

Comparative Study of Anterior Decompression for Caries Spine using Strut Graft with and without Instrumentation

Anterior Decompression for Caries Spine using Strut Graft

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ABSTRACT

Objective: To compare the anterior decompression for caries spine using strut graft with and without instrumentation.

Study Design: Comparative Study

Place and Duration of Study: This study was conducted at the Idris Teaching Hospital of Sialkot Medical College, Sialkot from January 2018 to July 2019.

Materials and Methods: A total of 60 patients were included into group A and Group B, 30 patients in each. Group A patients were managed with strut graft and instrumentation using Moss Miami system. Group B patients were treated by strut graft only. The sample size is based on the past 1 year record of the hospital and about this number of patient is expected to be available. Written Informed consent was taken from every patient included in this study. The permission of ethical committee was also taken Information was then collected using Performa. Participants were selected through non probability consecutive sampling technique.

Results: The outcome of and follow up of the patients immediate after operation, there was no patient of complete slippage and 50% slippage i.e. 100% patients were stable. On 3rd day, 100% patients were stable, on 1st month of discharge the patients were 100% stable, on 2nd month, there were 06(10%) patients of 50% slippage were found and there were 30/24(100/80%) patients were stable, on 3rd month there was 6(10%) patients of 50% slippage were found and 30/24(100/80%) patients were stable. On 4th month, 2 patients(3.33%) of complete slippage and 4 patients (6.66%) of 50% slippage were found and the rest of the patient were stable, on the fifth month the results were same as at the 4th month, at six month of discharge there were 2 patients (3.33%) of complete slippage and 04 patients(6.66%) of 50% slippage were found and the rest of the patient were stable.

Conclusion: We believe that graft with instrumentation is more effective than only graft from reducing the deformity and stabilizing the vertical column in patient who have tuberculosis of the spine.

Key Words: Caries spine, anterior decompression, strut graft with moss Miami and strut graft

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INTRODUCTION

Tuberculosis is the world's leading causes of the death, from a single infectious disease with 2 million death in 1990. It is the most endemic, chronic infection which paralyzes the society when it effects the spine due to its resultant neurological deficit. Despite the adequate control of pulmonary tuberculosis, the incidence of musculoskeletal tuberculosis is increasing¹.

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Progressive kyphotic deformity is a common end result of neglected TB spine. Anterior decompression along with anti-tuberculous chemo therapy will hasten formation of bone with prevention of kyphosis and its complication.² Spine instrumentation is needed to support the anterior strut graft in patients who have kyphosis that effect more than 2 levels. The anterior instrumentation is more effective than posterior instrumentation.³

Posterior decompression in the form of transpedicular fixation is necessary in short segment fixation only as it preserves the functional unit of spine.⁴

MATERIALS AND METHODS

A total of 60 patients were included into group A and Group B, 30 patients in each. Group A patients were managed with strut graft and instrumentation using Moss Miami system. Group B patients were treated by strut graft only. The sample size is based on the past 1 year record of the hospital and about this number of

patient is expected to be available. Written Informed consent was taken from every patient included in this study. The permission of ethical committee was also taken. Information was then collected using Performa. Participants were selected through non probability consecutive sampling technique. The permission of ethical committee of the research is also taken.

Sample selection:

Inclusion criteria:

1. All the patients were between 15-60 years of age of both sex with no previous spinal surgery having spinal tuberculosis from D7-L5 vertebrae were included
2. Having neurological status of any grade were included in this study
3. Tuberculous spine which involves less than 3 vertebrae included in this study
4. Patients not responding to conservative treatment were included in this study

Exclusion criteria:

1. Patients with caries of cervical and upper six segments of thoracic spine
2. Patients having congenital spinal deformity
3. Patients having myopathic and paralytical disorder

Data collection: Patients demographic information, history, clinical examination, investigations type of surgical procedure, the recovery and follow up were recorded in a special design performa. The data was analyzed by SPSS 10.0 version. As the outcome of this study was "quantitative" t-test were applied for significance.

Data Analysis: Data was entered and analyzed in SPSS v23.0. Quantitative variables include age, duration of dialysis and duration of PPI use and were expressed as mean \pm standard deviation. Qualitative variables include gender and presence of hypomagnesemia and were expressed as frequencies and percentages. Data was stratified for age, gender, duration of dialysis, duration of PPI use and type of PPI used to deal with effect modifiers. Post-stratification, Chi-square test was used. $P \leq 0.05$ will be considered significant.

RESULTS

At the age of 20-30 years there were 8 patients(13.33%) in group A and 12(20%) in group B. At the age of 31-40 years there were 8 patients (13.33%) in group A and no patient in group B. At the age of 41-50 years, there were 12 patients (20%) in group A and 6 patients (10%) in group B. At the age of 51-60 years there were 2 patients (3.33%) in group A and 12 patients (20%) in group B. At the age >60 years there were 4 patients in group A and no patient in group B as Shown in Table 1. There were 26 married patients (43.33%) in group A and 24 patients (40%) in group B. There were 4 unmarried patients (6.66%) and 6 patients (10%) in group B as shown in table 2.

