I. INTRODUCTION

Cutaneous hypersensitivity reaction to metallic implants used in orthopaedics and other surgical specialties is an uncommon manifestation. These allergic reactions can complicate surgical management and increase morbidity. Management of these reactions depends on their severity and may need topical or systemic therapy or even both.

II. CASE REPORT

A 40-year-old female presented with history of fall on right forearm from stairs and suffered a fracture right radius and ulnar shaft in July 2021. Patient underwent open reduction and internal fixation with stainless steel 3.5 mm Dynamic Compression plate (DCP) on the next day (Fig. 1).

10 days post operatively patient developed an erythematous rash on her right forearm which progressed to involve both upper limb, lower limb and trunk over the next few days. Dermatologist was consulted to evaluate the patient and a provisional diagnosis of allergic contact dermatitis was made. The patient was treated with 50 mg oral prednisolone for 3 days (followed by tapering of dose), potent topical steroids and oral antihistamines. She temporarily responded to the treatment and the skin lesions improved over a week’s time only to recur after a month. A punch biopsy of the lesion was taken, which showed irregular acanthosis, spongiosis, and superficial perivascular inflammatory infiltrate, suggestive of subacute dermatitis (Fig. 4).

There was slower healing of the surgical wound and suture removal had to be delayed. Serial X rays showed callus formation at 6 weeks. Later, a detailed history taking from the patient revealed history of allergy to steel chains and watches in the past and a patch test was obtained. Patch test was found to be positive for nickel and selenium allergy, which are the main components of stainless steel. Since radiological fracture union was progressing and symptoms were controlled, it was decided not to remove the implant till acceptable fracture union is achieved. Calcium and vitamin D supplementation was given for 3 months. There were 4 episodes of flare up of contact dermatitis (Fig. 2 and 3) over a period of 9 months which were managed by dermatologist with oral prednisolone. After acceptable fracture union was confirmed by CT scan, implant removal was done at 9 months postoperatively. There was no hypersensitivity reaction till 6 months post implant removal.

Fig. 1. Postoperative X ray showing metallic implant in situ.

Fig. 2. Inflamed scar and erythematous reactions in right arm.
mediated hypersensitivity reactions and implant failure [7]. Exposure are nickel, cobalt, and chromium causing metal extracutaneous allergic reactions after prolonged internal three most frequent metals that cause both cutaneous and swelling, corrosion of metals and implant loosening [7]. The form in the vicinity of the implants, causing discomfort, eczemas, bullous dermatitis and other inflammatory forms first reported [5]. The majority of cutaneous reactions include eczemas, bullous dermatitis and other inflammatory forms [6]. Additionally, more complicated immune reactions could form in the vicinity of the implants, causing discomfort, swelling, corrosion of metals and implant loosening [7]. The three most frequent metals that cause both cutaneous and extracutaneous allergic reactions after prolonged internal exposure are nickel, cobalt, and chromium causing metal-protein complex formation and ultimately leading to type IV-mediated hypersensitivity reactions and implant failure [7], [8]. However, same hypersensitive reactions can also be brought on by other metal ions and by elements of bone cement.

Debilitating reactions and implant loosening might warrant premature implant removal whereas most cases are successfully managed by short term oral corticosteroid therapy.

Various case reports have documented history of metal hypersensitivity in patients who suffered such reactions though most were idiopathic. The routine evaluation of metal hypersensitivity preoperatively is neither feasible nor cost effective. However, susceptible individuals with prior history of metal allergies should be screened by patch testing or LTT (Lymphocyte Transformation Test) before metal implantation [9]. Any implants containing metals testing positive in the patch test should be avoided [10].

IV. CONCLUSION

Missed diagnosis or delayed diagnosis leads to multiple debridement in suspicion of infection and surgeries which could be avoided. This inadvertently increases the morbidity and results in poor patient outcome. Hence appropriate interdepartmental communication and collaboration is pivotal in optimal management of such clinical challenges. In addition, guidelines for detection, management and prevention of such scenarios are yet to be laid out.

APPENDIX

LTT- Lymphocyte Transformation Test
CT SCAN- Computerized Tomography Scan
DCP- Dynamic Compression Plate

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CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

REFERENCES


