An Undervalued Piece of the Rowing Puzzle

The Shoulder Joint

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The shoulder joint is an undervalued piece of the rowing puzzle. When functioning optimally it goes unnoticed as a seamless link in the chain and the ability to “hang off the handle” is easy. However, if this link in the chain is functioning sub-optimally there is a huge energy cost. This is because the driving power generated by our trunk and legs becomes compromised in its transference to the handle.

The “true” shoulder joint is known anatomically as the glenohumeral joint and involves movement of the arm bone (humerus) with the shoulder socket (glenoid fossa). Being a ball-and-socket type joint, it is one of the most mobile in the body and as such, functionally favours mobility over stability. Normal motion of the shoulder should involve two parts “true” shoulder joint motion (glenohumeral motion) and one part assisted motion of the shoulder blade against the rib cage (scapulothoracic motion). This is called scapulohumeral rhythm – you use it all the time in daily life whether you’re picking up a parcel or simply opening a door. Essentially, it describes how our arms should move away from our bodies – an integral part of the rowing stroke. If an athlete can extend their arms from the finish position without excessive muscular strain and without excess movement in other areas, it is a good indication of correct shoulder function. →

However, the shoulder joint is often restricted. Whether this is to do with muscular recruitment or joint positioning, the lack of range must be made up elsewhere. Our bodies are adaptive and clever enough to compromise or alter the function of nearby body regions in order to achieve our movement goals. We often see the disruption of the scapulohumeral rhythm in the shoulder, whereby stability of the scapulothoracic joint is compromised because it needs to assist the glenohumeral joint achieve its full range of motion. Abnormal shoulder joint function can also affect the nearby head and neck complex, upper spine/rib cage complex and even contribute to forearm or grip issues.

When assessing dysfunctional movement patterns, whether it be at the shoulder joint or elsewhere in the body it is important to ask, "why did the compromise occur?" and "what is it compensating for?" Often stepping back and looking globally allows us to treat or correct the underlying cause of the problem and not just the symptom or latest compensation that has developed. Thinking and observing in this manner also allows foresight into potential future dysfunction or injuries and enables prevention strategies to be put in place.

"True" shoulder joint dysfunction

A relaxed shoulder at the front of the stroke when the arms are outstretched helps create a powerful lever/platform for transferring leg power into the oar. Stiffness in the shoulder joint capsule and over-recruited, tight anterior deltoid, biceps and pectoral muscles can often prevent ease of elevation of the shoulder. These tissues lie mostly in front of the shoulder and can be addressed with manual therapy, stretching and mobility exercises to improve the range. Interestingly, it is often a weakness or imbalance in the rotator cuff muscles that causes these tissues to over-activate. This is because the rotator cuff provides much-needed stability to the naturally quite unstable shoulder joint. When rotator cuff strength is lacking, it is little wonder the surrounding deltoid, pecs and bicep essentially activate to prevent the shoulder tissues from over-stretching and potential subluxation of the joint itself. Where this is the case, a rower will find it very difficult to maintain a relaxed shoulder when their arms are outstretched. You could try shaking their arms, cueing them to relax their shoulders and "hang" but the body will be inclined to protect the joint and thus maintain the existing muscular tightness.

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SICK scapula syndrome

For effective rowing movement, the goal to extend the arms from the body stands regardless of whether the "true" shoulder joint is restricted and is in self-preservation mode as described above. The scapulothoracic joint can, and often does, help the body attain the desired arms-away position by compromising its own stability for more mobility. This is where we often see SICK scapular syndrome present. The syndrome can involve abnormal scapular positioning such as "winging", shoulder pain and dysfunctional movement patterns (aka *scapula dyskineasias*). In the boat, careful observation for shrugging of the shoulders, excessive protraction/retraction (ie back and forward movement) of the shoulder complex or uneven shoulder heights can help identify it. At rest, "winging" of the scapula can be picked up if the bottom tip or middle border of the shoulder blade is prominent.

