

# Death by Sharp Object Trauma to Neck (Forensic Pathology Case Report)

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**Abstract-** Traumatology is the study of anything that is related to trauma to the tissue in living person. Mechanical trauma can be caused by sharp object trauma, blunt object trauma, and gun shot. The type of the weapon or tools used and how it is used will affect the type of wound formed. The type of wound caused by sharp object trauma can be categorized into incised wound, stab wound and chop wound. Most of the death victim were due to a blunt trauma in an accident, while in criminal cases sharp object was more often used in murdering the victims. In this case report, the victim was a 16-year-old male murdered by an unknown person. There was an incised wound in the neck, chest, and abdomen, lower right arm and right thigh and chop wound in the neck. Right carotid artery was severed along with broken trachea in the thyroid cartilage. The cause of death was chop wound that severed right carotid artery and trachea which was a sharp object trauma which causes massive bleeding. The estimated time of death was 12-24 hours. The motif of death was thought to be a murder. The culprit can be charged with Indonesia' KUHP chapter 338 and 389 about murder.

**Index Terms-** Sharp object trauma, Carotid Artery, Murder.

## I. INTRODUCTION

The percentage of murder using sharp object in the world was 24%. Murder cases in Europe were most often using sharp object compared to firearms in United States. In a study in Dallas, United States, it was found that from 630 cases of death by sharp object, 90% were a murder case, 7.5% were suicide, and 3.5% were accidents. In German, from 376 cases of death by sharp object, it was found that 80% of the cases were murder cases, 17% were suicide, and 3% were accidents. In the southeast Asia, sharp object trauma was the highest mechanism found in murder cases which was 38% followed by 26% by gun shot, and 36% by other mechanism. In 20123, the prevalence of an injury in West Sumatera was 6.8% and the most common cause of injury were motorcycle (49.5%), fall (33.2%), other land transportation (5.4%), sharp or blunt object trauma (7.4%) and the least was fall (3.0%)

At the present, there were so many cases of injury that happened around us, especially trauma from sharp object. This was promoted by the worsening of economic condition that raises

criminal cases especially violence using sharp object. These cases cause mild injury and sometimes sever injury. Most of the patients that were administered into the emergency department in many hospitals in Indonesia is patients suffering injury from sharp object trauma, that needs and immediate treatment, which if not may cause tissue damage and even organ damage. Sharp object as a tool of murdering in Jakarta was found in about 30-40% from all of the tools used for murder and on the contrary, was very rare found in suicide (2 cases per year).

## II. CASE REPORT

### Chronology

A case was reported for a corpse, identified, with initials AP, based on Visum et Repertum document dated to 17<sup>th</sup> December 2021, with document number: B/283/XII/2021/Reskrim, Investigator was L M, Ranked police commissioer, NRP 67100XXX, which by this explained that in 18<sup>th</sup> December 2021, at 08.00 West Indonesia Time, in the forensic department of Bhayangkara TK II General Hospital in Medan, post-mortem examination was performed, which was then continued by an internal examination of the corpse.

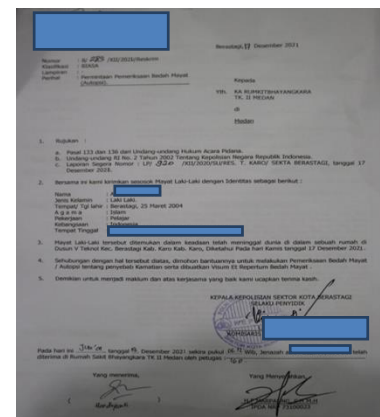


Image 1. Visum et Repertum Document

The victim was found unconscious by his father in his house covered in blood on 17<sup>th</sup> December 2021 at 14.30 West Indonesia Time. Around the crime scene, a machete was found.

The victim's father immediately took the victim to the hospital. An emergency treatment was performed, but the victim could not be saved. The parent's father reported the incidence to the Police. The victim was administered to general hospital at 06.00 west Indonesia time in the next day for an autopsy.

### Examination Result

Covering the corpse there was two red blankets and two cloth, blue and brown each. Signs of death: Livor mortis around the neck, back and thigh, purplish-red discoloration, and fixed even when pressure was applied. Rigor mortis was found in the jaw area, upper extremities, and lower extremities. Decomposition was not found.

