

Subcutaneous Injection of Metallic Mercury Mimicking Bacterial Cellulites: A Case Report

¹Mehdi Haghdoost, ¹Abolfazl Poorhasan, ²Kamyar Ghabili and ¹Omid Mashrabi

¹Department of Infectious Diseases,

²Tuberculosis and Lung Disease Research Center,

Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran

Abstract: Problem statement: Injection of metallic mercury in the forms of subcutaneous or intravenous has been hitherto reported in less than a hundred cases. **Approach:** We reported a 19 year old male with history of major depression who subcutaneously injected metallic mercury into his right forearm with suicidal intention. **Results:** A week later, a mild elevation of creatinine level was noted. Subsequently, mercury deposits were totally removed with all affected tissues and fascia of the right forearm. Later, the creatinine level decreased to the normal range. **Conclusion:** The present case is an example of suicidal attempt that presented with subcutaneous injection of elemental mercury mimicking bacterial cellulitis. Physicians should consider heavy metal injections when evaluating a patient with history of psychiatric disorders presented with bacterial cellulitis.

Key words: Mercury, subcutaneous, injection suicide, cellulitis

INTRODUCTION

Exposure to heavy metals, whether deliberately or fortuitously, has become an important hazard to human health (Vernon, 2005; Ghabili *et al.*, 2007). Among these, mercury not only may be poisonous to the general population via food and fish, but also it might affect the individuals. The latter might be as a result of suicidal attempt, (Isik *et al.*, 1997; Winker *et al.*, 2002; Ruha *et al.*, 2001; Kayias *et al.*, 2003) occupational accident, (Ellabban *et al.*, 2003; Vano-Galvan *et al.*, 2009) penile augmentation, (Oh *et al.*, 2007) and superstitious beliefs (Prasad, 2004). Injection of metallic mercury in the forms of subcutaneous or intravenous has been hitherto reported in less than a hundred cases since 1923 (Brodkin *et al.*, 2007). We report a case of subcutaneously injected elemental mercury with suicidal intention, presenting with signs of bacterial cellulitis.

MATERIALS AND METHODS

Case report: A 19 year-old male injected an unknown amount of metallic mercury subcutaneously into his right forearm in an attempt to commit suicide. He was referred to our department with a tender, erythematous, swollen right forearm on the third day post-injection. He stated that his right forearm had been swollen for

two days, without giving any history of mercury injection. On admission, physical examination revealed blood pressure 110/70 mmHg, body temperature 36.7°C, respiratory rate 18 min⁻³ and pulse rate 78 min⁻³. The remainder physical examination as well as the neurologic evaluation findings was unremarkable. Initial laboratory findings were as follows: hemoglobin 13.4 g dL⁻¹, white blood cell count 8.2×10³ mm⁻³, positive C-reactive protein, first-hour erythrocyte sedimentation rate 24 mm, serum creatinine 0.7 mg dL⁻¹, blood urea 24 mg dL⁻¹. With presumptive diagnosis of bacterial cellulitis, the patient was placed on intravenous cefazolin. On third day of admission and following unsatisfactory response to the administered treatment, radiographic examination showed significant volumes of radio-opaque metallic foreign material in the soft tissues of his right forearm (Fig. 1). Further thorough history taking assisted by a psychiatrist, disclosed the patient's intent to commit suicide by injecting the metallic mercury.

Subsequently, total body radiographic examination was performed which did not reveal any opacity indicating no distant mercury deposition or pulmonary emboli. Hepatic and renal laboratory findings along with urine analysis were within normal range. On seventh day of admission, a mild elevation of creatinine level (1.5 mg dL⁻¹) was noted. The following day, the patient was taken to the operating room.

Corresponding Author: Mashrabi Omid, Department of Infectious Diseases, Faculty of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran Tel: +98-9144049694/+98-4226226106



Fig. 1: (A) Antero posterior view and (B) lateral view of right forearm demonstrating scattered deposits of metallic mercury

There, mercury deposits were removed with all affected tissue and fascia of the right forearm. One month postoperative, the creatinine level decreased to the normal range. He was discharged with a favorable clinical condition.

RESULTS AND DISCUSSION

Mercury, a chemical agent, is broadly used in industry, agriculture (fungicide-pesticides) and laboratories (Vernon, 2005) In medicine, mercury was once used in the treatment of syphilis and then has been confined to dental amalgams, thermometers and dermal antiseptic preparations (Ellabban *et al.*, 2003). Apart from several reports of individual mercury intoxication, a few mass organic mercury poisonings have been recorded following consumption of contaminated fish and bread in Japan and Iraq, respectively (Vernon, 2005). Nonetheless, toxic effects of elemental mercury usually present following subcutaneous or intravenous injection (Isik *et al.*, 1997) Whether accidentally or intentionally (suicidal attempt and/or psychiatric disorder), this route of mercury poisoning infrequently occurs, i.e., less than a hundred cases have been reported since 1923 (Winker *et al.*, 2002) Once the injected metallic mercury is absorbed, it is gradually oxidized into mercuric salts that bind sulfhydryl groups and hinder a number of critical enzymatic processes, particularly in the central nervous system and the kidneys (Ellabban *et al.*, 2003; Vano-Galvan *et al.*, 2009).

The clinical scenario with which mercury poisoning may present depends on the chemical structure of the mercury compound, the amount absorbed and the route of administration (Winker *et al.*, 2002; Vano-Galvan *et al.*, 2009). In case of acute inhalation, vaporized mercury may cause pneumonitis and noncardiogenic pulmonary edema, which can progress to respiratory failure and death (Vano-Galvan *et al.*, 2009; Brodtkin *et al.*, 2007). While ingestion of organic or inorganic mercury leads to gastroenteritis, renal, cardiovascular and neurological involvement, orally ingested metallic mercury usually does not induce poisoning symptoms owing to the minimal absorption through the gut (Prasad, 2004; Brodtkin *et al.*, 2007). In subcutaneously injected forms, as in our case, the underlying tissue reacts to the mercury through acute inflammation, development of foreign-body giant cells and granuloma formation (Oh *et al.*, 2007; Prasad, 2004). Besides, there is a debate on whether systemic toxicity may be induced following subcutaneous injection of metallic mercury (Ruha *et al.*, 2001; Vano-Galvan *et al.*, 2009). In this report, we described a young male with history of major depression who injected metallic mercury subcutaneously. We also found a mild increase in creatinine level beginning on tenth day of admission, indicating probable involvement of kidneys. He had no pulmonary or neurologic deterioration.

Once subcutaneous mercury injection is confirmed, immediate excision of the subcutaneous areas to which mercury is injected has been highly recommended (Ellabban *et al.*, 2003; Krohn *et al.*, 1980). Afterward, to monitor the systemic toxicity the central nervous system and renal and pulmonary functions should be assessed (Kayias *et al.*, 2003; Ellabban *et al.*, 2003; Krohn *et al.*, 1980). Although controversial, chelation therapy with penicillamine or dimercaptopropanol has been found beneficial in some previous reports (Oh *et al.*, 2007; Krohn *et al.*, 1980) Moreover, psychiatric consultation and treatment might be indicated in some cases (Ellabban *et al.*, 2003; Krohn *et al.*, 1980). In the present case, surgical excision of the surrounding tissues effectively lowered serum creatinine level, without a need for the chelating therapy.

CONCLUSION

In summary, the present case is an example of suicidal attempt that presented with subcutaneous injection of elemental mercury mimicking bacterial cellulites. Physicians should consider heavy metal injections when evaluating a patient with history of psychiatric disorders presented with bacterial cellulites.

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