

## E86 A Postmortem Medicolegal, Radiological, and Toxicological Investigation in a Case of Suicide by Multiple Stabbings Associated With Ingestion of an N-Hexane Mixture

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**Learning Overview:** After attending this presentation, attendees will better understand the importance of a multidisciplinary investigation in a case of suicide by multiple stabbings and acute intoxication.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by providing an overview of postmortem medicolegal, toxicological, and radiological investigation by Postmortem Computed Tomography (PMCT) and Postmortem Cardiac Magnetic Resonance (PMCMR) in a case of suicide.

N-Hexane is a colorless liquid with a gasoline-like odor that is mainly used, mixed with other substances, as a solvent in cleaning agents, in the printing, textile, furniture, and shoemaking industries, and in the manufacture of pharmaceuticals.<sup>1</sup> Exposure to n-hexane most frequently occurs among industrial workers in occupational settings. Nevertheless, due to its easy accessibility, solvents and glues containing n-hexane are often used as inhalant abuse by “sniffers.”<sup>2,3</sup> Human data on the acute toxicity of n-hexane are extremely limited. The acute toxicity of n-hexane is very low, and no cases of lethality were reported after inhalation of n-hexane or its mixtures. According to research, there are no published cases of n-hexane ingestion, apart from a study conducted on rats that excluded liver toxicity after oral intake.<sup>4</sup>

The evaluation of stab wounds, well-known in the forensic field, has been recently implemented by postmortem radiological studies for the evaluation of the injury path. Only a few published cases studied the wound trajectory by performing postmortem imaging with the weapon still embedded.<sup>5,6</sup> Presented here is a toxicological and radiological evaluation in a case of suicide by multiple stabbing associated with the ingestion of an n-hexane mixture.

A 41-year-old man was found in his car, sitting on the driver’s side with a kitchen knife embedded in his chest. Other stabs were found in the thoracic and abdominal area. The man held in his right hand an empty bottle of a cleaning product containing n-hexane. Before performing the autopsy, a total body Postmortem Computed Tomography (PMCT) was performed in order to study the pattern of injuries. The radiological examination, conducted with the knife still embedded in the chest, revealed that there were several cutaneous and subcutaneous lesions of the chest, contiguous to the knife, massive bilateral hemothorax, left pneumothorax, and massive hemopericardium. Apart from the stab wound with the knife still embedded, the external examination showed that there were 14 other stab wounds, mostly in the precordial area, and the remnants in the abdominal area. All the lesions had an ogive shape, with the acute angle on the right side, and all had similar measures. The autopsy was conducted using a layer-by-layer technique, revealing that the majority of the lesions were very superficial, as they injured only the muscles. The deeper stabs were one in the abdominal area, that had superficially injured the right part of the liver, and the one with the knife still embedded. The tip of the blade protruded from the sternum for 32mm. The autopsy confirmed the presence of massive bilateral hemothorax and pericardium lacerations. The heart revealed a stab wound of the anterior wall, proximal to the apex. The heart was fixed in formalin, and a Postmortem Cardiac Magnetic Resonance (PMCRM) was performed, confirming the presence of a full thickness, incised wound penetrating the anterior wall of the heart, near the apex. The histological examination confirmed the vitality of all the lesions. The toxicological examination revealed the presence of a mixture of hexane isomer in the blood and in the stomach, compatible with the cleaning product found in the car. It confirmed that acute intoxication occurred, though no lethal effects could be attributed to this substance.

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### N-Hexane Intoxication, PMCT, PMCMR