Metallosis is a serious condition that occurs when metallic debris builds up in the soft tissues of the body. This condition is seen in individuals undergoing joint replacement surgery, like those of the hip, knee and elbow. Incidence of metallosis is not common. Here we present a case of a 61-year-old male, who had undergone right-sided total hip replacement 20 years earlier due to avascular necrosis. He presented to us with one-year history of massive swelling of right thigh and mild pain and discomfort in September 2013. He was unable to carry weight on the affected limb and had been bed-ridden for the preceding three months. On surgery, we found that the femur had eroded on the medial side, and the whole ilium had been destroyed except the iliac crest. We removed the stem, some metal particles and the fibrous tissue. After 2 months of surgery, he died of myocardial infarction.

**Keywords:** Metallosis, Eroded ilium, Acetabulum, Total hip replacement, Complication. (JPMA 64: S-54 (Suppl. 2); 2014)

**Case Report**

A 61-year-old male, who had undergone right-sided total hip replacement (THR) 20 years previously due to avascular necrosis, presented to us with massive swelling of the right thigh and mild pain and discomfort that he was having for about a year, in September 2013 at the Orthopaedic Department of Dow University of Health Sciences/Civil Hospital, Karachi. He was not weight-bearing on the affected limb and had been bed-ridden for the preceding three months. On surgery, we found that the femur had eroded on the medial side, and the whole ilium had been destroyed except the iliac crest. We removed the stem, some metal particles and the fibrous tissue. After 2 months of surgery, he died of myocardial infarction.

**Keywords:** Metallosis, Eroded ilium, Acetabulum, Total hip replacement, Complication. (JPMA 64: S-54 (Suppl. 2); 2014)

**Figure-1:** Complete osteolysis of ilium, acetabulum and proximal femur.
limb and was bed-ridden for 3 months. On examination we noticed, ill-defined firm swelling of 20x20cm extending from ilium, natal cleft posteriorly, down the mid-thigh, and dilated veins over the skin. Hip movement could not be assessed. Knee movement was 20 to 70 degrees. Distal pulses were intact. Sensation and power at foot was normal.

Radiologically, osteolysis was seen around the stem, ilium was completely destroyed (Figure-1), medial side of femoral shaft was eroded (Figure-1 & 2), Posterior view showing eroded ilium (Figure-3) and cup was placed at the lower abdomen (Figure-4). Haematological investigations are normal.

On surgery through lateral approach, we found no clear demarcation of the lateral compartment. Metal debris with reactionary fluid of black-brown colour was drained. Sludge-like material was also drained. We found that the femur stood eroded on the medial side. The whole ilium was destroyed, except the iliac crest. We removed the stem, some metal particles, and fibrous tissue. The whole cavity was washed; drain was placed; and the wound was closed. On 2nd postoperative day, there was leakage of brown-black fluid.
from the wound. Wound was explored again after 2 days and debrided. All material was sent for histopathology; sludge, fibrous tissue and metal particles separately. Multiple dressings were performed. The patient remained bed-bound. After 2 months of surgery, he died of myocardial infarction (MI). Histopathology report showed increased number of lymphocyte infiltrate along with macrophages and giant cells. Some metal debris were also noted.

Discussion

Metallosis is a rare but serious medical condition in which metallic debris build up in the body's soft tissues. Metallosis is defined as an infiltration of metallic debris in periprosthetic soft tissue and bone as a result of wearing arthroplasty.1 One of the major causes of this condition is medical implants such as hip and knee, elbow joint replacements.2 In 2010, metallosis became a well-known condition when a British study revealed that some patients who had a DePuy ASR hip implant had adverse reactions to metallic particles. It is not necessary for everyone undergoing replacement surgery to develop metallosis, but all patients should be informed about this complication before the surgery.3

When a person has an artificial joint in some implants, the abrasion of metal components causes metal ions to be released and these ions are absorbed in the surrounding soft tissues near the implant and into the bloodstream. The person's immune system then reacts to the foreign body — the metal ions — and tissues become inflamed around the debris which can cause severe pain and make it difficult for a person to move the joint. Though exact aetiology of soft tissue reaction is not known, it is suspected that reaction to high level of particles and debris result in cellular toxicity and metal hypersensitivity.4,5

Metallosis is common with metal-on-metal implants. It was thought that metal implants provide more durability. Due to direct friction of metal on metal it happens. There are other implant material that can produce metallosis, like cobalt, chromium and titanium.6 Silicone with grommets can cause metallosis.7,8 Metal concentration level can be measured in body that rises to >3% after 10 years of THR. Metal ion analysis can be performed with high-resolution spectroscopy to measure serum levels of cobalt and chromium. The Agilent 7700x ICP-MS is used to measure. Consistently high levels of cobalt and chromium >7ppb is indicative of accelerated wear/metallosis.5,9 Metallosis can present with severe pain at joint, loosening, bone deterioration, inflammation and swelling around joint. Sometimes it presents with psychological problem. Few complications have been reported with metallosis, like ilioosposa bursal cyst, venous compression as result of pseudotumour formation in metal-on-metal hip resurfacing, aseptic lymphocytic vasculitis.

Arthroplasty failure rate secondary to metallosis is 0.3 to 3.1% over 3 to 5 years after the arthroplasty.11 Besides, 1.2% revision is reported because of metallosis in another study.12 Some cases have been filed against companies making all-metal implants. It is very important to inform the patient about this problem.

Conclusion

THR is an excellent reconstructive procedure. But in developing countries where patients are not well-educated, not follow up timely after surgeries, total hip arthroplasty should be carried out only after detailed counselling, education and guaranteed proper follow-up. Otherwise, dangerous complications crop up that are not treatable.

References