

Characteristics of Head Trauma Sequelae Affected by Blunt Objects through the Clinical Forensic Assessment of the Rate of Body Damage at the National Institute of Forensic Medicine of Viet Nam

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Abstract

Objectives: To study the characteristics of head trauma sequelae affected by blunt objects in subjects who come for the forensic clinical assessment at the National Institute of Forensic Medicine of Vietnam.

Subjects and Methods: Cross-sectional descriptive studies were performed on 91 subjects with head trauma to the National Institute of Forensic Medicine of Vietnam assessed from January 01, 2009 to June 30, 2018.

Results: Out of 91 subjects with head trauma caused by blunt objects affecting, the injury at the point of impact due to the catastrophe, there were 82/91 cases, accounting for 90.11%, 24.18% of the lesions are different from the point of impact, 5.49% of the damage of multiple locations, the broken of the skull (5.49%), there are many severe cranial lesions that often occur in the manipulated person. 18.68% subdural hematoma, 17.58% subarachnoid hemorrhage; brain stamping caused by objects is 24.18%, the average change in Electroencephalogram (EEG) caused by objects is 15.38%; severe change in EEG caused by 1.10% material. Severe paralysis and average paralysis, is the result of blunt objects, meeting 6.59% and 2.2%, respectively.

Conclusions: the injury just below the point of impact is 90.01%; cerebral palsy (24.18%), subdural hematoma (18.68%), epidural bleeding (17.58%), subarachnoid bleeding (17.58%). The rate of nerve paralysis caused by blunt objects is 13.19%.

Keywords: Blunt object • Head trauma • Clinical forensic assessment

Introduction

Head trauma caused by blunt objects is a common type of injury in traffic accidents, domestic accidents and violence. Head trauma caused by a blunt object is the result of the interaction between the head and the object causing the injury [1]. Head injuries caused by blunt objects include many combined mechanisms caused, the damage is often complex and severe, affecting health.

Forensic clinic assessment dealing with cases, accidents without witnesses, unknown injuries object or an incident where many perpetrators use different weapons, the determination of Brain injury caused by any injury is very important, in order to help investigative agencies, prosecute civil or criminal liability of the person and the crime.

Up to now, there are many ways to understand and rank different body injury rates for the same type of head injury. Forensic majors in Viet Nam have not had a research topic on the characteristics of head injuries and injuries in the field of body injury assessment. Therefore, we carried out the project "characteristics of head injuries caused by blunt objects through assessment of the rate of body damage at the National Institute of Forensic Medicine of Viet Nam", with the goal of:

- i. Description of physical injury characteristics in subject of assessment with head injury caused by objects assessed at the National Institute of Forensic Medicine of Viet Nam.
- ii. The degree of influence of the object.

Subjects and Methods

Subjects

A study of 91 medical examiners with a history of head injuries received forensic clinic assessment of body injuries at the National Institute of Forensic Medicine from January 1, 2009 to June 30, 2018.

Selection criteria:

- i. The subject of the assessment suffered a head injury due to the impact of the object.
- ii. The comprehensive assessment file with lesion photography has been completed.
- iii. The conclusion of the assessment with conclusions on the blunt object causing the injury.

Exclusion criteria

- i. Cases are under during investigation.
- ii. The victims suffered head injuries but were not traumatized.
- iii. The victim suffered head trauma due to fire, sharp objects, or sharp objects.
- iv. In case the selection criteria are not satisfied.

Methods

Research design: A cross-sectional descriptive study method, with purposeful sampling of 91 assessment subjects with head injuries caused by objects.

Method of proceeding: In 91 cases, the subjects examined at the Department of Assessment of the National Forensic Institute were examined and determined to have traumatic brain injury. Subjects are assessed according to the assessment process, including the steps of receiving documents, contacting the soliciting agency, recording administrative procedures, examining injuries and recording signs of sequelae of injuries, performing a full examination. body, take pictures, appoint specialist examination, neurological examination, CT Scanner or MRI tests.

Analyze and process data

Data were collected and processed using Microsoft Excel 2010.

Research ethics

- i. Collect honest and objective data.
- ii. Information about research subjects is kept confidential.
- iii. Research purposes are descriptive research, in order to improve the quality of Forensic clinic assessment in the hope of contributing to better orientation for the examination.

Results

Characteristics of head injury due to impact

The site of the impact object and the site of the head injury depends on the magnitude of the force of the impact, the type of object causing the injury and the position of the head, whether the head is stationary or moving [1-2]. For an impact object when the head is stationary, the damage is done from the outside to the inside right where it is impacted, when the head is moved, besides the damage just below the point of impact from the outside into the brain parenchyma, there is also damage to the opposite side. Also known as "contrecoup" lesions, contralateral injuries, depending on the level of impact force, impact object, type of impact, can cause only brain contusion or even contralateral skull fracture [2-4]. Research results in (Table 3.1) show that injury at the point of impact due to a collision occurs in 82/91 cases, 90.11%. This is explained by the multiplicity of outside body lesions that may not be seen at the point of impact outside the scalp but cause subarachnoid haemorrhage or damage in the brain parenchyma. Our research results are similar with other authors [3-6]. The results in (Table 3.1) also show that head injuries caused by blunt objects are often complex, severe, and diverse with 24.18% of lesions different from the location of the impact point; 5.49% lesions combine multiple locations [4].

Table 3.1. Impacted site and head injury site

Trauma Object	Blunt Object	
Impact site and injury site	N	Percentage
At the point of impact	82	90.11%
Opposite the point of impact	4	4.40%
Other position	22	24.18%
Combined (at the site of impact and elsewhere)	5	5.49%

The craniocerebral lesions in (Table 3.2) are those diagnosed clinically through CT Scanner, MRI and surgically recorded by surgeons in the surgery/procedure sheet.