There were 25 male patients (41.66%) in group A and 20 male patients (33.33%) in group B. There were 05 female patients (8.33%) in group A and 10 female patients (16.66%) in group B as shown in table 3

At the site of D7-D8, there were 6 patients(10%) in group A and no patient in group B. The site of lesion at D8-D9 there were 4 patients (6.66%) in group A and 6 patients (10%) in group B. At D9-D10, there were no patient in group A and 06 patients (10%) in group B. At D10-D11 there was no patient in group A but 06 patients(10%) in group B. At the D12 there were patients(6.66%) in group A but there were no patient in group B. At Lumbar region (L1-L2) there were 12 patients (10%) in group A and 6 patients (10%) in group B. At L2-L3 there were 4 patients (6.66%) in group A but there was no patient in group B. At L4-L5 there was no patient in group A but 6 patients (10%) in group B as shown in table 4.

In neurological status, there were 24 patients(40%) having normal tone in group A and also 24 patients (40%) having normal tone in group B but the tone was increased in 06 patients(10%) in group A and also 6 patients (10%) in group B. The reflexes were normal in 24 patients (40%) in group A and 12 patients(20%) in group B but the reflexes were exaggerated in 6 patients(10%) in group A and 18 patients (30%) in group B. The muscle power was normal(5/5) in 14 patients (23.33 %) and 12 patients (20%) in group B, muscle power was 2/5 in 4 patients (6.66%) in group A and 6 patients (10%) in group B, the muscle power was 2+ in 4 patients (6.66 %) in group A and 06(10%) in group B, the muscle power was 4/4 in 8 patients(13.33%) in group A and 6 patients(10%) in group B. Sensory system was normal in 20 patients(33.33%) in group A and 12 patients (20%) in group B, Below D7, there were 4 patients (6.66%) in group A and 6 patients(10%) in group B, below d 10 there were 6 patients (10%) in group A and also 6 patients (10%) in group B, the sensory system was normal, below umbilicus in 6 patients (10%) in group B and there was no patient in group A as shown in table 5. According to frankel's classification, the neurological status in class A and class B there was no patient in pre operative and post operative cases, in class C there was 4 pre operative patients(6.66 %) in group A and 6 patients (10%) in group B and there was no post operative case in A group and 2 patients (3.33%) in group B, in class D there were 12 pre operative patients (20%) in group A and 12 patients(20%) in group B, there were 2 post operative patients(3.33%) in group A and B in each group, in class E there were 14 pre operative patients (23.33%) in group A and 12 patients (20%) in group B and there were 28 post operative patients (46.66%) in group A and 26 post operative patients(43.33%) in group B as shown in table no 6

The outcome of and follow up of the patients immediate after operation, there was no patient of

complete slippage and 50% slippage i.e. 100% patients were stable.

Table No 1:Age Distribution

Age(Years)	Group A	Group B
20-30	4(6.66%)	12(20%)
31-40	8(13.33%)	-
41-50	12(20%)	6(10%)
51-60	2(3.33%)	12(20%)
>60	4(6.66%)	-

Table No. 2: Distribution of marital status

Married/Unmarried	Group A	Group B
Married	26(43.33%)	24(40%)
Unmarried	4(6.66%)	6(10%)

Table No.3:Gender Distribution

Gender	Group A	Group B
Male	25(41.66%)	20(33.33%)
Female	05(8.33%)	10(16.66%)

Table No.4: Distribution of Site of Lesion

Site of Lesion	Group A	Group B
Thoracic (D7-D8)	06(10%)	-
D8-D9	04(6.66%)	6(10%)
D9-D10	-	06(10%)
D10-D11	-	06(10%)
D12	04(6.66%)	-
Lumbar (L1-L2)	12(20%)	06(10%)
L2-L3	4(6.66%)	-
L4-L5	-	6(10%)

Table No.5: Distribution of Neurological Status

System	Group A	Group B
Tone(normal)	24(40%)	24(40%)
Increased	06(10%)	06(10%)
Reflexes(normal)	24(40%)	12(20%)
Exageratted	06(10%)	18(30%)
Power(normal)5/5	14(23.33%)	12(20%)
2/5 both	4(6.66%)	6(10%)
2+both	4(6.66%)	3/5 both (6)(10%)
4/5	8(13.33%)	4/5 Lt,5/5 Rt (6)(10%)
Sensory System (Normal)	20(33.33%)	12(20%)
Below D7	4(6.66%)	6(10%)
Below D10	6(10%)	6(10%)
Below Umbilicus	-	06(10%)

Table No.6: Neurological Status according to Frankel's Grade classification Pre operative Post operative(6 months)