**Image 2. Livor Mortis of the Victim**



The corpse was a male, identified, circumcised, 16-year-old, yellowish skin, moderate nutritional status, hair was black, short, and straight, body length 164 cm, body weight 51 kg, and was an Indonesian citizen. From eye examination, both eyelids were pale.

Nose size was moderate, oval-shaped ear. Mouth opening was 2 centimeters, tongue not sticking out and not bitten. There was blood coming out from nostrils and ear.

**Image 3. The Victim's Lips Was Pale**



Injury found in the body were:

a. In the front right neck, there was a plaster and gauze stuck to the neck. When

the gauze was opened on the front neck, right at the midline, 10 cm inferior to the chin, there was an open wound with clear wound edge, sharp wound corner, no tissue bridging, wound base was muscle and throat, with the size of wound (when closed) was 11 cm in length and 1 cm in depth. Around the wound, there was 4 open wounds, with sharp corner, no tissue bridging, with the highest length was 5 cm and depth 0.1 cm deep. Distance from heels was 130 cm. There was a bruise around the wound, with red discoloration, 4x1 cm in size.

**Image 4. Chop Wound in the Victim's Neck**



b. On the chest, right at the midline, 5 cm under the



horizontal line that crossed nipples, there were 7 open wounds with smooth wound edge, sharp wound corner, and no tissue bridging, with the highest length was 5 cm and depth was 0.6 cm. distance from heels was 110 cm.

**Image 5. Chop Wound on the Victim's Abdomen**



c. On the abdomen, there was a gauze and plaster. After the plaster and gauze was opened, right at the midline, 11 cm under the horizontal line that crossed nipples, there was an open wound with smooth edge, sharp wound corner, no tissue bridging, wound base was muscle, with the size of the wound (when closed) was 9 cm in length and 3 cm deep. Distance from heel was 107 cm. also in the abdomen, right at the midline, 19 cm under the horizontal line that crossed nipples, there was an abrasion 25 cm in length.

d. In the right lower arm, in the front area, 2.5 above the wrist, there was an open wound with smooth edge, sharp wound corner, no tissue bridging, with the highest length was 5 cm and 0.1 cm deep, covering an area of 6 cm x 5 cm.

**Image 6. Multiple Cuts in the Right Wrist of the Victim**



e. In the upper left arm, 9 cm from the elbow, there was an open wound with smooth edge, sharp corner, no tissue bridging, wound base was skin with the size (when closed)



was 7 cm in length and 3 cm deep.

### Image 7. Chop Wound in the Upper Left Arm



- f. In the front side of the right upper limb, 14 cm above the knee, there was an open wound.

### Image 8. Incision Wound in Victim's Thigh

Lips tissue looked pale, skin tissue under hand fingernails looked pale, skin tissue under foot fingernails looked pale.

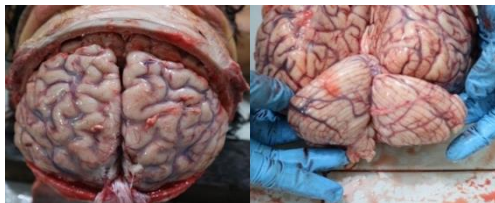
### Image 9. Victim's Finger Looked Pale

#### Examination of Internal Organs

Head:

- a. Inner scalp:
  - No signs of violence
- b. Skull: No signs of violence
- c. Dura mater was intact.
- d. Pia mater was intact.
- e. Cerebrum: Springy on touch, there was a dilatation of blood vessels on the brain's surface, gyrus was flat, sulcus was shallow.
- f. Cerebellum: Springy on touch, on there was a dilatation of blood vessels on the brain's surface, gyrus was flat, sulcus was flat.
- g. Brain stem: Dilatation of blood vessels was observed.
- h. Brain chamber: No signs of bleeding.
- i. The weight of the brain was one thousand three hundred seventy-eight grams.

### Image 10. Cerebral Tissue of the Victim



Opening of the chest skin: Width of the chest fat was 0.5 cm. Connective tissues under the skin on the neck. There was a blood absorbance on the skin of the anterior neck with the size of 8 x 5 cm. on the right carotid artery, there was a blood absorbance and a tear. The trachea was cut at the thyroid level.

