

## Thorn Prick – A tricky case report

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### Abstract

Unexpected death of a healthy young member in a family leaves the other family members in a sorrow full state and making them vertically think about foul play. In such cases the forensic expert plays a vital role in arriving at the cause and manner of death based on the post mortem examination and the history furnished by the investigating officer. Here we present a mysterious death of a 45 years old healthy young male who succumbed to death within a period of 8 hours, with alleged history of thorn prick, while post mortem finding did not convince us with the cause of death, FSL report concluded the case.

**Key words:** Cyanide, homicide, subcutaneous injection.

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### Introduction:

Death by poisoning is most commonly suicidal which, varies according to the region, availability of poisons and occupation. Accidental poisoning is the second commonest which happens due to drug over doses, occupational exposure. Blunt trauma, sharp trauma, burning, and strangulation forms the major methods of homicide however homicide by poisoning as such is very rare. Here we present one such rare homicidal poisoning case with a rare poisoning substance used in an atypical route of administration.

### Case Details:

**History:** The deceased, a 45 years old male had been to temple with his wife and while returning back, the wife has asked to stop the car on the way, for plucking leaves from tree, where he had a thorn prick. Deceased drove his car by himself to his residence after the incident and since he was symptomatic, was

taken to hospital with the help of his neighbor where he was admitted, treated for 8 hours and later declared dead.

**Autopsy findings:** Dead body that of a male, medium brown complexion, moderately built and nourished. Rigor mortis present throughout the body. Lividity seen over the back surfaces of the body and is fixed. Hospital induced intravenous injection mark noted over front of upper chest on right side, front of left forearm, outer aspect of right wrist and right groin.

### External injuries

1) Reddish brown lesion noted over outer aspect of abdomen (flank) on left side, oval in shape, measuring 11.5 x 06 cm situated 07 cm above the level of pubic symphysis and 13 cm to the left of midline, surrounding skin shows signs of inflammation. Center of the lesion shows blackish discoloration of skin, oval in shape measuring 2.5 x 1.5 cm. Skin over the area is hard as shown in figure 1.

2) Brownish black lesion of skin, circular in shape measuring 05 cm x 05 cm noted over back of middle of right side of chest, situated 17 cm below back hairline and 4.5 cm from midline. Redness noted in the surrounding skin. Center of the lesion shows reddish brown discolouration, present over an area of

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03 x 03 cm, circular in shape as shown in figure 2.

**Figure 1 - Reddish brown lesion noted over outer aspect of abdomen (flank) on left side**



**Figure 2 - Brownish black lesion of skin noted over back of middle of right side of chest**



### Internal injuries

1) On dissection of external injury no:1, blood extravasation noted in muscles of outer aspect of abdomen (Flank) on left side measuring 13 cm x 08 cm.

2) On dissection of external injury no:2, blood extravasation noted in the muscles of back of chest on right side measuring 08 x 08cm.

Blood, viscera, the skin and underneath muscle over left flank, control skin sample were sent to FSL for chemical analysis. Cause of death was kept pending. FSL opinion showed presence of cyanide ions in blood, skin and muscle from the left flank. Final cause of death was due to injection of compound containing cyanide ions.

On interrogation with the Police, it was found that the wife of the deceased had an extra marital affair with the accused, who has purchased potassium cyanide from gold smith and used for injection.

### Discussion:

Cyanide is an asphyxiant group of poison, available as gas, liquid and solid. Most frequently been administered by ingestion and by inhalation of toxic fumes. Most common deaths by cyanide is through accidental inhalation of gaseous cyanide at work places. It is a multifaceted poison – toxicant in fire smoke, agent of suicide, murder, terrorism and an industrial and occupational hazard. As it exists in gas, liquid, and solid forms, it can cause human toxicity via multiple routes including inhalation, ingestion, parenteral administration, and dermal or conjunctival contact.<sup>1</sup>

Use of cyanide for suicide is common in certain occupational groups who has ready access to cyanide. Eg. Pharmacists, chemists and medical and paramedical personnel. Accidental exposure to cyanide occurs in fumigation of ships, green houses, industrial and laboratory mishaps. Used in mass homicides in first world war, HCN is used as a war gas.<sup>2</sup> Used legitimately to kill convicted criminals in some states of USA.<sup>3</sup> Homicide by cyanide is quite rare, because Possible detection by smell Suspicion likely to be aroused by the dramatic nature of death.<sup>2</sup>

Sodium and potassium cyanide salts are widely used in many industries like ore extracting processes for the recovery of gold and silver, electroplating, case – hardening of steel, dyeing, printing, photography and in synthesis of organic and inorganic chemicals.<sup>4</sup> In our case, the accused has purchased potassium cyanide from a gold smith. Use of Cyanide in injection form is rare, however literature reviews describe suicide and homicide by subcutaneous, intramuscular and intravenous injection of cyanide. Homicide by intramuscular injection of potassium cyanide has also been described in literature.<sup>5</sup>

Reports of dermal exposure following cyanide poisoning secondary to burns by cyanide salts and immersion in a cyanide solution are also recorded.<sup>6,7</sup> With hospital case sheets of the deceased, we noticed blood lactate level of 20 mmol/L, person had lactic acidosis and difficulty in breathing with SpO<sub>2</sub> 49% in room air and was gasping at the time of admission, following which the deceased was started on mechanical ventilation. As cyanide acts by inhibiting the cytochrome oxidase of aerobic cellular respiration, there is activation of anaerobic respiration leading to accumulation of lactate<sup>8</sup>, as seen in our case. The survival period is short following an episode of injection of cyanide, however literature reports a patient who was brought to hospital in coma after a subcutaneous self-injection, who sustained on hemodialysis, though laboratory confirmed that the injected substance was cyanide,<sup>9</sup> as seen in our case, the deceased survived for a period of 8 hours following the episode, with supportive measures alone. The characteristic autopsy finding of ingestion of cyanide like bright pink discolouration of the tissues was not seen in our case as it was used intramuscularly/subcutaneously.

The characteristic "Bitter almond" smell of cyanide was also not perceived at the time of autopsy as the ability to smell cyanide, as about 20 to 40 % of human population does not possess this capacity as it is an inherited as a sex-linked recessive trait. However, the presence of macular erythematous lesions noted in our case, was also observed in similar cases with subcutaneous injection of cyanide.<sup>9</sup>

### Conclusion:

Whilst the various methods of homicide, and cyanide being rarely used for homicidal act as it has a limited availability, our case is one among the rare case report of cyanide used as an injection form for homicidal act in Karnataka, and cyanide being a fast-acting drug causing rapid death, in our case the

deceased has survived for eight hours following the injection only with supportive measures. Since there are very few instances of delayed deaths by cyanide, we have reported this as one among the rare cases.

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