Original Article

Frequency of Cerebrospinal Fluid Leakage in Patients with Caries Spine Treated with Cage Fixation Procedure with Anterior Approach

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ABSTRACT

Objective: To determine the frequency of cerebrospinal fluid leakage in patients with caries spine treated with cage fixation procedure with anterior approach.

Study Design: Descriptive study

Place and Duration of Study: This study was conducted at the Department of Neurosurgery Bahawal Victoria Hospital, Bahawalpur from November 2014 to May 2015.

Materials and Methods: A total of 157 patients with proven tuberculosis and having significant kyphosis (>40° of segmental kyphosis) and instability (anteroposterior translation; >40° of segmental kyphosis), 30 to 60 years of age were included. Patients with h/o previous operation and those who were not willing to participate excluded from the study. All patients were followed for 1 month for presence or absence of CSF leakage (yes/no) and final outcome was noted.

Results: There were 102 (64.97%) males while 35.03% patients were females with mean age of 48.07±8.35 years (30-60 years). Cerebrospinal fluid leakage was found in 13 (8.28%) patients, whereas no CSF leakage in 144 (91.72%) patients.

Conclusion: The cage fixation procedure with anterior approach is safe and effective with low rate of cerebrospinal fluid leakage.

Key Words: Pott's disease, **S**urgery, **A**nterior approach, **C**erebrospinal fluid, **L**eakage

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INTRODUCTION

Worldwide, Pott's disease (tuberculous spondylitis) considered as one of the oldest diseases.[1] Spinal tuberculosis is the frequent type of skeletal tuberculosis and approximately rated 50% of tuberculosis cases.[2] In 1779, first advanced case of spinal TB was reported by Percival Pott.[3] In TB patients there is just <1% of spinal involvement but in developing and developed countries the prevalence of tuberculosis is increasing day by day due to multiple causes and this situation accounts to increase the rate of spinal TB.[4] The most influenced part of spine are lower thoracic and upper lumbar vertebrae.[5]

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In scientific language this malignant disorder is known as tuberculous spondylitis and mostly found in thoracic part of the spine.[5,6]

The previous studies reported that the pott's disease is resulted due to proliferate of TB from other sites and then the infection proliferate from two adjacent vertebrae.[7] This malignant infection causes bone extinction and development of abscess, which could induce untreatable neurologic deficit and devastating situation in the case of diagnosis delays. Indeed, for avoiding the severity of the related complications, the early diagnosis is the main priority for the management of spinal tuberculosis. Early and accurate diagnosis and proper treatment will be effective and it can help to decrease the spinal TB rate.[8]

The symptoms of spinal TB are backache and neck-ache, radicular pain in arms and legs, weakness in both upper and lower limbs and spinal deformity with sphinteric involvement and bedsores.[9] Studies described that early and effective treatment methodologies is helpful in the prevention of long term neurological deficits.[10] Due to unawareness, many of patients presented late and it caused severe neurological disorders.[11] Surgical treatment for severe spinal instability or progressive neurological symptoms with evidence of cord compression and deformation is considered.[7] After meticulous debridement of all

infected tissue, the anterior column defect is then reconstructed with bone graft or titanium cages can also be used to reconstruct these defects.[12-14] Cerebrospinal fluid leakage associated with cage fixation of caries spine has been reported in 9.1% patients.[15]

MATERIALS AND METHODS

This descriptive, case series study was carried out at Department of Neurosurgery, Bahawal Victoria Hospital, Bahawalpur from 15th November 2014 to 14th May 2015. A total of 157 patients with proven tuberculosis and having significant kyphosis (>40° of segmental kyphosis) and instability (anteroposterior translation; >40° of segmental kyphosis), 30 to 60 years of age were included. Patients with h/o previous operation and those who were not willing to participate excluded from the study. The patients were explaining all the risks or complications of the procedure to the patients and patients underwent cage fixation of caries spine through anterolateral approach. All patients were given same injectible antibiotics pre-operatively and for 5 days post-operatively. All patients were followed for 1 month for presence or absence of CSF leakage (Yes/No) and final outcome was noted. The data was analyzed using SPSS-20.

RESULTS

There were 102 (64.97%) males while 35.03% patients were females with mean age of 48.07±8.35 years (30-60 years). CSF leakage was found in 13 (8.28%) patients, whereas no CSF leakage in 144 (91.72%) patients (Table 1).

