

Hand and Wrist Injuries Caused by Glass Cuts: Accidental or Due to Sudden Anger?

Cam Kesimine Bağlı El ve El Bileği Yaralanmaları: Kaza veya Ani Öfke?

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SUMMARY

Objectives

Traumatic hand and wrist injuries are the type of injuries commonly seen in the emergency department (ED). Hand and wrist injuries related to punching windows due to sudden discomposes are frequent in Turkey. The aim of this study was to analyze clinical and demographic specifications of hand and wrist injuries related to glass cuts and their underlying causes.

Methods

The patient files who presented to the Dicle University Hospital ED (Diyarbakır-Turkey) with injuries due to glass cuts have been examined. Demographic data of the patients have been recorded in the standard work form and then were analyzed.

Results

One hundred and fifty four patients were included in the study. 53.8% of the patients constituted those who punched on the glass during an angry episode. Punching on the glass was more frequently observed in men (n=81, 97.6%), with cuts to the right hand being the most frequent type of resulting injury (n=65, 78.3%). Twenty four (28.9%) of the patients with injuries related to glass punching were under the influence of alcohol during the incidents and injury rates of radial artery, ulnar nerve, median nerve and ulnar artery have been found considerably higher in this group.

Conclusions

A thorough artery, nerve and tendon examination of the patients presenting to the ED with hand and wrist injuries needed to be performed, and especially for those under the influence of alcohol in order to prevent functional losses of the underlying structures.

Key words: Alcohol; glass punching; hand; wrist.

ÖZET

Amaç

Travmatik el ve el bileği yaralanmaları acil serviste yaygın görülen yaralanmalardır. Ani öfkelenmeye bağlı cama yumruk atma ile ilişkili el ve el bileği yaralanmaları ülkemizde siktir. Bu çalışmanın amacı oluş nedenlerine göre cam kesisi ile ilişkili el ve el bileği yaralanmalı hastalarda klinik ve demografik özellikleri analiz etmektir.

Gereç ve Yöntem

Dicle Üniversitesi Tıp Fakültesi Acil Servisi'ne cam kesimine bağlı yaralanma nedeniyle başvuran hastalar çalışmaya dahil edildi. Hastaların demografik verileri standart çalışma formuna kaydedildi. Demografik veriler istatistiksel olarak analiz edildi.

Bulgular

Çalışmaya 154 hasta dahil edildi. Hastaların %53.8'i ani sinirlenmeye bağlı olarak cama yumruk atan hastalardı. Cama yumruk atma erkeklerde daha sık gözlemlendi (n=81, %97.6), yumruk atan grupta sağ el yaralanması daha sık görüldü (n=65, %78.3). Cama yumruk atma ile ilişkili yaralanmalı 24 hasta (%28.9) alkollüydü ve bu hastalarda radial arter, ulnar sinir, median sinir ve ulnar arter yaralanması anlamalı düzeyde yüksek bulundu.

Sonuç

El ve el bileği yaralanması nedeniyle acil servise başvuran hastaların damar, sinir ve tendon muayenelerinin dikkatli yapılması, özellikle alkollü hastalarda bu anatomik yapıların yaralanmalarının birlikte olabileceği, sonrasında ciddi fonksiyon kayıplarına yol açmaması için erken dönemde kontrollerinin yapılması sağlanmalıdır.

Anahtar sözcükler: Alkol; cama yumruk atma; el; el bileği.

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Introduction

Hand and upper extremity injuries are among the most commonly seen injury types in emergency departments.^[1] Hand is the most active piece of upper extremity, yet the least protected, thus facing injuries most frequently.^[2,3] Although hand injuries are not life threatening, they cause limitation in daily activities.^[4] There are studies in the literature indicating that upper extremities are the most frequently observed.^[5,6] Approximately 13% of hand injuries are caused by glass cuts.^[7]

Glass related hand and wrist injuries overall are regarded as intentionally self-inflicted injuries frequently as a result of

punching window glass, however, some of them may happen accidentally in home environment or work places.

The purpose of this study was to quantify glass related hand and wrist injuries seen in our emergency department, and analyze their clinical and demographic characteristics in relation to their mechanism of injury.

Materials and Methods

This study is a retrospective chart review of patients presented with glass related hand and wrist injuries to the ED of a tertiary care hospital between March 2005 and December 2006.

