

ALICI SPINAL SYSTEM IN THE TREATMENT OF FRACTURES AND FRACTURE-DISLOCATIONS OF THE THORACIC AND LUMBAR SPINE.

KAPUBAĞLI A., M.D.

ÖZYALÇIN H., M.D.

KARA S., M.D.

10 patients with fracture or fracture- dislocation of the thoracic or/and lumbar spine were treated surgically by Alici Spinal Instruments in the Orthopaedic Surgery and Traumatology Clinic of Ege University Medicine Faculty, between November 21, 1989 and July 30, 1990; and clinical and radiological early results were reviewed.

All of the patients had shown sensory and/or motor function loss and their neurologic status was appraised according to Frankel's Criterize.

Posterior spinal instruments were used in all of the operations.

Early results revealed better conclusions of reduction and stabilization. Operated patients were began rather early rehabilitation therapy.

Key Words: Fractures and fracture- dislocations of the thoracolumbar spine, Alici Spinal Instrumentation.

INTRODUCTION.

Fractures and fracture- dislocations of the thoracolumbar spine are important injuries as they lead to neurological complications. For this reason, restoration of the fragments and vertebral column is certainly required.

The Harrington instrumentation is the most famous and common method in reduction and stabilization of fractures and dislocations of the spine (1,5).

In the last years, Luque, Weiss-Spring and Cotrel-Dubousset instruments are evolved in spinal surgery (1, 3, 4, 7).

This report presents the early results of 10 patients operated with Alici Spinal Instruments.

MATERIALS AND METHODS.

There were 4 females (40 %) and 6 males (60 %) patients who ranged in age from 18 to 62, with an average of 33.8. Reasons of trauma were motor vehicle accidents in (60 %) and falls from heights in the other 4 (40 %).

One patient had a fracture of 3 vertebrae (T- 10, 11, 12). Levels of injuries were 90 % between T- 10, L-2. Only 1 patient had a T-5 fracture. (Table I).

The fracture patterns were burst fractures in 2 patients (20 %) and compression fractures in 8 (80 %). Fracture- dislocations of the spine are seen in 4 (40 %) patients. (Table II).

Preoperative neurological evaluation is performed according to Frankel's classification for spinal cord injuries. It is determined Frankel A in 3 patients (30 %), Frankel B in 2 (20 %) patients. Frankel C in 3 patients (30 %) and Frankel D in 2 patients (20 %).

Local kyphosis angle ranged from 12 to 46 degrees with a mean of 29.2. Angle of anterior compression ranged from 4 to 32 degrees with a mean of 18.6 and height loss of vertebral bodies ranged from 15 to 80 % with a mean of 40.8 % in preoperative radiological examinations.

All of the patients are operated on within 6 hours of the accidents. And posterior spinal instruments are used in all of the operations.

During the operation, the patient is placed prone on the table. Through a longitudinal skin incision, a muscle splitting approach is made to expose the spine and the laminae. Processus spinosus of

Table I: Levels of injuries and their etiologies.

Name	Sex	Etiology	Levels of injuries.	Preop. Neurological Evaluation. (Frankel)
D.G.	f	FH	T-10, 11, 12	A
B.A.	f	MVA	T-12	C
Ö.M.	m	FH	L-1	D
D.A.Y.	m	MVA	T-5	A
S.K.	m	MVA	L-2	B
H.B.	m	MVA	L-1	D
E.E.	f	MVA	L-1	B
E.G.	m	FH	L-1	C
S.D.	m	MVA	L-1	C
H.Y.	m	FH	T-12	A

Table II: Levels of injuries and their etiologies.

Level of injury	Compression Fractures	Burst Fractures	Fracture-Dislocations	TOTAL	PC
T-5			1	1	8.3
T-10	1			1	8.3
T-11	1			1	8.3
T-12	1	1	1	3	25
L-1	3		2	5	41,6
L-2		1		1	8.3

the fractured vertebra and one upper and one lower vertebrae are cut out. Open pedicle hooks are inserted to the two upper intact vertebra pedicles and closed lamina hooks to the two lower intact vertebra laminae. Distraction was applied by using appropriate size rods. Same procedure was also carried out for the other side. Between the rods which are inserted bilaterally, two transverse connectors are applied so to stabilize the system. Three levels short fusion are included from the posterior.

RESULTS

Early results of the postoperative period are evaluated clinically and radiologically.

The patients are observed 1 to 9 months, with a mean of 4 months.

