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Reconstruction of the Abdominal Wall Secondary to Mercury-Induced Granulomas in a Patient with ASIA Syndrome and Gym Nephropathy

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INTRODUCTION

Mercury is a less recognized cause of heavy metal poisoning(1). Typically, mercury exposure occurs through the consumption of methylmercury in seafood, inhalation of elemental mercury vapors, or accidental or intentional injection for various purposes(2). Elemental mercury injection is rare, with only about 72 cases reported in the literature between 1923 and 1995. Direct subcutaneous injection or extravasation of mercury injected into blood vessels can produce local granulomas and abscesses(3). Generally, cutaneous deposits of elemental mercury cause limited systemic effects, but infiltration into different layers of subcutaneous cellular tissue, fasciae, and muscle can represent a complication at the time of resection(4-5).

We present an unusual case of a 49-year-old bodybuilder who experienced mercury poisoning due to unintentional intramuscular inoculation, causing granulomas in various muscles, with infiltration into the deep fasciae of the abdominal wall, requiring resection and reconstruction of the abdominal wall.

OBJECTIVE

To describe the case and surgical approach for abdominal wall reconstruction secondary to mercury toxicity in soft tissues, caused by the unintentional inoculation of mercury in the abdominal wall, pectorals, glutes, and biceps in a bodybuilder with chronic use of intramuscular anabolic steroids and oral dietary supplements.

CASE PRESENTATION A 49-year-old male bodybuilder with chronic and intermittent use of oral protein supplements, testosterone, and intramuscular steroids. In 2019, he began to develop periumbilical and right flank dermal lesions with progressive growth and mild tenderness on palpation. The condition progressed with new lesions on the left forearm, left anterior hemithorax, and cervical region. Associated symptoms included asthenia, adynamia, hypersomnia, short-term memory loss, and unintentional weight loss of approximately 16 kilograms in 6 months. Thyroid profile and renal function tests were conducted, diagnosing Hyperthyroidism and chronic kidney disease KDIGO G3A. A biopsy of the supraumbilical region lesions reported suppurative and hemorrhagic granulomatous dermatopanniculitis secondary to mercury.

Toxicology service measured mercury levels in urine, yielding a result of 135µg/l (normal value: <20µg/l) and in blood, 221µg/l (normal value: <5µg/l). A comprehensive protocol was followed, including chest and abdominal X-rays (see Image 1), revealing infiltration at the abdominal wall level. Multidisciplinary medical management was initiated, involving Nephrology, Endocrinology, Psychiatry, Psychology, and Plastic Surgery.

Image 1. Radiograph of the Chest, Abdomen, Pelvis, and Cervical Spine of the Patient. Figure A: AP Chest Radiograph. **Figure B and C:** AP and Lateral Radiographs of the Abdomen and Pelvis. **Figure D:** Cervical Spine Radiograph. All figures show radiopaque infiltrative lesions with a metallic appearance.

The patient was evaluated by the Plastic and Reconstructive Surgery service for resection of granulomatous lesions. They requested intraoperative consultation from the General Surgery service due to the infiltration of granulomas into the left rectus abdominis muscle and peritoneum. A partial resection of the left rectus abdominis muscle was performed, resulting in a secondary wall defect. This required anterior component separation, reconstruction with a myocutaneous flap from the anterior aponeurosis of the lower rectus muscles, and mesh placement (See Image 2).

The histopathology report of the surgical specimen revealed extensive and severe xanthogranulomatous and suppurative nodular inflammatory infiltrate, with both recent and old hemorrhage, myxoid degeneration, fibrosis, and foreign body reaction associated with mercury (See Image 3).

