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RESEARCH ARTICLE

TUBERCULOUS ARTHROPATHY OF THE ELBOW JOINT: A CASE REPORT.

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Abstract

Tuberculosis arthritis is a rare form of extrapulmonary tuberculosis affecting 1-3% of the population. The diagnosis of TB arthritis is challenging since different diseases mimic its presentation. However, early detection and treatment are very crucial to have better prognosis and outcome. Musculoskeletal tuberculosis most commonly affects the spine, followed by the weight bearing joints like the hip and knee joints. The elbow joint is rarely involved in musculoskeletal tuberculosis and represents 1-5% of musculoskeletal tuberculosis cases. Here we are reporting a 75-year-old male known case of pulmonary TB presented with right elbow swelling and pain, and diagnosed with TB arthritis based on clinical history and exam, imaging, and joint fluid aspiration.

Introduction:-

Tuberculosis (TB) is an airborne bacterial infectious disease caused by Mycobacterium tuberculosis. Worldwide, TB is considered among the top 10 causes of death (1). It usually affects the lungs, however it may affect other organs like pleura, abdomen, joints, skin, or lymph nodes (2). Almost 20% of patients with TB have extrapulmonary involvement (3). The prevalence of extrapulmonary tuberculosis (EPTB) varies according to the immune status of the patients, with occurrence rate of 15-20% in immunocompetent patients, and 50% in HIV positive or immunocompromised patients (4). Factors that were found to be associated with EPTB include young age, female gender, HIV patients, and Asian population (5). In addition, a study done comparing EPTB with pulmonary TB found that those with diabetes mellitus have high risk to have EPTB rather than pulmonary TB (6). The diagnosis of EPTB is challenging, however definitive diagnosis is made by different modalities depending on the site affected, for example lymph node biopsy is the gold standard for TB lymphadenitis, while joint fluid aspirations has high yield in the diagnosis of TB arthritis (2). Since 10-50% of patients with EPTB have concomitant pulmonary involvement, all patients who suspected to have EPTB should be tested for pulmonary TB (7). Skeletal TB accounts for up to 35% of all cases of EPTB, with the spine being the most commonly affected site (2). Extraaxial skeletal TB usually presents as a monoarticular involvement, with the hip joint being the most commonly affected, followed by the knee and sacroiliac joints. The elbow joint is infrequently affected by skeletal TB (3). Here we are reporting a 75 year old male known case of pulmonary TB presented with right elbow swelling and pain, and diagnosed to have TB arthritis based on clinical history and exam, imaging, and joint fluid aspiration.

Case Report:-

A 78 years old male known case of pulmonary TB, presented to our hospital with right elbow pain and swelling. He was well until 5 months ago when he had productive cough, fever, night sweats, and weight loss. He was investigated in outside hospital and diagnosed as case of pulmonary TB. He was started on isoniazid (INH)300 mg,

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rifampicin 600 mg, ethambutol 1000 mg, and pyrazinamide 1500 mg. Upon presentation to our hospital, the patient was complaining of right elbow pain and progressive swelling for the last few weeks prior to the presentation. There was no history of skin rash, trauma, or previous similar episodes. On examination, the patient was afebrile, heart rate 74/min, blood pressure114/95 mmHg, and respiratory rate 20/min. There was swelling, tenderness, and decrease range of motion of the right elbow. His initial investigations revealed white blood cell count of $2x10^3$/mL with lymphopenia and neutropenia of 0.59 $x10^3$/mL and $1.02x10^3$/mL, respectively. His Hemoglobin and platelets were within normal range. The erythrocyte sedimentation rate was 42 mm/ hr and C-reactive protein was 3.4 mg/L. Other laboratory data including renal profile and electrolytes were normal. Based on the history and examination, septic arthritis was highly suspected. Hence, the patient was planned for imaging and joint aspiration. Plain radiograph of the right elbow showed joint effusion with lytic lesion involving the distal humerus, however there was no evidence of fracture or dislocation (Fig 1). Magnetic resonance imaging (MRI) of the right elbow was done and showed significant synovial hypertrophy and thickening around the elbow joint, which extends to the distal humeral epicondyles. In addition, there was a lobulated heterogeneous appearance with associated invasion and cortical breach at the level of the elbow joint, more pronounced in the medial epicondyle (Fig 2). There were ill-defined erosions and destruction of the medial epicondyle with marked narrowing of the radiohumeral and ulnohumeral joints (Fig 3). Following IV gadolinium administration, avid enhancement was evident (Fig 4). There was no evidence of sinus tract. Joint fluid aspiration was performed and was positive for M.tuberculosis in the polymerase chain reaction (PCR) of the synovial fluid. In addition, acid-fast bacilli were identified in the synovial fluid aspiration. The patient was diagnosed with tuberculous arthritis of the right elbow. The patient was planned to continue on the four anti TB medications for another two months, and after that to continue only on INH and rifampicin for four months as a continuation phase.

