



Pathology & Biology Section – 2008

G38 Cocaine Skin Popping: A Fatal Case

Margherita Neri, MD*, and Carmela Fiore, MD, University of Foggia, Department of Forensic Pathology, Viale Pinto 1, Foggia, 71100, ITALY

The death of a “skin popper” cocaine abuser is presented. Postmortem findings and cocaine distribution in fluids and tissues are discussed. The goal of this paper is to show an unusual fatal case of cocaine consumption.

This presentation will impact the forensic community in the contribution of a careful crime scene investigation, toxicological and histological examinations in drug-related death in order to clarify the exact mechanism of the death.

The most common routes of cocaine abuse are by inhalation, snorting, and intravenous injection. Cocaine skin inoculation is rare and it's used to avoid track marks or when peripheral veins are sclerosed and the addict, unable to access a peripheral vein, injects substance by mistake or deliberately, in subcutaneous tissue and muscle. Deliberate subcutaneous injection (skin popping) is also used to avoid track marks which represent stigmata of drug addiction.

On 3 September 2006 at 5 p.m., a car was discovered in a parking isolated area in the outskirts of Foggia, Italy, far from urban traffic. A dead man was seated in the driving seat, he had seatbelt fastened, and he lay down on the right hip. The deceased, a young adult man, was fully and tidily dressed, and was identified as a 29-year-old local resident. The car engine was turned off. The car keys were in the ignition in the “off” position, the windows were closed and the doors were locked from the inside: no damage was observed inside or outside the car. On the floor of the car near the anterior right seat, there were five empty small packages; a cigarette filter; a syringe full of 1 milliliter of brownish liquid, its needle was smeared with dried blood. Remote from the body, near his head, on the anterior right seat, there were a small metallic spoon, a needle plastic cap, and two other plastic packages full of white power. The thanatological data recorded by the forensic pathologist called to the scene (5:30 p.m. of 3 September 2006) stated that at the time of discovery, the cadaver showed rigor mortis, and hypostasis that was partly mobile on digital pressure, but congruous with the position.

At the external examination, the left arm showed a round atrophic scar and left forearm an healing ischemic ulcer. The right antecubital fossa had pigmented pop-scars and swelling of the soft tissue with a necrotic area and two needle punctures; the upper one was surrounded by an extensive ecchymosis, the entire area measured cm 7x5.5.

A complete autopsy was performed 48 h after death. Internal examination revealed that the heart weighed 450 g, measured 14x13.5x5cm. The coronary arteries, the myocardium and the valvular apparatus were normal. All the other organs did not show specific alterations except for an intense vascular congestion.

Routine histological investigations, applying hematoxylin and eosin staining, were performed on all organ samples. Lung sections showed massive pulmonary oedema. Myocardium presented foci of fragmentation of entire myocytes in anomalous cross bands formed by segments of hyper-contracted sarcomeres and myofibrillar rhexis. The histological examination of the skin section, collected in right cubital fossa, showed a loss of the upper epidermal layers and accumulation of leukocytes, in particular polymorphonuclear neutrophils, and erythrocytes in deeper epidermal and dermal layers. All these skin findings suggested for typical necrotizing ulcers. The examination of other organs was unremarkable except for brain edema and generalized haemostasis.

Cocaine was detected in the subject's urine through immunoenzymatic screening. Toxicological analysis by solid-liquid extraction and gas chromatography-mass spectrometry (GC-MS), was carried out to identify and quantify the individual substances present in the biological fluids and organs. Total cocaine concentrations were as follows: blood 4.08 mcg/mL/g, liver 10.19 mcg/mL/g, brain 6.19 mcg/mL/g, urine 57.00 mcg/mL/g, and bile 17.72 mcg/mL/g. No other drugs or alcohol were detected.

The toxicological analysis of empty and full packages demonstrated that the white power was cocaine and quinine (used as an adulterant), and the brownish liquid in the syringe, collected in the car, was positive only for cocaine. According to the crime scene data, autopsy and histological and toxicological findings, death was attributed to a fatal arrhythmia during cocaine skin inoculation.

In cocaine skin inoculation, cutaneous necrosis and necrotizing ulcers may develop as a result of several combined factors, including “skin popping”, toxicity and the irritant properties of the drug and adulterants, vascular thrombosis, and infection. Quinine used as an adulterant has known caustic effects. In addition cocaine has potent vasoconstrictive and thrombotic effects. Various mechanisms such as cocaine-related increase in plasma lipids, direct and indirect increase in endothelial permeability, higher prevalence of mast-cells and other inflammatory cells in plaques may contribute to the lesions. Typical are round atrophic scars, clustered predominantly on the arms and legs, frequently seen in intravenous drug abusers, particularly cocaine abusers. These may represent healed abscesses, healed ischemic ulcers due to vasoconstrictive effect of cocaine, or the direct toxic effects on capillary endothelium.

Cocaine, Skin Popping, Necrotizing Ulcer