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Appendix

Shoulder ultrasonography was performed in real time with a Siemens Elegra or Antares scanner (Siemens Medical Solutions, Mountain View, California) or a GE E8 or E9 scanner (GE Healthcare, Madison, Wisconsin) and a variable high-frequency linear array transducer (7.5 to 13 MHz) by one of three radiologists with extensive experience in musculoskeletal ultrasonography. A partial-thickness tear was diagnosed when there was a defect on the bursal side of the cuff or a distinct hypoechoic or mixed hyperechoic and hypoechoic defect on the articular side of the cuff that could be visualized in both the longitudinal and the transverse plane. The maximum anteroposterior dimension of the tear was measured on transverse views (perpendicular to the long axis of the cuff) and designated as the width of the tear. The maximum degree of retraction was measured on longitudinal views (parallel to the long axis of the cuff) and designated as the length of the tear. Tear length was measured from the tendon defect to the lateral edge of the normal tendon footprint on the greater tuberosity. To evaluate fatty degeneration of the rotator cuff muscles, the echogenicity and architecture of the supraspinatus and infraspinatus muscles were graded with use of a modified 3-point scale originally described by Strobel et al.[25]. The classification has been validated by our institution as an accurate and reproducible method of evaluating rotator cuff muscle degenerative changes compared with MRI[24]. The echogenicity was graded as compared with overlying muscle (the trapezius for the supraspinatus and the deltoid for the infraspinatus). The architecture was graded on the basis of the visibility of the central tendon and the normal muscular pennate pattern. The sum of the echogenicity and architecture grades was used for analysis. The radiologists were blinded to the tear dimensions of previous ultrasound studies but referred to previous studies for consistency in cursor placement given variability in individual osseous anatomy. ■