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Research Article

**A RESEARCH TO ASSESS THE CEREBROSPINAL LEAKAGE  
AFTER CAGE FIXATION BY ANTERIOR APPROACH AMONG  
CARIES SPINE PATIENTS**

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**Abstract:**

**Objective:** To assess the leakage of cerebrospinal fluid after fixation of the cage along with the anterior approach within patients of caries spine.

**Methods:** The study held at Jinnah Hospital, Lahore from April 2017 to January 2018. The patients with confirmed tuberculosis (ESR greater than 100 mm/h and with positive skin tuberculin test) and significant kyphosis (Above 40° of segmental kyphosis) or instability (segmental kyphosis lateral translation; >40° or anteroposterior) were considered as positive. Patients with Cerebrospinal Fluid Leakage, having any CFS postsurgical leakage from the wound on a calculated tomography myelogram scan which is the leakage of contrast from the dural site tear up to the surface of the skin, was positive and final outcome was observed after 30 days. Patients of both genders having an age range from 31 to 62 years were enrolled within the research.

**Results:** The age range in this study was from 32 to 62 years having an average age of (49 ± 8.40) years. Out of 157 patients, 102 (64.97%) were males and 55 (35.03%) were females with male to female ratio of 2:1. CSF outflow was observed with 13 (8.28%) participant patients, and without CSF leakage within 144 (91.72%) patients.

**Conclusion:** This study concludes that there is a lower frequency of leakage of cerebrospinal fluid after cage fixation with the anterior approach within caries spine patients.

**Keywords:** Pott's Disease, Kyphosis, Spinal Fusion, Anterior Approach and Cerebrospinal Fluid Leak.

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**INTRODUCTION:**

Pott's disease which also has the name as tuberculous spondylitis, having been observed and documented within spinal leftovers from the Iron age within European territories and within very old mummies from the Pacific coast of South America and the Egypt [1]. Spinal tuberculosis is one of the most common forms of skeletal tuberculosis and comprises over approximately, 50 % of all tuberculosis cases of joints and bone [2]. The spinal involvement happens within less than 1 percent of patients with TB but the growing frequency of TB within both developing and developed countries is continued making the spinal TB a health issue [3, 4]. The upper lumbar vertebrae and lower thoracic are the parts of the spine which are most often affected [5]. It has also the name as tuberculous spondylitis Scientifically and its localization is most common within the thoracic part of the spine [5, 6]. The indications of spinal TB include neck-ache and backache, radicular pain in legs and arms, deficiency in both lower and upper limbs and spinal deformity and bedsores with sphincteric participation [7]. Early treatment and diagnosis are important within the long-term neurological sequelae prevention [8]. Surgical treatment for progressive neurological symptoms or severe spinal instability along with signs of cord deformation and compression are considered [9]. The goal lines of surgery within Pott's spine are adequate debridement, adequate decompression, reinforcement and maintenance of stability and prevention and correction of deformity [10]. After vigilant debridement of all infected tissue, the frontal defect of the column is then rebuilt by titanium cages or bone graft can also be utilized in the reconstruction of these defects [11, 12]. The leakage of Cerebrospinal fluid linked with cage fixation of caries spine has been observed and noted within 9.1% of patients [13]. The study focused to detect out cerebrospinal fluid leakage frequency after cage fixation with the anterior approach within the patients of caries spine. No data was available from this region and this highlights the extent of the problem locally but will also help us in developing guidelines and recommendations for clinical staff to reduce postsurgical morbidity within caries spine patients.

**METHODS:**

The study held at Jinnah Hospital, Lahore from April 2017 to January 2018. The patients with confirmed tuberculosis (ESR greater than 100 mm/h and with positive skin tuberculin test) and significant kyphosis (Above 40° of segmental kyphosis) or instability (segmental kyphosis lateral translation; >40° or anteroposterior) were considered as positive. Patients with Cerebrospinal Fluid Leakage, having any CFS

postsurgical leakage from the wound on a calculated tomography myelogram scan which is the leakage of contrast from the dural site tear up to the surface of the skin, was positive and final outcome was observed after 30 days. Patients of both genders having an age range from 31 to 62 years were enrolled within the research study and patients were having confirmed tuberculosis and kyphosis which is segmental kyphosis greater than 40° and uncertainty (anteroposterior translation; segmental kyphosis higher than 40°). The patients who were not fit for surgery, not willing for surgery, unwilling to be included in the study, already operated and which involved spine other than dorsal spine were excluded from the study. Ethical approvals were obtained from the hospital ethical committee. A total number of 157 patients admitted in the hospital fulfilling satisfying inclusion criteria were enrolled in the study. Informed consent was obtained from all participant patients by clearing up all the hazards of the procedure, all patients undertook caries spine cage fixation by anterolateral approach and all patients were pre-operatively provided with the same injectable antibiotics and postoperatively for five days. Patients were under observation for 30 days for knowing the presence or absence of CSF leakage and the final outcome was recorded as yes or no. Data was recorded on proforma. Computer software SPSS was utilized for data collection and analysis. Standard and mean deviation was measured for measurable variables i.e. disease duration and age. Percentage and frequency were measured for variables i.e. CSF leakage (yes or no) and gender. Effect modifiers like gender, duration of disease and age were controlled by the mean of stratification. After the stratification chi-square test was utilized to observe their properties on the outcome. P-value 0.05 was considered as significant.

