Rheumatoid arthritis (RA) of the shoulder is a challenging problem for the surgeon due to the resultant effect of the disease on both bone and soft tissue. When evaluating a patient with shoulder arthritis due to rheumatoid disease, it is very important to understand prior treatment, patient expectations, as well as other joint involvement. In addition, a careful examination in conjunction with proper imaging studies will enable the physician to present treatment options that are appropriate for the individual patient.

**Patient Evaluation**

**History**

It is critical to understand the patient’s history of RA, prior treatment modalities, as well as complications of these treatments. The advent of extremely powerful immunosuppressant medications has been a breakthrough in helping treat RA. However, there has been an association with an increased risk for infection with some of these medications. Therefore, it is important to understand how the patient has been treated and complications associated with these modalities.

It is essential to clearly understand the patient’s primary symptoms. Due to the high association of rotator cuff pathology with degenerative arthritis, it is important to determine whether the primary complaint is pain, loss of motion, or loss of strength. One needs to understand the specific pattern of pain. Is the pain centered around the shoulder region or is there a more radicular nature to the discomfort? One needs to be aware that cervical spine pathology can sometimes present as shoulder pain.

**Physical Examination**

A careful physical examination is critical. One routinely inspects for signs of muscular atrophy as well as evaluation of the skin integrity. A standard part of all examinations of patients who present with shoulder pain is assessment of cervical range of motion and a Spurling test. A bilateral examination of the upper extremities is performed including the shoulder, elbow, and wrist. Shoulder range of motion and strength are tested. Active and passive shoulder elevation is recorded. Anterior–superior humeral head escape may occur in patients with massive rotator cuff tears.

**Radiographic Studies**

An axillary view and 40° posterior oblique view with internal and external rotation are typically obtained. Superior subluxation of the humeral head with a decrease in the acromial–humeral distance is common in patients with large rotator cuff tears. The axillary view provides important information in regard to glenoid version, glenoid erosion, and humeral head subluxation.

Prior to performing shoulder arthroplasty, a CT scan provides additional information in regard to glenoid version and evaluating bone loss. In RA, there is typically central glenoid erosion compared with posterior glenoid erosion seen in osteoarthritis.

**Treatment**

Information obtained through the history, physical examination, and radiographic studies are then integrated to outline treatment options for the patient. It is clear that conservative, non-operative treatment plays a central role in the early stages of shoulder arthritis. In addition to systemic medications aimed at treating the rheumatoid disease, intra-articular steroid injections may be considered. A physical therapy program may help some patients maintain motion and improve strength.

In patients with more severe disease, surgery may be an option. Understanding the patient’s goals is critical in order to determine the most appropriate treatment. In addition, the patient must be willing to be compliant with post-operative rehabilitation and restriction.

**Hemiarthroplasty and Total Shoulder Arthroplasty**

There have been several publications on the outcome of shoulder arthroplasty for the treatment of shoulder
Arthritis in patients with RA. Stewart and Kelly reported on the outcome of 58 Neer total shoulder arthroplasties in patients with RA. At a minimum of seven years, 37 shoulders were available for review. Among these shoulders, 29 had no pain or slight pain, four had pain with unusual activity, and four had moderate or severe pain. The mean elevation was 75º and external rotation was 38º. There was revision surgery for three loose glenoid components and two loose humeral components. 

Sperling et al recently reported on the outcome of hemiarthroplasty versus total shoulder arthroplasty (TSA) in patients with RA. There were 187 TSAs and 95 hemiarthroplasties with a minimum two-year follow-up (mean 11.6 years) or follow-up until revision. Shoulder arthroplasty was associated with significant long-term pain relief (p<0.0001), improvement in active elevation (p<0.0001), and external rotation (p<0.0001). Comparing hemiarthroplasty and TSA for patients with a thin or torn rotator cuff, there was no significant difference in improvement in pain and motion. Among patients with an intact rotator cuff, improvement in pain and elevation were significantly greater with TSA. The risk for revision was significantly lower for TSA compared with hemiarthroplasty among patients with an intact rotator cuff (p=0.04).

**Reverse Prosthesis**

There has been increasing interest in the use of the reverse prosthesis for patients with massive rotator cuff tears and arthritis. The reverse prosthesis was originally described in 1993 by Grammont. The concept of a reverse prosthesis is based on using a convex glenoid and a concave humerus. The reverse prosthesis places the center of rotation in the scapular neck, thereby decreasing the stress on the glenoid component and increasing the lever arm of the deltoid. There have been a few large reports in the literature on the reverse prosthesis in a mixed diagnosis population.

Frankle and colleagues reported on the results of the reverse prosthesis in 60 patients with rotator cuff deficiency and glenohumeral arthritis. All patients were followed for a minimum of two years from the time of surgery. There was significant improvement in functional scores as well as pain scores. Thirteen complications occurred, with seven patients requiring additional surgery.

A recent study by Walch highlighted some of the potential complications with the use of this design. He reported on 60 reverse shoulders with a minimum five-year follow-up. He noted that there were two specific breaks in the survival curves. The first break occurred at approximately three years post-operatively and this was related to early component loosening. The second break was at approximately six years and was considered to be due to progressive functional deterioration. The authors recommended that the reverse be used only for patients over 70 with minimal functional demands.

**References**