

EDITORIAL

NOTES-LESS RADICAL PROSTATECTOMY

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Radical prostatectomy (RP) remains the gold standard for the surgical treatment of localized prostate cancer. Evolution of the technique was started by the timely work by Walsh and Donker. The accurate description of the dorsal vein complex, pelvic plexus and cavernous nerves and pelvic fascia had a real impact in number of patients operated for prostate cancer, procedure's morbidity and mortality and scientific investigation in prostatic carcinoma. Schuessler et al described the initial experience in laparoscopic radical prostatectomy (LRP), which they initially considered with no benefits when compared to its open counterpart, however, they rationalized that technical progress and experience could improve results. Since this initial description LRP has gradually evolved into a less invasive procedure.

In 1998, the Montsouris team started the experience in LRP with their self-developed technique. LRP technique was well standardized; however, changes have been gradually introduced as a natural evolution of our surgical performance. The objective is to comply with the demanding oncologic and functional objectives, while minimizing the invasive nature of the procedure. NOTES (natural orifice trans-endoluminal surgery) and LESS (laparo-endoscopic single site surgery) have recently received considerable attention as a possible next step in delivering effective treatment with decreased morbidity. We have recently incorporated LESS-NOTES surgery as a natural evolution to optimize surgical performance. Our aim is to present the latest advances in the technique for LRP, at a point in which our team has evolved from the steep learning curve of the procedure and arrived into a plateau in which rethinking and improvement become mandatory.

EDITORIAL

NOTES-LESS radical prostatectomy: experimental, transitional and clinical studies.

The development of NOTES-LESS radical prostatectomy has incorporated experimental, transitional and clinical experiences. In the experimental arena, an approach to the robot-assisted LESS radical prostatectomy was completed by Desai et al. in 2 human cadavers, utilizing a transvesical approach. The first case utilized 4 closely grouped trocars, while the second was performed using a single port device. While somewhat greater conflict was noted with the single port, this approach obviated the need to close multiple entry sites into the bladder. Again, articulated robotic instruments facilitated the complex motions need for vesico-urethral anastomosis and bladder closure.

Our team previously described a transitional experience to NOTES-LESS radical prostatectomy completed in a cadaveric model, and the technique was then transitioned to a human patient in which we used the robotic interface. The team used standard laparoscopic ports gathered at a single umbilical incision for the experimental experience. An additional 5-mm port was placed in the right lower abdomen for suction and countertraction, as well as drain placement. Standard robotic instruments were deployed in the clinical experience. Despite some instrument clashing that made exchanging robotic instruments difficult, the team reported good results with an operative time of 150 minutes. We have recently reported our the first clinical experience of complete LESS-RARP with no extra ports needed. The procedure was successfully completed with the initial approach and a change in port triangulation was a key point to accomplish the task.

Several studies reported on LESS prostatectomies in the clinical field. Kaouk et al. completed 4 U-LESS radical prostatectomies using a Uni-X port at the umbilicus, and flexible shaft laparoscopic instruments. After dividing the bladder neck, the surgical team found it difficult to maintain adequate traction to dissect the seminal vesicals; therefore they proceeded to the apical dissection and completed the surgery in a retrograde manner. Anastomotic sutures were tie extracorporeally, and tightened with a knot-pusher. There were no interoperative complications, however, one patient developed a recto-urethral fistula 2 months postoperatively.

Similar to the experimental experience, robotic technology has been used to augment clinical LESS procedures. Kaouk et al. completed a radical prostatectomy, a dismembered pyeloplasty, and a radial nephrectomy via U-LESS placement of da Vinci robotic instruments. The procedures were completed without additional ports or instruments, and no complications were reported.

The future of NOTES-LESS prostatectomy

Since introduction of NOTES in urological practice in 2002 by Gettman et al, with a report transvaginal nephrectomies in pigs, over five years have passed until the first publication on the clinical application of this technique for radical prostatectomy. The LESS-NOTES evolution of surgery has been embraced by the urological community in the last few years. Only referral

EDITORIAL

centers for laparoscopic urologic surgery have reported the applications of the LESS-NOTES principles for LRP. Apparently, deployment of the robot highly contributes with the accomplishment of the surgical procedure, due to the augmented mobility provided by the Endowrist technology.

At this point the application of LESS-NOTES for LRP is confined to a limited number of publications when one compares it to other laparoscopic urological operations (adrenalectomies, nephrectomies). This is due to the fact that radical prostatectomy remains a challenging procedure and it should be performed by experienced surgeons in order to achieve the best results. The idea of performing LESS-NOTES radical prostatectomies on an everyday basis is driving engineers and companies to design new instruments and devices to satisfy the needs of the surgeons which will surely impact the future evolution.

Our idea and objectives currently are to continue to develop our technique and contribute to its expansion by providing training and mentoring for surgical teams willing to start a LESS-NOTES urological experience. With ongoing refinement of technique, and continued development of novel instruments, we hope that LESS-NOTES prostatectomies will no longer be confined to a few academic centers, but will be incorporated into the armamentarium of urologists in the community.

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