

Managing Rotator Cuff Spectrum Disease

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Rotator cuff disease is the most common pathology affecting the shoulder, with varying degrees of cuff tearing demonstrated in 50-85% of shoulder pain treated by health care providers. The incidence of rotator cuff disease is well appreciated to increase with age, especially after the 6th decade of life, and asymptomatic degenerative-age related tears are common^{1,2,3}. As much as 2/3 of people with rotator cuff tears are asymptomatic³⁴. The number of surgeries to repair the cuff has increased in the past 15 years, but research has raised significant doubt as to the merits of surgical management compared to nonoperative care⁴. There is often uncertainty regarding the cause of shoulder pain, with associations noted to cuff disease, as well as gender, age and psychosocial factors^{35,36,37}.

Clinical tests for assessing shoulder structures are unreliable. The rotator cuff tendons do not function as separate entities. Assessing the individual structures of the cuff is challenging – some would say impossible – because the tendons fuse near insertion, form a sheath around the biceps tendon, and adhere to the glenohumeral joint capsule. Any movement of the shoulder by the rotator cuff will impact the subacromial bursa¹⁶. Clinical assessment of the shoulder can result in a high sensitivity for symptoms but has a low specificity for determining the cause of the pain. Many clinicians and researchers feel that shoulder imaging has limited usefulness because of the lack of correlation between pain and imaging findings. For this reason, clinical interpretation of diagnostic imaging of patients with shoulder pain remains controversial³⁸.

There has been no demonstrated linear association between pathology/tears in the rotator cuff and symptoms of shoulder pain¹⁷, so one must consider that the cuff may not be the source of the pain. Studies have demonstrated that cuff pathology is similar in patients with and without symptoms^{18, 19, 20}, but a normal-looking tendon structure does not rule out the tendon as being the source of pain and dysfunction. For this reason, imaging for complaints of ‘shoulder pain’ is not always advisable or helpful in the clinical management of shoulder pain complaints.

At the turn of this century, shoulder pain was often conceptualized on the basis of impingement of the soft tissue structures in the subacromial space. However if this was a valid cause of shoulder pain, then debriding the subacromial space surgically should resolve pain issues. This has not been demonstrated and more recent evidence does not support the concept of impingement related pain^{5,6,7,8,9}. Current research has outlined that acromioplasty is not more clinically beneficial than rehabilitation alone because the bony architecture of the shoulder is not the only mechanism contributing to the pain issues^{10, 11,12, 13, 14}.

Today, impingement is a term that has fallen out of favor to account for shoulder pain. And rotator cuff pathology cannot consistently account for pain^{18, 19, 20}. In contemporary medicine, terminology is now used that is more consistent with the uncertainties of the causal basis of shoulder pain and ‘subacromial pain syndrome’ or ‘rotator cuff related pain syndrome’ is more appropriate. This defines the “clinical presentation of pain and impairment of shoulder movement and function usually experienced during shoulder elevation and external rotation” caused mainly by maladaptive load imposed on the rotator cuff and related tissues¹⁶. This may be a more vague term but it encompasses the medical and clinical knowledge that shoulder pain can be caused by bursal tissue, mechanical or functional impingement against the acromion, the glenohumeral joint, tendon aging or failure, muscle imbalances and/or central sensitization mechanisms. These more vague terms considers the broader mechanisms that factor into



the presentation of shoulder pain because normal age-related degenerative changes in the soft tissue structures are well appreciated to be a contributing factor¹⁵ and there is no absolute manner to definitively associate the rotator cuff as the pain generating factor¹⁶.

Contemporary thinking is also changing regarding the merits and role for rotator cuff surgery in managing patients with shoulder pain complaints when pathology is identified in the cuff tendon(s). Moosmayer²¹ demonstrated that both surgical and nonsurgical management of cuff tears demonstrated functional improvement, and the 5-year rate of treatment failure was the same for physiotherapy and surgical management of cuff tears. Kukkonen²² has outlined that functional assessment scores at 1 year after treatment for patients undergoing surgical management of shoulder pain was clinically similar to those undergoing rehabilitation. Heerspink²³ found no significant functional difference in outcomes one year after surgery or rehabilitation, and although surgical patients reported lower pain, the rate of recurrence of cuff tear in the surgical patients was extremely high with 74% of the patients experiencing failure of the surgical procedure.

Successful surgical management has been demonstrated to correlate to size and chronicity of the tear (including fatty atrophy), and the number of tendons involved²⁴, and superior results are demonstrated if the cuff tear is acute and surgical repair is done within six months of the injury²⁵. Although Robinson²⁶ reported better pain with overhead activity at 6 months, surgical management of cuff disease does not always result in successful repair of the tendons. The literature outlines that 25-90% of rotator cuff surgery fails^{27,28,29}, but surgical failure does not necessarily affect patient outcome and satisfaction. One has to consider that after surgical management, patients participate in physical therapy, and the rehabilitation may explain why medical literature reports similar outcomes between healed and failed rotator cuff repairs.

Non-operative treatment is successful in approximately 75-85% of patients with shoulder pain that is presumed to be associated with rotator cuff disease/tears^{30, 31,32,33}. Research conducted in Alberta³² has identified that only 11% of patients with shoulder pain required surgery to address the issues and 78% of patients were successfully managed with an active progressive rehabilitation program. Dunn³³ has also demonstrated that 85% of patients with rotator cuff tears are successfully managed with physical therapy and the strongest predictor to fail rehabilitation and prompt surgical management was the patient's expectation regarding physical therapy. This further highlights that pain related to rotator cuff syndromes is multifactorial, and the stiffness, weakness, joint stability and kinetic chain alterations to the shoulder all contribute to the painful shoulder and need to be addressed in an active rehabilitation program.

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