

Using video analysis to understand the technical variation of robot-assisted radical prostatectomy (RARP) in a statewide surgical collaborative

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INTRODUCTION AND OBJECTIVES: Video assessment is an emerging tool for understanding variation in surgical technique. Despite its widespread adoption, patient outcomes for RARP may be linked to technical aspects of the surgery. In an effort to refine surgical approaches and improve outcomes, we sought to understand technical variation for the key steps of RARP in a statewide collaborative.

METHODS: The Michigan Urological Surgery Improvement Collaborative (MUSIC) is a statewide quality improvement consortium of 260 urologists from 44 diverse community/academic practices, aiming to improve prostate cancer care. Representative complete videos of nerve-sparing RARP were voluntarily submitted to the MUSIC coordinating center. The duration and variations in the tasks performed during each part were captured.

RESULTS: The anterior approach was used by 65% of surgeons (vs posterior) for the seminal vesicle (SV) dissection. Captured video analysis data identified variation in time to complete different steps (Figure 1): bladder takedown (2-24 mins), endopelvic fascia dissection (4-11 mins), dorsal venous complex (DVC) control (2-10 mins), bladder neck dissection (7-30 mins), SV dissection (9-32 mins), nerve-sparing/pedicle control (8-33 mins), apical dissection (4-17 mins), and anastomosis (17-44 mins). Seven different permutations involving suture, staples and electrocautery for dividing/controlling the DVC were used. Management of the pedicle/nerve-sparing was performed using hem-o-lok clips (15), Enseal tissue sealer (4), and titanium clips (1). Prior to anastomosis, only 5/20 undertook a posterior reconstruction. A non-barbed (vs barbed) running suture (12/20) was the predominant anastomosis method and 6/20 placed a urethral suspension stitch. At the end, 50% of surgeons performed a bladder leak test with 11/20 surgeons placing drains regardless of the result. Two surgeons utilized SP tubes for bladder drainage.

CONCLUSIONS: RARP technique is not uniform. Video analysis identified variation in (1) time to complete each step (2) methods for DVC control, (3) nerve-sparing technique, and (4) performance of the urethrovesical anastomosis. Future efforts linking differences in technique with clinical outcomes can provide objective evidence to support best practices.

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Figure 1: Time to complete major steps of robot-assisted radical prostatectomy for surgeons in a surgical collaborative