	Group A	Group B	Group A	Group B
A	-	-	-	-
B	-	-	-	-
C	4(6.66%)	6(10%)	-	2(3.33%)
D	12(20%)	12(20%)	2(3.33%)	2(3.33%)
E	14(23.33%)	12(20%)	28(46.66%)	26(43.33%)

Table No.7 : Outcome and follow ups

	Complete Slippage	50% Slippage	Stable
Immediate after operation	-	-	30/30(100/100%)
On 3 rd day	-	-	30/30(100/100%)
On discharge (1 st month)	-	-	30/30(100/100%)
2 nd month	-	0/6	30/24(100/80%)
3 rd month	-	0/6	30/24(100/80%)
4 th month	0/2	0/4	30/24(100/80%)
5 th month	0/2	0/4	30/24(100/80%)
6 th month	0/2	0/4	30/24(100/80%)

On 3rd day, 100% patients were stable, on 1st month of discharge the patients were 100% stable , on 2nd month, there were 06(10%) patients of 50% slippage were found and there were 30/24(100/80%) patients were stable ,on 3rd month there was 6(10%) patients of 50% slippage were found and 30/24(100/80%) patients were stable. On 4th month, 2 patients(3.33%) of complete slippage and 4 patients (6.66%) of 50% slippage were found and the rest of the patient were stable ,on the fifth month the results were same as at the 4th month, at six month of discharge there were 2 patients (3.33%) of complete slippage and 04 patients(6.66%) of 50% slippage were found and the rest of the patient were stable as shown table 7.

Comparison between group A and group B at the level of 1st month after operation and at 6 months after follow up, the p<0.05 i.e. statistically not significant

DISCUSSION

Tuberculosis is most endemic, chronic infection, which paralyzes the majority when it effects the spine due to its resultant neurological deficit. Despite adequate control of pulmonary tuberculosis, the incidence of musculoskeletal tb increasing.⁵

There is continuous rise in the patients of TB spine not only in the under developed country but also in developed countries has led to a challenging problem and created an increasing demand on the orthopedic department.⁶

Moreover, this disease poses a very grave effect on financial & economical balance of the society. There disabilities demand a more quick, rewarding and practicable mode of treatment of the patients in the form of full physical recovery and quiescence of the disease. But the picture had been quite opposite and confusing regarding treatment option. Especially in the

anterior column disease which is the most frequent and most often lead to paraplegia. In the pre chemotherapy era, the balance was more in the favour of surgery. In this regard, Hodgson and Stock contributed the most and made the situation quite clear by establishing and popularizing anterior decompression and fusion as a definite mode of treatment of anterior column TB. But with the advent of chemotherapy, situation become more debatable regarding conservative vs surgical procedure. It was the trial of MRC & WP which made the situation quite clear but there last reports favour conservative approach .As this grave disease is quite endemic in Pakistan so need for local study was always felt.⁷⁻¹²

In our study, there were 70-80% patients were stable on Anterior Decompression For Caries Spine using Strut Graft With And Without Instrumentation, which correlates with study of Hodgson and Stock.

Lonestein reported lower rates of penetration , breakage ,collapse and psuedoarthrosis of the rib grafts. With use of anterior instrumentation than the use of posterior instrumentation.¹⁰⁻¹⁷

In our study, there were 70-80% patients were stable on Anterior Decompression for Caries Spine using Strut Graft With and Without Instrumentation, which correlates with study of Lonestein. Other authors have reported ,when more than 2 levels are involved there is anterior instability and the kyphosis progresses rapidly^{11,12,18-20}. However, we find that sufficient stability and correction can be obtained with anterior instrumentation and bone grafting after decompression of tuberculosis spine without increasing the rates of persistent and recurrent tuberculous infection.

The use of anterior instrumentation alone is possible only if the posterior column is intact. Anterior instrumentation should not be used to correct kyphotic deformity when posterior column is affected^{13,21,22,23,24}.

In our study ambulant chemotherapy was continued for 1 year .Complete neurological recovery was seen in 88% with an average duration of 8 months. Regarding the final outcome of grafting, group A was stable throughout the follow up. At the end of 4 month in group B 2 patients (3.33%) were found to have partial slippage of graft 50% slippage out of 6 patients (10%) and at the end of 5 month 2 patients (3.33%) were having partial slippage of graft. In group B at the end of six months 2 patients (3.33%) were having complete slippage of graft i.e. the graft was not confined and 4 patients showed partially graft slippage (50% slippage) And 24 patients (40%) were stable .We concluded that graft with instrumentation is more effective than only graft of reducing deformity and stabilizing the vertical column in patients who have TB of spine.

CONCLUSION

We concluded that graft with instrumentation is more effective than only graft of reducing deformity and

stabilizing the vertical column in patients who have TB of spine.

Author's Contribution:

Concept & Design of Study: Muhammad Asif Saeed
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