Aim

• To assess the most accurate method of Bladder wall thickness (BWT) measurement.
• To assess the impact of different frequency probes on BWT measurements.

Methods

• 18 bladder dome specimens were harvested from cadavers with ethical approval.
• Scanned with 3 ultrasound probes
  - AB27D (TA 2D, 7MHz)
  - RAB25D (TA 2/3D, 5MHz)
  - RIC59D (TVS 2/3D, 9MHz)
• GE Voluson E8 scanner.
• Minimum and Maximum width measurements were taken for all specimens using a micrometer calliper.
• 18 samples were scanned on 2 separate occasions by 2 operators.
• All specimens were scanned with 2 methods as shown in Figure 1.

Conclusion

Measurement of the detrusor muscle only (without the bright echo) was more accurately correlated with micrometer caliper measurements. The 5MHz scanning showed less reliable results.

Results

• Spearman’s rho correlation coefficient was used to assess the agreement on the readings between the different probes (Table 1).
• 9MHz gave closest readings to micrometre calliper.

Interpretation

• The 9MHz TVS probe casts the least acoustic shadows.
• Higher frequency probes delineate more tissue detail giving a sharper image for measurements to be taken.
• The 5MHz and 7MHz probes were curved arrays. The 9MHz probe was an endo array. The inherent technological differences in transmitting the ultrasound waves may have also influenced the measurements.
• Non-invasive method of predicting detrusor over-activity.
• Accurate BWT assessment may reduce the need for invasive and costly urodynamic investigations.¹
• In men BWT is measured abdominally, where peritoneal acoustic shadows can be very prominent.
• The peritoneal surface of the bladder was found to cast an acoustic shadow leading over-estimation of BWT.

Reference