**RESULTS:**

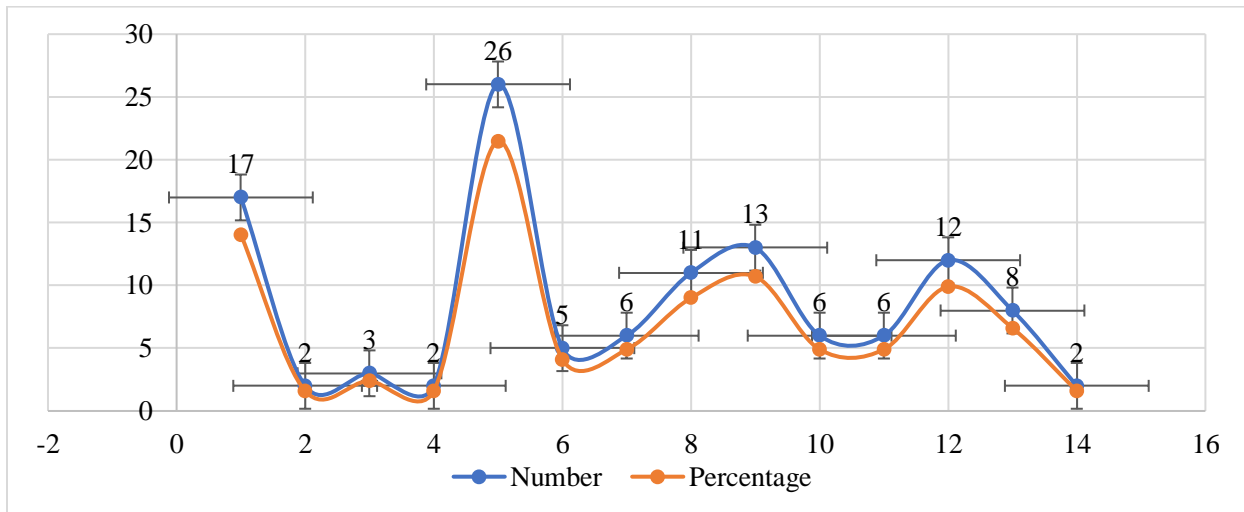
The patients within our study comprised over from 31 to 62 years with an average age of (49 ± 8.40) years. CSF leakage was present within 13 patients (8.28%) whereas CSF leakage was not within 144 patients (91.72%). Three groups were made for the patients as age group 30 to 40 years, age group 41 to 50 years and age group 51 to 60 years. Thirty-four patients (22.25%) belonged to the age group 30 to 40 years, 59 patients (36.94%) belonged to the age group 41 to 50 years and 64 patients (40.76%) belonged to age group 51 to 60 years. The CSF leakage was observed within two patients (5.71%) of 30 to 40 years group, 05 patients (8.62%) of 41 to 50 years age group and 06 patients (9.38%) of 50 to 60 years age group. Insignificant (P = 0.815) CSF leakage association with the age of the patients was observed. The CSF leakage

was found in 08 (7.84%) male patients out of total 102 (64.97%) male patients and within 05 (9.09%) female patients out of 55 (35.03%) total female patients. CSF leakage with gender was noted statistically insignificant with p-value 0.788. Within 94 patients (59.87%) the disease duration was  $\leq 3$  years and

leakage of CSF was observed within 05 patients (5.32%). Within 63 patients of  $>3$  years (40.13%) the leakage of CSF was observed in 08 patients (12.70%). Insignificant ( $P = 0.100$ ) CFS leakage association with disease duration was observed.

