

Hollywood Inspired Self Injection of Mercury- A Case Report

Annu Babu¹, Ajay Kumar¹, Amulya Rattan¹, Manish Kumar Pandey¹, Piyush Ranjan².

¹Senior Resident, Department of Surgical Disciplines, AIIMS, New Delhi, India

²Assistant Professor, Department of Surgical Disciplines, AIIMS, New Delhi, India

*Corresponding author

Annu Babu

Email: drpmishra28@gmail.com

Abstract: We present a unique case of deliberate self-injection of elemental mercury by a young male with the intention to become Mercury Man as he was inspired by the movie X-men. He presented with history of accidental trauma by a sharp object along with non-healing ulcer over left forearm since two months. On detailed psychiatric evaluation the details regarding his behavior were elicited. Systemic toxicity ruled out and X-rays were taken to know the extent of involvement. Staged excision of skin and subcutaneous tissue was carried out under X-ray guidance. Multiple silvery pellets in soft tissues were found and removed and split thickness skin graft was done at a later stage. Follow up X-rays and serum levels of mercury were normal and patient was followed up with regular psychiatric consultations. Most reports in literature, regarding mercury injection were suicidal and intended to annihilate one's life rather than enhance it.

Keywords: Mercury, self-injection, superhero, non healing ulcer.

INTRODUCTION

Almost all people have at least trace amounts of mercury in their tissues, reflecting its widespread presence in the environment. People may be exposed to mercury in any of its forms under different circumstances. The factors that determine how severe the health effects are from mercury exposure depend on its chemical form, dose, duration, and route of exposure. Mercurial injections, in most instances, are of suicidal intent. We present a unique case of deliberate self-injection of elemental mercury by a young male with the intention of becoming a superhero as he was inspired by the movie X-men and wanted to become Mercury Man.

CASE PRESENTATION

A 16-year-old male presented with history of non healing ulcer over left forearm for two months. He gave history of trauma with a sharp object. Patient had no other complaint and was triaged in as per protocol. On local examination there was an ulcer of about two by two centimeters over distal forearm with nodular lesions over forearm and lower arm on volar aspect fixed to skin (FIG 1). Rest of the physical examination was unremarkable. Due to presence of nodules along the course of superficial veins, we suspected substance abuse. Psychiatric evaluation revealed subcutaneous

injection of mercury, obtained after breaking thermometer and sphygmomanometer thrice after watching Hollywood movie X-Men. He wanted to become Mercury Man. He gave past history of multiple bites by spider to simulate Spider Man. He had no other psychiatric problems including normal intelligence quotient. Complete biochemical and toxicology evaluation including elemental mercury level of blood, urine and nails was done. X-ray of left forearm showed multiple subcutaneous radiopaque deposits till lower arm (FIG 2A). CT showed corresponding radiodense deposits in subcutaneous tissue (FIG 3). Doppler scan was done to evaluate any deposits in underlying vessels, though all the peripheral pulses were palpable. Chest X-ray was normal. Serum mercury level was 14.3 µg/L (normal <3.6 µg/L) and 24-hour urinary excretion of mercury was 21.7 µg/L (normal < 15 µg/L). Excision of skin and subcutaneous tissue containing granuloma was done under X-ray guidance; post-procedure X-ray showed minimal residual mercury (FIG 2B). Skin was left open and partial thickness skin graft was applied later. At the time of surgery, multiple tiny silvery pellet-like mercury deposited in inflamed tissue was removed. Microscopic examination revealed focal areas of necrosis and granuloma formation. Follow up X-ray of left forearm was normal (FIG 2C). Serum mercury level after two months of follow up was 2.27 µg/L.



Fig-1: Nodular lesions over left forearm and lower arm



Fig-2: X-ray of left forearm showed multiple subcutaneous radiopaque deposits (2A), Post-procedure X-ray showing minimal residual mercury (2B). Follow up X-ray of left forearm (2C)



Fig-3: CT left forearm showing radiodense deposits in subcutaneous tissue

DISCUSSION

Elemental mercury-induced cutaneous granulomas are rare, with fewer than a hundred reports presented in the world literature. Metallic mercury is used in thermometers, manometers, dental materials and some paints. Mercury exposure can occur in several forms: ingestion, inhalation, injection or topical application. Mercury poisoning has variable and multiple manifestations, depending on the route of entry into the body and the subsequent metabolism of its compounds, since they affect different target organs of the human body.

While oral intake of metallic mercury is usually of no consequence to the patient's health, subcutaneous or intravenous injection of metallic mercury is always harmful, causing a local abscess and granuloma formation [1]. Subcutaneous deposition of metallic mercury may occur by extravasation during attempted intravenous injection or directly without an intravascular component. A review of the published literature on cutaneous granuloma involving penetration of the skin by metallic mercury revealed that the vast majority of these cases, represent a deliberate attempt at injecting the metal, typically with accompanying suicidal ideation. More unusual scenarios of deliberate injections of elemental mercury include a previous assault with mercury tipped bullet, protection against assault with bullets, misguided attempts to make a boxer's punches quicker and improve soccer performance [2]. Various accidental causes of cutaneous mercury granuloma include injury by a broken mercury thermometer, following an anaerobic blood sampling procedure in which mercury was used as a sealant in the syringes, dog bite wound, repeated application of mercuric ointments and creams to cutaneous wounds etc. Subcutaneous mercury deposits are also systematically absorbed, sometimes causing pulmonary and visceral organ embolism. These result in greatest concentrations of mercuric salts in the kidneys, spleen and liver and in elevated serum and urine mercury levels, as well as signs and symptoms of mercury poisoning which can have serious and even fatal consequences [3-5]. Renal tubular epithelium is more vulnerable to the mercuric salts, and acute tubular necrosis may ensue. Despite increased blood and urinary levels of mercury, functional impairment may not be present.

Surgical excision of the mercury granulomas significantly lowered serum and urine mercury levels or returned them to normal values [6]. The diagnosis of a cutaneous mercury granuloma from metallic mercury can be made easily, if a history of exposure is obtained. In its absence, the diagnosis will depend on the examination of the tissue removed by surgery. The following guidelines for the management of cutaneous injury by metallic mercury are recommended-

1. Pre-operative and postoperative measurement of the mercury levels in blood and urine should

be made in all cases, to determine systemic absorption.

2. Prompt excision of all accessible cutaneous and subcutaneous tissue containing mercury should be done [7, 8]. This is best accomplished under X-ray guidance to ensure complete mercury removal because the metal tends to disperse when the tissue is manipulated.
3. There should be appropriate monitoring of the central nervous system, respiratory and renal functions for evidence of mercury poisoning.
4. If poisoning is evident, the use of chelation therapy, although controversial [6], is recommended by some.
5. Psychiatric consultation and treatment in those cases of deliberate self-injection, either proved or suspected.

CONCLUSION

Self-injection of mercury is a rare occurrence. Most reports in literature regarding mercury injection were suicidal and intended to annihilate one's life rather than enhance it. Such cases may present as non-healing ulcers in surgical practice. Soft tissue injection of metallic mercury can produce local necrosis and may allow continuous absorption with persistent elevations in blood and urinary mercury levels. Therefore, early surgical removal of subcutaneous mercury deposits is required to prevent local complications and minimize the risk of systemic absorption and toxicity. Complete removal of mercury can be ensured by excision under image guidance. A psychiatric evaluation should be carried out in all such cases.

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