior approaches to cervical disc surgery. Direct surgical trauma to the recurrent laryngeal nerve is rare and the most likely mechanism of injury is from indirect stretch or focal pressure on the nerve. We had 3 (3.2%) patients who developed transient hoarseness after surgery. This was the most common complication in our study. In another study this complication was 1.27%²³. This could be because we adopted right side approach in majority (93/95) of the cases and this nerve is more prone to trauma on the right side approach.

Worsening of neurodeficit is one of the common complications after anterior spine surgery. But we had no such complication in our patients. The exact reason for this is not clear but could be because of not using bone graft and securing good hemostasis. The latter could be the reason that we had no wound hematoma in our patients, while some studies reported postoperative wound hematoma in 1.3% cases which needed evacuation²⁴.

Postoperative spine infection is infrequent due to rich blood supply of the vertebrae and prophylactic use of antibiotic. We had two (2.2%) patients who developed postoperative discitis and one (1.1%) superficial wound infection with the overall infection rate of 3.3%. The results vary in different studies. In some of the studies the infection rate is more (4.8%)^{25,26}. These results are almost identical to our study. In some studies these complications are lower (0.1%)²⁷. In another study the reported disc space infection rate is 0.5% after anterior cervical discectomy²⁸. The infection rate was lower than our study. The reason may be because this study was conducted in developed countries where infection rate is lower. The difference between sample sizes may be another

explanation for this.

If we compare the overall morbidity, Bertalanffy^{21,24} reported that it is 10.8% after simple anterior cervical discectomy. This is comparatively an old study with complication rate more than our study (8.5%), which means that these complications can further be reduced with improved surgical skills, good illumination and magnification.

No doubt the use of bony fusion with or without metal implants improve symptomatology with decreased spinal instability, however Postoperative morbidity is increased after anterior cervical discectomy and fusion. In one of the studies the complication rate after anterior spinal surgery was 29.5%²⁹. Fountas²⁷ and colleagues studied 1015 patients who underwent anterior cervical discectomy with fusion and the overall morbidity in their study was 19.2%, which is more than double to our study. THIS means that simple anterior cervical discectomy is much safer.

CONCLUSIONS

We concluded from this study that cervical disc herniation is more common in men and the common age group affected is 41-50 years. The overall morbidity after simple anterior cervical discectomy is 8.4 % which means simple anterior cervical discectomy without interbody fusion is reasonably a safe procedure with an acceptable operative morbidity and lack of mortality.

REFERENCES

- Jacobs WC, Anderson PG, Limbeek J, Willems PC, Pavlov P. Single or double-level anterior interbody fusion techniques for cervical degenerative disc disease. *Cochrane Database Syst Rev* 2004;4:CD004958.
- Oktenoglu T, Cosar M, Ozer AF, Iplikcioglu C, Sasani M, Canbulat N, et al. Anterior cervical microdiscectomy with or without fusion. *2007;20:361-8.*
- Robinson RA, Smith GW. Anterolateral cervical disc removal and interbody fusion for cervical disc syndrome. *Bull Johns Hopkins Hosp* 1955;96:223-4.
- Aebi M, Zuber K, Marchesi D. Treatment of cervical spine injuries with anterior plating. Indications, techniques, and results. *Spine (Phila Pa 1976)* 1991;16:38-45.
- Farey ID, McAfee PC, Davis RF, Long DM. Pseudarthrosis of the cervical spine after anterior arthrodesis: treatment by posterior nerve-root decompression, stabilization, and arthrodesis. *J Bone Joint Surg Am* 1990;72:1171-7.
- Gore DR, Sepic SB. Anterior cervical fusion for degenerated or protruded discs: a review of one hundred forty-six patients. *Spine (Phila Pa 1976)* 1984;9:667-71.
- Ahn JS, Lee JK, Kim JH. Comparative study of clinical outcomes of anterior cervical discectomy and fusion using auto bone graft or cage with bone substitute. *Asian Spine J* 2011;5:169-75.
- Brown CA, Eismont FJ. Complications in spinal fusion. *Orthop Clin North Am* 1998;29:679-99.
- Shen FH, Samartzis D, Khanna N, Goldberg EJ, An HS. Comparison of clinical and radiographic outcome in instrumented anterior cervical discectomy and fusion with or without direct uncovertebral joint decompression. *Spine J* 2004;4:629-35.
- Oslan MA, Nepple JJ, Riew KD, Lenke LG, Bridwell KH, Mayfield J, et al. Risk factors for surgical site infection following orthopaedic spinal operations. *J Bone Joint Surg Am* 2008;90:62-9.
- Kilburg C, Sullivan HG, Mathiason MA. Effect of approach side during anterior cervical discectomy and fusion on the incidence of recurrent laryngeal nerve injury. *J Neurosurg Spine* 2006;4:273-7.
- Sinkiewicz A, Harat M, Furtak J. Complications after surgery of the anterior cervical spine. *Neurol Neurochir Pol* 1997;31:135-44.
- Hessler C, Boysen K, Westphal M, Regelsberger J. Functional and radiological outcome after ACDF in 67 cases. *Z Orthop Unfall* 2011;149:683-7.
- Al-Shatoury HAH, Galhom AA. Cervical spondylosis [Online]. 2009 [cited on 2009 May 24]. Available from URL: http://www.emedicine.medscape.com/physical_medicine_and_rehabilitation_cervical_spondylosis.html
- Chatley A, Kumar R, Jain VK, Behari S, Sahu RN. Effect of spinal cord signal intensity changes on clinical outcome after surgery for cervical spondylitic myelopathy. *J Neurosurg Spine* 2009;11:562-7.
- Kwon JW, Lee JW, Kim SH, Choi JY, Yeom JS, Kim HJ, et al. Cervical interlaminar epidural steroid injection for neck pain and cervical radiculopathy: effect and prognostic factors. *Skeletal Radiol* 2007;36:431-6.

