

# Occulo-cerebral arrow injury in a homicide victim: An autopsy case report

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## **Abstract:**

Since the advent of firearm the use of manual projectile weapons have decreased dramatically around the world. However in India death due to injuries caused by manual projectile weapons like arrow & spear is still prevalent and constitute a significant percentage of homicidal death. I report a case of a male victim who was killed due to an arrow strike . The arrow entered the cranial cavity through left eye socket piercing the eye-globe in the process. It caused substantial brain tissue damage including laceration of brainstem. According to the eyewitnesses present on scene death was instantaneous. This according to me is a rare occurrence.

**Key Words:** Arrow, Brain, Homicide , Injury , Penetrating

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## **I. Introduction:**

Penetrating injury of skull and brain are relatively rare in presentation . It constitutes about 0.4% of all head injuries<sup>1</sup> . This is probably due to the relatively small surface area of the head and the innate protective reflexes. Among that the trans -orbital penetrating injury (TOPI) is even rarer amounting a mere .04% of all head injuries<sup>2</sup>. Although rare , they are associated with high degree of fatality . Prompt surgical and multi-disciplinary approach is required for survival of the victim. Even if the victim survives, there is a high incidence of complications such as brain abscess, CSF leakage, neurological deficits ( 6.7%)<sup>3</sup> .

TOPI occurs due to impact with missile or non -missile depending on the speed of the offending object. There will be different pattern of injuries depending on the velocity of the penetrating object. Missiles are classified as objects travelling at >100m/s and the injuries are produced mainly due to heat ( eg gunshot injuries) . In objects travelling at a speed <100m/s injuries are produced due to the lacerative potential of the object (eg arrow, spear)<sup>4</sup>.

In India weapons like arrow and spear are quite common especially in rural and tribal area. They are used primarily for hunting and domestic protection. However they are often used as an as an assault weapon in case of quarrel , homicide etc. Inflicted wounds are more common in chest and abdominal region. Cranio-cerebral injuries while rare are inevitably fatal if not managed promptly. The case under discussion here occurred during an inter-tribal fight over land.

## **II. Case report:**

### **History :**

On 27/11/2017 a dead body of a male aged 55 years was brought to the mortuary of North Bengal Medical College for autopsy. Police inquest revealed that he was a resident of a nearby tribal area where a inter-tribe fight broke out. Members of the tribes were armed with bows & arrows, swords and spears. Multiple injuries occurred including one fatality. Police reached the scene and dispersed the mob and recovered the body. It was taken to a local hospital where he was declared dead. The body was subsequently sent for medico-legal autopsy at North Bengal Medical College.



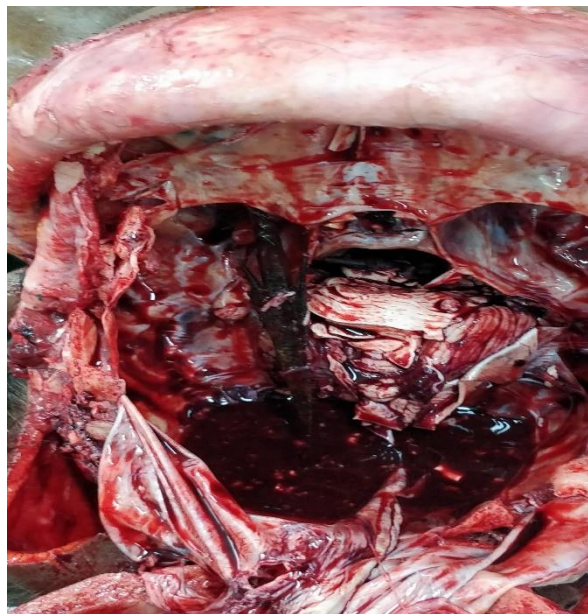
Findings in autopsy :

It was the body of an averagely built male wearing grey track pants. Four chest leads were attached to the anterior chest wall .Shaft of an arrow was protruding out of the left eye socket. Coagulated blood was present around the left eye socket and the left side of the face. Rigor mortis was present all over the body. ( Figure 1 )



Laceration of size 2"x1" x muscle deep present over the lateral aspect of left arm was present along with an abrasion of size 3 ½ "x ¼ " over the anterior aspect of left shoulder .

There was a penetrating wound over the anterior surface of left eye ball causing an entry wound of size 2 ¼ "x 3 " caused by the entry of arrow head. The arrow entered through the above mentioned wound and travelled infero-medially exiting at the posterior pole of left eyeball through a wound measuring 3"x3 ½ ". The arrow head caused tear of optic nerve and retinal blood vessels while exiting the optic canal. The wound track followed a course from above downwards and medially causing laceration of size 1"x2 ½ "x ½ " over the left cerebellar hemisphere 2 " above the medulla oblongata and a laceration measuring 2"x1½ "x 1" over the brainstem 1 " above the first cervical vertebrae .



Cranial cavity contains clotted blood . The metal arrowhead was lodged inn the left atlanto- occipital joint. Bilateral diffuse sub-dural hematoma was present. All internal organs were congested. Stomach cavity contained 30 ml of odourless fluid.

### **III. Discussion :**

With the rising availability of firearms especially country made firearms ( katta/tamancha), injuries produced by indigenous weapons like spear , arrow and swords are on decline. However penetrating ocular trauma remains high. In Scotland it has been reported 11.2% emergency room visits are due to ocular trauma<sup>5</sup>.injury depends on the range at which the arrow is fired, the trajectory it pierce, the degree of penetration, and whether poisons were applied to the tip of the arrow or not.<sup>6</sup>Arrows laced with poisons causes paralysis or serious wound infection depending on the nature of the poison. Arrow shot to the neck can easily penetrate and injure blood vessel, and patient may present with massive bleeding, hematoma, or shock. Injury to the pharynx or oesophagus may result in odynophagia, dysphagia, or hematemesis. The patient with laryngeal or tracheal injury may present with

air blowing wound, expanding emphysema, or upper airway obstruction that require immediate surgical intervention. Brain and spinal cord injury may cause paraplegia, quadriplegia,ventricular haemorrhage, or immediate death.

Death is generally instantaneous and invariably all such cases are brought for autopsy . Most such cases are homicidal in nature and determination of cause of death is relatively simple. However proper determination of course of the missile along with the structures damaged takes time and painstaking effort. A pre autopsy CT scan is often helpful in this matter.

### **IV. Conclusion:**

Even if ocular penetrating missile injury are rare they are invariably fatal and creates unique challenges during autopsy. Here I presented a case of fatal penetrating arrow injury to eye which is a rare occurrence.

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