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CERVICAL DEGENERATIVE DISC DISEASE: ANALYSIS OF CLINICAL SERIES

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ABSTRACT

Objective: The aim of the study is to analyze the surgeries for cervical degenerative disc disease with anterior approach in a year.

Materials and Method: We inspected 82 patients who were operated for cervical spinal problems between January-2017 and December-2017 at Department of Neurosurgery. The parameters that evaluated are the level of disease, side of the cord compression and type of surgery.

Results: Data of a total of 82 patients were included in the study. Mean age of the participants was 48,9 ± 11,1 years, M/F was 36 / 46 (43.9 % vs. 56.1 %). The lesions were on the left side in 44 cases (53.7 %), on the right side in 30 cases (36,6 %), and bilateral in 8 cases (9,8 %). Most frequent level was C5-6, C6-7 (n=17; 20,7 %). 79,3 % of the patients had cage operation, and 17,1 % had cage + plate. The comparisons of the clinical parameters between males and females revealed that age (p=0,091), lesion side (p=0,169), level (p=0,414) and operation type (p=0,599) were similar between genders.

Conclusions: Anterior cervical discectomy and fusion is the most efficient, safe and selected surgical technique in our clinic for the treatment of degenerative cervical disc diseases.

Key Words: Cervical degenerative disc disease, anterior cervical discectomy, cervical radiculopathy.

Level of Evidence: Retrospective clinical study, Level III

INTRODUCTION

The most suggested surgery technique for cervical degenerative disc diseases is anterior cervical discectomy and fusion (ACDF). Many trials have been carried out to get better results from the procedures, and it was essential to develop new graft materials and implants but these changes could not always guarantee better results [16].

Lahey and Warren described anterior cervical approach to expose esophageal diverticula [9]. Then Smith and Robinson had first applied this approach to cervical spine and reported the result of anterior cervical interbody fusion by using a horseshoe-shaped graft harvested from iliac crest but there was no attempt to remove the structure compressing neural structure and simply disc was removed and autologous bone graft was filled in the hollow space to conduct the fusion [15].

Cloward reported interbody arthrodesis by using dowel type graft [2]. It is applied Wiltberger's lumbar interbody dowel fusion technique on cervical spine, and unlike Smith-Robinson technique, it removed not only discs but also all lesions that compressing the neural structure anteriorly under direct visualization, and used a large drill to prepare the area for bone graft [2].

After its introduction in the treatment of degenerative cervical lesions, ACDF is widely used and is reported to produce good results. In our study we try to analyze our experience of anterior approach cervical procedures for cervical degenerative disc diseases in a year retrospectively.

MATERIALS AND METHODS

We inspected 82 patients who were operated for degenerative cervical disc

disease with the anterior cervical approach technique between January-2017 and December-2017 at Department of Neurosurgery. Cervical stenosis, fractures and spondylopaties excluded from the study. The information were collected from the patients file achieves retrospectively. Radiological data were inspected from the PACS system. The parameters that evaluated are the level of discopathy, side of the disc herniation and type of surgery.

Statistical Analyses

Descriptive data were presented by using mean and standard deviation, and frequencies and percent. Chi-square and Mann-Whitney U tests were used for comparisons between the independent groups of the study, and statistical significance was evaluated according to a two-sided Type-I error level of 5%. Statistical Package for the Social Sciences (SPSS) 21 software (IBM Corp. in Armonk, NY) was used for all statistical analyses of this research.

RESULTS

Data of a total of 82 patients were included in the study. Mean age of the participants was 48,9 ± 11,1 years, M/F was 36 / 46 (43.9 % vs. 56.1 %). The lesions were on the left side in 44 cases (53.7 %), on the right side in 30 cases (36,6 %), and bilateral in 8 cases (9,8 %). Most frequent level was C5-6, C6-7 (n=17; 20,7 %). 79,3 % of the patients had cage operation, and 17,1 % had cage + plate (Table-1).

The comparisons of the clinical parameters between males and females revealed that age (p=0,091), lesion side (p=0,169), level (p=0,414) and operation type (p=0,599) were similar between genders (Table-2).

Table-1. General characteristics of patients

	Mean	**SD**
Age	48,9	11,1
	n	**%**
Sex		
Male	36	43,9
Female	46	56,1
Side		
Left	44	53,7
Right	30	36,6
Bilateral	8	9,8
Level		
C2-3 sequestrated DH	1	1,2
C3-4, C4-5	2	2,4
C3-4, C4-5 DH + C5-C7 OPLL	1	1,2
C3-4, C4-5, C5-6	6	7,3
C3-4, C4-5, C5-6, C6-7	1	1,2
C4-5 operated DH and C4-5, C5-6, C6-7	1	1,2
C4-5, C5-6	6	7,3
C4-5, C5-6, C6-7	13	15,9
C4-5, C6-7	2	2,4
C5-6	16	19,5
C5-6, C6-7	17	20,7
C5-6, C6-7, C7-T1	1	1,2
C6-7	14	17,1
C7-T1	1	1,2
Operation		
Cage	65	79,3
Cage+plate	14	17,1
Revision	3	3,7