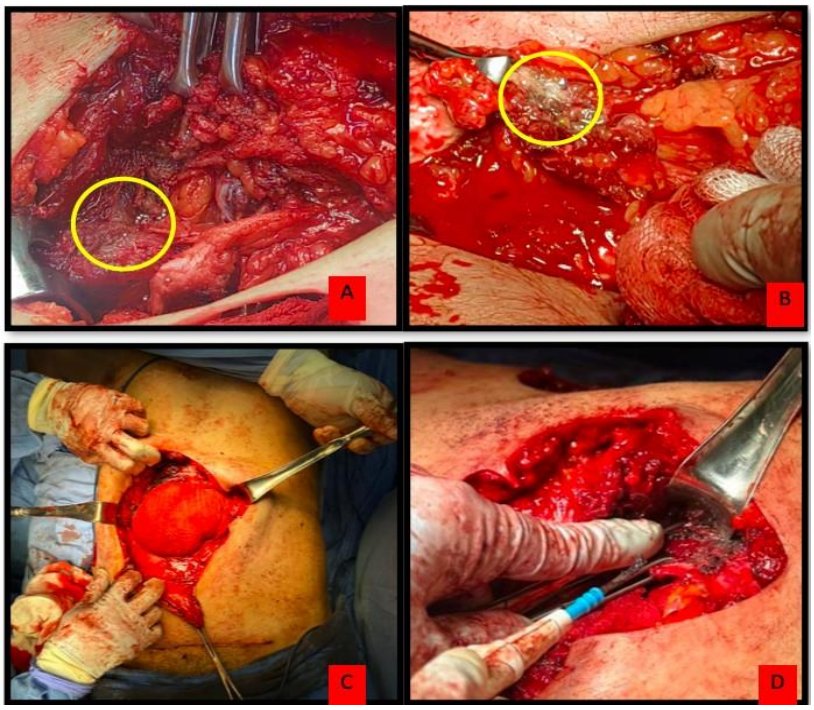

Image 2. Intraoperative Findings of the Surgical Procedure. Figure A and B: Metallic material identified as mercury. **Figure C:** Resection of part of the abdominal wall, including superficial and deep planes. **Figure D:** Anterior component separation of the lower rectus muscles for the myocutaneous flap

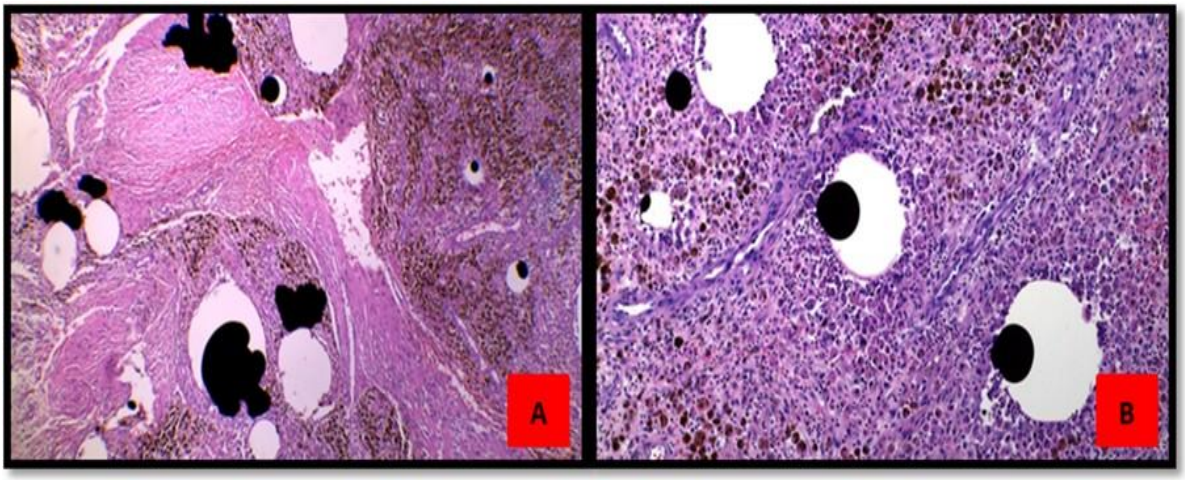

Image 3. Histopathological Findings of the Surgical Specimens. Figure A: Evidence of deep abdominal wall involvement, with extensive and severe xanthogranulomatous and suppurative nodular inflammatory infiltrate, along with both recent and old hemorrhage. **Figure B:** Evidence of infiltration into the muscular layers of the abdominal wall.

RESULTS

In the immediate postoperative period, the patient exhibited signs of postoperative ileus, managed with enteral fasting and nasogastric tube placement, leading to clinical improvement and discharge. However, the patient was readmitted 72 hours later due to abdominal distension, emesis, absence of bowel movements, and acute abdomen. An abdominal radiograph was requested (See Image 4), highlighting pathological air-fluid levels. An exploratory laparotomy was performed, revealing a pinpoint perforation of the ileum 320 cm from the Treitz angle, a 300cc abdominal cavity abscess, and a right indirect incarcerated inguinal hernia Nyhus II, with a hernial defect measuring 4.0x4.0cm and a hernial sac containing omentum measuring 6.0x5.0cm. The procedures performed included ileostomy, partial omentectomy, and right inguinal hernioplasty.

Image 4. AP Abdominal Radiograph of the Patient.

This radiograph shows evidence of air-fluid levels at different heights, with a small amount of fecal content in the rectal ampulla. A significant reduction in the infiltrative lesions of the abdominal wall can be observed compared to the previous abdominal radiograph.

The patient was discharged from the operating room with central aminergic support and signs of acute kidney injury AKIN II. After 7 days of satisfactory progress, with a functional stoma and tolerance to enteral feeding, the patient was discharged home with follow-up by the multidisciplinary team in the outpatient clinic.

CONCLUSION

We recommend that cases of subcutaneous injection of metallic mercury be managed through the complete surgical excision of the lesions under X-ray control, with serial monitoring of mercury concentrations in blood and urine.

CONFLICT OF INTEREST

None.

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