Evaluation and Management of Rotator Cuff Tears: a Primary Care Perspective

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Abstract

Purpose of Review To provide a primary care perspective regarding the evaluation and management of shoulder pain and rotator cuff tears.

Recent Findings In the primary care setting, rotator cuff pathology is commonly encountered. Information regarding the risks of oral medications for the management of the associated pain keeps mounting. Partial-thickness rotator cuff tears remain difficult to diagnose with a single imaging modality. Musculoskeletal education in medical schools and non-orthopaedic residency and fellowship training programs continues to be an area for additional improvement.

Summary In the primary care office, the initial evaluation of shoulder pain should include a thorough musculoskeletal evaluation in order to identify the source of the pain (e.g., shoulder, cervical spine, chest wall), as well as the development of an initial treatment plan. Access to imaging modalities such as ultrasound and MRI can vary depending on the resources available in the primary care setting. The identification of patients who may benefit from early surgical referral is imperative for optimizing outcomes.

Keywords Primary care · Rotator cuff · Non-operative · Shoulder

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Introduction

Shoulder pain is commonly encountered in the primary care setting. Prior studies have reported that shoulder pain is the third most common musculoskeletal complaint. Annually, 1–2.4% of adult visits to primary care providers are for the evaluation of new onset shoulder pain [1–3]. Rotator cuff pathology, including tears and tendinopathy, accounts for approximately 65% of these visits [1]. Many aspects of patient care regarding the evaluation and non-operative management of rotator cuff tears, such as the physical examination, imaging modalities, medication management, injections, and physical therapy, overlap between primary care and orthopaedics. Therefore, this feature will provide a perspective on rotator cuff tears and issues germane to their care from the primary care vantage point.

The initial visit

Early identification of full-thickness and medium-to-large-sized partial-thickness rotator cuff tears is important for primary care providers, as early identification will aid in

optimizing outcomes (e.g., advanced imaging and surgical referral) [4]. The key for primary care providers in order to facilitate prompt identification of these injuries is obtaining a detailed history and performing an appropriate physical examination. Studies have shown that a history of nighttime pain, consistent pain, and older age are predictors of rotator cuff tears [4, 5]. Co-morbidities including diabetes mellitus, high body mass index, oral corticosteroid use, Achilles tendinitis, carpal tunnel syndrome, and trigger finger have been associated with rotator cuff disease [6]. In those presenting with shoulder pain, referred pain and etiologies other than the shoulder girdle must also be considered, including cervical spine disorders, neuropathy, thoracic outlet syndrome, infections, rheumatologic disorders, malignancy, and cardiopulmonary disease (e.g., acute coronary syndrome, pneumonia, pneumothorax, pulmonary embolism) [7].

The physical examination for assessing the integrity of the rotator cuff can prove challenging. The sensitivity and specificity for each maneuver is variable; thus, synthesizing the information from each of the examination components is imperative in order to optimize diagnostic accuracy [4]. Although the examination is an important component to the evaluation of the rotator cuff, clinicians should have a low threshold for diagnostic imaging (i.e., ultrasonography or MRI) due to limited predictive values of the history and examination [8]. Sensitivity, specificity, positive predictive value, and negative predictive value of individual history and examination components have varied in prior studies. A systematic review and meta-analysis analyzing each test's clinical utility supports the utilization of a comprehensive history and physical examination as opposed to a single test. The best test combination (defined as the best sensitivity, specificity, or both from the studies with the least bias) was night time pain, age ≥ 65 , and external rotation weakness with sensitivity of 49%, specificity of 95%, positive likelihood ratio of 9.84, and negative likelihood ratio of 0.54 [9]. In addition to the physical examination, one may consider an anesthetic injection (most commonly subacromial) as a diagnostic tool. If weakness persists after adequate analgesia, it should raise one's suspicion for a significant rotator cuff tear [7].

