April 2007

Construct Validity of the Pig Intestine Model in the Simulation of Laparoscopic Urethrovesical Anastomosis

John R. Boon MD
Baylor College of Medicine

Desiderio Avila MD
Baylor College of Medicine

Javier E. Sosa MD

Ismael Salas MD

Nilson A. Salas MD
Baylor College of Medicine

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John R Boon, MD. BCM, Houston, TX, 77030. Desiderio Avila, MD. BCM, Houston, TX, 77030. Javier E Sosa, MD. Others, Maturin, Ismael Salas, MD. Others, Caracas, Nilson A Salas, MD. BCM, Houston, TX, 77030.

Introduction: Laparoscopic training models are increasingly important in urology to allow trainees to improve their laparoscopic skills prior to going to the operating room. For a training model to be valid, it must correlate with performance in a real case. The model must also discriminate between experienced and inexperienced subjects.
Purpose: We examined the construct validity of a simulation for the urethrovesical anastomosis during laparoscopic radical prostatectomy (LRP).
Methods: Pig intestine was used to create a model for laparoscopic urethrovesical anastomosis (L-UVA). Anastomosis of two segments of pig intestine was performed laparoscopically in the LapTrainerTM in the same fashion as for an urethrovesical anastomosis in LRP. 12 subjects with different levels of experience in laparoscopy were divided into 3 groups depending on their level of laparoscopic experience and experience with robot assisted laparoscopic prostatectomy (RALP). Each subject performed a running laparoscopic anastomosis of pig intestine in the box trainer. Performance time and volume of leak from the anastomosis were recorded. Volume of leak was measured by instilling 30cc of water through the anastomosis at 10ml/min and measuring the volume of water that leaked from the anastomosis.
Results: The most experienced group (n = 4) averaged 2058 seconds to complete the anastomosis. The less experienced group (n = 4) averaged 4028 seconds, and the inexperienced group (n = 4) averaged 6883 seconds. The difference between the groups was statistically significant with one-way ANOVA ($p < 0.0001$). The most experienced group averaged 2.638mL of leak from the anastomosis. The less experienced group averaged 9.975mL, and the inexperienced group averaged 26.38mL. The difference between the groups was statistically significant with one-way ANOVA ($p = 0.0005$).
Conclusion: This model for L-UVA correlates well with the subject's experience in laparoscopy and in RALP. It can discriminate between inexperienced and experienced subjects, exhibiting good construct validity.