### Image 11. Severed Right Carotid Artery



Heart Examination: The weight of the Heart was 260 grams. The diameter of the tricuspid valve was 11 cm. the width of the muscles on the right ventricle was 0.5 cm. The diameter of the pulmonary valve was 7 cm. The diameter of the bicuspid valve was 9 cm. The width of the left ventricle was 1.5 cm. The diameter of the aortic valve was 5 cm. The vessels were not clotted. Heart looked pale. On the pulmonary examination: right lung looked pale, surface was smooth, springy on touch, three hundred seventy-five grams in weight. On all parts of the posterior lung, there were blood absorbance. Left lung looked pale, surface was smooth, springy on touch, three hundred eight grams in weight. On all parts of the posterior lung, there were blood absorbance

### Image 11. Victim's Lungs



Duodenum: There was a yellowish mucus, the mucus layer was shining with greyish and yellow color.

Liver: Brownish red color, edgy corner (right and left), some parts were solid during palpation, and some parts were spongy like a jelly, the ligament was brownish red, the weight was 1502 grams.

### Image 12. Macroscopic Examination of the Liver



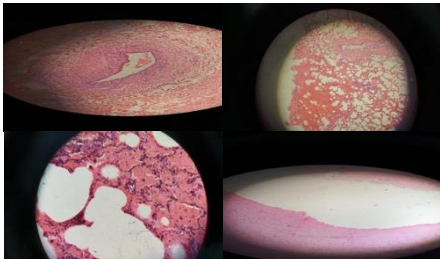
For anatomical pathology examination, heart, right lung, right carotid artery, liver, cerebellum, cerebrum, neck skin and thyroid bone was taken:

- Heart tissue sample from showed a striated muscle fiber with the core morphology within normal range, no necrosis or bleeding was found, there was a fattening.
- Cerebrum tissue sample showed glial cells focus within normal range, no signs of interstitial bleeding.
- Cerebellum tissue sample showed no signs of interstitial bleeding.

- Right carotid artery tissue sample showed the distribution of the PMN and MN cells, interstitial bleeding was observed.
- For the neck skin tissue, from epidermis, dermis and stratified squamous epithelial cell were observed, there were also sebaceous gland, lipid, and hair follicles.
- From the liver tissue, hepatocyte was within normal range, portal vein was also observed.
- From the thyroid bone tissue, there were thyroid glands with a ground glass core along with muscle cells and lipid cells, shown on the cartilage.

With the conclusion of the anatomical pathology examination was that the cause of death was circulatory failure.

### Image 13. Microscopic Examination of the Tissues.



### III. DISCUSSION

The legal basis for Visum et Repertum was the Indonesia' KUHAP chapter 133, which stated that if the examined was human, who is a victim or a suspected victim of a crime, either alive or dead.

KUHAP Chapter 133.

KUHAP Chapter 133.

1. In a case of an investigator prior to the court, investigating a victim, either wound, poisoning or dead which was a suspected crime, he/she has the right to propose for an expertise from an expert forensic & medicolegal doctor or doctor with another expertise.
2. A proposal for an expertise from an expert, as stated in verse (1) is done in written document, which clearly included the aim either to perform wound examination, dead body examination, or autopsy.
3. Dead body delivered to a doctor with forensic and medicolegal expertise or a doctor in a hospital must be treated well with dignity and must be given a label that includes an identity, stuck and stamped and labeled in their toe thumb or other part of the body.

According to KUHAP chapter 133 verse 2, an expertise request must be in a written document by the investigator either for wound examination, dead body examination or an autopsy. In this case, the visum proposal was from the police sector of Brastagi city with the document number B/283/XII/2021/Reskrim which request for external and internal post-mortem examination of for the corpse of Azizi Pratama.

KUHAP Chapter 133 stated that legal officer who can propose for a visum et repertum is an investigator. Afterwards, because visum et repertum was performed for a crime in physical and mental health, which is concluded as general crime, then the

investigator is a police officer from (and military police officer). Afterwards, the regulation for the rank requirement for an investigator or investigator assistant according to the constitution is regulated in the Government Order No. 27 year 1983 chapter 2 that said: Investigator is Indonesia Police Officer which is at least in the rank of lieutenant II.

