

# Pseudotumor Humerus: An Uncommon Case Of Foreign Body Reaction To Orthopaedic Implants

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## Abstract

Hereby we are presenting a case of a 60 years old female with 2 years old operated fracture shaft humerus with gradually increasing swelling and pain in the operated arm. There were no signs of infection or neurovascular involvement. The radiological examinations revealed a gross cystic enlargement of humerus with loose implants. The Histopathology examination showed chronic nonspecific inflammatory cells. The patient underwent implant removal and the fracture was treated conservatively.

## INTRODUCTION

Pseudotumor humerus due to orthopaedic implants is an uncommon postoperative presentation. This article describes an unusual case of pseudotumor of humerus due to the foreign body reaction against the orthopaedic implants (plate and screws). The patient presented to us after one year of surgery with gradually increasing swelling and pain of whole arm. The radiological examinations revealed a cystic enlargement of humerus with loose implants. The Histopathology examination showed chronic nonspecific inflammatory cells. The patient underwent implant removal and the fracture was treated conservatively.

## HISTORY

A 60 year old female presented to the outpatient department with complaints of gradually increasing pain and swelling of right arm over the period of one year. The patient had a fall before 2 years which resulted in a shaft humerus fracture and was treated with a dynamic compression plate fixation at a nursing home. The post operative course was uneventful for one year. After a year of the surgery, the patient started having mild constant pain and swelling in the arm without any history of fresh trauma. The patient had no history of constitutional symptoms or fever. There were no other similar swellings or pain in other parts of body. Patient had no known hypersensitivities. There was no relevant significant medical history.

## ON EXAMINATION

On Examination, there was diffuse swelling of whole of

right arm extending from shoulder to elbow joint, with tense and shiny skin. There was a well healed scar of previous surgery (posterior approach to humerus for plating.) There was no sinus, abnormal pigmentation, abnormal pulsations or dilated veins over the arm. Range of motions of right shoulder and right elbow were full and free with some pain in the arm. The limb was neurovascular intact.

## INVESTIGATIONS

A digital radiograph of right arm showed homogenous well defined gross cystic enlargement of whole (mainly lower half) of humerus with loose implant. The distal 4 screws were lying at the bottom of the cavity, which were freely mobile with the movement of the arm which was evident by the lateral x-ray. The cavity didn't have any septa. The surrounding soft tissue shadow was prominent.

Routine blood picture showed eosinophilia.

Angiography of the arm showed the lesion was hypovascular and there was no specific feeding vessel. A routine skeletal survey was carried out to rule out any primary or metastatic involvement of the bone which was negative.

The Histopathological examination of the lesion revealed chronic non specific inflammatory cells only. The patient was referred to Gujarat Cancer Research Institute. They gave the clinical impression of the foreign body reaction to orthopaedic implant.

Figure 1



Figure 2



### **SURGERY**

Implant removal and open biopsy of the lesion done. The cavity was found to be filled with a serous fluid. No septa or granulation tissue was found. The humerus plate along with the screws was lying free inside the cavity. The fracture was not healed and it was found unstable. No fixation attempted.

Histopathological Examination report revealed chronic nonspecific inflammatory cells.

Figure 3



Figure 4



#### **FOLLOW UP**

The patient had no postoperative neurovascular deficit. A humerus brace was given. The postoperative course was uneventful. We are planning to follow up the patient every monthly to check regression of the lesion. Plan is to reconstruct the bone gap with structural fibular grafts in future.

#### **DISCUSSION**

Pseudotumor humerus is a term used to describe a mass in the body due to allergic reaction to a foreign body. If the foreign body is composed of any cotton material, then it is known as gossypiboma, textiloma or cottonoid (1). This is usually due to retained surgical gauze piece, sponge or any other cotton material.

The nonabsorbable materials of the retained surgical foreign bodies induce two types of reaction:

Aseptic fibrinous response: that creates adhesions and encapsulation, leading to foreign body granuloma.

Exudative response: which leads to abscess formation with or without secondary bacterial invasion. A sinus or fistula

formation may occur which may extrude the foreign body.

Metallosis (2) is a known entity in joint replacement field in which there is infiltration of periprosthetic soft tissues and bone by metallic debris resulting from wear of joint arthroplasties.

Tezer M (3) reported a case of intraspinal metalloids adjacent to the pedicular hook occurring after treatment of vertebral fracture by posterior spinal instrumentation and fusion, and causing paraparesis at the 3rd postoperative year. Crevice and fretting corrosion are results at the junctions of rod-screw, rod-hook, transverse connector rod and other connector rods in modular spinal implants.

Humeral nonunion associated with metalloids secondary to use of a titanium flexible humeral intramedullary nail (4) has been reported in literature. Metallosis is reported frequently in the vicinity of traditional titanium fixing elements. (5). A forearm plate retained for 50 years was removed because an acute inflammation mimicked chronic infection. During the operation metallosis was observed. (6).

In one study in Russia, biopsies of soft tissues of patients taken from the region of metallic construction implantation which were in the host for osteosynthesis from 5 months to 4 years were examined histologically, histochemically and electron microscopically. Control biopsies were taken in 4 patients with false joints of long bones 5 months--1 year after the trauma. It is proven that the signs of the metal corrosion destruction are most frequently observed when complex multicomponential metallic implants prepared from heterogeneous metals are used. Corrosion results in the "metallic" tissue response long after the implantation. This is characterized by the formation of dense fibrillar connective tissue, its focal infiltration with fragments of metallic constructions and the products of their destruction in the form of various metal-protein complexes, syderosis, acute or chronic inflammation as a result of corrosion, metallosis and trauma. Metallosis of tissues in the implant bed is to be considered as a late complication of the metallic osteosynthesis. (7). Compound metallic constructions

produced from different metals and alloys were subjected to corrosion 3 times as frequently. (8).

## **RADIOLOGICAL FINDINGS**

Plain radiographs and CT are the investigation of choice. Plain radiograph may show an inhomogenous, low density mass with thin high intensity capsule and signs of chronic inflammatory changes in the surrounding soft tissues. In our case, we made the diagnosis on the basis of history of surgery before one year, presence of well defined encapsulated lesion in the humerus with the presence of metallic implants within it and surrounding soft tissue changes. HPE didn't show any metallic granulomas but it revealed presence of chronic inflammation.

The differential diagnosis of this metallosis includes gossypiboma, abscess and tumor.

In summary, it's the diagnosis of exclusion. A history of surgery is obvious and typical radiological findings are supportive. Intraoperative findings and HPE reports confirm the diagnosis. The prognosis remains uncertain.

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