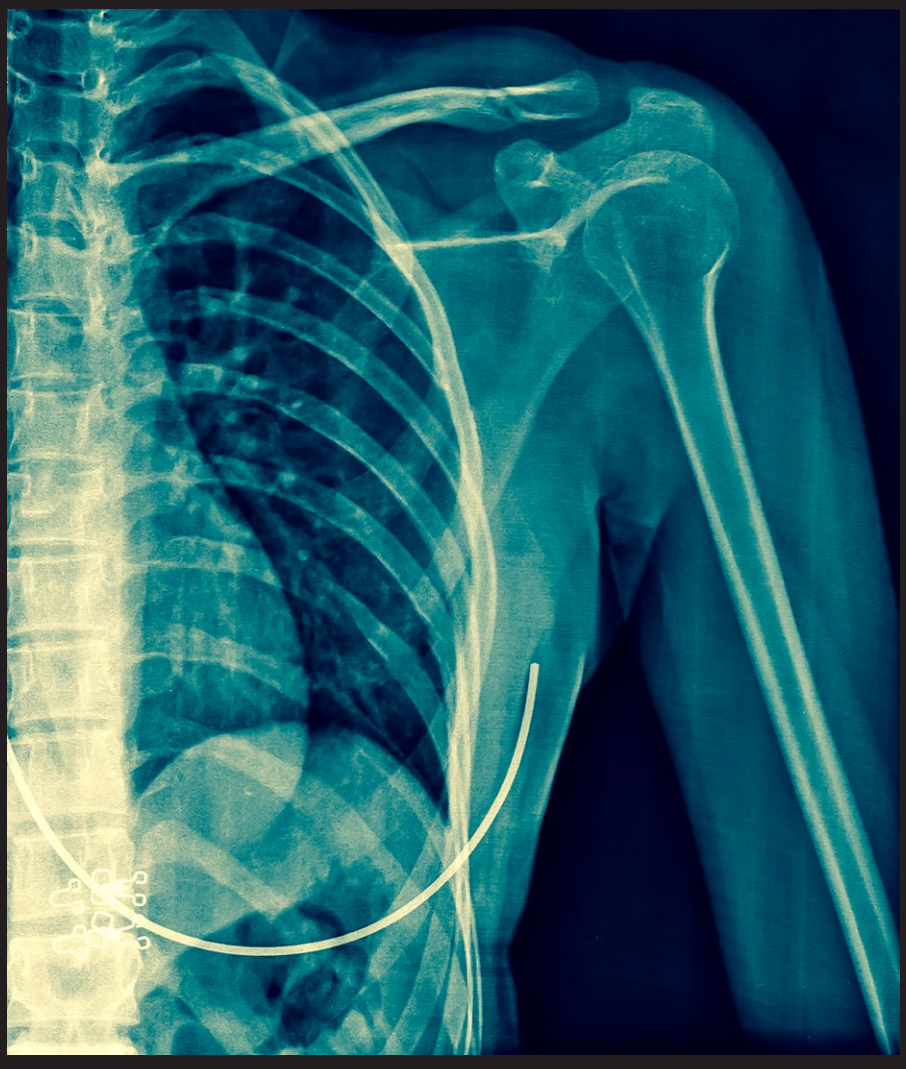
In terms of dysfunctional movement, excessive forward tilting and downward rotation of the shoulder blade is commonly adopted in rowers. Over time, this movement pattern significantly compromises power transfer as the key muscles such as the trapezius and serratus anterior can become inhibited by the stronger, more-frequently firing pectoral muscles, levator scapulae and rhomboids. When well ingrained, this dysfunction can give off a hunched forward and rounded look to the shoulders leading to increased flexion of the mid spine (aka rounding of the back) and over-use of the upper body. The athlete may complain of difficulty performing over-the-head movements, difficulty keeping their head/eyes up in the boat as well as maintaining the arms in a horizontal position as they come up the slide. Dependent on the individual pattern, stretching and release work to the muscles primarily responsible for forward tilting and downward rotation such as the pectoral muscles, levator scapulae and rhomboids and re-training how to recruit the opposing muscles can help encourage a more neutral scapular position. However, these corrections should be performed in conjunction with work on the "true" shoulder (glenohumeral joint) and rotator cuff whether it be the cause or the compensation of the issue.

Elbow and wrist

If we look at the other side of the shoulder joint we can see key connections to the elbow and wrist. The effects of a weak or over-tight grip on the handle cannot be overlooked for its influence on the shoulder joint is immense. Interestingly, studies on grip strength found a lack of grip strength to be correlated with a lack of shoulder external rotator muscle strength. Essentially, in the rowing stroke this weakness might look like fingers slipping off the handle, shrugged shoulders or often "shooting of the slide". This is because the ability to externally rotate the shoulders and maintain grip assists the transference of load from the handle to our trunk and legs whereby our joint positioning is favourable for latissimus dorsi muscle activation – a major contributor to force production in rowing.

Involvement of the spine

The other way to affect shoulder positioning and create relative shoulder external rotation can be by lengthening the spine. When an athlete is not switching on their core and lumbar spine muscles, postural collapse will position the shoulders unfavourably for power transfer without the athlete having even moved their shoulders. If the upper body collapses, a lunge at the catch might be observed, or a hunch causing the athlete to overuse their upper body. Whereas if the lower body collapses, a posterior tilt of the pelvis can be observed. A posterior pelvic tilt is undesirable and occurs when the athlete falls to the back of the seat, often slouching and dumping the oar down at the finish. Essentially, from this →



position it is difficult to then move the shoulders freely away from the body. By shifting an athlete's focus away from their seemingly "primary issue" (ie their shoulders) to an area they might have better control over, such as their spinal posture, it might yield better shoulder joint positioning for our primary muscle levers than even suggesting they "relax their shoulders" might. Perhaps too, the same could be said for correcting head position in relation to the neck and shoulders. Cueing "look forward and not down" might allow better recruitment of postural muscles and as such allow the shoulders to also sit in a preferable joint position.

Good rowing technique is like a jigsaw puzzle in which the shoulder joint is an integral piece. However, when multiple pieces or body regions are dysfunctional, successful technique or completion of the puzzle cannot be attained by treating or addressing one part in isolation. This is where repeating cues like "relax your shoulders" or "hang off the handle" can fail to yield the desired effect even if the intention is there. Movement patterns, after all, are well-ingrained habits which require serious practice to change. The practice of repeated conscious thoughts relating to the identified problem areas are necessary to change neuromuscular firing before the action becomes a learned and naturally occurring one. Similarly it can become particularly important to look elsewhere in the body to attain the desired movement position when the athlete is non-responsive or challenged by the cues in that region itself. ROW360

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