Case Report

Extensive Soft Tissue Injuries as a Cause of Death

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Abstract

The blunt trauma injury is the most common type, a pathologist encounter when doing medico-legal autopsies. Sometimes, while searching the main cavities of the body for the fatal injuries like lacerations and damages to the vital organs, we, the Forensic Pathologist commonly ignores the superficial small abrasions, bruises over the other parts of the body. Cutaneous injuries i.e. abrasions, contusions in most cases, are not fatal and are seemingly unimportant. However, soft tissue injuries not always are simple as mostly described in the literature but sometimes these injuries may be so extensive internally that leads to irreversible shock. In fact, these injuries prove fatal when taken collectively into consideration. Sometimes trivial circumstances lead to serious quarrel, resulting into death of the victim which apparently looking uninjured externally while conducting autopsy. Under such circumstances sometimes at primary health care centres the inexperienced autopsy surgeons are not in a position to correlate the superficial looking soft tissue injuries attributing towards death.

Key Words: Soft Tissue Injury, Contusion, Abrasion, Hemorrhagic Shock, Blunt Trauma

Introduction:

A contusion or bruise is an area of haemorrhage into soft tissue due to rupture of blood vessels caused by blunt trauma. [2] There are many variables that influence the development and absorption of bruises, as well as their appearance and extent of spread, thus adding to the difficulty in their interpretation. The type of surface and force that impacts on the body will have great effect on the intensity, size, shape, and pattern of the resultant bruising. Skin coloration modifies the appearance of a bruise to the naked eye. It is much easier to observe the extent and colour of bruising in lighter skinned individuals. Thus, it is particularly important to take extra care when examining dark skinned individuals so that any bruising is not overlooked. [3] Absence of a bruise does not indicate that there was no blunt force to that area. Deep bruises may not be visible externally and may be discovered only on incising the soft tissue. [3] Bruises do not necessarily lie at the point of impact.

The blood may travel for a distance in the deeper tissue planes before it reaches the surface; there may also be delay in its appearance. On occasion the bleeding may remain deep-seated. [1]

Another point to remember is that a contusion might be much larger than the object that produced it. [2] As a rule, bruises are not fatal and are simple injuries. They are seldom fatal unless accompanied by the rupture of an internal organ, or by extensive crushing of the tissues and large extravasation of blood, producing sloughing and gangrene of parts. [4] However, multiple contusions with extensive soft tissue haemorrhage may produce shock and death from massive blood loss. [2] However, several bruise, though trivial individually, may cause death from shock and haemorrhage.

Death may occur from primary or neurogenic shock. Shock may result from exhaustion caused by several combined injuries; though each one of them separately may be very slight. [4] Loss of 40-50% of circulating blood volume can lead to death. [5] Thus an extensive soft tissue trauma can be a cause of death. In the case presented here there were multiple cutaneous injuries i.e. bruises and abrasions over the body which resulted into death.

Brief History:

First Information Report (FIR) speaks that the deceased was an illiterate unskilled labourer residing in a non-urban area of north India. On the evening of 23.11.2010 while he
was crossing the street near to his house, innocently, unintentionally had a soft touch of his hand with another resident of his neighbourhood. On this he got annoyed and started blaming him that he has touched him intentionally and has to face the consequences. After about 10 minutes he along with his couple of companions attacked him with stick, hands and feet and thrown him on the ground and went on attacking him with kicks and blows all over his body. On hearing noises few people gathered and mediated to separate them. On the next very day a formal compromise was also made between the parties in the local Panchayat of the village. This is a common practice in such type of cases in India. After that the deceased was in pains but didn’t go to any hospital, stay at his home only. In the next morning the deceased had severe discomfort for which he was taken to General Hospital, from where he was referred to a tertiary care hospital but he was not in a position to go to tertiary care hospital, so, taken to a private practitioner. But the private practitioner showing his inability to manage him asked the relatives to take him to some big hospital. While he was being taken to a tertiary care hospital, on the way he expired.

