



CERVICAL TRAUMAS

Mehmet YAMAN¹

¹ *İstanbul Training and Research Hospital, Department of Neurosurgery, Istanbul, Turkey.*

ORCID Number:
<https://orcid.org/0000-0002-6514-115X>

ABSTRACT

Objective: The aim of our study is to investigate the clinical data of patients with cervical traumas.

Materials and Method: We investigate 65 patients who were hospitalized for cervical traumas in Department of Neurosurgery and this study is planned for Neurosurgery specialty thesis. The patient's files were evaluated from archives retrospectively.

Results: Forty seven man (72 %) and 18 (28 %) woman were included in the study. Mean age of patients were 35.1 (14 months-90 years). 36 patients were treated with surgery and 27 were followed up with conservative treatment with external immobilization. Total mortality was 18 (27.6 %) patients and 12 were exitus before surgery. Forty patients had cervical fracture-dislocation and 4 of them had C1-C2 upper cervical dislocation. Seventeen patients were treated with external immobilization; 2 of them with halo vest, 4 with rigid cervical collar and 11 with brace. Five of operated patients were re-operated because of complications.

Conclusion: The cervical spine is the most vulnerable and hence the most damaged portion of the vertebral column because of the position in relation to the brain, injury can have catastrophic results. The key points in management of cervical spine trauma are to identify the injury to treat and reverse neurological deficits, and to prevent long-term disability by stabilization of the fracture.

Key words: Cervical trauma, cervical spine, cervical injury.

Level of Evidence: Retrospective clinical study, Level III.

INTRODUCTION

The incidence of clinically significant cervical spine injury among blunt trauma patients ranges between 1 % and 3 % (^{9,15}). The incidence of death from cervical traumas and spinal cord injuries is 21% because of traffic accidents. Cervical cord injuries are serious cause of morbidity with high ratios of mortality. The most important situations are to prevent injuries, take precaution for accidents. Injury severity can range from minor and possibly insignificant, to major and immediately life-threatening. Older patients in particular are vulnerable to the mechanical forces of trauma due to musculoskeletal changes and alterations in cardiovascular and respiratory function, making them more

susceptible to injury than their younger counterparts (¹⁴).

Management of cervical spine injuries depends on patient factors, mechanism of injury and subsequent effects of the injury on the cord or roots. If there are symptoms of cord compression, decompression may be performed. Fractures or subluxations require reduction and realignment to anatomical position (⁴).

The critical care and education to prevent additional injuries to cervical vertebra and spinal cord injuries must be given to emergency health team. Early immobilization, reduction and stabilization of the patients is the key points for these kind of injuries. The number of early complications could be decreased by these precautions.

Address: Mehmet YAMAN, İstanbul Eğitim ve Araştırma Hastanesi, Fatih, İstanbul, Turkey.

E-mail: mehmet.yaman21@gmail.com

Tel: +90 532 266 89 92

Received: 11th June, 2018.

Accepted: 22th August, 2018.

The aim of our study is to investigate the clinical data of patients with cervical traumas.

MATERIAL AND METHOD

We investigate 65 patients who were hospitalized for cervical traumas in Department of Neurosurgery and this study is planned for Neurosurgery specialty thesis. The patient's files were evaluated from archives retrospectively.

Patients were classified with Frankel Score System:

- A- Complete quadriplegia
- B- Incomplete quadriplegia-No active motor function.
- C- Incomplete quadriplegia-Active motor function.
- D- Nerve root functions positive.
- E- No neurological deficits.

RESULTS

Forty seven man (72 %) and 18 (28 %) woman were included in the study. Mean age of patients were 35.1 (14 months-90 years) (Table-1). History of patients were presented in Table-2.

36 patients were treated with surgery and 27 were followed up with conservative treatment with external immobilization. Total mortality was 18 (27.6 %) patients and 12 were exitus before surgery.

Forty patients had cervical fracture-dislocation and 4 of them had C1-C2 upper cervical dislocation (Table-3).

Seventeen patients were treated with external immobilization; 2 of them with halo vest, 4 with rigid cervical collar and 11 with brace. Surgical techniques were presented in Table-4.

Five of operated patients were re-operated because of complications.

Patients were scored with Frankel system preoperatively and postoperatively (Table 5).

Table-1. Demographic data of patients

	Mean	Min-max
Age (years)	35.1	14 month - 90 years
	N	%
Sex		
Male	47	72
Female	18	28

Table-2. History of patients with cervical trauma

History	Number of Patients
Traffic accident	36(55.5%)
Fall	20(35.5%)
Stroke	5(8%)
Penetrating trauma	2(3%)
Sports injury	2(3%)

Table-3. Type of cervical traumas

Type of Trauma	Number of Patients
Fracture-dislocation	40(62%)
Compression	19(29%)
Whiplash injury	2(3%)
SCIWORA	4(6%)

Table-4. Surgery ratios of patients with cervical trauma

Surgery	Number of Patients
Anterior fusion	27(75%)
Anterior fusion+anterior plate	5(14%)
Posterior laminectomy	1(2.7%)
Posterior stabilization	3(8.3%)

Table-5. Preoperative and postoperative Frankel Scores of patients

Preoperative Frankel Score	Number of Patients	Exitus	A	B	C	D	E	Total
A	5	3	2	-	-	-	-	5
B	6	3	1	1	1	-	-	6
C	12	-	-	-	7	3	2	12
D	8	-	-	-	-	5	3	8
E	5	-	-	-	-	-	5	5
Total	36	6	3	1	8	8	10	36

DISCUSSION

The cervical spine is the most mobile, and thus the most vulnerable portion of the spinal construct. Of all traumatic fractures of the spine, 20.8 % occur at the cervical region⁽⁵⁾. Causes of cervical spine fractures include motor vehicle accidents, falls, sports injuries and other modes of trauma. The risk of neurological deficit is highest with cervical spine fractures because of the proximity to the brainstem⁽⁴⁾. Traumatic fractures of the cervical spine cause considerable mortality and morbidity, with a high economic burden to society, and thus early diagnosis and optimal management is necessary in these patients.

