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Swimmers Shoulder

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Introduction

Swimmers have a significant potential for shoulder injuries due to the unique nature of the different strokes involved in swimming as well as the high volume of repetitions needed during training. Swimmer's shoulder is a term that can represent numerous shoulder pathologies. These include impingement syndrome, rotator cuff tendinitis, labral injuries, instability secondary to ligamentous laxity or muscle imbalance/dysfunction, neuropathy from nerve entrapment, and anatomic variants. In order for the athlete to return to the sport in an appropriate and timely manner, the clinician must be able to differentiate between these different etiologies. [0][0][0][0][5][6]

Etiology

Swimming is a unique activity because it requires primarily the upper body for the propulsive force, with 90% of the driving force provided primarily by the torque generated from the shoulder. To swim at an elite level, each swimmer must log between 60,000 and 80,000 meters per week, which is equivalent to 30,000 strokes per arm. Fundamentally, the swim stroke requires the shoulder to move to range-of-motion extremes while tremendous muscular force is exerted upon the shoulder. [0]

Epidemiology

The incidence of swimmer's shoulder, depending on the study, ranges from 3% to 70%. When defined as shoulder pain that interferes with training or progress in training, the incidence is reported as approximately 35% in elite and senior level swimmers. [0]

Pathophysiology

Swimming strokes can be broken down into pull-through and recovery phases. The latissimus dorsi and the pectoralis major are the primary contributors to propulsive forces of the swim stroke by adduction and internal rotation. The subscapularis and serratus anterior muscles also play an integral role in the freestyle stroke. The freestyle stroke can be divided into six dinstinct parts/phases: [0]

- Hand entry
- Forward reach
- Pull through
- Middle pull through
- Hand exit
- Middle recovery

It is important for the athlete to have a properly balanced shoulder regarding muscle strength. Improper muscle balancing can cause the onset of shoulder pain. An absolute or sudden increase in training yardage and poor technique can also be associated with the onset of pain. The coaching staff can observe a dropped elbow during the recovery phase of the freestyle stroke as one of the early signs of possible injury.

History and Physical

As is the case with most physical ailments of the body, a thorough physical examination is imperative for diagnosing a swimmer's shoulder pain. The shoulders should be checked for atrophy and symmetry, the range of motion should be measured. Special attention should be paid to scapular positioning at rest and symmetry in motion to assess for abnormal motion. Strength testing likely will produce pain, and in advanced cases, the shoulder may fail to resist the examiner's force.

Special testing may provide further insight. The apprehension/relocation test and sulcus signs provide insight into instability. The Hawkins test is a useful and sensitive exam in the diagnosis of subacromial impingement. In patients with positive laxity test results, the examiner also should check other joints for laxity to rule out a generalized condition. [7]

Evaluation

Plain radiographs are obtained initially to rule out any abnormal anatomic variations. Following evaluation by a sports medicine physician, an MRI may be ordered to better identify pathology in the muscles, tendons, ligaments, and cartilage or to exclude other structural causes, such as labral cysts. Although many shoulder diagnoses can be reached based on the physical examination alone, MRI is useful in confirming a diagnosis or when shoulder pain appears to have more than one source. An MRI arthrogram can be considered when a labral or tendon tear is suspected, Although imaging is an important part of the diagnosis, caution is warranted in interpreting imaging because repetitive motion creates asymptomatic pathology in many athletes.

Treatment / Management

Nonsurgical Management [0][0]

Eliminating acute inflammation is the priority in shoulder rehabilitation. After a swimmer, first experiences pain, ice, NSAIDs, and rest can prevent progression. If pain continues or worsens, a 7-day to 10-day course of NSAIDs and rest is ideal but often proves difficult if the injury occurs during the middle or late part of the season. At a minimum, effort should be made to reduce yardage to below the point of pain. For swimmers with impingement, tendinitis, or scapular dyskinesis, a subacromial and/or glenohumeral corticosteroid injection may be beneficial diagnostically and for pain reduction.

Stretches that focus on the posterior capsule are important for preventing and reversing impingement. When they are coupled with overstretching of the anterior capsule, swimmers can create imbalances that worsen impingement. The swimmer can stretch the posterior capsule by horizontally adducting the arm and using the contralateral arm to pin it against the body.

Disproportionately increased adduction strength and internal rotation are unavoidable consequences of swimming. Overdevelopment of the pectoralis major and latissimus dorsi muscle groups creates a force that displaces the humeral head anteriorly, leading to joint instability. Additionally, rotator cuff strengthening will lead to muscular balance restoration, which will reduce or eliminate impingement. As muscle endurance and strength improve, sport-mimicking exercises can be attempted, followed by low-yardage workouts at slow speeds, as long as the swimmer is pain-free, and progressing slowly until the swimmer can return to competition.

Surgical Management [0][0]

Surgery is appropriate for structural pathologies. An athlete may elect symptomatic management rather than surgery so that he or she may continue competing until the pain begins to interfere with daily life. For swimmers with

persistent multidirectional instability, a capsular plication or inferior capsular shift procedure should be considered. Athletes should be aware. However, that training volumes may need to be reduced permanently to avoid pain. A subacromial exploration and removal of the hypertrophied, inflamed, and scarred tissue (thereby maintaining the structural integrity of the shoulder) is an option for athletes who obtain only limited relief from physical therapy. For swimmers with a labral tear in whom nonsurgical treatment has failed, the next treatment option is labral debridement or repair.

Pearls and Other Issues

The shoulder provides the greatest range of motion of all joints in the body but also possesses the greatest inherent instability. As a result of the complexities, combinations, and variations encountered when examining the painful swimmer's shoulder, a correct diagnosis can be challenging. A range of provocative tests and imaging studies is critical in identifying the source of the pain and in determining the appropriate treatment. Although some pathology may be managed symptomatically by ice and NSAIDs, athletes with persistent pain should seek evaluation by a sports medicine physician who may be able to offer more aggressive treatments. Physical therapy can be especially helpful in balancing muscle groups, reducing in-season symptoms, and potentially preventing future injuries.

Questions

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