

ÜST SERVİKAL TRAVMALARDA KRANIYOFASİYAL YARALANMALARIN PREDİKTİF ve YOL GÖSTERİCİ ÖNEMİ

PREDICTIVE AND GUIDING IMPORTANCE OF CRANIOFACIAL INJURIES IN UPPER CERVICAL TRAUMAS

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Özet

10 yıllık bir dönemde kliniğimizde tedavi edilen maksillo fasiyal yaralanması da olan 33 olgu incelendi. Serideki enginç hasta 25, enyaılısı 80 yaşıdaydı ve yaş ortalaması 27.4 idi. 22 olgu erkek, 11'i kadındı. Yaralanmanın en sık nedeni trafik kazasıydı. Spinal lezyonların en sık lokalize oldukları yer C₃ - C₄ seviyesiydi (%49). Spinal lezyona en sık katılan ilave yaralanma mandibula fraktürüydü (%49). Serinin mortalite oranı %18 idi. Bu çalışmanın sonucunda, kraniyofasiyal yaralanmaların travmatik gücün yoğunluk ve yönünü göstermelerinden ötürü uyarıcı bir değere sahip oldukları yargısına varıldı.

Anahtar kelimeler: *Kraniyofasiyal travma, üst servikal travma*

Summary

In this study, of 114 cases with cervical trauma treated in our department in the period of 10 years, 33 cases with upper cervical spinal injury, associated with cranio-facial traumas, were analysed. The youngest patient was 2.5 years old, and oldest patient was 80 years old. The average age was 27.4. 22 patients were male, and 11 female. Traffic accident was most common cause. The most frequent location of spinal lesions was the C₃ to C₄ level (49 %). Mandible fracture was the greatest associated injury (49 %). The mortality rate of series was 18 %. In conclusion, we state that cranio-facial traumas has a warning value because they indicate the traumatic power intensity and direction.

Key words: *Cranio-facial trauma, Upper cervical trauma*

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Introduction

Cervical spinal traumas are closely related with cranio-facial injuries (1). These injuries are often resulted from traffic accidents. The cranio-facial injuries and especially hyperextension injury of cervical spine are due to struck the vehicle interior and ejection from the vehicle during accidents (1-5). In this study, it is impressed that cranio-facial injuries have a significantly predictive value in upper cervical traumas, and especially in the patients without neurological deficit, it is aimed that the practicable precautions should be considered.

Materials and Methods

Of 114 cases with cervical trauma managed in our Department in the period of 10 years, 33 cases with upper cervical spinal injury, associated with cranio-facial traumas, were analysed retrospectively, with age, sex, and etiological causes. In addition, they were analysed in view of the relation of the types of cervical trauma and cranio-facial injury, and types of spinal trauma.

In management, cervical collar or skeletal traction by Cruthfield device with the aim of reduction of dislocation was applied when cervical lesion was determined or suspected. Prophylactic medical treatment was added to it till the patient would gain both a stable clinical condition and the reduction of spinal dislocation. After this stage, 23 cases were performed in internal fixation and fusion, and also, 7 cases were followed-up after cervical collar was applied. Of 23 cases applied internal fixation, 19 cases were performed soft-wire circulage, and 3 cases Halifax device. In 1 case, firstly soft-wire circulage was performed, but the result of which was unpleasant. So, Halifax device was applied in the second operation. 3 cases died in preoperative period.

Results

Of 33 cases made up our study, 22 were male (67 %), 11 were female (33 %), the youngest patient was 2.5 years old, while the oldest was 80, with a mean age of 27.4. The most populated group was 11-to 30 age group. 6 cases died (Table 1).

Table 1: Classification of the Cases as to Age and Sex

age group	male	female	dead	
	n	n	n	%
0-10	1	2	-	
11-20	6	2	1	13
21-30	5	2	3	43
31-40	3	2	1	20
41-50	3	1	-	
51-60	-	1	1	100
61+	4	1	-	
total	22	11	6	18

Traffic accidents were the most common cause of trauma (58 %). Then, fall-down (30 %) and assault (12 %) were following it (Table 2).

Of the spinal lesions in cases, 10 were dislocation fracture, 6 compression fracture, 5 compression and dislocation fracture, 4

Table 2: The Causes of Injuries

cause	number of cases	%
traffic accident	19	58
fall-down	10	30
assault	4	12
total	33	

odontoid fracture, 3 laminae fracture, 3 laminae fracture and dislocation, and 2 laminae and pedicles fractures (Table 3).

In one patient (3 %), occipito-atlantal luxation was diagnosed. The spinal lesion located at C₁ vertebrae in 2 cases (6 %), at C₁-C₂ level in 7 (21 %) cases, at C₂-C₃ level in 7 (21 %), and at C₃-C₄ level in 16 (49 %) cases.

It was determined that cranio-facial trauma was mandible fracture in 16 (49 %) cases, naso-ethmoidal fracture in 8 (24 %) cases, maxillae fracture in 3 (9 %) cases, occipital linear fracture in 1 (3 %) case, frontal linear fracture in 2 (6 %) cases, and zygomatic fracture in 3 (9 %) cases. Cervical lesion associated with cranio-facial traumas commonly located at C₃-C₄ level. The most common cranio-facial lesion seen associated with cervical injury was mandible fracture (Table 4).

The soft-tissue injury was determined on 1/3 lower face in 18 cases, on 1/3 mid face in 9 cases, on 1/3 upper face in 12 case, and on scalp in 15 cases. The most common soft-tissue injuries were associated with cervical lesions at C₃-C₄ levels which involved in 17 cases (Table 5).

