Shear wave elastography of the testis in the healthy man – comparison of standard values using ARFI and VTIQ techniques

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Introduction: Shear wave elastography is a recent technique in the assessment of tissue elasticity. Different elastographic techniques have been described over the years. Acoustic Radiation Force Impulse Imaging (ARFI) uses mechanical excitation of tissue to create detectable shear waves, a higher shear wave velocity being associated with an increased tissue stiffness. The Virtual Touch Tissue Imaging Quantification (VTIQ) generates a mechanical push pulse as well, additionally creating a colour-coded map, in which tissue stiffness can be measured on the stored colour map after measurement. VTIQ has already been used in the evaluation of unclear scrotal masses. Both techniques allow an operator-independent examination without application of mechanical pressure.

Material and Methods: Twenty healthy patients without testicular pathology underwent standard B-mode sonography and additional elastography in the ARFI mode as well as the VTIQ mode of both testes using the Siemens Acuson S2000® ultrasound device. Measurements of shear wave velocity were performed in the upper pole, the central portion and the lower pole separately for each testis. Values were described in m/s.

Results: Shear wave velocities determined by VTIQ were all significantly higher than values gained in the ARFI mode. (p<0.001 to p=0.007). Values were between 0.22150 and 0.28600 m/s higher when the examination was performed using VTIQ.

Conclusion: Both ARFI and VTIQ elastography modes proved to be feasible techniques in the assessment of testicular tissue elasticity. Consideration of higher values for VTIQ are important when comparing different elastography measurements, especially when applying the devices to clinical fields, e.g. work-up of scrotal masses.