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## **Deliberate self harm with mercury injection in forearm**

A. I. Mario and M. Tare  
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Erle C. H. Lim, Raymond C. S. Seet,  
Andre E. J. Cheah and Aymeric Y. T. Lim  
*Yong Loo Lin School of Medicine, Division of Neurology,  
and Hand and Reconstructive Microsurgery, National  
University Hospital, Singapore*  
E-mail: mdcelch@nus.edu.sg

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### Deliberate self harm with mercury injection in forearm

Dear Sir,

We present a case of a deliberate self harm with mercury injection into forearm. This was treated by immediate exploration and evacuation by aspiration, avoiding extensive soft tissue resection and the need for reconstruction.

A 45-year-old female with borderline personality disorder, depression and a long history of deliberate self harm presented with multiple metallic foreign bodies in her left forearm. She underwent removal of these foreign bodies under general anaesthetic through an exploratory longitudinal 10 cm long incision on the inner aspect of her forearm, which was closed primarily with interrupted sutures. Twenty-four hours later, following discharge, she broke a fish tank thermometer and self-administered mercury into the flexor compartment through the incision site.

A consultant toxicologist was consulted for advice regarding appropriate investigation. Emergency investigations included mercury blood concentration, urine mercury levels at 24 hrs, urea and electrolyte screens and respiratory investigations as well as psychiatric assessment. Considering the toxic nature of mercury, complete removal was suggested. Immediate radiographs of the forearm showed localised radio-opaque deposits within the forearm flexor compartments.

The patient was taken to theatre promptly for wound exploration. The C-arm was used to obtain radiographic imaging and localisation of the tiny mercury deposits. After careful dissection within the muscle compartments, liquid shiny droplets of mercury were found. The droplets were localised in the fascial planes between the muscle bellies. These droplets were aspirated using a 10 ml syringe and a soft cannula. No excision of tissues

was performed. Thorough washout of the contaminated area was carried out with normal saline. Complete removal of mercury was confirmed radiographically. After 48 hrs, the patient was transferred back to psychiatric care. The patient has subsequently remained symptom free and repeat blood repeat have been reported normal.

There are around 30 cases of mercury injection reported in the literature; most of them are accidental. Systemic mercury intoxication leads to local tissue reaction with renal, neurological and respiratory sequelae (Gerstner et al., 1977; Oliver et al., 1987). A few cases of intravascular injection of mercury resulting in pulmonary embolisms are also reported. Though only three deaths have been reported so far, the morbidity arising from mercury poisoning is significant. These patients are first seen by chest physicians, neurologists and nephrologists but rarely by hand surgeons. However in localised injection site cases, the hand surgeon may be called upon to excise and reconstruct. Scant information is available about the local tissue effects. Most of the reported cases were treated surgically many days after the event. Cases often present late with an inflammatory response, granuloma and abscess formation and with the extrusion of globules of mercury. The mercury deposits slowly convert into mercury salts leading to systemic absorption. The recommended treatment is prompt excision of all accessible subcutaneous areas in which mercury is demonstrated, along with monitoring of CNS and renal function. Removal of mercury granulomas at injection sites should be attempted as this will prevent ongoing systemic absorption of the mercury deposits (Netscher et al., 1991). Skin and granuloma resection may leave vital structures exposed, necessitating flap coverage (Isik et al., 1997; Netscher et al., 1991), with the associated morbidity. Chelation therapy is recommended in case of systemic toxicity.

Paramount for our approach was the immediate surgical intervention, as tissues had not undergone reactive changes and the metallic mercury was still easily identifiable and accessible as liquid droplets. Mercury shows a propensity to disperse into finer particles, the reverse is also true when these are allowed to aggregate into larger ones. Multiple tiny droplets of mercury, when pushed towards each other with a soft cannula, coalesce to form a single big drop of mercury. It is easy to aspirate a single drop with a 10 ml syringe. This technique facilitates neat removal of mercury minimising further contamination and spread. The approach of early intervention avoided the need for the resection of tissues, avoiding the reconstructive procedures.

In view of the rarity of the condition, we share our experience of a successfully treated case of metallic mercury injection into soft tissues by means of precise aspiration.

**Conflict of interests**

None declared.

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A. I. Mario, MRCS and M. Tare, MS, MRCS,  
M.Ch, (Plast), DNB (Plast), FRCS (Plast)  
*St Andrew's Centre for Burns & Plastic Surgery*  
*Broomfield Hospital Chelmsford, Essex, UK*  
E-mail: mtare@hotmail.com

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**Severe digital ischaemia caused by a hairdryer burn**

Dear Sir,

A left-handed 29-year-old lady with longstanding generalized seizure epilepsy presented with a discoloured, painful and blistered left hand. She had a seizure while blow-drying her hair and was found lying on the bed approximately 15 minutes later. The hairdryer was unplugged. The relative who found her described an immediate bluish discoloration of the forearm and hand, followed 10 minutes later by blistering of the hand. She had been taking long-term topiramate and levetiracetam for epilepsy, smoked occasionally and did not use illicit drugs. She was otherwise well.

On arrival in the Accident and Emergency Department, the distal phalanges of all digits were necrotic. Blisters were seen over the hand and wrist (Fig 1). Sensation was impaired and capillary refill over the hand grossly delayed. The radial and ulnar pulses were normal.

Initial treatment with a glyceryl trinitrate infusion was unsuccessful. Intra-arterial digital subtraction angiography showed normal vessels up to the level of the digital arteries, with sudden cut-off just distal to the metacarpophalangeal joints in all digits (Fig 2).

Tolazoline (an  $\alpha$ -adrenergic receptor antagonist) was injected intra-arterially and followed by a 7 day prostacyclin infusion in order to maximize vasodilation. The hand failed to improve and she subsequently required amputation of all her fingers and the distal phalanx of her thumb.

Autoimmune and thrombophilia screens were negative, although anti-cardiolipin antibody levels later rose slightly. She was not on any medication known to induce vasospasm, the vasculitic screen was negative and there was no suggestion of malignancy. A 24 hour tape was normal. Photoplethysmography readings of the affected hand were normal.

The striking feature was the temporal relationship of the seizure, use of the hairdryer and acute ischaemia. It is therefore likely that heat or electricity was the mechanism of arterial injury. Although the hairdryer was unplugged when the patient was found, it is possible that the extreme movements induced by the seizure pulled the plug out of the socket. The precise underlying cause of such dramatic digital ischaemia remains uncertain but is likely to be a combination of vasospasm and coagulation necrosis.

Individuals suffering from epilepsy, especially where there is suboptimal control, are at increased risk of thermal injury due to lack of awareness during a seizure of the pain induced by heat. Arterial occlusion can occur immediately following a third degree burn. There is irreversible coagulation, leaving only the major vessels patent (Order et al., 1965). Hot air burns resulting from hairdryers held against the skin are rare but temperatures can reach up to 80°C, depending on the wattage of the hairdryer, head setting and position

Fig 1 Severe digital ischaemia shortly after presentation.