Table 3: The Type of Spinal Injury

	n	%
dislocation fracture	10	30
compression fracture	6	18
compression and dislocation fracture	5	15
odontoid fracture	4	13
laminae fracture	3	9
laminae and dislocation fracture	3	9
laminae and pedicle fracture*	2	6
total	33	

Table 4: The Relationship Between the Level of Spinal lesion and Cranio-Facial Injuries

	occipito- atlantal	C1-C2	C2-C3	C3-C4	n	total	%
occipital fracture				1	1	3	
naso-ethmoidal fracture	1	2	2	3	8	24	
frontal fracture		1	-	1	2	6	
maxillar fracture	-	-	1	2	3	9	
mandibular fracture	2	3	4	7	16	49	
zygomatic fracture	-	1	-	2	3	9	
total (n)	3	7	7	16	33		
%	9	21	21	49			

Discussion:

Fractures of the cervical spine are relatively common in a neurosurgical practice (6). It is logical to presume a relationship between injuries of the cervical spine and soft-tissue and skeletal injuries of the face and scalp (1). Such injuries are resulted from vehicular trauma (1,3). Facial injuries are caused by blows from the steering wheel, dashboard and windshield (1).

We determined that the largest number of upper cervical traumas associated with cranio-facial traumas were in 21-40 age group and males. We may explain that, the young males are more common sustained from cervical traumas because they have an active role in life. Reiss et al noted skull or facial fracture in 21.1 %, and both of them in 9 % of 84 consecutive patients having cervical spine fractures (6).

In Lewis et al's report of 982 patients sustaining spinal cord injuries, 14 % had associated soft-tissue injuries, and 8.6 % had facial fractures. They found that the most frequently injured bone was the mandible (1). Maiman and Larson noted associated traumas in one-half of the patients, head injuries in 49% (25 cases), and associated facial fractures in 3 patients (5.9 %) (4). Apuzzo et al reported similar results in 45 patients with odontoid fractures, including 31 %

with scalp lacerations, 18 % with skull fractures, and 8.9 % facial fractures (2). Seljeskog and Chou found four (15.4 %) mandibular fractures and two (7.7 %) skull fractures among 26 cases of Hangman's fracture (5).

Our series was formed of 33 with craniofacial injury of 114 cases with cervical spine traumas. Of 33 cases, we found various types and severity of scalp injuries in 15, upper face injuries in 12, and lower face injuries in 18 patients. Associated lesions were more frequently seen on mid and lower face in vehicle accidents, while they were more commonly observed on upper face in fall down.

In all reported series, the most significant cause of traumas was traffic accidents. In traffic accidents, struck the vehicle interior and ejection from the vehicle cause the cranio-facial injuries and especially hyperextension fractures of cervical spine (1-5). This concept was supported by Maiman and Larson (4), and Seljeskog and Chou's (5) findings of which the rates of facial fractures were 5.9 % and 26.7 %, respectively in series with C₂ fractures. Lewis et al reported similar results in 982 patients with cervical fractures, including 14 % soft tissue, and 8.6 % facial fractures (1).

Table 5: Soft-Tissue Injuries Determined in the Cases

	occipito- atlantal	C1-C2	C2-C3	C3-C4	total
scalp	2	5	3	5	15
upper face	4	1	4	3	12
mid face	1	5	1	2	9
lower face	2	4	5	7	18
total	9	15	13	17	

In extensive investigation of cervical injuries resulted from automobile accidents, Huelke et al (3) noted one-third of the dead victims were injured as a result of ejection from the vehicle. Facial injuries are observed at a decreasing rate among seatbelt wears (1).

It was shown that approximately one-third of the occupants with such neck injuries had head-windshield contact. Less often, such injuries are sustained from striking the roof, door, or other structures in car (3). In our series, the most common cause of trauma was traffic accidents, the rate of which was 53 %. The second and third causes of trauma were fall-down from a height (27 %) and assault (20 %), respectively. In traffic injuries which are also most frequent causes of cervical trauma in our series, involvement of the cervical spine is greater and more severe (7). The

all results of reported and our findings show that spinal cord has a great risk of involvement in cervical spine injuries.

The fall-down on forehead or nape cause the cervical spine lesions by an acute and over-bending forces on spine. Therefore, these injuries are seen mainly associated with maxillo-facial and/or cranial injuries (1,3,7). High cervical fractures are frequently seen in association with severe cranial trauma. Upper cervical injuries has special clinical significance, because at this level the spinal canal is wide relative to the cord, and the chance of permanent neurologic injury diminished (5). However, in fatal injuries the cord damage occurs near the craniospinal junction (7). It thus becomes particularly important to disprove injuries to the upper

cervical spine in patients with laceration of the chin and fracture of the mandible (1).

It is stressed the importance of traumatic forces in injury to the spine (1,3,4). The face and skull were subjected to these forces, and were primarily directed to the scalp or upper face. These forces are compatible with the location of soft-tissue trauma found in our study. It would, thus, seem that close observation of the soft tissue injury can provide strong indications for the mechanisms of, and type of, injury to the spine. The data in this study are not sufficiently detailed to prove this conclusively. However, as a result, we suggest that vehicular occupants should incur the injuries, sitting in different locations in the auto. The type of soft-tissue injury and the fracture of any part of bone indicates the intensity and direction of the traumatic force. This craniofacial injuries in the victims with upper cervical fracture, especially without neurodeficity or being proved, may be accepted as predictive and guiding indicators.

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