Table 1. Clinical and demographic specifications of our patients

	Punching on the glass n (%) 83 (53.9)	Accidental injuries n (%) 71 (46.1)	Total n (%) 154 (100)	p
Sex				
Woman	2 (1.3)	21 (13.6)	23 (14.9)	<0.001
Man	81 (52.6)	50 (32.5)	131 (85.1)	
Age (year; mean±SD)	24.58±9.33	26.48±15.28		0.346
Marital status				
Married	54 (35.1)	41 (26.6)	95 (61.7)	0.407
Single	29 (18.8)	30 (19.5)	59 (38.3)	
Residency				
Rural	–	4 (2.6)	4 (2.6)	0.043
Urban	83 (53.9)	67 (43.5)	150 (97.4)	
Employment status				
Employed	27 (17.5)	27 (17.5)	54 (35)	0.502
Unemployed	56 (36.4)	44 (28.6)	100 (65)	
Alcohol intake prior to incident				
Positive	24 (15.6)	–	24 (15.6)	<0.001
Negative	59 (38.3)	71 (46.1)	130 (84.4)	
Injured hand-wrist				
Right	65 (42.2)	42 (27.3)	107 (69.5)	0.014
Left	18 (11.7)	29 (18.8)	47 (30.5)	
Injured anatomic formation				
Muscle	79 (51.3)	66 (42.8)	145 (94.1)	0.730
Flexor tendon	41 (26.6)	31 (20)	72 (46.6)	0.519
Extensor tendon	21 (13.6)	20 (12)	41 (25.6)	0.718
Ulnar artery	26 (16.9)	10 (6.5)	36 (23.4)	0.013
Ulnar nerve	16 (10.4)	5 (3.2)	21 (13.6)	0.034
Radial artery	25 (16.2)	5 (3.2)	30 (19.4)	<0.001
Radial nerve	2 (1.3)	1 (0.6)	3 (1.9)	1.000
Median nerve	15 (9.7)	7 (4.5)	22 (14.2)	0.171

The patients were identified and selected from the database by using the chief complaint and clinical history upon arrival. We searched the patients from forensic records. Patients with insufficient information from their charts had been excluded from the study. Demographic information of the patients such as age, gender, the dominant hand, the district where the patient lives (rural or urban), the occupation, mechanism of injury (punching window glass, or accidental injuries such as fall at home or work related injuries), details of injury (osseous, muscle, tendon, nerve and vessel injuries) as provided in surgery records and presence of alcohol consumption at the time of injury were reviewed and recorded. Patients were divided into two groups according to the mechanism of injury; as punching window glass (group 1) and accidental injuries (group 2).

Study data were analyzed in SPSS 11.5 for Windows. The variables were expressed as mean±standard deviation (SD). Comparison of two groups with categorical variables was performed by chi-square test. All the hypotheses were constructed as two tailed and an alpha critical value of 0.05 was considered as significant.

Results

A total of 162 patients were identified but eight patients were excluded due to missing data in their files. The remaining 154 patients were included in the study. The study subjects had a mean age of 25.5±12 and 85% (n=131) of them were men.

Eighty three (53.8%) of the patients punched glass during an angry episode, while 71 (46.2%) of them injured as a result of accidents. Clinical and demographic features of the study patients are shown in Table 1.

Although glass punching was more frequently observed in male patients (n=81, 97.6%), the accidental injuries was the prominent cause in females (n=21, 42%) (p<0.001). Only four patients presented to the ED from the rural areas and all of them had accidental injuries.

Twenty four (15.5%) of the patients admitted consuming alcohol before the injury. The 28.9% of the patients injured after punching glass were under the influence of alcohol; whereas none of the patients injured with other causes had consumed alcohol (OR 28.47, 95% CI 3.74 to 216.84, p<0.001).

There were four (2.6%) of the patients suffered only tendon injury, 17 (11%) patients only vessel injury and 3 (1.9%) patients only nerve injury. Number of patients with both tendon and neural injuries was 6 (3.9%), tendon and vessel injuries 17 (11%), nerve and vessel injury 3 (1.9%). Twenty six (16%) of the patients suffered tendon, neural and vein injuries at the same time.

When the severity of injury and the anatomic structures involved; radial artery, ulnar, nerve and ulnar artery injury averages were identified considerably higher in those patients punching on the glass (p values <0.001, 0.034 and 0.013 respectively).

Radial artery, ulnar nerve, median and ulnar artery injuries were considerably higher in those consumed alcohol than those free of alcohol. Relationship between presence of alcohol and the anatomic formation is given in Table 2.