Table No.1: Demographic information of the patients (n=157)

Variable	No.	%
Age (years)		
30-40	35	22.29
41-50	58	36.94
51-60	64	40.76
Gender		
Male	102	64.97
Female	55	35.03
Duration of symptoms (years)		
≤3	94	59.87
>3	63	40.13
CSF		
Yes	13	8.28
No	144	91.72

Table No.2: Comparison of CSF leakage with age groups

Age (years)	CSF Leakage		p-value
	Yes	No	
30-40	2 (5.71%)	33 (94.29%)	0.813
41-50	5 (8.62%)	53 (91.38%)	
51-60	6 (9.38%)	58 (90.62%)	

When the CSF leakage compared with age, gender and duration of disease, it was found no significant difference statistically (Tables 2-4).

Table No.3: Comparison CSF leakage with gender

Gender	CSF Leakage		p-value
	Yes	No	
Male	8 (7.84%)	94 (92.16%)	0.787
Female	5 (9.09%)	50 (90.91%)	

Table No.4: Comparison of CSF leakage with duration of disease

Duration of disease (years)	CSF Leakage		P value
	Yes	No	
≤3 years	5 (5.32%)	89 (94.68%)	0.100
>3 years	8 (12.70%)	55 (87.30%)	

DISCUSSION

Spinal TB is usually insidious in onset; rarely it may present acutely. The symptoms are backache and neck-ache, radicular pain in arms and legs, weakness in both upper and lower limbs and spinal deformity with sphinteric involvement and bedsores. Sciatica mimicking symptoms have also been reported. Surgical treatment for severe spinal instability or progressive neurological symptoms with evidence of cord compression and deformation is considered.[16-18]

Surgeon's used both techniques anterior or posterior for surgical treatment of spinal disorders and described that these methods showed significant outcomes regarding prevention of long term neurological deficit.[19] Meticulous debridement of all infected tissue, the anterior column defect is then reconstructed with bone graft or titanium cages can also be used to reconstruct the defects.[14]

The age range was 30 to 60 years with mean age of 48.07±8.35 years, 102 (64.97%) were males and 55 (35.03%) were females. These results shows similarity to some other studies in which males patients was high in numbers as compared to females with age ranges 40 to 65 years.[20] in the present study and CSF leakage was found in 13 (8.28%) patients, whereas no CSF leakage in 144 (91.72%) patients in the present study. While Hsu et al[15] reported that cerebrospinal fluid leakage associated with cage fixation of caries spine has been reported in 9.1% patients.

Ali et al[10] believes that canal decompression and correction of spinal deformity is best achieved through anterior decompression and grafting technique. Out of 36 cases, excellent results were achieved in 27 cases within first 2 months. All these patients achieved power of 4/5 according to Medical Research Council grading and were walking without support independently after 6 months. Sphinteric improvement was seen in 29 cases in first 4 months. The early management for spinal TB

is the use of ATT drug. This type of management is suitable for cases that are in the early course of disease, without myelopathy and without demonstrable radiological instability or cord compression. Even then, such patients should be closely observed with repeated imaging to look for delayed instability. Anti-tubercular drugs with immobilization and external orthosis is a must in the initial stage of treatment.[22]

Anterior surgery on the spine represents a less commonly utilized but important adjunct in the armamentarium of the spine surgeon. The anterior approach provides excellent exposure of the thoracic and lumbar spine.[23] Through a single-stage approach, direct visualization for spine decompression and stabilization is possible. Anterior approaches to structured insufficiency of the anterior and middle column and to anterior decompression of the neural structures are based on solid theoretical concepts with favorable clinical results.[24] Spinal reconstruction in cases of tumor, infection or trauma will continue, under certain circunstances, to be routine indications for anterior surgery of the thoracic and lumbar spine.[25,26]

Advocates of the traditional anterior approach[27] cite the ability to directly access the disease pathology and perform decompression, less muscle dissection and the ability to place a large graft under compressive load for fusion. Spinal instability is likely to increase after surgical decompression in the immediate postoperative period. The bone graft does not give initial stability and graft related complications occur more often when the span of the graft exceeds a two-disc space.[28] Many of previous studies regarding caries spine illustrated cage fixation method with anterior approach had a better outcomes with no procedural complications and the rate of cerebrospinal fluid leakage was low.[29-30]

CONCLUSION

There is low frequency of cerebrospinal fluid leakage after cage fixation with anterior approach in caries spine patients. So, we recommend that anterior approach for cage fixation should be used primary approach in carries spine patients in order to reduce their morbidity.

Author's Contribution:

Concept & Design of Study:	Mumtaz Ahmed
Drafting:	Muhammad Feroz Nawaz
Data Analysis:	Habib Ullah, Faisal Ali
Revisiting Critically:	Mumtaz Ahmed, Muhammad Feroz Nawaz
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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