17. Windsor RE, Nieves RA, Sullivan KP, Hiester ED. Cervical discogenic pain syndrome. [Online] 2009 [cited on 2010 Feb 02]. Available from URL: http://www.emedicine.medscape.com/sports_medicine_cervical_discogenic_pain.html
18. Wright IP, Eisenstein SM. Anterior cervical discectomy and fusion without instrumentation. *Spine (Phila Pa 1976)* 2007; 32:772-5.
19. Ali MH, Vashdev, Shaikh BF, Choudhry AM. Changes in sensory and motor functions after surgical management of cervical prolapsed intervertebral disc by the anterior approach. *Med Channel* 2009;15:191-3.
20. Bhadra AK, Raman AS, Casey AT, Crawford RJ. Single-level cervical radiculopathy: clinical outcome and cost-effectiveness of four techniques of anterior cervical discectomy and fusion and disc arthroplasty. *Eur Spine J* 2009;18:232-7.
21. Bertalanffy H, Eggert HR. Clinical long-term results of anterior discectomy without fusion for treatment of cervical radiculopathy and myelopathy. A follow-up of 164 cases. *Acta Neurochir (Wien)* 1988;90:127-35.
22. White BD, Buxton N, Fitzgerald JJ. Anterior cervical foramenotomy for cervical radiculopathy. *Br J Neurosurg* 2007;21:370-4.
23. Kahraman S, Sirin S, Erdogan E, Atabey C, Daneyemez M, Gonul E. Is dysphonia permanent or temporary after anterior cervical approach? *Eur Spine J* 2007;16:2092-5.
24. Bertalanffy H, Eggert HR. Complications of anterior cervical discectomy without fusion in 450 consecutive patients. *Acta Neurochir (Wien)* 1989;99:41-50.
25. Chang FY, Chang MC, Wang ST, Yu WK, Liu CL, Chen TH. Can povidone-iodine solution be used safely in a spinal surgery? *Eur Spine J* 2006;15:1005-14.
26. Fang A, Hu SS, Endres N, Bradford DS. Risk factors for infection after spinal surgery. *Spine (Phila Pa 1976)* 2005;30:1460-5.
27. Fountas KN, Kapsalaki EZ, Nikolakakos LG, Smisson HF, Johnston KW, Grigorian AA, et al. Anterior cervical discectomy and fusion associated complications. *Spine* 2007;32:2310-7.
28. Jallo GI, Marcovici A. Diskitis [Online]. 2009 [cited on 2009 Aug 22]. Available from URL: http://www.emedicine.medscape.com/orthopedic_surgery_diskitis.html
29. Spennato P, Rapanà A, Sannino E, Iaccarino C, Tedeschi E, Massarelli I, et al. Retropharyngeal cerebrospinal fluid collection as a cause of postoperative dysphagia after anterior cervical discectomy. *Surg Neurol* 2007;67:499-503.

CONTRIBUTORS

ZK conceived the idea and planned the study. SS did the data collection and analyzed the study. MA supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.