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Milwaukee Shoulder: A Rare Case Report

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Abstract

Milwaukee shoulder syndrome is a rare orthopaedic entity. Affected individuals usually have significant functional impairment at presentation. Few cases of this condition are documented in the literature making it a hard condition to treat. However, for the affected shoulder joint viable surgical options are between a reverse shoulder arthroplasty or shoulder arthrodesis as salvage procedures. Both procedures leave the shoulder relatively functional and therefore effort she'll be on early diagnosis and treatment of precursor stages of the disease. We also highlight our case of a 56 years old African female with Milwaukee shoulder of the left shoulder as well as precursor rotator cuff arthropathy of the contralateral shoulder sparking a review of recent literature.

Keywords: Arthroplasty • Milwaukee shoulder syndrome • Epilepsy • Calcium-phosphate • Inflammation

Introduction

Milwaukee Shoulder Syndrome (MSS) or Rapidly Progressive Rotator Cuff (RTC) Arthropathy is a rare condition. Named after the city in which it was described, Wisconsin (Milwaukee). McCarty, et al. was there first to report on the condition, noted in four of their patients [1]. Pathologically it is a condition represented by shoulder synovial thickening secondary to inflammation triggered by calcium-phosphate crystal deposition into the cuff [2-4]. Usual presentation of rotator cuff arthropathy is that of joint space narrowing, and proximal humeral head migration in a clinically painful and stiff joint. We present here an atypical radiological presentation of MSS of the left shoulder joint. To our knowledge, there is no other case of a similar presentation.

Case Presentation

A 56-year-old female presented herself to our Tumour and Infection Unit at Chris Hani Baragwanath Academic Hospital, Johannesburg. Her main complaint was that of pain and loss of function in the left shoulder for two years. She gave a prior history of trauma to that shoulder in 2006 complicated by a fracture, which was treated successfully conservatively at the time. With the prevalence of TB in our social context she was subsequently treated with anti-TB chemotherapy for her un-resolving shoulder symptoms in 2013, however without any long-term improvement in her symptomatology. A background diagnosis of previous Rotator cuff tendinitis was also noted to be affecting both shoulder joints. Medically controlled hypertension and epilepsy were her other reported co-morbidities (Figure 1).

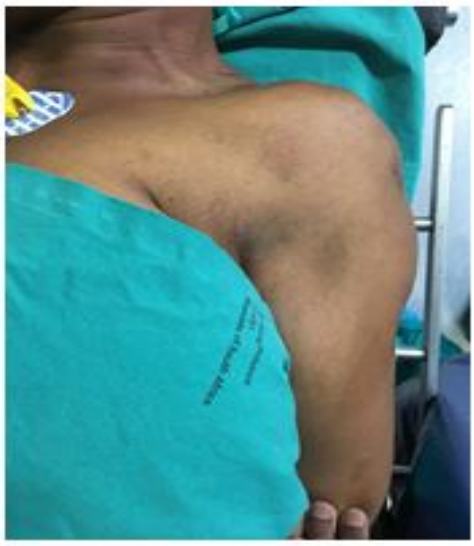

Figure 1. The clinical picture of the left shoulder showing marked muscle wasting.

On examination

A well-looking elderly lady presented herself. She lacked any signs of chronic illness. The left shoulder showed wasted deltoid muscles with obvious swelling of the joint proper. Shoulder joint movements were irritable, with tenderness on attempted range of motion. However, distal pulses and nerve function were intact (Figure 2).

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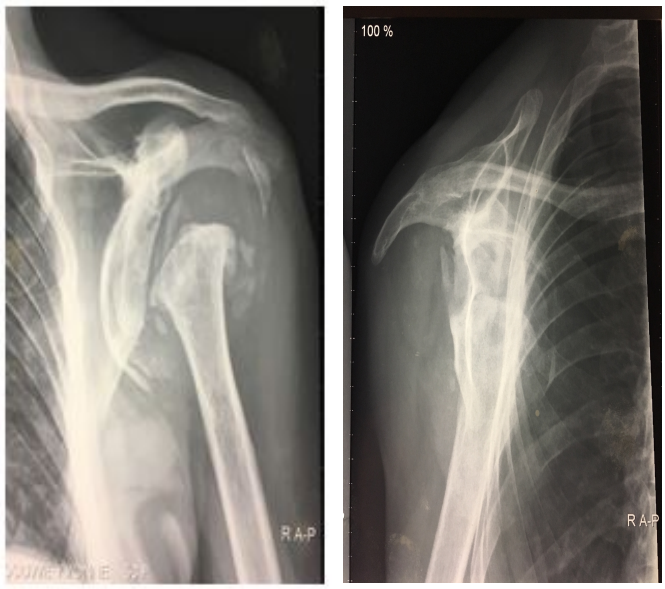

A B

Figure 2. A) Anterior B) Lateral gross destruction of the left shoulder joint.

Antero-posterior view of the shoulder: Gross destruction of the humeral head and glenoid articulation, with loss of bony contact. Soft tissue calcific deposits were noted around the joint forming a ring configuration around the joint. On the lateral X-ray view of the shoulder, the humerus and glenoid were aligned.

MRI: T2 axial and coronal images of the affected shoulder with gadolinium are shown in Figure 3. Show a massive effusion with floating osseo-cartilaginous particles.

