THE VASCULAR ANATOMY OF THE GLENOHUMERAL CAPSULE AND LIGAMENTS

+*Andary, J L (A-Wayne State University); *Petersen, S P
+*Wayne State University, Detroit, Michigan. One South Hutzel Hospital, 4707 St. Antoine, Detroit, MI 48225, 313-882-9408, Fax: 313-993-0857, andary@home.com

Introduction: While a detailed description of the vascular anatomy of the shoulder capsule is lacking, surgical procedures such as open and thermal capsulorrhaphy may place the capsular blood supply at risk. The purpose of this study was to describe the vascular anatomy of the human glenohumeral capsule and ligaments and its relevance to surgical treatment of the shoulder.

Methods: In 23 fresh adult cadaveric shoulders the axillary artery proximal to the thoracoacromial branch and the suprascapular artery were injected with India ink and treated with a modified Spalteholz technique.

Results: The glenohumeral capsule demonstrated consistent arterial contributions. The posterior circumflex artery supplies the posterior lateral capsule. A posterior periosteal anastomosis between the suprascapular and the circumflex scapular arteries provide vascular support to the posterior medial capsule. Vessels from the anterior circumflex supply the anterior lateral capsule. An anterior periosteal network originating from variable contributions from the subscapular, circumflex scapular and suprascapular arteries supply the anterior medial capsule. The arterial supply is centripetal in nature as the supplying arteries enter the capsule superficially and penetrate to deeper layers. The major supplying vessels enter the capsule either laterally or medially and arborize toward the middle of the capsule creating a watershed region. Variable contributions also come from penetrating vessels from the overlying cuff musculature. The dominant capsular vessels run horizontal and form intracapsular anastomosis via vertical branches. The anterior and posterior bands of the inferior glenohumeral ligament complex (IGHLC) are less vascularized but receive supply from adjacent parallel vessels. The humeral capsular insertion is supplied by vasculature from the overlying cuff tendons. In specimens demonstrating a hypovascular zone near the supraspinatus insertion, there was an associated hypovascular zone of the underlying capsule.

Discussion and Conclusion: The glenohumeral capsule is well-vascularized but does demonstrate areas of hypovascularity. Capsular shrinkage techniques that space thermal exposure (i.e. “grid pattern” techniques) might be more likely to leave vascular channels intact over more global “painting” techniques. Horizontal capsular incisions are likely to create less vascular insult than vertical incisions. Incisions along the relative watershed region could experience delayed healing.

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