

# Position Paper of the Italian Society of Orthopaedics and Traumatology (SIOT) on the Treatment of Rotator Cuff Tears

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**Background:** Rotator cuff tears (RCTs) are a common condition, particularly among the aging population, and the choice of treatment depends on various factors. There is extensive literature on their management, but still no consensus given all the evidence.

**Purpose:** To provide guidance on the indications for nonoperative or surgical treatment for RCTs.

**Study Design:** Narrative review.

**Methods:** Research of the literature on this topic was performed and articles were analyzed to draw up guidelines. A rating group of professionals specializing in shoulder pathology reviewed the results and integrated them with their clinical experience.

**Results:** It is widely accepted that nonoperative treatment is typically recommended for degenerative tears. Surgical repair is suggested for traumatic tears, degenerative tears unresponsive to nonoperative treatment, and young and active patients with high functional demands. The choice of surgical technique depends on the surgeon's preference.

The Società Italiana di Ortopedia e Traumatologia (Italian Society of Orthopaedics and Traumatology) emphasizes the importance of patient evaluation in determining the most appropriate treatment for RCTs.

**Conclusion:** Nonoperative treatment is the first-line choice of treatment in the case of degenerative tears, while in the remaining cases surgical treatment must be considered from the beginning.

**Keywords:** rotator cuff tear; surgical indication; conservative treatment; arthroscopy

Rotator cuff tears (RCTs) are a common pathology, with their frequency increasing with age; one-third of individuals >60 years of age experience rotator cuff diseases. Treatment options depend on several factors: anatomopathological, functional, and clinical. The literature on RCTs is extensive, but often there is no strong evidence regarding which are the most appropriate treatments.<sup>25</sup>

This paper outlines the position of the Società Italiana di Ortopedia e Traumatologia (SIOT; Italian Society of Orthopaedics and Traumatology) regarding the recommendations for nonoperative versus surgical treatment of RCTs.

## Etiopathogenesis

RCTs can be either traumatic or degenerative. Traumatic lesions are related to either direct or indirect trauma, as well as a shoulder dislocation or an unexpected sprain; often, the onset of the symptomatology correlates with the traumatic event. In contrast, degenerative lesions are typically age related and may arise from microtraumas (job or overhead sports), subacromial impingement, or tendon diseases often related to metabolic conditions (eg, diabetes or dyslipidemia).<sup>19,28</sup> Differentiating between these 2 conditions is crucial, as doing so will directly influence treatment decisions.

## Clinical Presentation

A considerable number of RCTs, especially degenerative ones, are asymptomatic, and consequently, they are neither diagnosed nor treated. Different patterns of

symptomatic lesions exist based on their pathogenesis: a new onset or a sudden worsening of pain in a poorly symptomatic lesion is usually related to a traumatic condition, while a gradual worsening of chronic symptoms is typical of degenerative lesions. Pain, typically during the night and/or related to some activities, is the most common symptom, and it is not related to the extension of the lesion.<sup>20</sup> Loss of function, loss of strength, and reduction in the range of motion are related to the location and extension of the lesion. The clinical presentations can be different; in partial lesions, the functional impairment is usually mild, but in rotator cuff arthropathy it can be as severe as pseudoparalysis.

## Imaging

The initial investigation is always performed by obtaining common radiographs in at least 2 of the following views: anteroposterior (with the arm in internal or external rotation), axillary, and scapular Y view. Radiographs allow the evaluation of skeletal disorders, calcification, and eventually a superior migration of the humeral head.<sup>14</sup>

Ultrasound is less invasive and more available than other techniques; nevertheless, it is operator dependent, thereby limiting information for therapeutic planning.

Magnetic resonance imaging (MRI) is the gold standard for evaluating rotator cuff-related pathology as it provides information about the soft tissue structures. When MRI is contraindicated, computed tomography (CT) or arthro-CT imaging can provide valuable images and information for surgical planning.<sup>1,22</sup>

## NONOPERATIVE VERSUS SURGICAL TREATMENT

Several different characteristics should be considered when deciding on the appropriate treatment. First, patient demographics such as age, lifestyle, functional demand, comorbidity, and compliance to treatment need to be taken into account. Second, the clinical-functional presentation needs to be considered, that is, onset, pain, and functional limitations. Lastly, the anatomic-pathological pattern needs to be investigated. This involves whether the lesion is degenerative versus traumatic, the size of the lesion

and the tendons involved, any associated lesions (such as long head of the biceps [LHB] or cartilage), rotator cuff fatty infiltration, and arthropathy (Hamada classification).

