SURGICAL TREATMENT IN MULTIPLE NON-CONTIGUOUS SPINE FRACTURES*

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ABSTRACT :

Multiple non-contiguous spine fractures are more rarely encountered when compared with multiple level (contiguous) spine fractures. Instrumentation in order to get reduction and stabilisation in multiple non-contiguous spine fractures has specific characteristics.

In this study, we evaluated the results of posterior reduction and stabilisation with Alıcı Spinal System in the treatment of 6 patients with multiple non-contiguous spine fractures. In the light of these applications choice of instrumentation type in such injuries were discussed.

Naturally, statistical analysis hasn't been done because of the fewness of our cases. On the other hand we also decided that, in the treatment of multiple non-contiguous spine fractures, when pedicular anatomy is suitable, in order to get better correction, decompression and immobilisation of fewer segments, transpedicular screw fixation would be better when compared with long segment hook applications.

Key words: *Thoraco-lumbar spine, Multiple non-contiguous fractures, Alıcı Spinal System.*

INTRODUCTION

The incidence of spine fractures with multiple levels may be 3-5% in all spine fractures (15). There are several studies that attempt to determine the incidence of multiple non-contiguous spine fractures (4, 7, 8, 12, 13, 14). Although, it has suggested that non-contiguous spine fractures are rare (3, 7, 16, 17), this rate range 0.2% (10) to 23.8% (11) in the literature.

In addition, multiple non-contiguous spine fractures are rarely not associated with spinal cord injuries (3, 15). Calenoff et al (5) had pointed out the rate of multiple non-contiguous spine fractures without neurodeficit as 4.5%.

Unstable thoracolumbar spine fractures are being treated surgically. However, in surgical treatment of multiple non-contiguous spine fractures there are specific management and planning characteristics.

In this study, we evaluated the results of posterior surgical reduction and stabilisation in the treatment of unstable multiple non-contiguous spine fractures of 6 patients.

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MATERIALS and METHODS

In this study, 6 patients with unstable multiple non-contiguous spine fractures, were evaluated. Mean follow-up was 32.8 months. All of them were male and their mean age was 42.5. Injury cause was fall from height in 4 cases and traffic accident in 2 cases. In four cases, there were additional injuries (Table 1). Levels of lesions and types of fractures are summarized in Table 1.

Neurodeficits were complete in 1 case and incomplete in 2 cases.

In all cases, reduction and stabilisation was achieved by Alıcı Spinal System (1). Technique is shown in Table 1. Mean hospitalisation time in the postoperative period was 16 days.

RESULTS

Either neurologic recovery or progressive neurodeficit wasn't noted in the postoperative period. Any complications medical or related to instruments hasn't been developed following surgery.

Postoperative correction achievement was shown on Table 1.

Table I. Multiple non continguous thoracolumbar fractures (6 patients)

Patient No.	Sex	Age	Aetiology	Additionel Lesion	Mean follow-up (months)	Level of lesion	Lesion Type (6)	Anterior Vertebral Hight (%)		Vertebral Body Angle		Cobb's Angle		Medullary Canal Encroachment (%)		Frankel's Classification (9)		Instrumen-tation	Fusion	Postoperative Hospitalisation (Day)	Complication
								Preop.	Postop.	Preop.	Postop.	Preop.	Postop.	Preop.	Postop.	Preop.	Follow-up				
1	M	41	F	Subtrochanteric fracture,	70	L_1 L_3	Burst Type B Burst Type B	61 30	38 25	18° 12°	5° 4°	8° 0°	7° 4°	32 12	28 3	E	E	T_{11} H L_5 H	+	23	-
2	M	23	F	Metacarpal fracture	65	T_6 T_{10}	Compression Burst Type B	60 41	10 11	15° 6°	2° 5°	18° 6°	14° 3°	30 3	12 0	E	E	T_{6-7} H T_{11-12} H	+	5	-
3	M	60	F	—	24	T_{11} L_2	Burst Type B Burst Type B	48 63	10 18	14° 8°	8° 2°	2° 0°	0° -2°	62 44	55 20	D	D	T_{10} H L_1 S L_3 S	+	12	-
4	M	31	F	Calcaneus, tibia fracture	20	L_2 L_4	Burst Type A Burst Type B	55 36	21 13	35° 41°	19° 14°	14° 10°	0° -4°	21 89	12 37	C	C	L_1 S L_3 S L_5 S	-	10	-
5	M	54	T.A.	—	12	T_{11} L_1 L_2	Burst Type B Burst Type A Compression	56 40 7	30 18 5	7° 10° 13°	6° 2° 3°	19° 2°	0° -3°	35 12 -	28 4 -	E	E	T_{10-11} H L_{4-5} H	-	12	-
6	M	46	T.A.	Cerebral trauma	6	T_7 T_{12}	Burst Type A Burst Type B	30 62	6 7	6° 11°	4° 4°	32° 4°	24° 3°	15 42	12 16	A	A	T_5 H T_{9-10} H L_{3-4} H	-	28	-

F: Fall from height TA: Traffic accident, H: Hook, S: Screw

DISCUSSION

Multiple non-contiguous spine fractures which are encountered rarely as to the literature (3, 10, 15) has a high rate of neurodeficits (5, 15). Our 3 of 6 cases were associated with neurodeficits.

According to Handerson et al. (12) traffic accident was the cause of 61% cases. Fall from height was the cause of mortality in our series.

Association of thoracolumbar junction and servical spine fractures are frequent in multiple non-contiguous spine fractures (4, 12, 15). However, there is no servical spine fractures in our series. In our hospital cervical traumas are managed by the Department of Neurosurgery. This may explain why our series does not have cervical spine fractures.

Multiple level spine fractures are accepted as unstable and are frequently treated surgically (15). But, in the treatment of multiple non-contiguous spine fractures a special instrumentation technique is required. In such fractures, also unstable but although non-contiguous, if they are not far from each other - long - segment instrumentation will be suitable. We reduced and stabilised our 6 cases, with hooks and/or screws on the same rod. In cases of hook-hook applications (patients no: 1, 2, 5, 6) number of immobilised segments were excessive. The patient (no: 4) in which the pedicular anatomy was suitable, fractures were reduced and stabilised with transpedicular screws to upper, lower and to intermedier segments. Owing to this application, immobilised segment was short. As known, postoperative complication and pain risks are very high in the lumbar region because of its high range of motion, loss of lordosis due to long instrumentation and immobilisation of excessive segments (2). We applied a long instrument in case 1, but we haven't encountered any complication in the follow-up. In cases of transpedicular screw applications, correction and decompression were better.

Although a healthy statistical analysis is impossible to do due to fewness of our cases, we can suggest, transpedicular screw fixation in cases having suitable pedicular anatomy in the treatment of multiple non-contiguous spine fractures with its advantages such as: short segment immobilisation, better correction and decompression ability.

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