Table-2. Comparisons of clinical parameters between males and females

	Male	Female	p
	Mean±SD	**Mean±SD**	
Age	46,4±9,5	50,9±11,9	0,091
	n (%)	**n (%)**	
Side			0,169
Left	21 (58,3)	23 (50)	
Right	14 (38,9)	16 (34,8)	
Bilateral	1 (2,8)	7 (15,2)	
Level			0,414
C2-3 sequestrated DH	1 (2,8)	-	
C3-4, C4-5	2 (5,6)	-	
C3-4, C4-5 DH + C5-C7 OPLL	-	1 (2,2)	
C3-4, C4-5, C5-6	3 (8,3)	3 (6,5)	
C3-4, C4-5, C5-6, C6-7	-	1 (2,2)	
C4-5 operated DH and C4-5, C5-6, C6-7 Discopathy	-	1 (2,2)	
C4-5, C5-6	4 (11,1)	2 (4,3)	
C4-5, C5-6, C6-7	7 (19,4)	6 (13)	
C4-5, C6-7	-	2 (4,3)	
C5-6	5 (13,9)	11 (23,9)	
C5-6, C6-7	6 (16,7)	11 (23,9)	
C5-6, C6-7, C7-T1	1 (2,8)	-	
C6-7	7 (19,4)	7 (15,2)	
C7-T1	-	1 (2,2)	
Operation			0,599
Cage	29 (80,6)	36 (78,3)	
Cage+plate	5 (13,9)	9 (19,6)	
Revision	2 (5,6)	1 (2,2)	

DISCUSSION

Cervical degenerative disc disease is a common cause of pain and disability. Most symptomatic cases present between the ages of 40-60, although many individuals never develop symptoms [5]. Cervical radiculopathy is a common cause of pain and can result in progressive neurological deficits [6]. Many conservative treatment modalities like physical therapy and injection were described. MRI studies have documented the presence of cervical degenerative disc disease in 60 % of asymptomatic individuals aged greater than 40 years and 80% of patients over the age of 80 years [10,11].

Anterior cervical discectomy and fusion (ACDF) is a standard surgical procedure in the treatment of symptomatic cervical radiculopathy and myelopathy [7]. It affords the surgeon the ability to provide direct (from the discectomy) and indirect (through restoration of disc height) decompression and stabilization [4]. Various implant and graft devices have been developed for use with ACDF [18]. The anatomy of cervical spine must be well known for the better results of the operations [8].

Kim et al reported the largest serie operated for cervical radiculopathy with 1420 cases [6]. They found that the levels most often affected were C6 and C7, the most common primary procedure performed to treat radiculopathy was ACDF (50 % of cases), the overall revision rate was 6.4 % for cases where the index procedure was performed at the same institution and clinical adjacent segment pathology was the most common reason for revision surgery comprising 4.2 % of cases at 3.3-year follow-up [6].

Despite the overall success of ACDF, the complex and potentially dangerous anatomy of an anterior cervical approach has been associated with high complication rates [12,17]. Complications of ACDF could be exampled as dissection injuries (vascular, esophageal, and tracheal), nerve injuries, hyperostosis, CSF fistula and bone graft site injuries[3].

Many of the complications are hypothesized to be related to increased tissue edema and damage due to retractor placement, increased operative time, and prolonged intubation [12]. The donor site complication due to the use of host bone led to the morbidity rate of 20% or higher, and it is presented as pain in the donor site, seroma, hematoma, infection, hip fracture, and Meralgia Paresthetica [14]. Allogenic bone graft and synthetic devices were suggested to resolve those problems.

TDR has been proposed as an alternative treatment to ACDF. Cervical arthroplasty maintains motion and believed to decrease the adjacent segment disease and reduce the rate of reoperations [1]. Literature have shown similar outcomes for ACDF and TDR(13). TDR is not indicated for cervical disease at more than 2 levels. These devices are indicated for skeletally mature patients for reconstruction of disc following discectomy at a single level or adjacent levels for radiculopathy or myelopathy. In our series we did not use any TDR.

Mayo et al described a significant surgical learning curve associated with ACDF in their study and they reported that as a surgeon performs more operations, decreases in procedural time and estimated blood loss are observed [12]. The most meaningful portion of improvement occurs during the first 60 cases, with arthrodesis rate increasing over a longer time period; however, no difference in hospital length of stay, complication rate, or improvements in postoperative pain were demonstrated with increased surgeon experience [12].

CONCLUSION

Anterior cervical discectomy and fusion is the most efficient, safe and most selected surgical technique in our clinic for the treatment of degenerative cervical disc diseases.

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