Imaging

Plain films are always recommended to evaluate for alternative pathology as the cause of shoulder pain, such as calcific tendinitis, osteoarthritis, or fracture [5]. However, there are plain film findings that can suggest a rotator cuff tear. For example, a high-riding humeral head (≤ 7 mm of acromiohumeral distance) may be seen on anteroposterior radiographs indicating a massive rotator cuff tear [10]. In patients with advanced glenohumeral or acromiohumeral arthritis, MRI is not indicated. MRI techniques and the role of

ultrasound are discussed in detail in a dedicated article in this issue. From the primary care standpoint, several points germane to advanced imaging should be noted. Some argue that early advanced imaging (e.g., MRI or ultrasound) is unlikely to improve management for shoulder disorders as a whole since many can be managed conservatively. As such, early imaging may identify incidental structural abnormalities that are not the primary source of pain, prompting unnecessary referrals [3]. Others, however, recommend having a low threshold for diagnostic imaging due to poor predictive values of the history and examination [8]. As such, the provider's threshold for ordering advanced imaging may vary in a case-by-case basis.

The diagnostic accuracy of MRI is not completely reliable for partial-thickness rotator cuff tears [11]. For partial-thickness tears, MRI and ultrasonography both have poor sensitivity (74 and 52%, respectively). For full-thickness tears, MRI and ultrasound have excellent diagnostic accuracy (sensitivities of 94 and 92%, respectively, specificity of 93%) [12]. Dynamic ultrasound (real-time imaging during movement of the body part being imaged) may improve the diagnostic accuracy when used in conjunction with MRI for partial-thickness tears [11]. It is important to note that ultrasonography has the limitations of being operator-dependent and the variability of ultrasound interpretation training [5].

Treatment

The treatment plan for rotator cuff tears in the primary care setting depends upon several critical variables. Age, occupation, pain level, baseline functional ability, and co-morbidities should all be considered. Achieving adequate pain control is important in motivating patients to participate in their rehabilitation [3]. NSAIDs are commonly used for pain management and may be beneficial for short-term pain relief. However, the adverse effects of these medications must be considered [13]. Ideally, acetaminophen should be used as a first-line medication if there are no contraindications (e.g., liver disease, allergy), with NSAIDs intermittently used as a second-line treatment, assuming no contraindications (e.g., renal failure, allergy, history of gastrointestinal bleeding) [3]. Acetaminophen has not been found to have an association with increased risk of cardiovascular events including myocardial infarction and stroke [14]. Due to all NSAIDs having varying degrees of adverse events on a number of body systems (e.g., the cardiovascular, gastrointestinal, and renal systems), NSAIDs should be utilized for the shortest time period possible and at the lowest effective dose [14, 15, 16•]. If long-term NSAIDs are prescribed, patients should be monitored for the development of gastrointestinal bleeding, edema, increased in blood pressure, decreased renal function, or other potential complications [14].

Corticosteroid injections have the potential to provide short-term pain relief [13]. A subacromial injection is the most common location for an injection to be performed in order to provide short-term pain relief and to facilitate rehabilitation [3]. Subacromial injection accuracy is similar for landmark-guided injections as compared to image-guided injections with ultrasound [17]. There is mixed evidence on the efficacy of subacromial injections with ultrasound-guided injections versus landmark-guided [17, 18]. Aly et al. reported greater improvement in pain and functional scores when utilizing ultrasound guidance for subacromial injections. However, Cole et al. report no significant difference in clinical outcomes [17, 18]. Accuracy for other shoulder injections is greater with ultrasound guidance as compared to landmark-guided injections (e.g., glenohumeral joint 92.5 vs 72.5%, acromioclavicular joint 93.6 vs 68.2%, biceps tendon sheath 86.7% vs 26.7%), with a trend towards less side effects with ultrasound guidance [17].

Physical therapy and home exercise programs have been shown to be effective in treating many musculoskeletal pain issues, especially those with pain at multiple anatomic sites [13]. Though commonly used for rotator cuff pathology, there is uncertainty as to the effect of exercise and manual therapy alone [19]. A multicenter study did show a 75% success rate in controlling symptoms utilizing a physical therapy protocol in the treatment of atraumatic full-thickness rotator cuff tears [20]. With that said, combinations of therapies, such as physical therapy plus medications (acetaminophen and/or NSAIDs), and/or corticosteroid injections, should be considered [19]. Shams et al. reported that a subacromial injection of platelet-rich plasma (PRP) in symptomatic partial-thickness rotator cuff tears resulted in improved clinical outcomes at 12 weeks post-injection compared with a corticosteroid injection. However, there was no difference in the groups at 6 months. Therefore, PRP could be considered as an alternative to corticosteroids, especially in those with contraindications to corticosteroids [21].