Evaluating the patient and understanding their functional demands and the type of lesion are essential to choosing the appropriate treatment. Furthermore, 2 concepts need to be emphasized: (1) nontreated lesions are going to grow in a few years,<sup>13</sup> and (2) traumatic tears (acute) maintain better musculotendinous elasticity than degenerative ones.<sup>26</sup>

## Nonoperative Treatment

It is widely accepted that degenerative lesions should be treated nonoperatively, whereas symptomatic traumatic lesions should be treated surgically as soon as possible.<sup>8,24</sup> When RCTs occur in young patients with high functional demands, surgical repair is warranted, regardless of the nature of the lesion.<sup>6</sup>

Concerning nonoperative treatment, the only universally accepted way to reduce pain and improve shoulder function in the case of degenerative lesions is physical therapy (both passive and active). However, many other techniques exist.<sup>15</sup> Indeed, physical therapy has been shown to obtain similar results to surgical procedures in the case of degenerative lesions.<sup>16,17</sup>

If a concomitant stiff shoulder is present, the priority is to restore the complete range of motion of the shoulder. Otherwise, when abnormal biomechanics of the shoulder or a correctable loss of strength is found, physical therapy must focus on restoring the normal scapulohumeral rhythm in addition to reinforcing the remaining intact muscle fibers.

Different authors have suggested starting with physical therapy for at least 3 to 6 months. If no improvement of symptoms is seen, a longer period of rehabilitation often does not work.<sup>21,25</sup> If nonoperative treatment fails, then a surgical indication is universally accepted.

Several different treatments can be associated with physical therapy. Nonsteroidal anti-inflammatory drugs or corticosteroid injections are useful in case of inflammatory reactions. Moreover, instrumental physical therapy (laser, magnetic field therapy, and diathermy) can be used as a support to physical therapy; however, scientific

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evidence about its use is poor.<sup>7,27</sup> Hyaluronic acid infiltration is still debated, but it has been demonstrated that it can improve pain. The mechanism through which it does so is not completely clear.<sup>23</sup> Mesenchymal stem cell and platelet-rich plasma injections have not yet found application in clinical practice, especially because of their cost-benefit ratio.<sup>5</sup>

Because a high success rate of nonoperative treatment in the case of degenerative lesions has been shown, patients should be carefully selected before suggesting a surgical procedure to relieve symptoms. Therefore, it is suggested that most patients with an RCT, when a traumatic history is lacking, should start with nonoperative treatment. It is important to highlight, however, that there is a high risk of worsening of the pathology. Patients who initially feel better with nonoperative treatment could show clinical exacerbation after a long period due to enlargement of the RCT.<sup>18</sup> Worsening of the tear is related to factors such as young age, high-demand jobs, and overhead or contact sports.<sup>10,12,29</sup>

## Surgical Repair

Surgical indication requires careful evaluation of the patient's clinical history and presentation, in addition to an accurate analysis of patient expectations and needs. Surgical repair of RCTs can be performed with an open or arthroscopic technique. The arthroscopic approach is considered the gold standard. In the last few decades it has been increasingly used, especially for massive or complex RCTs.

The main surgical indications are acute traumatic lesions, degenerative lesions that do not improve with nonoperative treatment after 3 to 6 months, and young and active patients with high functional demand.

Two radiological findings represent absolute contraindications to surgical repair: (1) severe fatty infiltration of rotator cuff muscles, which underlies an irreversible degeneration of the muscle belly with concomitant loss of function,<sup>25</sup> and (2) severe humeral head migration with reduction of acromiohumeral distance, which is a sign of rotator cuff arthropathy.

It was not the aim of this paper to investigate different surgical techniques described for rotator cuff repair. However, it is important to highlight that many studies have been performed to compare different suture anchor patterns (single-row, double-row, and suture bridge) for complete tears, as well as different types of repair for partial tears (transtendinous repair, completion of the lesion, and repair of the lesion).<sup>9,11</sup> There is no one surgical technique that has been demonstrated to be superior. Therefore, the choice of the surgical procedure depends on the surgeon's preference and/or ability.

RCTs are often associated with tendinopathy or rupture of the LHB tendon. A subluxation or dislocation of the LHB could be associated with either a traumatic event or an expression or cause of a subscapularis tear. In the latter, this lesion could even be misdiagnosed on MRI. LHB pathology may be treated with tenotomy or tenodesis.<sup>2</sup>

Currently, in symptomatic massive RCTs with upper migration of the humeral head and severe fatty infiltration, a reverse shoulder arthroplasty is indicated.<sup>3,4</sup>

## CONCLUSION

The position of SIOT is in favor of nonoperative treatment in the case of degenerative RCTs. In these patients, physical therapy (3-6 months) is suggested. If pain or functional impairment is still present after physical therapy, surgical repair must be considered, while reverse shoulder arthroplasty is suggested in the case of RCT arthropathy. Surgical treatment is recommended for symptomatic traumatic and acute lesions, as well as for young patients with high functional demands or in the case of a previous failed nonoperative treatment.

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