To simplify the authentication of the visum et repertum proposal, the writing of the visum et repertum letter by Indonesia Police always written on behalf of the head of the local police station, which according to Government Order No 27-year 1983 stated above, is always an investigator. Due to this regulation, the one who will be in charge is the attribute officer, which is the commander (as an investigator), while the officer that signed the document or the mandatory officer is only responsible to the commander.<sup>10</sup> In the Visum et Repertum document no. B/283/XII/2021/Reskrim the investigator was a police ranked police commissioner who was the Chief police of the Brastagi City, which means that he was legal to be an investigator.

There was a livor mortis, which does not disappear upon touch and rigor mortis that was not easy to move. From this result we can conclude that the estimated time of death was around 12-24 hours before an external postmortem examination was performed, in which the postmortem examination was performed on 08.00 of west Indonesia time on 18<sup>th</sup> December 2021, do the estimated time of death of the victims was 08.00 west Indonesia time (17<sup>th</sup> December 2021) up to 20.00 west Indonesia time (17<sup>th</sup> December 2021). During death, body will naturally produce livor mortis at the lowest part of the body (the direction of the gravity), livor mortis appeared during 30 minutes to 1 hour of death but can then still disappear with touch. After 6-12 hours, the blood vessels that contains red blood cells will undergo a cell lysis and will leak into the tissue depending on the position of the corpse, in this can be measured with a fixed livor mortis which may not disappear when a pressure is applied. During death there will also be a rigidity of the muscle depending on the level of glycogen in the muscle. Rigor mortis happened because of muscle contraction at death because of undergoing cellular metabolism which was the breaking of glycogen → Energy → ADP → ATP. When there was still an energy → actin and myosin is still relaxed. If all the glycogen was used and there was no more energy, then ADP cannot be converted into ATP → ADP is piled up → actin and myosin is frozen → rigidity. Start: 1-3 hours post-mortem (average is 2 hours), rigid 6-24 hours, starting from smaller muscle: lower jaw, upper extremities, chest, abdomen, lower extremities, and then total rigidity of the body. The muscle will be relaxed after 24 hours (secondary relaxation), and then decomposition of the corpse will start. In this case report, there was no decomposition on the corpse.

Wound is an abruption of the normal skin (Taylor, 1997). Wound is the disruption of the continuity of the skin, mucous membrane and bone or other organ (Kozier, 1995). In performing an examination of a patients with a wound from violence, a doctor is obliged to be able to give an explanation about the type of wound, type of violence that may cause the wound, and the qualification of the wound.

Wound caused by sharp object can be differentiated from wound caused by other objects, by looking at the normal condition of the tissue surrounding the wound, smooth wound edge, and

wound corner – total sharp corner or partly sharp corner and also with the absence of bridging tissue.

Sharp object wound is a disruption of the body caused by a contact with a sharp tools and/or pointed object, or even a pointed object that is not sharp. Sharp object can incise, pointed object can stab or tear. Examples: Knife, shattered glass, razor, sword, keris, sickle, axe, dagger, bayonet, etc.

Characteristic of wound caused by sharp objects:

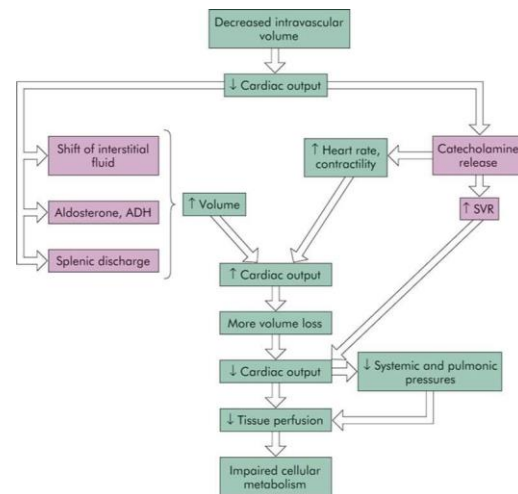
- a. Smooth wound edge
- b. Sharp wound corner
- c. Hair was cut
- d. Absence of bridging tissue
- e. Absences of bruise or abrasion around the wound.

