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Original Research Paper

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"SAGGITAL CORRECTION IN SURGICALLY TREATED PATIENTS OF THORASIC AND LUMBAR POTTS SPINE"

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ABSTRACT **AIMS AND OBJECTIVES..** To study the level of saggital correction in terms of pre and post operative cobb's angle in operated patients of thoracic and lumbar pott's spine.. **MATERIAL AND METHOD** :we take 28 patients with potts spine , divided in two according to treatment given either laminactomy alone or laminectomy with instrumentation and comare the result. **RESULT & CONCLUSION:** in our study we conclude that laminectomy and decompression with instrumentation is the surgical procedure of choice for thoracolumbar Pott's spine as this is simple, safe procedure with improved stability of spine.

KEYWORDS : potts spine, laminactomy, spine fixation

INTRODUCTION

Pott's disease ,described by Sir Percival Pott,is one of the oldest demonstrated diseases affecting humans [1,2]. Tuberculosis is common in developing countries, with 50–60% of skeletal affections occurring in the spine [3]. Isoniazid and rifampin given for 9 months (with streptomycin added for the first 3 months for resistant strains) is now the standard medical treatment [4]. The thoracolumbar spine is the most commonly affected, with less frequent involvement of the cervical and sacral spine [4]. When the anterior and lateral portions of the vertebral body are affected, vertebral collapse occurs, resulting in kyphosis and gibbus deformity[5].

Patients with pott's spine treated conservatively have an average increase of 15^0in kyphotic deformity. 3-5% of patients with potts spine develop a deformity greater than 60^0.Tubercular spondylitis represents the most common form of extrapulmonary TB.

In the sagittal plane there is a physiologic cervical curve with anterior convexity, a thoracic curve with posterior convexity, a lumbar curve with anterior convexity, and a small sacral curve with posterior convexity.With use of a Cobb's angle measurement in the sagittal plane we can quantify the saggital deformity and the range of normal thoracic kyphosis is 20 degree to 50 degree. Apart from cobb's angle, length and width of curve plays a significant role in measurement of saggital deformity. Neurologic deficits with or without kyphotic deformities are a frequent sequelae of serious disease [9].

The surgical procedures for kyphosis may be categorized into anterior, posterior, combined, and miscellaneous surgical considerations(osteotomies and vertebral resections). In our study, we analyze the pathology of kyphosis in spinal TB and discuss the surgical outcome in terms of saggital curve correction in thoracic and lumbar spine using various modalities of surgical correction.

MATERIAL AND METHODS:

This study will be conducted in J.A. Group of Hospitals attached to G. R. Medical College, Gwalior. The patients for this study will be selected from the patients admitted in this hospital with a diagnosis of thoracolumbar pott's spine from January 2018 to December 2020.

Selection of patients:

Present study comprises of 28 patients of thoracolumbar pott's spine admitted in the department of Neurosurgery, G.R.Medical College Gwalior & J.A.Group of hospitals Gwalior from October 2018 to December 2020.

Inclusion Criteria:

1. Patient with kyphotic deformity (cobb's angle more than 20 degree between adjacent vertebra)
2. Caries spine without neurological deficit
3. Caries spine with neurological deficit .
4. Evidence of instability.

Exclusion Criteria:

Some patients can be excluded from study who

1. Severe co-morbid illness
2. Absconded / Left against medical advice
3. Tuberculosis of spine other than thoracic or lumbar spine
4. Patients not willing for operation.
5. Children less than 5 years of age.

In our study, 2 groups were formed on the basis of surgical procedures performed

a) **Group A(control group)**: consists of 14 patients who has cord compression mainly due to the paraspinal collection of pus and granulation tissue and cobb's angle less than 15^0(mainly GATA Type II). These patients has undergone through surgical procedure which is known as laminotomy with decompression of cord.

b) **Group B (test group)**: consists of 14 patients who has cord compression mainly due to the angulation of vertebral body (cobb's angle 12^0 to 41^0) along with collection of pus and granulation tissue in spinal canal (mainly GATA Type III). These patients has undergone through surgical procedure which is known as laminectomy and decompression of cord with instrumentation. Instrumentation is required in these patients to provide stability to vertebral bodies.

At the end after evaluation of the results of group A and group B with a follow-up of 7days, 3 months and 6 or more months, we compared the results of both the groups and inference shall be made based on the data obtained from study in following points:

1. Neurological outcome
2. Mobility
3. Deformity

4. Back pain
5. Control of infection
6. Complication

End results were compared in each group by following parameters, for back pain we used visual analogue scale, for deformity we used cobb's angle, for power we used MRC grading, for mobility Nurick's grading and for autonomic and sensory symptoms improvement, subjective findings were taken into account.

RESULT AND ANALYSIS:

Present study comprises of 28 patients of thoracolumbar pott's spine admitted in the department of Neurosurgery, G.R.Medical College Gwalior & J.A.Group of Hospitals, Gwalior from October 2018 to December 2020.

Table 1 : Age wise distribution of patients

Age in years	No. of patients	Percentage
Upto 20	3	10.71%
21-40	15	53.57%
41-60	8	28.57%
>60	2	7.14%

The mean age of patients in the study was 35.39years and the standard deviation is 13.43years.

Table 2 : Sex wise distribution of patients

Sex	No. of patients	Percentage
Male	15	53.57%
Female	13	46.43%

15 out of 28(53.57%) patients were males and remaining 13 (46.43%) patients were females.