On this the relatives requested to the police to register case against the accused and body was sent for post-mortem examination. In the primary care hospital a board of three medical officers conducted the post-mortem examination. They observed externally multiple soft tissue injuries in the form of abrasions and bruises all over the body which were not dissected to visualize the extent of extravasations of blood in the soft tissues; and internally no injury was appreciated in the vital organs in all the three cavities except the trachea which was containing some gastric contents. They were unable to correlate the injuries to be a cause of death. So the body was referred for re-post-mortem examination to the Department of Forensic Medicine, Postgraduate Institute of Medical Sciences, Rohtak, Haryana.

**Post-mortem Examination:**

The re-post-mortem was carried out by a board in the Department of Forensic Medicine on 27.11.2010. It has been observed that the rigor mortis was in passing phase and post-mortem staining was faintly visible over back. The body was having an "I" shaped post-mortem stitched midline incision and stitched post-mortem incision over the head. The internal organs in the main three cavities of the body were found dissected in their respective places. No incision was made externally through the skin on the soft tissue injuries to elucidate the condition and extent of extravasations of blood in the internal tissues during the first autopsy.

The following external injuries were marked over the body:

1. Diffuse bluish reddish contusion was found around the left eye with appreciable redness of conjunctiva of left eye;
2. A brownish scabbed abrasion (2.5×2.5 cm) situated over left side of face, 5 cm below left eyebrow and 5.5 cm away from the tip of nose;
3. A brownish scabbed abrasion (1.5×0.5 cm) situated over right lateral aspect of neck, 2 cm below right ear lobule;
4. A brownish scabbed abrasion (2.0×0.3 cm) situated over dorsum of nose, 1.5 cm above the tip of nose;
5. A brownish scabbed abrasion (3.5×1.0 cm) with surrounding diffuse contusion (9×7 cm) situated over posterior aspect of right shoulder, 18 cm away from the midline;
6. A brownish scabbed abrasion (1×1cm) situated over anterior aspect of right knee joint;
7. Multiple brownish scabbed abrasions (four in numbers) of size varying from 1×0.5 cm to 3×0.2 cm over anterior aspect of right leg, situated 16 cm below right knee joint;
8. Multiple brownish scabbed abrasions (two in numbers) of size varying between 0.5×0.3 cm to 0.5×0.5 cm over lateral aspect of right leg at its lower end, 10 cm above right heel;
9. Multiple brownish scabbed abrasions of size varying from pinhead size to 2.0×0.2 cm over medial aspect of left leg 8 cm above left heel;
10. A bluish contusion (18×10 cm) present over left calf region 16 cm below left knee joint. (Fig. 1)
11. A bluish contusion (8×8 cm) over antero-lateral aspect of left thigh situated 24 cm below antero-superior iliac spine; (Fig. 2)
12. Multiple brownish scabbed abrasions (three in numbers) of size varying between 0.5×0.5 cm to 2.0×0.7 cm over posterior aspect left elbow joint; (Fig. 3).
13. A brownish scabbed abrasion present over dorsal aspect of left ring finger;
14. A brownish scabbed abrasion (1.0×0.5 cm) situated over back of left shoulder 1.5 cm away from left acromion process; (Fig. 4)
15. A brownish scabbed abrasion (0.5×0.3 cm) situated over left clavicle, 6.5 cm away from midline;
16. A bluish contusion (3×2 cm) present over right side of neck 3 cm below right angle of mandible and 5 cm away from midline;
17. Multiple bluish contusions (three in numbers) of size varying from 0.5 × 0.5 cm to 1.0 × 0.5 cm in an area of 4 × 3 cm present over left side of neck 3.5 cm away from midline and 5 cm below chin; (Fig. 5)
18. A brownish scabbed abrasion (2.5 × 1.0 cm) present over frontal region of scalp, 6 cm above medial end of right eyebrow and just right to midline;
19. A bluish contusion (3 × 2 cm) over right side occipital region situated 4 cm away from midline and 4 cm above external occipital protuberance; (Fig. 6)
20. Diffuse bluish reddish contusion was found around left knee joint; and left elbow joint;
21. Diffuse bluish reddish contusion (37× 24 cm) over whole of back of the trunk on left side extending towards right side; (Fig. 7) A brownish scabbed abrasion (1.0 × 1.0 cm) over left side of back of abdomen, 2 cm above postero-superior iliac spine and 4 cm away from midline;
22. A brownish scabbed abrasion (2.5 × 0.5 cm) in midline just above gluteal cleft. On dissection ecchymosis seen underneath in an area of 30 × 11 cm. (Fig. 8)

The cause of death in this case was injuries and their complications. All the injuries were ante-mortem and inflicted by someone else by blunt force impacts.