There was an incision wound on the neck, chest, abdomen, upper extremities, and lower extremities of the corpse, in which incised wound was a wound caused by sharp object with the direction of the force is parallel to the skin, shaped like a line with the depth of the wound is smaller than the length of the wound. Both corner of a wound by a knife is always sharp.

Chop wound at the neck, chest, and abdomen of the corpse, in which this chop wound was caused by sharp object trauma relatively perpendicular to the skin. If one of the corners of the skin was blunt, then the wound was caused by a one-edged weapon because the blunt corner was formed by the back of the weapon. Stab wound which has a dull corner for both wound corners usually was caused by weapon with two dull corner such as chisel or axe. However, if both corner of the wound was sharp, the wound may be caused by a double-edged weapon or a one-edged weapon from several angle. Sharp weapon stabbed with an angle tilted to the blade will form a wound with one corner formed by the blade and one corner formed by the end of the knife, which resulted in both corners of the wound to be sharp. The length of the wound can explain the maximum width of the weapon. Withdrawing the weapon while twisting it will form a wound that is no more shaped like a line. The depth of the wound does not guarantee the length of the weapon, because weapon is not always stabbed to its base, on the contrary, even if it was stabbed to its base, the skin can still be pushed inwards.

Chop wound that caused a tear to the artery of the neck, which was the carotid artery and cut the base of the trachea. Bleeding occurred after laceration, fracture, and compression. Losing 1/10 of the blood volume is not clinically significant. Losing ¼ of blood volume may cause faint, even when laying position. Losing ½ volume of blood rapidly will cause shock and anemia due to a decrease of Hb which will cause anoxic anemia. This was marked by pale lips and tissue under fingernails of both hands and feet. Due to massive bleeding the loss of red blood cells from someone in an accidents or murder in which there was a massive acute bleeding, which was called external bleeding. Hb is a protein rich in iron, has a high affinity to oxygen which will form an oxyhemoglobin in the red blood cells. By this function, oxygen will be transported to the lungs and to all parts of the body.

#### Image 14. Pathophysiology of Hypovolemic Shock



Chop wound is a wound with the depth of the wound more or less is similar with the length of the wound due to the force applied was oblique from the skin. Chop wound is a wound caused by a weapon or tools which is heavy, with a sharp edge or a little bit blunt, applied with one swing with a huge force.<sup>11</sup>

As an example, several weapons that may cause a chop wound are sword, sickle, axe, ship turbine. There are 6 characteristics of chop wound as follows:

1. The size of chop wound is large
2. The edge of chop wound depends on the edge of the weapon
3. The corner of chop wound depends on the edge of the weapon
4. Almost always causes injury to the bone
5. Sometimes severe parts of the body that was hit
6. Contusion or abrasion can be observed around the wound.

The cause of death of the people in chop wound are<sup>9</sup>:

1. Bleeding
2. Vital organ injury
3. Pulmonary emboly

#### IV. LEGAL REVIEW

The suspect for this murder was not yet known however several chapter from the KUHP can be charged to the suspect/culprit such as:

About murder and premeditated murder. KUHP Chapter 388, whoever purposely took another person's live, will be charged because of murder with an imprisonment for a maximum of fifteen years. KUHP Chapter 339, murder followed by, along with, or preceded with a crime, which was done to prepare or to ease the execution, or to release oneself or other person from crime if caught, or that ensure the ownership of an item he/she received illegally, will be charged with lifetime imprisonment, or imprisonment for up to twenty years. KUHP chapter 340, whoever purposely and with preceded planning took another person's life, will be charged on murder with plan, with dead sentence, or lifetime imprisonment, or for an imprisonment maximum of twenty years.

## V. CONCLUSION

Based on all this literature review, case report and discussion above, we can conclude that:

- a. Estimated time of death was between 12 hours - 24 hours before postmortem examination;
- b. The victim died of an unnatural cause.
- c. The cause of death was chop wound at the base of the neck which severed the carotid artery and cut the trachea, which resulted in death by massive bleeding and suffocation.

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