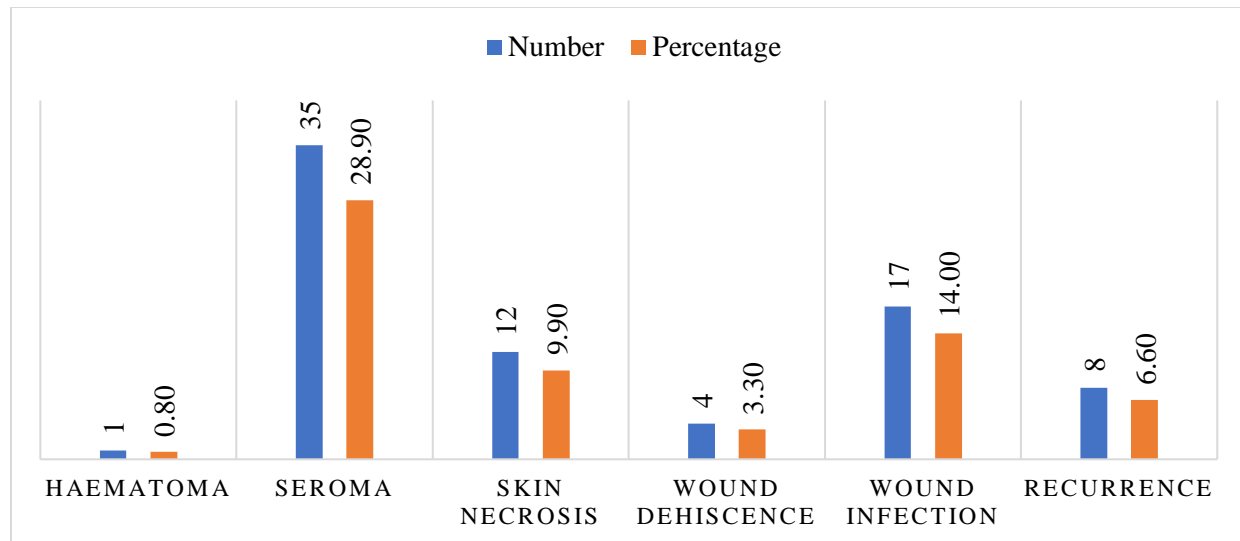
**Table – I:** The previous operations leading to incisional hernia (121)

Previous Operation		Number	Percentage
Kocher's incision	a. Cholecystectomy	17	14.04
	b. Hydatid cyst liver	2	1.60
	c. Obstructive jaundice	3	2.40
Left subcostal incision	Post Splenectomy	2	1.60
Midline incision for	a. Emergency surgery	26	21.48
	b. Elective surgery	5	4.10
Pfannensteil incision for	a. Elective gynecological procedures	6	4.90
	b. Emergency obstetrical procedures	11	9.00
	c. Bladder / prostate surgery	13	10.70
Gridiron incision for	a. Appendectomy	6	4.90
	b. Right Hemicolectomy	6	4.90
Rutherford Morrison's incision for	a. Pyelo / nephrolithotomy	12	9.90
	b. Nephrectomy	8	6.60
	c. Perinephric abscess drainage	2	1.60
Others		2	1.60



**Table – II:** Postoperative Complications (77)

Complications	Number	Percentage
Hematoma	1	0.80
Seroma	35	28.90
Skin necrosis	12	9.90
Wound dehiscence	4	3.30
Wound infection	17	14.00
Recurrence	8	6.60



### DISCUSSION:

The major purpose of our research study was to detect out the fluid leakage (cerebrospinal) frequency after cage fixation with the frontal method in the patients of caries spine. The age range of participant patients within our study ranged from 31 to 62 years with an average age of  $(49 \pm 8.40)$  years. Maximum patients 64 (40.76%) were among 50 to 60 years of age. Out of 157 participant patients, 102 patients (64.97%) were male and 55 patients (35.03%) were females (male to female ratio of 2:1). The leakage of CFS was observed in 13 patients (8.28%), while there was no CSF leakage in 144 patients (91.72%). A study reported 9.1% of patients with leakage of cerebrospinal fluid associated with caries spine cage fixation [13]. A study presented by Ali M et al stated that canal decompression and spinal deformity correction was best achieved by mean of grafting and anterior decompression technique [8]. Usage of ATT drug is early management for spinal TB and current type of administration is found appropriate for cases within the initial course of the disease, without demonstrable as well as without myelopathy or compression of the cord. Patients like this must be under close observation with arrangements of repeated imaging for watching

for overdue instability. Against tubercular drugs along with external orthosis and immobilization are very important within the early stage of treatment [14]. Surgery of anterior surgery on the spine is an important assistant in the armamentarium of the spine surgeon. There is an excellent exposure of the lumbar and thoracic spine through anterior approach [15]. Direct imaging for spine stabilization and decompression is likely through a single stage approach. Anterior approaches towards anterior decompression of the neural constructions and structured deficiency of the anterior as well as central column are based on favourable clinical results and solid theoretical concepts [16]. Spinal rebuilding within cases of tumour, trauma or infection will remain, under specific circumstances, as routine signs for surgery of anterior of the lumbar and thoracic spine [17, 18]. Alternatively, the anterior approach to the lumbar and thoracic spine is a more complex process and requires technical and anatomic knowledge by the spine surgeon [18]. Early stability and complications are not provided by bone graft, as related to graft happen more often when the graft distance surpasses a two-disc space [19]. The anterior instrumentation within tuberculous spondylitis is a new concept. In a

study presented by Oga et al evaluated the adherence Mycobacterium tuberculosis capacity to stainless steel and stated result that adherence was negligible and the usage of implants within regions with active tuberculosis infection may be safe [20]. Many studies have verified that the treatment of active tuberculosis spondylitis with the help of anterior instrumentation along with fusion and anterior debridement provides an effective and high rate of deformity maintenance and correction [14]. Yet, there can be associated with lung scarring secondary to active/old pulmonary tuberculosis, which can impede the anterior approach.

### CONCLUSION:

This study concludes that there is a lower frequency of leakage of cerebrospinal fluid after cage fixation with the anterior approach within caries spine patients.

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