Discussion:-

Tuberculosis continues to be a major public health concern in the developing countries. Musculoskeletal system is involved in about 1-3% of tuberculosis cases, and is the third most common site for extrapulmonary TB, accounting for about 35% of all extrapulmonary tuberculosis cases (2-8). Musculoskeletal tuberculosis most commonly affects the spine, followed by the weight bearing joints like the hip and knee joints (3). The elbow joint is rarely involved in musculoskeletal tuberculosis and represents 1-5% of musculoskeletal tuberculosis cases (9).

The diagnosis of tuberculous arthropathy is challenging and usually there is an average of 2 years delay between the start of symptoms to the final diagnosis (10). The symptoms are nonspecific and can mimic septic or inflammatory arthritis. A history of exposure to tuberculosis or family history of tuberculosis should raise the suspicion of tubercular arthritis. The common manifestations include chronic joint pain, limited range of motion, swelling and erythema. Systemic symptoms like weight loss, night sweats, decreased appetite and low grade fever may be present (11).

Laboratory investigations may show leukocytosis, elevated C-reactive protein, and erythrocyte sedimentation rate. A positive tuberculin skin test aids in supporting the diagnosis, but a negative result does not rule out the infection (8). Joint aspiration is very helpful in confirming the diagnosis. The aspirated fluid is usually turbid and typically shows increased white blood cell count and low glucose level. Polymerase chain reaction (PCR) analysis of the synovial fluid provides a rapid, specific and sensitive tool for detecting mycobacterium tuberculosis (12). Synovial culture is positive in 80% of the cases. Finally, synovial biopsy is positive in approximately 95% of the cases and usually demonstrates caseating granuloma and lymphocytic infiltration, however it is not highly specific since it can mimic other granulomatous diseases (13).

Most radiological findings are not characteristic of skeletal tuberculosis. The plain radiographs show a triad of periarticular osteoporosis, peripherally located erosion and gradual narrowing of joint space (Phemister's triad), however these findings are not specific and can be seen in other inflammatory and infectious arthritis. As the infection advances, there might be bone sequestration and formation of a sinus tract. MRI is considered the modality of choice in tubercular arthropathy and it demonstrates the severity and extension of the infection. The synovial proliferation usually appears hypointense in the T2 weighted images. Marrow changes appear as low intensity in T1 weighted images and hyperintense in T2 weighted images and typically enhance after gadolinium administration (3).

Medical treatment is the mainstay in the management of osteoatricular tuberculosis and if initiated early, most patients will have almost full recovery. The standard four drug regimen, which includes isoniazid, rifampin, pyrazinamide and ethambutol, is recommended. However, the duration of therapy is still disputed. Generally, 6-9

months regimen is appropriate (2 months of isoniazid, rifampin, pyrazinamide and ethambutol followed by 4–7 months of isoniazid, and rifampin). However, prolongation is recommended if the organism is known to be drug-resistant or in patients showing slow response. Surgery is indicated in abscess drainage and after failure of medical treatment (14).

Conclusion:-

Tuberculosis burden remains high in developing countries. Tubercular arthritis of elbow is a rare manifestation and requires high index of suspicion for diagnosis. Although labs investigations and imaging might help in the diagnosis, joint fluid aspiration remains a cornerstone in the diagnosis. Early detection and treatment are very crucial to improve the outcome.