Table 3 : Distribution according to location of disease

Location of disease	No. of patients	Percentage
Upper dorsal spine (D1-4)	2	7.14%
Mid dorsal spine (D4-8)	5	17.86%
Lower dorsal spine(D8-12)	12	42.86%
Lumbar spine (L1-5)	9	32.14%

In present study we have found that dorsal spine was most commonly affected (67.86%) while lumbar spine was affected in only 32.14% of patients.

Table 4 : Clinical features

Symptoms and signs	Number of patients	Percentage
Backache	28	100%
Motor weakness in lower limb	25	89.28%
Paraplegia	12	42.86%
Sensory deficits	23	82.14%
Autonomic disturbances (Bowel and bladder involvement)	14	50%
Immobility	16	57.14%

In present study backache was the most common presenting symptom and found in all the patients followed by motor weakness in lower limb as a second most common symptom.

Table 5 : Distribution of patients according to type of operative intervention

Type of operative intervention	No. of patients	Percentage
Laminotomy with decompression of cord (Group A)	14	50%
Laminectomy with decompression of cord with instrumentation (Group B)	14	50%

On the basis of surgical intervention we have divided patients under two groups:

Group A (control group) consists of those patients who has undergone laminotomy with decompression of cord.

Group B (test group) consists of those patients who has undergone laminectomy with decompression of cord with instrumentation.

Both groups have same number of patients that is 14 each.

Table 6 : Comparison according to pre operative cobb's angle (Group A vs Group B) patients

Pre operative Cobb's angle	Group A	Group B
$0\text{-}10^0$	6	0
$11\text{-}20^0$	8	4
$21\text{-}30^0$	0	5
$31\text{-}40^0$	0	3
$>40^0$	0	2

Table 7 : Comparison according to postoperative cobb's angle(Group A vs Group B)

Post operative Cobb's angle	Group A	Group B
$0\text{-}10^0$	9	10
$11\text{-}20^0$	5	3
$21\text{-}30^0$	0	1
$31\text{-}40^0$	0	0
$>40^0$	0	0

Table 8 : Comparison of degree of correction in cobb's angle (group A vs group B)

Degree of correction in Cobb's angle	Patients of group A	Patients of group B
$0\text{-}5^0$	14	0
$6\text{-}10^0$	0	2
$11\text{-}15^0$	0	2
$16\text{-}20^0$	0	5
$21\text{-}25^0$	0	3
More than 25^0	0	2

This un-paired t test was applied between degree of correction in cobb's angle of both groups.

The t-value is -9.84337 and the p-value is <0.00001

The result is significant at $p<0.05$.

The difference between both the procedures (laminotomy and decompression vs laminectomy and decompression with instrumentation) was found statistically significant.

DISCUSSION

According to WHO report of 2019, 10 million people fell ill with tuberculosis and out of which 2.4 million people were from India.

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Extra pulmonary TB accounts for about 15-20% of all cases and nearly 1-3% patients suffering from TB have involvement of skeletal system.

In our study 28 cases of thoracolumbar Pott's spine were studied. Out of which 14 patients were chosen for laminotomy withdecompression alone and remaining 14 were chosen for laminectomy and decompression with instrumentation.

In present study patients having thoracolumbar Pott's spine presented in age group ranging from 12 years to 62 years, with mean age of 35.39years.

15 (53.57%) patients were males and remaining 13 (46.43%) were female patients. Our study is accordance with A.K jain[169] ,Suryakant (2017)[170], Sahoo (2012)[171], Guangru[172] , Weiwei Li[173]

In this study, out of 28 patients with Pott's disease of the spine, thoracic spine was the most affected level of the spine; where17 patients (61%) was found to be affected with

tuberculosis. In 2 cases (7%) the disease affected the thoracolumbar vertebrae (D12-L1) and in 9 cases (32%) lumbar spine was affected.

Our study is accordance with A.K jain [169] ,Suryakant (2017)[170,] ,Weiwei Li[173,]Su et al.[174]

Among the 28 patients studied the most common symptom was back pain 28 (100%), fever detected in 7(25%), and weight loss in 16 (57.14%) of cases. In neurologic examination 25 (89.28%) had paraparesis. 23 (82.14%) had sensory loss, 14 (50%) of patients complained of sphincter problem, and immobility 16 (57.14%) cases.our study in accordance with A.K. Jain et al. (2008)[169] Elbashir G Ahmed et al.[175] Sahil Mehta et al. (2012)[176] Fam et al.[177]

In our study, 2 groups were formed on the basis of surgical procedures performed

a) Group A(control group): consists of 14 patients who has cord compression mainly due to the paraspinal collection of pus and granulation tissue and cobb's angle less than 15^0. These patients has undergone through surgical procedure which is known as laminotomy with decompression of cord.
b) Group B: consists of 14 patients who has cord compression mainly due to the angulation of vertebral body (cobb's angle 12^0 to 41^0) along with collection of pus and granulation tissue in spinal canal. These patients has undergone through surgical procedure which is known as laminectomy and decompression of cord with instrumentation. Instrumentation is required in these patients to provide stability to vertebral bodies.

This un-paired t test was applied between degree of correction in cobb's angle of both groups. The t-value is -9.84337 and the p-value is < 0.00001. The result is significant at $p < 0.05$.

The difference between both the procedures (laminotomy and decompression vs laminectomy and decompression with instrumentation) in terms of degree of cobb's angle correction was found statistically significant.

CONCLUSION

In our study we conclude that laminectomy and decompression with instrumentation is the surgical procedure of choice for thoracolumbar Pott's spine as this is simple, safe procedure with improved stability of spine.

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