CASE REPORT

Liposuction Technique Used as a Treatment Modality for Suicide Attempt by Injection of Mercury

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Abstract Elemental mercury poisoning commonly occurs through vapour inhalation as it is well absorbed through the lungs. Administering subcutaneous and intravenous elemental mercury is very uncommon with only a few isolated case reports in literature. We present a case of attempted suicide by subcutaneous injection of elemental mercury, an unusual substance used for suicide. As the attempt at self-injury was not confessed by the patient, diagnosis was challenging. Patient was treated with an initial diagnosis of cellulitis, but with repeated and persistent questioning, a history of self-injection of mercury into the arm was revealed. On confirmation, mercury was aspirated from subcutaneous space similar to liposuction technique under X-ray guidance. Management of subcutaneous injection of elemental mercury with particular emphasis on the need for surgical removal of all available mercury is discussed.

Keywords Elemental mercury · Self-inflicted injury · Subcutaneous injection · Suicide

Introduction

Mercury is a unique liquid metal that has no essential biological function. Exposure to mercury is an occupational hazard in many industries and can occur in many ways such as inhalation of its vapour, ingestion of mercury salts, ingestion of elemental mercury (deliberate or accidental) and intravenous/

subcutaneous injection of elemental mercury. Mercury toxicity is not often included in differential diagnosis. Inhalation of elemental mercury vapours is more hazardous than its ingestion or intravenous injection [1]. The use of elemental mercury as a suicidal agent is extremely rare [2], but it can be fatal if entered into systemic circulation. In these cases, early treatment by surgical removal from the body and use of a chelating agent is important, and the outcome varies.

Case Report

A 16-year old girl was admitted with history of swelling and pain in the left arm since 2 days with no other associated complaints at the time of presentation. Initially, the patient was diagnosed as cellulitis of the left arm and managed conservatively. However, the edema and redness were progressive. On further examination, we suspected the swelling was due to localised pus collection that needed confirmation. To our surprise, elemental mercury (quicksilver) was aspirated from the area of swelling. After further discussion and thorough patient questioning, including any past history of self-harm, we elicited a history of injecting mercury into the arm as an attempt to commit suicide.

Plain X-Ray of the region showed scattered radio-opaque substance in the left arm region (Fig. 1). CT scan of involved area with 3D reconstruction was done to look for the plane of deposition of mercury which showed extension of mercury in subcutaneous region scattered from the elbow joint to shoulder joint. Chest X-Ray was normal. Blood showed increase in levels of mercury of 100 µg/L (acknowledgement to Thyrocare labs, Mumbai, as the sample was tested by them). Urine mercury analysis could not be carried out. Other haematological, liver and renal parameters were in normal range.

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Fig. 1 Plain X-ray and 3D reconstructed CT image showing radio-opaque substance scattered in the left arm extending from the elbow joint distally to shoulder joint proximally in the subcutaneous plane

Immediate management was to aspirate mercury from the subcutaneous space, similar to a liposuction procedure under X-ray guidance (Fig. 2). High negative pressure plastic suction tube was used to aspirate with multiple small incisions over the arm and infraclavicular region. Mercury was aspirated under C-arm guidance along with adjacent normal fat

Fig. 2 Clinical image showing involved region of the arm and progression of the lesion within 2 days treated by multiple small incisions made to suction out mercury under C-arm guidance which shows no residual mercury at the end of procedure

tissue. Post procedure CT was repeated after 1 day to confirm for any remnants. Two days post operatively, swelling and pain reduced. Patient underwent psychiatric counselling and was discharged home 3 days later with oral antibiotics for 7 days. In the follow-up appointment 6 months later, patient was found to be healthy, with no renal, gastrointestinal, or neurologic effects that can result from the oxidation of mercury in the blood and consequent exposure of these organ systems.

Discussion

Mercury is the only common metal that is in liquid form at room temperature. It is used in making thermometers, manometers, electronic devices, mercury vapour lamps, skin ointments, and dental amalgams. Mercury is toxic in all forms; however, when injected intravenously, it can cause widely varying presentations: from total lack of symptoms to respiratory failure, kidney damage, liver damage, neurologic symptoms and even death [3]. The toxic effects of mercury after subcutaneous injection are not as serious as that seen after acute inhalation of mercury vapour. The heavy metal tends to gravitate to dependent areas and extravasate into tissues. When carried by circulation, it tends to lodge in the lungs and mediastinum and is also known to reach other organs over a period of time [4]. In cases of intravenous self-administration, aggregation of mercury at the site of injection may be radiologically seen [5]. Membranous fat necrosis is one of the complications seen in subcutaneous mercury injection [6].

Pleuritic chest pain has been reported whereas symptoms of renal and central nervous involvement were less common. Elemental mercury poisoning has also been implicated in the causation of cortical myoclonus [7]. Abscess formation is the most common local presentation [8] as seen in this particular case.

Mercury can be removed from the body by oral treatment with 2,3-dimercaptopropane-1-sulphonate and meso-2,3-dimercaptosuccinic acid [1]. As chelation therapy removes 1 mg of mercury per day only, it is best to physically remove as much of mercury as possible from all the accessible areas and use chelation therapy for the remaining mercury. There are several long-term complications of retained mercury which include microscopic inflammation of the lung [4], axonopathy of various nerves, asthenozoospermia, renal impairment, liver toxicity, and cardiac granuloma [5].

In cases of mercury poisoning, close monitoring of the medical parameters including neurological effects on the patient is required with follow-up for at least 2 years. Extensive exposure and physical removal of mercury along with surrounding tissue, if necessary, are essential [8]. Mercury is mainly excreted from the body by the kidneys, but the rate of excretion is usually very slow and traces of mercury can be

seen on radiographs and in urine even after 2 years of the index event. Our patient, however, made a full clinical recovery and did not show any renal, hepatic, neurologic or pulmonary sequelae over 1 year of follow-up.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no competing interests.

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