(Table 3.2) shows that there are injuries caused by the impact of the object causing the skull base to break (5.49%), there are many severe brain injuries that often appear in people affected by the impact, subdural bleeding is encountered 18, the rate of 68%, subarachnoid bleeding was 17.58%; brain contusion occurred in 24.18%.

Table 3.2. Morphology of head injury due to impact.

Trauma object	Blunt object	
Trauma of characteristic	N	Percentage
Skin tear	55	60.44%
Subsidence of the skull bone	4	4.4%
Subsidence of both skull bones	15	16.48%
Fracture of skull arch bone	46	50.55%
Broken skull base	5	5.49%
Epidural bleeding	16	17.58%
Subdural hematoma	17	18.68%
Subarachnoid hemorrhage	16	17.58%
Brainstorming	22	24.18%

In addition to a few cases of single injury, the majority of head injuries caused by head injuries are diverse and combine many forms of injury under a single point of impact such as laceration, chipping, skull fracture, epidural bleeding, subarachnoid haemorrhage, cerebral contusion. However, the extent of neurological effects lies mainly in the brain parenchyma. Lesions with epidural bleeding, subdural bleeding, if treated, almost leave no sequelae [6-7].

The sequelae and the rate of bodily injury upon examination

EEG used to determine brain parenchymal lesions and electroencephalogram recording in patients in the assessment is a type of functional investigation that is relatively reliable.

Research results in (Table 3.3) show that the rate of brain parenchymal damage and its sequelae are clearly shown on the EEG results. EEG changes on average 15.38% due to blunt objects; Severe changes in the electroencephalogram were seen due to the object 1.10%. There were 15 cases with the rate of 16.48% of the subjects coming to the assessment who were affected by the brain without electroencephalography because these subjects after craniotomy with large bone window size, bone defect. The bulging bottom is afraid of life-threatening so it is not indicated to do an EEG. These cases, if the EEG is recorded, often also change the severity.

Table 3.3. Electroencephalogram.

Trauma object	Blunt object	
Electroencephalogram	N	Percentage
Stimulate	23	25.27%
Slight change	16	17.58%
Average Variation	14	15.38%
Severe Variation	1	1.10%
Normal	22	24.18%
Do not do electroencephalogram	15	16.48%
Total	91	100%

Paralysis is a manifestation of damage to the brain parenchyma in the motor and sensory parts of the brain. Depending on the degree of damage to the brain parenchyma in the part of the extremities and the cranial nerves, the clinical manifestations are in levels of severe, moderate, and mild paralysis... According to the research results Studies of nerve palsy lesions have shown varying degrees of brain parenchymal damage [8].

The results of the study in (Table 3.4) showed that the degrees of severe paralysis, on average, caused by blunt object occurred in 6.59% and 2.2%, respectively. Cranial nerve palsy met 5 cases, the rate was 5.49%.

Table 3.4. Sequelae of nerve damage due to the impact of the object.

Trauma object	Blunt object	
Nerve damage	N	Percentage
Mild hemiplegia	9	9.89%
Moderate hemiplegia	2	2.2%
Severe hemiplegia	6	6.59%
Cranial nerve palsy	5	5.49%
Paralysis (upper, lower)	2	2.2%
Circular muscle disorder	2	2.2%
No paralysis	69	75.82%

Discussion

Research results show that for the level of brain damage and nerve paralysis in victims of trauma, the victims have to have surgery to expand the skull, lift the sunken bones, have intracranial surgery, and often the victims are affected. affect other areas of the body, so percentage of health decline is high. The research results also show that blunt objects are considered a less dangerous weapon, the ability to damage is lower than that of the sharp objects, but when it hits the head, it causes very heavy sequelae on the brain [4]. Through the study, we encountered a number of cases of traffic accidents, head injuries caused by objects, subject to assessment had many forms of trauma such as scalp tear, dural bleeding, subdural bleeding, bleeding subarachnoid, cerebral contusion.

Conclusion

Out of 91 subjects with head injuries from impact blunt objects examined by the National Institute of Forensic Medicine of Viet Nam:

- i. Injury just below the point of impact in the body is found in 90.01%.
- ii. Brain contusion (24.18%), subdural bleeding (18.68%), epidural bleeding (17.58%), subarachnoid haemorrhage (17.58%).
- iii. The rate of nerve paralysis due to the object was 13.19%.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

1. Anh N, et al. "Morphology Study of Brain Contusions Due to Road Traffic Accident through Forensic Medicine Examination." VNU J. Sci Med Pharm Sci. 33.1 (2017).
2. Textbook of Forensic Medicine, Hanoi Medical University 2006.
3. Yoshida, Sara JM. The Replication of Depressed, Localized Skull Fractures: An Experiment Using *sus Domesticus* AS. Diss. Simon Fraser University, 2000.
4. DiMaio V, and Dana S. Handbook of forensic pathology. CRC press, 2006.
5. Chattopadhyay S, and Tripathi C. "Skull fracture and haemorrhage pattern among fatal and nonfatal head injury assault victims—a critical analysis." J inj violence Res. 2.2 (2010): 99.
6. Sharkey E. et al. "Investigation of the force associated with the formation of lacerations and skull fractures." Int j leg med. 126.6 (2012): 835-844.
7. Textbook of Surgery, Hanoi Medical University 2009.
8. Sulaiman N, et al. "Blunt force trauma to skull with various instruments." Malays j pathol. 36.1 (2014): 33.