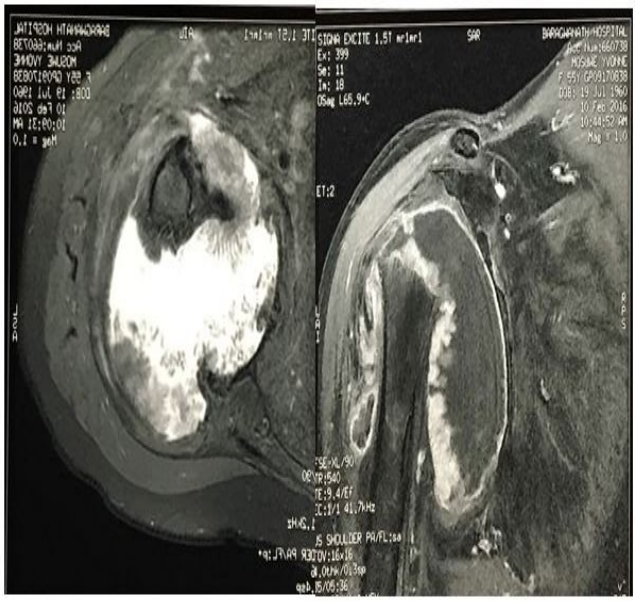

Figure 3. Axial and anteroposterior T2 images off the left shoulder.

Preoperative evaluation

The cardio-respiratory assessment was normal. Her laboratory septic work-up was unremarkably normal; an Erythrocyte Sedimentation Rate (ESR) of 12 mm/hr was a relevant negative finding in her case. Principles of tumour management were applied, and a tissue biopsy was performed twice with in-conclusive diagnoses each time. Both samples failed to grow any infectious organism. The final histological report was that of a hypo-cellular matrix with occasional gaint-cell-like cells at our multi-disciplinary team discussion (orthopaedic, radiology, and histopathology) the diagnosis of Milwaukee shoulder was attached to our patient's condition. Ultrasound-guided aspiration of the index shoulder was performed at our radiology department, and the fluid specimen was sent for analysis and to relieve the collection. Our patient was appropriately referred to our Sports and General outpatient's department for further treatment of her rotator cuff disease.

Results and Discussion

Milwaukee shoulder or rapidly destructive rotator cuff arthropathy is a rare condition. It commonly affects elderly females with a background of pre-existing Rotator Cuff (RTC) symptoms [1]. A traumatic insult to the shoulder usually precedes the pathological process which was the case with our patient as well. MSS disease progression is usually rapid without any clearly defined stages of the disease. Histologically the synovium is thickened and grossly acellular with focal areas of hyperplasia and occasional giant cells and two of our biopsies showed similar results after they were reviewed by a senior histopathologist. It is postulated that the process is triggered by calcium-phosphate crystal from micro-fractures of the calcified rotator cuff [4] are triggered after they engulf calcium-phosphate crystal debris from the micro-fractures of a calcified rotator cuff. The associated effusion shows cartilaginous debris from the action of protease enzymes released from activated lymphocytes [2-4]. This was the case with our patient as loose bodies are clearly shown on her MRI images. She was previously treated for extra-pulmonary TB with no resolution of her symptoms after the typical 12 months of anti-TB chemotherapy. This treatment approach was based on a high index of suspicion, the exclusion of malignant or aggressive lesions on biopsy as well as the fact that TB is prevalent in our setting. Especially since TB of the shoulder can present variably as a "great mimicker" [5]. Popov et al., in their case report describe a severely destructive case of MSS similar in characteristics to our case but the patient had an underlying prior diagnosis of Pigmented villonodular synovitis [3]. An alarming factor in the latter case was a high of ESR of 71 mm/h signifying a sinister underlying diagnosis. Our case had a normal ESR level.

For a diagnosis of MSS, supportive treatment with analgesic and intra-articular steroid injections have shown good symptomatic relief in the early stages but in our case of end-stage disease, they would not offer much benefit. The use of intra-articular steroids should also be balanced against their risk of iatrogenic intra-articular infection, especially in the elderly. Operative management for earlier stages (RTT) is less aggressive with options like arthroscopic debridement and cuff tear suturing, which have been shown to minimise progression to MSS later on [6].

For end-stage established MSS, few surgical options exist namely, a reconstructive reverse shoulder replacement or the salvage option of shoulder arthrodesis. Reverse Shoulder Replacement (RSR) is indicated with loss of function of the RTC action as a conventional shoulder replacement would bio-mechanically fail. The RSR implant relies on tension in the deltoid muscle to assist with shoulder stability and function regardless of RTC status. However, anatomical pre-operative requirements are a functioning Deltoid muscle with a good bone stock of both the humeral head and glenoid [7]. Our case had a destroyed glenoid and therefore sitting off the glenoid-sphere was deemed impossible. As such arthrodesis was the viable surgical option in her situation; this would bio-mechanically offer a stable base for better upper limb dynamics and help reduce her pains. Sadly, the possibility of pseudo-arthrosis and eventual failure for shoulder arthrodesis should always be discussed with the patient as a possible complication. A successful arthrodesis however will result in complete loss of shoulder motion, in which case the contralateral side should be treated aggressively early to avoid a similar fate to the shoulder joint. McCarty et al. showed that up to 80% of patients had bilateral rotator cuff involvement, with the dominant side usually being severely affected [1]. From this finding one should implement aggressive early treatment of the mildly affected side to improve overall patient outcomes.

Conclusion

MSS is still a rare clinical presentation to orthopaedic surgeons. End-stage rotator cuff arthropathy is the usual precursor. Affected individuals have limited surgical options for severe clinical presentations. Early aggressive rotator cuff disease management is vitally a preventative measure for the development of MSS.

Conflict of Interest

No disclosures or conflicts of interest are to be reported.

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