COMMENTARY & PERSPECTIVE

Surveillance of Conservatively Treated Rotator Cuff Tears Is Warranted

Commentary on an article by Stefan Moosmayer, MD, PhD, et al.: "The Natural History of Asymptomatic Rotator Cuff Tears. A Three-Year Follow-up of Fifty Cases"

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The purpose of the study by Moosmayer et al. was to assess the clinical and morphological changes that occur in asymptomatic full-thickness rotator cuff tears and to compare these changes between tears that remain asymptomatic and those that develop symptoms. Longitudinal studies such as this are critical to clinicians caring for patients with rotator cuff disease, primarily in counseling patients for the risk of tear progression over time. This information is particularly true at this time point, as recently published higher-quality research has demonstrated clinical success in treating certain symptomatic full-thickness cuff tears conservatively in the short term¹.

The potential downsides of conservative treatment are fundamental to counseling patients with a full-thickness rotator cuff tear, whether symptomatic or not. Although it has been long theorized that atraumatic rotator cuff disease is progressive in nature, not until the last decade have studies begun to carefully document tear and symptom progression over time²⁻⁵.

In the current study, fifty subjects with asymptomatic, full-thickness rotator cuff tears were reassessed three years after enrollment. Baseline and follow-up assessments included measures of shoulder motion, strength, a validated scale of shoulder function (American Shoulder and Elbow Surgeons [ASES] score), and assessment of tear size with ultrasonography and magnetic resonance imaging. The development of pain was well defined and was assessed at the time of the latest follow-up, although it was not closely tracked during the study period. Although clinical and ultrasound examinations were not performed by an independent investigator, bias was minimized by blinding the examiner to the presence of new-onset pain. The results demonstrated that eighteen subjects (36%) developed pain at a mean time of eighteen months following enrollment. The mean ASES score dropped 29 points in the newly symptomatic group, a significant change compared with the persistently asymptomatic group and consistent with previous literature demonstrating the longitudinal assessment of asymptomatic cuff tears².

Moosmayer et al. demonstrated a greater risk of tear size progression and degenerative muscle changes in the newly symptomatic group. The mean sagittal-plane tear size significantly increased ($p = 0.02$) when the newly symptomatic group (10.6 mm) was compared with the still-asymptomatic group (3.3 mm). Interestingly, there were no differences in the mean tear size at baseline between the shoulders that became newly symptomatic and those that remained asymptomatic, which contradicts previous literature showing a larger tear size at baseline to be an independent risk factor for the onset of pain². A unique finding in this study was the analysis of degenerative muscle changes. The authors found a greater risk ($p = 0.08$) of progression of muscle degeneration as measured by a positive tangent sign when the newly symptomatic group (35%) was compared with the still-asymptomatic group (12%). The authors also found on magnetic resonance imaging a significant change ($p = 0.02$) in muscle fatty degeneration when the newly symptomatic group (35%) was compared with the still-asymptomatic group (4%). However, it is noteworthy that three of the eighteen newly symptomatic subjects developed symptoms without tear progression and twelve of thirty-two subjects remained asymptomatic, although they had deterioration of the rotator cuff in at least one of the study factors.

The limitations of this study were well recognized by the authors. One primary issue is that of recall bias with regard to the onset of pain as subjects were assessed at two time points only; the onset of pain may not have been accurately remembered. The authors recognized the short-term follow-up duration of the study and the potential heterogeneity of the cohort at baseline as some subjects had a painful tear in the contralateral shoulder while others did not. The authors highlight the notion that tear size progression alone is only one factor that may help to explain the onset of pain. Other factors, yet to be defined, also play a role in symptom development, which was beyond the scope of the present study.

It is well accepted that many patients with an atraumatic full-thickness rotator cuff tear will respond well to conservative treatment in the short term. In many instances, because of advanced patient age, socioeconomic issues, and medical comorbidities, conservative treatment may be the preferred definitive treatment. However, the challenge persists in how to appropriately counsel the younger (under sixty to sixty-five years old), more active patient with a repairable full-thickness cuff tear, whether painful or not. Recent work by the MOON (Multicenter Orthopaedic Outcomes Network) Shoulder Group has shown short-term success in the

treatment of full-thickness cuff tears with conservative treatment¹. However, data regarding tear progression and durability of clinical success are unknown. Similar to the present study, Safran et al.⁵ and Maman et al.⁴ followed subjects with conservatively treated symptomatic tears and independently noted the risk of tear progression between 19% and 49% at a follow-up duration of eighteen to thirty months. The present study demonstrates the progressive nature of cuff disease in previously asymptomatic shoulders, highlighting not only a risk of tear size progression but also the progression of degenerative muscle changes in time. These factors are important to the clinician as both of these variables have been shown to negatively affect the healing potential of the repair construct and to potentially affect clinical outcomes.

This study, along with previous research, highlights the importance of an informed discussion with a patient with a full-thickness rotator cuff tear. There is an important role for surveillance imaging for patients with risk of tear progression over time including patients with both asymptomatic tears and symptomatic tears who elect for conservative treatment. The primary goal of surveillance would be to avoid progression of a tear to the point where patient age and the biology of the tear may lead to an irreparable defect or a tear with a much lower chance of healing if symptoms recur. This study represents another important step in helping to outline the risks of tear progression and the onset of pain in subjects with asymptomatic tears. However, further research is needed to better define other factors associated with the progression of cuff disease.

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