Fig 1:- Elbow radiograph showing joint effusion and lytic lesion of distal humerus

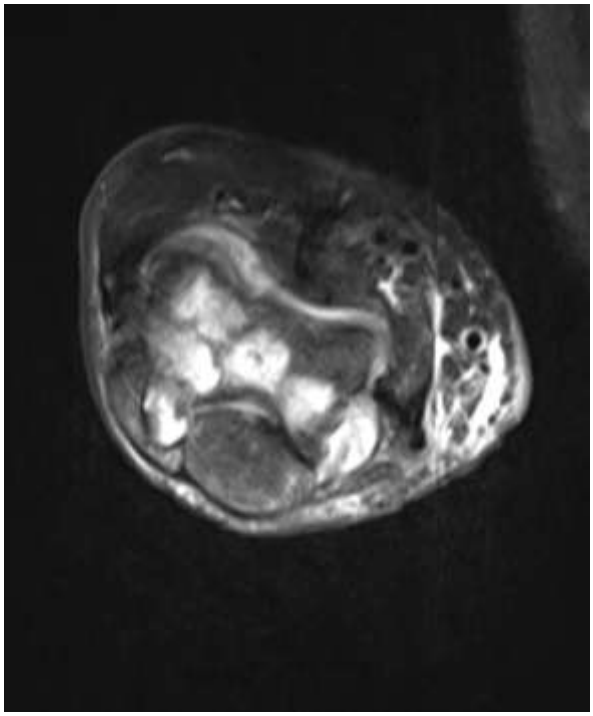

Fig 2:- Cross sectional T2W image of the elbow showing hyperintense lobulated heterogenous lesion

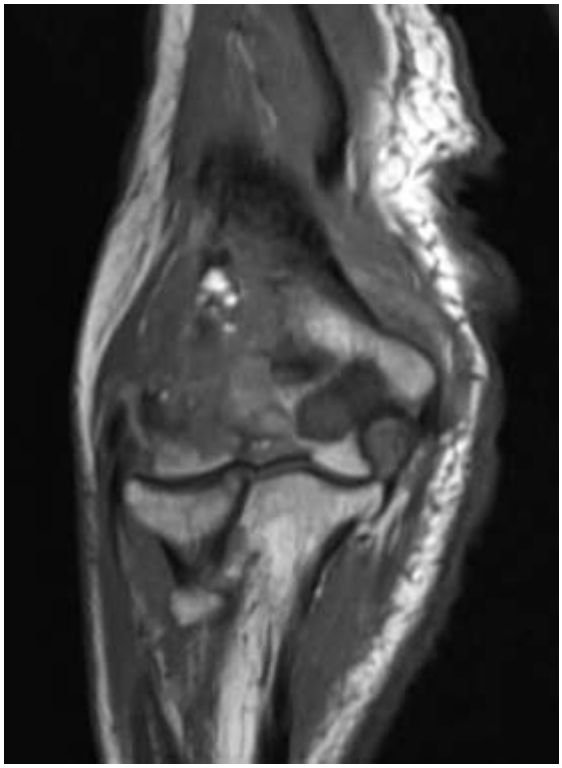

Fig 3:- Coronal T1W image of the elbow showing ill-defined erosions and destruction of the medial epicondyle

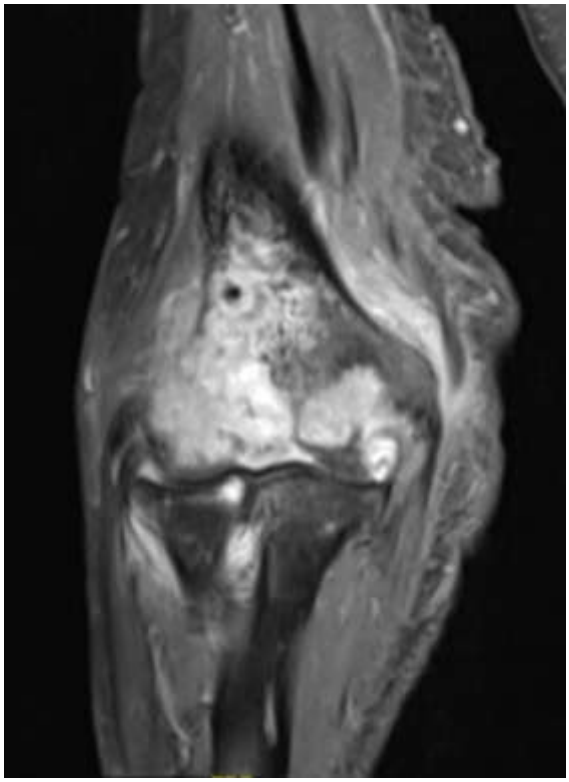

Fig4:- Coronal T1W post gadolinium contrast image of the elbow showing avid enhancement and joint space narrowing

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