The rate of cervical spine injury has been reported to be twice as high in the elderly than in the non-elderly population^(7,16). Owing to the high kinetic forces transmitted in these injuries, 65 % of these fractures have significant associated injuries and thus the cervical spine fracture may initially be overlooked⁽¹⁰⁾.

At present, routine radiographic investigation of the cervical spine following blunt trauma is not indicated, and is associated with risks of radiation exposure in younger patients and over-utilisation of limited healthcare⁽¹³⁾.

The most frequent cause of cervical trauma was traffic accident in our study which correlate with literature^(1,12,17). Traffic accident rate was 55.5 %. Second cause of cervical traumas were fall down with the ratio of 30.5 %. The most frequent reason was different in pediatric patients with fall down with 60 %. Sports injury rate was lower than the ratio of stroke.

Thirty six patients were operated and 27 of them gone under anterior fusion surgery. Five of operated patients were re-operated because of graft dislocation. Corpectomy and Cloward techniques were applied for the patients. Five patients had anterior plate with fusion. Anterior cervical procedures were frequently chosen and successful surgery techniques with good planning and correct indications^(2-3,6,8).

We followed up patients with Frankel Scores and we saw that patients had A and B scores had 50 % mortality. The 12 patients died before surgeries were also scored as A and B. These results are similar to the researches in the literature^(2,11). Postoperative recovery was seen better in C and D scored patients and we found that 3 patients from C group and 2 patients from D group had recovered and became group E. Recovery rate was 37.5 % in group D. We had not observe any worsening of neurological examination in group E.

CONCLUSION

The cervical spine is the most vulnerable and hence the most damaged portion of the vertebral column because of the position in relation to the brain, injury can have

catastrophic results. The key points in management of cervical spine trauma are to identify the injury to treat and reverse neurological deficits, and to prevent long-term disability by stabilization of the fracture.

REFERENCES

1. Bauer RD, Errico TJ. Cervical spine injuries. *Spinal Trauma* 1991; 4: 71-121.
2. Benzel EC, Larson SJ. Functional recovery after decompressive spine operation for cervical spine fractures. *Neurosurgery* 1987, 20(5): 742-746.
3. Cain CM, Langston PG, Wenston PF. Assesment of spinal cord flow and function in sheep after anterolateral cervical interbody fusion in the presence of cord damage. *Spine* 1994; 19(5): 511-519.
4. Copley P, Tilliridou V, Jamjoom A. Traumatic cervical spine fractures in the adult. *Br J Hosp Med (Lond)* 2016; 77(9): 530-535.
5. Devons CA. Comprehensive geriatric assessment: making the most of the aging years. *Curr Opin Clin Nutr Metab Care* 2002; 5: 19-24.
6. Goffin J, Piets D, Van den Berg R. Anterior cervical Fusion and osteosynthetic stabilization according to Caspar; A prospective study of 41 patients with fractures and/or dislocations of cervical spine. *Neurosurgery* 1989, 25: 865-871.
7. Goode T, Young A, Wilson SP, Katzen J, Wolfe LG, Duane TM. Evaluation of cervical spine fracture in the elderly: can we trust our physical examination? *Am Surg* 2014; 80: 182-184.
8. Hamilton A, Webb JK. The role of anterior surgery for vertebral fractures with and without cord compression. *Clin Orthop* 1994, 300: 79-89.
9. Inaba K, Byerly S, Bush LD. Cervical spine clearance: a prospective Western Trauma Association Multi-institutional Trial. *J Trauma Acute Care Surg* 2016; 81:1122-30.
10. Leucht P, Fischer K, Muhr G, Mueller EJ (2009) Epidemiology of traumatic spine fractures. *Injury* 40(2): 166-72
11. Nielsen CF, Annertz M, Persson LL. Posterior wiring without bony fusion in traumatic distractile flexion injuries of the mid to lower cervical spine. Longterm Fllow-up in 30 patients. *Spine* 1991, 16(4): 467- 472.
12. Oiler DW, Boone S. Blunt cervical spine Brown-Séquard injury. (A report of three cases). *Am Surg* 1991; 57: 361-365.
13. Paykin G, O'Reilly G, Ackland H, Mitra B. Review article: NEXUS criteria to rule out cervical spine injury among older patients: A systematic review. *Emerg Med Australas* 2018; 30(4): 450-455.
14. Pudelek B. Geriatric trauma: special needs for a special population. *AACN Clin Issues* 2002; 13: 61-72.
15. Stiell IG, Wells GA, Vandemheen K. Canadian C-Spine Rule for radiography in alert and stable trauma patients. *JAMA* 2001; 286: 1841-1848.

-
16. Touger M, Gennis P, Nathanson N. Validity of a decision rule to reduce cervical spine radiography in elderly patients with blunt trauma. *Ann Emerg Med* 2002; 40: 287–293.
 17. Wagner FC. Injuries to the cervical spine and spinal cord. In Youmans *Neurological Surg* 1990; 4: 2378-2391.