Discussion:
Injuries distributed on different surfaces of the body may, depending on the circumstances of injury, represent multiple concurrent impacts or repetitive trauma. Extensive soft tissue trauma can be a cause of death. The position and arrangements of bruises will be generally over the one side of body in cases of accidents with the evidence of sand, gravel or mud over them. Generally multiple and extensive cutaneous injuries imply a greater degree of force and are homicidal in manner. A bruise is evidence of implication of blunt force, and usually the circumstances are those of an accident or of homicide. In attempts to assess the degree of violence from the appearance of bruises several factors must be taken into consideration. Where the tissues are closely applied to the bone it normally requires substantial violence to produce a bruise. [1]

One of the most common causes of circulatory shock is trauma to the body. Often the shock results simply from haemorrhage caused by trauma, but it can also occur even without haemorrhage, because extensive contusions of the body can damage the capillaries sufficiently to allow excessive loss of plasma into the tissues. This results in greatly reduced plasma volume, with resultant hypovolemic shock. Traumatic shock seems to result mainly from hypovolaemia, although there might also be a moderate degree of concomitant neurogenic shock caused by loss of vasomotor tone. [6] Hypovolemic shock is characterized by diminished blood volume such that there is inadequate filling of vascular compartment. It occurs when there is acute loss of 15% to 20% of the circulating blood volume. The decrease may be caused by an extensive loss of whole blood (haemorrhage), plasma (severe burns), or extracellular fluid (severe dehydration or loss of gastrointestinal fluids with vomiting or diarrhoea). Hypovolemic shock also can result from an internal haemorrhage or from third-space losses, when extracellular fluid is shifted from the vascular compartment to the interstitial space or compartment. [8]

Shock is a progressive disorder that, if uncorrected, leads to death. Unless the insult is massive and rapidly lethal e.g. a massive haemorrhage, shock tends to evolve through three general phases. These have been documented most clearly in hypovolemic shock but are common to other forms as well. An initial non-progressive phase, during which reflex compensatory mechanisms are activated, and perfusions of vital organs are maintained. A progressive stage characterized by tissue hypoperfusion and onset of worsening circulatory and metabolic imbalance, including acidosis. An irreversible stage that sets in after the body has incurred cellular and tissue injury so severe that even if the hemodynamic defects are corrected, survival is not possible. [7]

Considering these parameters of shock the cause of death was evaluated as injuries (supra) that are extensive soft tissue injuries which were inflicted by someone else from their pattern of distribution in the instant case.

Conclusion:
Soft tissue injuries not always are simple as mostly described in the literature but sometimes these injuries may be so extensive internally that leads to irreversible shock as in the instant case; where almost all over the body was having them with extensive blood loss in the soft tissues itself. From supra it is clear, contrary to the presumption that injuries to the vital organs mostly prove fatal, even the soft tissue injuries without involving the internal vital organ may also prove fatal. So, our emphasis is to stress that even the simple looking superficial injuries should not be overlooked and should be carefully evaluated and interpreted.
References:

Photo 1: Post-Mortem Cut with Underneath Ecchymosis in Left Calf Region

Photo 2: Post-Mortem Cuts With Underneath Ecchymosis on Left Thigh & Knee

Photo 3: Scabbed Abrasion over Left Elbow Joint with Ecchymosis Underneath

Photo 4: Post-Mortem Cuts With Underneath Ecchymosis over Left Shoulder

Photo 5: Underneath Ecchymosis over the Left Side of Neck

Photo 6: Reflected Scalp Showing underneath Ecchymosis in Occipital Region

Photo 7: Multiple Post-Mortem Cuts with Ecchymosed Areas over Back of the Trunk

Photo 8: Multiple Post-mortem Incisions with Underneath Ecchymosis in Gluteal Region