International Journal of Orthopaedics Sciences

E-ISSN: 2395-1958
P-ISSN: 2706-6630
IJOS 2021; 7(3): 761-763

www.orthopaper.com
Received: 25-05-2021
Accepted: 27-06-2021

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Ankylosing spondylitis of shoulder joint treated with total shoulder arthroplasty: A case report

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DOI: https://doi.org/10.22271/ortho.2021.v7.i3k.2831

Abstract
Case report: We report a case of ankylosing spondylitis in a 36-year-old male with pain in right shoulder since 8 years associated with early morning stiffness and restricted activities of shoulder joint. X-ray and MRI of the shoulder joint revealed arthritis of shoulder joint. In this case report, we review Total Shoulder Arthroplasty as a treatment modality for shoulder arthritis secondary to Ankylosing spondylitis. At one and half year post-operative follow up, patient had a good functional outcome. **Conclusion:** Good functional outcome can be obtained with Total Shoulder Arthroplasty for ankylosing spondylitis of the shoulder joint.

Keywords: ankylosing spondylitis, spondyloarthropaties, total shoulder arthroplasty, deltopectoral approach, arthritis

Introduction
Spondyloarthropathy is a chronic, multisystemic inflammatory rheumatic disease that causes progressive arthritis predominantly involving sacroiliac joint and spinal column. Ankylosing spondylitis is a prototype of seronegative spondyloarthopathies with inflammation of axial skeleton, peripheral arthritis and enthesitis [1].
A typical patient of ankylosing spondylitis is usually a young male with inflammatory back pain, peripheral enthesitis, arthropathy and other organ specific manifestations. Peripheral musculoskeletal involvement in ankylosing spondylitis is about 30-50% of all patients. Hip involvement usually occurs in initial 10 years, typically bilateral and nearly symmetrical. Shoulder joint is involved in 30% of the cases and is usually bilateral, causing surface erosion at superolateral aspect of humerus and uniform loss of joint space [2].
We treated a patient of shoulder arthritis secondary to ankylosing spondylitis with total shoulder arthroplasty. The patient was informed that data concerning the case would be submitted for publication, and consent was obtained.

Case report
A 36-year-old male (height 1.60 m; weight 70 Kg; body mass index 27.34 Kg/m^2) with pain in the right shoulder, as well as gradually decreasing range of motion in the same shoulder since 8 years. The activities that were limited include combing his hair, wearing a shirt on his own and picking things up from a shelf. Patient also gives a history of occasional pain and restricted activities of cervical and lumbar spine since 6 years which was insidious in onset and progressive in nature
Patient was diagnosed to be a case of ankylosing spondylitits 6 years ago, with Human Leukocyte Antigen B27(HLA B27) being positive. Patient underwent right Total Hip Replacement 4 years ago and left Total Hip Replacement 3 years ago for complains of pain and restriction in the range of motion of bilateral hip joints. No documentary evidence available for medications taken during the last 8 years.

Physical Examination
Right shoulder was at a higher level compare to the left shoulder. No significant muscle wasting, scar or sinus seen.
Right side shoulder joint flexion being 20 degree, 20 degree of extension, 20 degree abduction,

5 degree external rotation and internal rotation was limited to thumb touching coccyx.

Investigations

Radiographic view of right shoulder joint showed glenohumeral arthritis of the right shoulder with proximal migration of right humerus. (Figure 1)

MRI of right shoulder showed

1. Moderate degree joint effusion with synovial proliferation and marrow edema in right shoulder joint.
2. Right shoulder joint narrowing with small osteophytes suggestive of osteoarthritis.
3. Mild atrophy of rotator cuff muscles on the right side.

X ray whole spine were consistent with ankylosing spondylitis findings.

Surgical Procedure

- **General anaesthesia:** Nasotracheal intubation.
- **Patient positioning:** Beach chair position with sand bag under the right scapula.
- **Surgical Approach:** Deltopectoral approach.
- **Humeral Preparation**
  - Entry reaming was done just lateral to the joint
  - Using an intramedullary referencing-boom and guide, humeral head osteotomy was done at 30˚ of retroversion.
  - Broaching in 30˚ of retroversion done till appropriate size. Trial prosthesis was checked.
  - Original implantation was done without cement.

- **Glenoid preparation**
  - Glenoid exposed and soft tissue handled.
  - Eccentric reaming of glenoid socket done at proper inclination and version.
  - Peripheral peg preparation was done.
  - Trial prosthesis was checked. Original implant was fixed with cement and impacted.

- **Humeral Head preparation**
  - Humeral head sizing was done and trail was inserted.
  - Original implant was inserted and reduced by traction and internal rotation.

- Thorough wash was given and drain placed. Rotator cuff muscles along with subscapularis were tagged to the original implant. Deltopectoral interval was closed in layers. Dressing done and immobilized in arm pouch.