Discussion

Upper extremity injuries related to glass cuts were more in men in their 30s.^[8,9] In our study, average age of the patients were identified to be 25.4 years and the ratio of male patients

Table 2. Relationship between presence of alcohol and injured anatomic formation

	With alcohol n (%) 24 (15.6)	Non alcohol n (%) 130 (84.4)	Total n (%) 154 (100)	p
Injured anatomic formation				
Muscle	24 (15.5)	121 (78.6)	145 (94.1)	0.356
Flexor tendon	14 (9.1)	58 (37.5)	72 (46.6)	0.267
Extensor tendon	6 (3.9)	35 (21.7)	41 (25.6)	0.845
Ulnar artery	10 (6.5)	26 (16.9)	36 (23.4)	0.033
Ulnar nerve	8 (5.2)	13 (8.4)	21 (13.6)	0.006
Radial artery	13 (8.4)	17 (11)	30 (19.4)	<0.001
Radial nerve	2 (1.3)	1 (0.6)	3 (1.9)	0.064
Median nerve	8 (5.2)	14 (9)	22 (14.2)	0.008

to female patients was 5.7. Being male in the third decade of life is a risk factor for upper extremity injuries related to glass cutting. In their studies, Bokhari and Stirrat claim that punching on the glass due to discompose is almost an epidemic case.^[10] Our study also supports this claim since more than half of our patients constitute those punching on the glass due to discomposes. While punching on the glass during an angry episode was a more common cause of injury in men, accidental injuries were more often seen in women and this result was found to be statistically significant. In the literature, injuries related to glass cuts were especially found in those employed in the glazier industry.^[8] In our study, however, a considerable part of patients presenting to the ED with glass cuts were unemployed.

The dominant hand in the population is the right hand^[11] and in the previous studies on hand injuries.^[8,12-14] The dominant hand was seen to be the most injured. In our study, right hand injuries occurred more commonly. Furthermore, considering the relationship between the injured hand and form of injury; it was identified that the hand injuries due to glass punching were more common in the right hand and the accidental injuries were more common in the left hand.

There is a close relationship between being under the influence alcohol and accidental injury.^[15-18] Some serious hand injuries result following alcohol intake.^[19,20] Clark et al., in their study^[21] found out that 18% of the patients were under the influence of alcohol while it was 31% in Marston's study.^[16] In our study 15.5% of the patients were under the influence of alcohol and in most of those patients, the injuries resulted from punching glass. This finding was consistent with the literature. Alcohol was not present in those suffered accidental injuries, however this finding was not consistent with the related findings in the literature.

Hand injuries resulting from glass cuts tend to proceed to the bone or another solid structure if some force is applied.^[22,23] Possibility of vessel, nerve and tendon injuries increases due to severe punching on the glass during angry episodes.

Alcohol consumption is a predisposing factor for injury during angry episodes. Radial artery, ulnar artery and nerve injuries were most frequently seen injuries in our study. At the same time, patients with alcohol intake were found to have higher rate of artery and nerve (radial artery, ulnar nerve, median nerve and ulnar artery) injuries than those of non-users. In tendon injuries, the location of laceration and the position of the finger during the impact is important. Most of flexor tendon injuries happen due to lacerations.^[23] While tendon injuries was most frequently seen in the flexor surface as found by Keskin et al., artery and nerve injuries were more commonly seen on the extensor surface of the hand.^[8] Findings in our study show similarity with that study.

When the arteries are involved in injuries on the volar surface of the hand, nerve injury should also be taken into consideration.^[23] Similar to the findings in the literature, we found that the nerve injuries are accompanied by arterial injuries on the flexor surface of the hand or the wrist. In another study carried out by Keskin et al., it was indicated that most frequently accompanying nerve injury was ulnar nerve.^[24] However, we identified in our study that the median nerve injuries were most frequently seen, followed by the ulnar nerve injuries.

The most commonly injured tissues in extremity injuries related to glass cuts are muscles and tendons. On the other hand, nerve and artery injuries are more common in sudden anger group. Flexor surface injuries are seen higher in number than those of extensor surface injuries. We think that hand injuries are caused by glass cuts occur when the punching fist is drawn back.

The severity of injuries resulting from punching glass is higher compared to that caused by accidental cuts by glass. The likelihood of artery, tendon and nerve damage is also higher in injuries caused by glass punching.

Limitations

Our study is a retrospective study which impairs the reliability of data provided by the patients or their relatives. This can even render the differentiation process of "accidental" and "punching" injuries from each other. For alcohol consumption we only searched the records whether our patients had consumed alcohol or not. Laboratory data could not be used.

Conclusion

The first condition to be considered in glass-caused hand injuries is tendon examination. Alcohol consumption is a predisposing factor for injuries that result during episodes of sudden anger. Injuries of radial artery, ulnar nerve, median and ulnar artery are more frequently seen in patients under the influence of alcohol. Emergency physicians should thoroughly evaluate the patients for nerve and flexor surface damage in glass-related injuries resulting from sudden anger.

Conflict of Interest

The Author(s) declare(s) no conflict of interest related to this work.

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