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EVALUATE THE PHYSICAL ACTIVITY (MOBILITY-INDOOR,OUTDOOR) AND VAS SCORE OF TRANSPEDICULAR DECOMPRESSION AND INSTRUMENTED FUSION IN PATIENTS WITH THORACIC AND THORACOLUMBAR FRACTURE

Orthopaedics

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ABSTRACT

AIMS & OBJECTIVES:Evaluate the Physical activity (mobility-indoor,outdoor) and VAS score of Transpedicular decompression and instrumented fusion in patients with thoracic and thoracolumbar fracture .

Method:We include 30 patients and score was recorded from admission, preoperatively, immediate post operatively at the time of discharge and follow up period (1 month, 6 month, 1 year) and evaluate the patients Physical activity (mobility-indoor,outdoor) and VAS score.

Result:In this study we found that there is gradual and excellent improvement in functional outcome in patients daily life . with the help of walking aids , wheelchair/ physiotherapy patients improve their routine lifestyle after undergo transpedicul decompression and instrumented fusion.

In this study we found that there is gradual and excellent improvement in functional outcome in patients daily life .Mean mobility-indoor,outdoor is 1.4 in post op, 8.9 in 3 month, 14.23 at 6 month , 19.36 at 1 year and VAS score at pre op , post op , 3 month 6 month and 1 year is respectively 8 , 7.75 , 4.06 ,1.9 , and 1.23 .

KEYWORDS

Clinical significance spinal cord independence measure, spinal cord injury.

INTRODUCTION

Spinal trauma due to injury is devasting event on a personal and family level as well as tremendous financial burden to society because of morbidity expenses and prolonged treatment[1]. Spinal injury is most common in adult population who are the bread earner of the family. Spinal trauma occurs usually due to fall from height, Road side accidents and Work related injuries . Thoracic and Thoracolumbar fracture are the most common spinal injury. Transpedicular decompression provides 360 degree decompression of spinal cord and added instrumented fusion enables patients to go for early rehabilitation[2] .The SCIM Score is more sensitive than the FIM to functional changes in patients with Spinal cord lesion(SCL).

Method

The study population consisted of 30 patients having Spinal cord lesion (19 males, 11 females) in the Spinal Department of orthopedics NSCB MCH JABALPUR, for whom complete data were available 19 patients had complete paraplegia or almost complete lesions (ASIA A) and 11 had incomplete lesions (ASIA B,C or D). Ages ranged between 15 year and 55 year (mean=31.76 year).

All patients were evaluated with the SCIM for the first time at the time of admission in the department and then postoperative and follow up period. Follow-up ranged from 3 month, 6 month and 1 year. Each area of function on the SCIM Score was recorded and measured.

The neurologically intact patients or patients with stable injury or with injury at multiple levels and those unfit for surgery/refusing surgery were excluded from the study. The mean age was 31.76±13.41 years (range, 15–65 years). eighteen patients had fallen from a height /trivial trauma and 12 had road side accidents. Patients were given detailed information about the purpose of the study and written consent was obtained from all the participants. The complete history of patients was taken to rule out any other occult medical or neuropsychological problems and the complete general physical examination and neurological examination was done. Neurological deficit as per American Spinal Injury Association (ASIA) Impairment Scale were as follows: A in 19; B in 4; C in 4; E in 3 and D in none of the patients . X-rays of the thoracolumbar spine, both anteroposterior (AP) and lateral views were done. A computed tomography (CT) scan was done to evaluate osseous injury, canal compromise, and to evaluate adjacent vertebral injury. MRI was done to further observe the injury to the neurological structures and to determine the status of the posterior elements. 26 patients had single vertebral fracture and 4 had two or more vertebral fractures. The levels of single vertebral fractures were D10 in 2 patients, D11 in 2, D12 in 8, L1 in 11, L2 in 3 and L3 in 2 patients. Four patients who had two or more vertebrae fractures had levels between D6–L1. According to AO classification, 5 patients had fracture dislocations and 9 patients had burst fractures and 16 had compression impaction type fracture. Two patients had fractures of calcaneum and no one patients had other associated skeletal injuries.

After the decision for surgical intervention was taken, patients were investigated as per the requirement of the preanesthetic check up. Surgery was performed as early as possible. Pedicle screw spinal system of rods and screws (both monoaxial and polyaxial versions) were used.

A standard technique of pedicle screw insertion was used. Decompressive laminectomy at the fractured vertebral level was done in 30 patients with burst fractures showing severe canal stenosis on preoperative CT/MRI. Retropulsed fractured vertebral body was pushed anteriorly to decompress the spinal cord. Adequacy of the decompression was checked by looking for the pulsations in the dural sac, as well as by gently passing a blunt probe in the spinal canal of the superior and the inferior vertebrae. The nerve roots were identified and released from the compression, if present. In two patient of fracture dislocation with complete translation of the spine, there was a complete transaction of the cord. Monosegmental bone grafts were put after decortication of transverse processes and facet joints of fractured vertebra by high speed drill to achieve local Spine fusion. Fixation was done two level above and two level below(4 level each side) of the fracture vertebrae) in 27 patients and 3 level fixations (2 levels proximal to fracture and 1 level distal to fracture) were done in 3 patients. Early ambulation and rehabilitation was encouraged. Mobilisation and rehabilitation was done depending on the neurological recovery using different orthoses, e.g., spinal brace and knee-foot-ankle-orthoses.