Referrals

The optimal timing of referrals to an orthopaedic specialist for a rotator cuff tear has many variables. In general, a referral should be made if the patient requests further evaluation by an orthopaedic specialist, no matter the timing. However, the primary care provider should first evaluate the patient to verify the body region from which the pain is originating (e.g., cervical spine versus shoulder versus chest wall). This will aid in ruling out alternate diagnoses and ensuring a referral to the appropriate sub-specialist.

Young, active patients with evidence of acute full-thickness tears should be promptly referred to an orthopaedic specialist, as improved outcomes have been shown with early operative

repair [5]. Those with higher activity levels have an increased rate of failure with non-operative management [22]. Outside of this scenario, there is mixed information on the optimal timing of these referrals. Those with chronic tears generally respond well to conservative management [7]. Some advocate that all patients with suspected cuff tears should be referred for a discussion of operative versus non-operative management [5]. Others implement more stringent referral criteria such as shoulder pain or disability lasting more than 6 months despite therapy, history of instability, diagnostic uncertainty, or red flag criteria including signs of cancer, infection, and/or disabling pain or weakness [3]. The referral of partial-thickness tears is generally more immediate in athletes, patients with high demand occupations, and those with associated labral pathology. Early diagnosis and referral in the setting of a potential need for surgical repair are important in order to preserve tissue viability and optimize potential surgical outcomes [4]. A reasonable approach is to refer all medium (≥ 1 cm) to large (≥ 3 cm) partial-thickness tears and full-thickness tears promptly to an orthopaedic specialist. If there is a delay in referral or the patient prefers a more conservative approach, a discussion with the patient should address repair delays, including the possibility that such a delay could render the tear unrepairable or result in a less favorable clinical outcome [4]. Small tears also have the potential to become larger and potentially more symptomatic. Predictors of which asymptomatic small rotator cuff tears may become symptomatic and the risks of progression in the size of a rotator cuff tear have not been fully identified [20]. Patients with full-thickness tears who are treated conservatively, however, should be more closely monitored for progression [23]. If surgery is performed, it is also important for the primary care provider to understand that their care of the patient post-operatively can have implications on the patient's recovery and outcome. For example, use of fluoroquinolone antibiotics within 2 months of a rotator cuff repair is associated with increased rates of repair failure and the need for revision of the rotator cuff repair [24•]. Additionally, in diabetics, effective glycemic control is important for decreasing rotator cuff repair failure and improving rates of healing following repair [25].

Area for Improvement

In both medical school and non-orthopaedic residency and fellowship training programs, research suggests that training in musculoskeletal medicine is inadequate [26, 27•]. The general population continues to age, and greater than 50% of chronic medical issues in developed countries are bone and joint related [27•]. As such, musculoskeletal medicine has been an area of focus for curriculum improvement within many medical schools and residency training programs. Increased involvement of operative and non-operative

orthopaedic physicians, including those outside of academia, can improve the education of trainees by volunteering to lead small groups or physical examination sessions [27•].

Conclusions

Shoulder pain and specifically rotator cuff tears are commonly encountered in the primary care setting. A high index of suspicion is necessary to avoid delays in treatment for those who are potential surgical candidates. Early surgical referral should be considered, especially in the setting of younger age and higher activity levels, to optimize surgical outcomes. Those with chronic rotator cuff tears generally respond well to conservative management (e.g., medications, injections, and/or physical therapy). Side effects and contraindications to medications including NSAIDs need to be considered. Orthopaedic physicians should be encouraged to seek out teaching opportunities, including medical student education and within non-orthopaedic residency and fellowship programs.

Compliance with Ethical Standards

Conflict of Interest Both authors declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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