How to treat the multidirectional shoulder instability patient – Arthroscopic and Open Techniques

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Multi-directional instability (MDI) was first described by Neer and Foster in 1980 when they described a series of failures after Bankart repair, and found that correction of a capsular redundancy with an inferior capsular shift reduced the risk of a redislocation. MDI has been described more as a symptom than a diagnosis, and some surgeons defer that MDI exists as a single pathological unit. Furthermore it means one thing to one doctor and quite something else to another. It is therefore important to have clear definitions and as clear classification as possible. The pathophysiology of MDI is a combination of many concurrent factors involving weak capsular tissue and severe disturbances of neuromuscular function.

The surgical treatment for shoulder MDI has evolved over the years. Prior to the development of arthroscopy, the only surgical options were using open techniques. The goal of the surgery was to reduce capsular volume by performing a capsular shift and repair labral tears. These techniques require muscle detachment or splitting approaches to enter the glenohumeral joint in order to treat both the labrum and capsule. Capsular shifts can be performed with either humeral based (lateral), glenoid based (medial), horizontal, or combined (T-plasty) techniques (Neer and Foster 1980, Altchek et al 1993). Currently, some authors would continue to advocate an open capsular shift for patients who play contact sports, or who have failed an arthroscopic procedure (Pagnani 2008).

In the mid 1990’s to the present day, arthroscopic surgical techniques have been developed and improved to allow evaluation of the entire glenohumeral joint and address the multiple pathologies associated with MDI, including the anterior, posterior, and inferior
capsule, labrum, rotator interval, and the rotator cuff. This prevents the need to open the shoulder when significant anterior and posterior pathology exists and can be addressed. Arthroscopy allows for both shifting of the anterior-inferior and posterior-inferior capsule with or without labral repair, and rotator interval closure when indicated. With the development of suture anchors and specialized surgical equipment, the ability to significantly shift the capsule can be performed, and the results of these techniques have attained similar results. Based on cadaver studies, it has been shown that arthroscopic techniques may be as effective as open plication in decreasing capsular volume (Cohen et al 2005). The biggest clinical question is how much capsular volume reduction needs to be performed to gain stability in the MDI shoulder. Over the years my personal arthroscopic approach has changed from inserting at least two anchors anterior-inferiorly, and at least two anchors posterior-inferiorly to simply placing one anchor anterior and one anchor posterior shifting the bands of the IGHL 10 mm proximally and 5 mm medially. This seems not to influence recurrence rate, but rather reduces the prevalence of prolonged postoperative stiffness.

A component of multidirectional instability has been attributed to the rotator interval including the SGL and CHL. As a result closure of the rotator interval has some role in stabilizing the shoulder for patients with MDI. The original description by Harryman et al (1992) was a medial/lateral closure, which resulted in decreased posterior and inferior glenohumeral translation. Subsequently, additional descriptions of rotator interval closure (RIC) were mainly performed arthroscopically and involved a superior/inferior closure. The open or arthroscopic procedure involved suture closure of the interval preferably medial to lateral at the conclusion of capsular shift once it is determined that mainly some inferior laxity still exists.
Bony defects of the glenoid or humeral head is rarely present in patients with MDI but must be addresses if present in an effort to prevent recurrent instability.

The biggest difference in the surgical treatment of patients with MDI compared with unidirectional instability is the need to specifically address all areas of instability including the anteroinferior, posterior, and/or anterosuperior capsule. Another important issue in MDI patients is the frequent associated neuromuscular dysfunction that appeal mainly to a long-term conservative approach prior to surgery. Furthermore these dysfunctions lead to prolonged postoperative courses. Even if the surgical procedure successfully reduces the capsular volume, the tissue and the collagen composition of the patient renders the reconstruction to become weaker with time resulting in a higher risk of recurrence.