Post-operative protocol

- Immobilization with shoulder immobilizer done
- Active motion of hand and elbow was encouraged.
- Gradually pendulum exercise in sitting and leaning forward was started.
- Gentle passive range of motion was started after 5 days.
- Isometric strengthening exercise was started after 10 weeks.
- Indomethacin 75mg BD was given orally for 6 weeks.

Complications

None.

Follow-Up

Patient was regularly followed up for an year and a half,

At 3rd month, Right side shoulder joint flexion was 50 degree, 40 degree of extension, 45 degree of abduction, 20 degree of external rotation and internal rotation with thumb touching upto L5.

At one and half year, Right side shoulder joint flexion being 90 degree, 45 degree of extension, 90 degree abduction, 30 degree external rotation and internal rotation with thumb touching upto L2.

Fig 1: X- ray of right shoulder of patient with ankylosing spondylitis. AP view showing glenohumeral osteoarthritis.

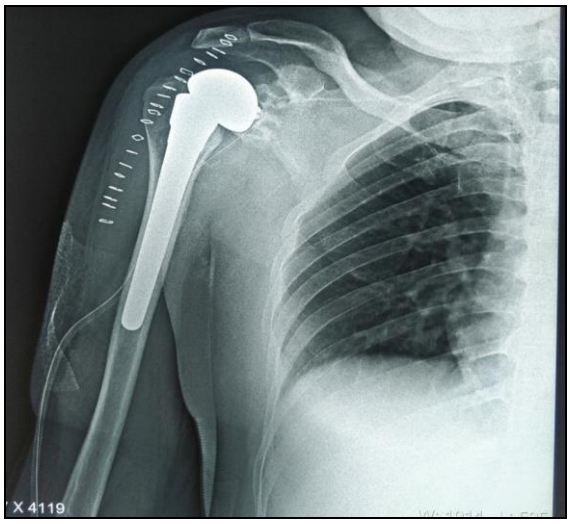

Fig 2: Post-operative X ray of right shoulder with Total Shoulder Arthroplasty.

Fig 3: Intra-operative pictures of glenoid component.

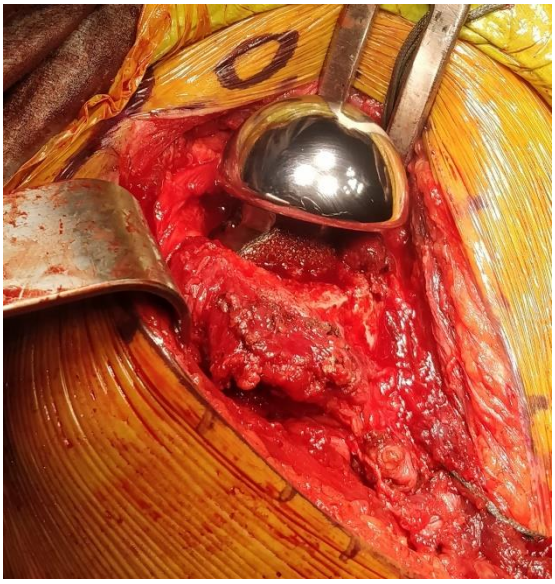

Fig 4: Intra-operative pictures of humeral component.

Fig 5: Range of motion of patient with total shoulder arthroplasty-Extension.

Fig 6: Range of motion of patient with total shoulder arthroplasty-internal rotation

Discussion

This patient illustrates the clinical overlap frequently seen in spondyloarthropathy patients, presenting here for a surgical evaluation at an advanced stage after decades of minimally treated disease.

Spondyloarthropathy typically affects the axial skeleton. Among the peripheral joints, hip is the most commonly affected, in 40–50% of ankylosing spondylitis patients, followed by shoulder and knee involvement [1, 2].

European Consensus report provides guidelines for the medical management of ankylosing spondylitis including medications (NSAID's, Traditional DMARD's such as sulfasalazine and methotrexate and biologic DMARD's such as anti-TNF (tumor necrosis factor) agents) as well as physical therapy modalities.

Orthopedic surgery is considered in ankylosing spondylitis patients to improve function and relieve pain, when medical management has failed to prevented joint damage. Joaquin *et al.* concluded that anatomical shoulder arthroplasty is the treatment of choice for most patients with inflammatory arthritis of the shoulder. It is more reliable in terms of both pain relief and functional improvement. Hemiarthroplasty may be considered for patients with no glenoid involvement. Reverse shoulder arthroplasty can be considered for patients with cuff tear arthropathy and revision surgeries [3].

In ankylosing spondyltitis of the shoulder joint a Total Shoulder Arthroplasty shows good results in short-term. This case highlights the technical difficulties and complications associated with total shoulder arthroplasty in Ankylosing spondylitis patients. Careful pre-operative preparation, appropriate instruments and knowledge is necessary to achieve successful outcomes. Longer follow-up is needed to evaluate mid-term and long term results.

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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