Local kyphosis angle was decreasing to 3 to 23 degrees, with a mean of 8.2. Angle of anterior compression is diminished to 0 to 16 degrees, with a mean of 4.3. Vertebral bodies height loss was 0 to 30 %, with a mean of 6 %. (Table III).

Table III: Radiographic findings.

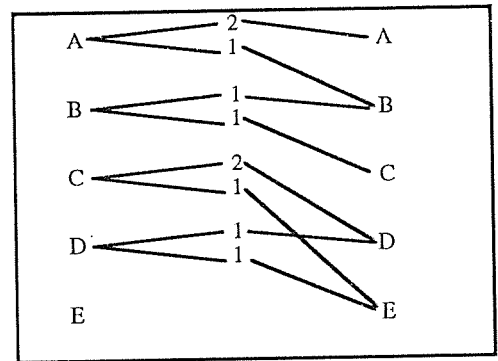
	PREOPERATIVELY		POSTOPERATIVELY	
	Mean	Range	Mean	Range
Local Kyphosis Angle	29.2	12-46	8.2	3-23
Ant. Comp. Angle	18.6	4-32	4.3	0-16
Height Loss	40.8	15-80	6	0-30

Neurologic status was determined after 6 weeks of the operations. 2 patients in Frankel A group stayed at A and 1 returned to B. 1 patient in B stayed at B and 1 returned to C. 2 patients in C returned to D and 1 returned to E. 1 patient in D stayed at D and 1 returned to E. (Table IV).

The rehabilitation of the patients were began on the third day after operation. And their wounds are

healed they were mobilized. During the early mobilization, we didn't see any loss of reduction.

Table IV: Return of neurological function.



The rehabilitation of the patients were began on the third day after operation. And their wounds are healed they were mobilized. During the early mobilization, we didn't see any loss of reduction.

DISCUSSION

It is very important to restore the vertebral column in the presence of fractures or fracture-dislocations with neurological deficit.

For a long time, the Harrington rods are accepted as a standard way to treat surgically vertebral fractures (1,5). The most important handicap is the absence of its security of rotational stability (1,2).

Luque's segmental spinal instrumentation (7,8) provides better stabilization, but the early mobilization of the patient is the cause of the loss of reduction (1,2).

The Cotrel-Dubousset method has initiated a new age in internal spinal instrumentation and it has been suggested that this method could be effective in all dimensions of the deformity (1,4).

Alici Spinal System differs from all others instruments by possessing supernumerary hooks (4 in proximal and 4 in distal fragments). And so, the transverse apparatus, attached to proximal and distal segments of the system procure rotational stability.

Early results of the surgical treatment of the thoracolumbar fractures and fracture-dislocations of the spine with Alici instruments showed us;

Neurological outcome of the patients is approximately the same in accordance with the other instruments, but the stabilization and correction of the vertebral column is better,

Supernumerary hooks and transverse apparatus are advantages of the system,

All of the operated patients were able to begin to rehabilitation on the third day, and their return to daily living activities was realized in a short time.

REFERENCES

1. Alıcı E, Baran Ö, Tolgay M, Serin E: Early results of thoracic and lumbar vertebrae injuries with treatment by Alıcı Spinal Instrumentation. *The Journal of Turkish Spinal Surgery*, 1, 3: 4-7, 1990.
2. Aebi M, Mohler J: Analysis of 75 operated thoracolumbar fractures and fracture-dislocations with and without neurological deficit. *Arch Orthopedic Trauma Surg*. 105: 100, 1986.
3. Benzel EC, Lovson SJ: Operative stabilization of the posttraumatic thoracic and lumbar spine. A comparative analysis of the Harrington distraction rod and the modified Weiss-Spring. *Neurosurg*. 19, 3 + 378, 1986.
4. Cotrel E, Dubousset J: New universal instrumentation in spinal surgery. *Clin Orthop*. 227: 10, 1988.
5. Dickson JH, Harrington PR, Erwin WD: Results of reduction and stabilization of the severely fractured thoracic and lumbar spine. *J Bone Joint Surg*. 60-A: 799, 1978.
6. Frankel HL, et al.: The value of postural reduction in the initial management of closed injuries of the spine with paraplegia and tetraplegia. *Paraplegia* 7: 172, 1969.
7. Luque ER, et al.: Segmental spinal instrumentation in the treatment of fractures of the thoracolumbar spine. *Spine* 7: 312, 1982.
8. Wegner Dr, Carolle J: The mechanics of thoracolumbar fractures stabilized by segmental fixation. *Clin Orthop*. 189: 89, 1984.