B. Radiological evaluation of:

1.Cobb angle: defined as the angle formed between a 1 line drawn parallel to the superior endplate of 1 vertebra above the fracture and a line drawn parallel to the inferior endplate of the vertebra 1 level below the fracture)

2.Vertebral height (AVH and PVH): AVH is measured from the anterosuperior corner of the vertebra to t he anteroinferior corner, and PVH is measured from the posterosuperior to posteroinferior corner.

3. ASIA Scale (grade A,B,C,D and E)

Result

Transpedicular decompression and instrumented fusion was performed in 30 cases including 19 male and 11 female. Mean(sdv) of age was 31.76(13.41).

When we evaluate the ASIA Scale 16.66% patients grade was not improved,83.33%patients grade was improved(B,C,D or E) .Eight (26.66%) patients improved by grade one , 11(36.66%) patients was

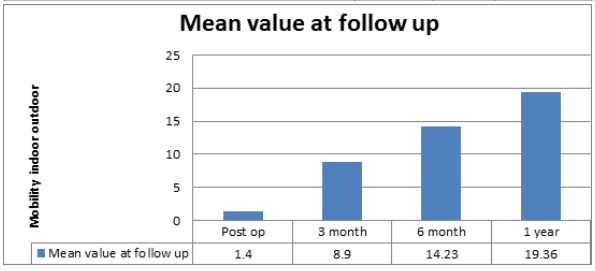
improved by grade two , 2(6%) patients was improved by grade three . 14(73.68%) patients of grade A improved by one or more grade.

- All patients who did not improved had complete paraplegia.

Table Showing Significant Increase In Mobility(indoor,outdoor) During Follow-up

GRAPH NO. – 1

MOBILITY(INDOOR, OUTDOOR)	MEAN	STDV	P-VALUE
POST OP	1.4	1.4	-
3 MONTH	8.9	5.8	>.0001
6 MONTH	14.23	8.05	>.0001
1 YEAR	19.36	8.94	>.0001

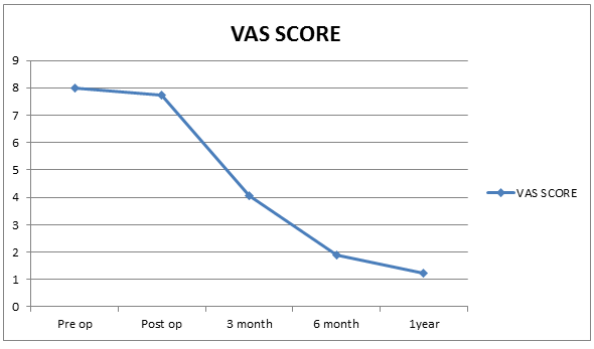


Line diagram showing significant increase in the mobility during follow up

Table Showing Significant Correction In Vas Score During Follow-up

Variable	Mean	SDV	P-value
Pre op	8	.64	-
Post op	7.75	.57	-
# month	4.06	1.25	<.0001
6 month	1.9	.84	<.0001
1 year	1.23	.43	<.0001

GRAPH NO. – 15



DISCUSSION:

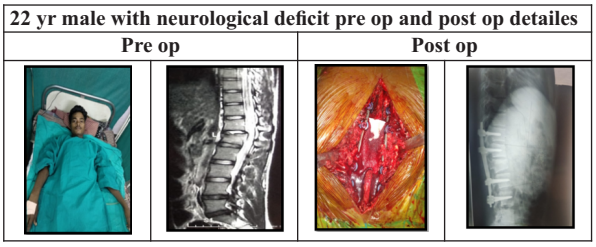
Most authors believe that surgical treatment is needed for unstable fractures. Common opinion is to obtain the most stable fixation by fixing as few vertebrae as possible with neural canal decompression. Posterior fixation is the most common and simple treatment, offering the advantage of incorporating fewer motion segments in the fusion. The goal of treatment of every spinal injury is restoration of the patient to maximal possible function with disability free life. Early stabilization of thoracolumbar spinal fractures favors neurological improvement Operative intervention is intended to convey immediate stability to spine, allow for correction of deformities and optimize neurologic improvement by directly or indirectly relieving any residual impingement of the neural elements.

We found that Scim score is a good tool for evaluation of the functional outcomeof the patients with spinal cord leison after undergo transpedicular decompression and instrumented fusion.

Posterior transpedicular fixation has been the preferred method for stabilizing acute unstable thoracolumbar fractures. This study used stabilization of the cases of the unstable thoracolumbar spine injuries with short segment posterior instrumentation.

Prospective interventional study was undertaken in the department of orthopaedics, NSCB MCH Jablapur in order to achieve the study objective. 30 patients with acute thoracolumbar injuries who gave written informed consent for surgery admitted during the study period were included in the study. All fractures were classified according to the AO classification system.

CASE IMAGES 22 yr male with neurological deficit pre op and post op detailes



CASE IMAGES

Mobility indoor outdoor

COMPLICATIONS: Patients were treated with higher antibiotics and regular dressing in sterile fashion.

- None of the patients had deep infecion.
- None of the patients had hardware failure (impalnt loosening, broken or screw impingment).
- Noneofthe patients hadcomplication of neurological deterioration, chest infection , DVT UTI.

CONCLUSION

The findings of these study show that posterior transpedicular decompression and instrumentation is an excellent implant system used in the treatment of vertebral fractures. There is a very high statistically significant restoration of vertebral body height, mean kyphotic angle. Single stage posterior only Vertebral Column fixation is a safe and effective method to correct these deformities. It helped to stabilize and helped in good nursing care and early mobilization of patients that improve functional outcome of the patients with thoracic and thoracolumbar fracture .

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