

# Robot-assisted RP: Managing inguinal hernias

## Experienced and skillful robotic repair of inguinal hernias



**Prof. A. Erdem Canda**  
Yildirim Beyazit  
University  
School of Medicine  
Ankara Atatürk  
Training & Research  
Hospital  
Department of  
Urology  
Ankara (TR)

**Robot-assisted radical prostatectomy (RARP) is increasingly being performed for the surgical management of localized prostate cancer and, to some extent, some patients might have preoperatively detectable or intraoperatively identified inguinal hernias (IHs) (Photo 1).**

It was reported that 33% of the patients had incidental IHs during radical retroperitoneal prostatectomy (RRP) (1). In a study carried out at Karolinska University Hospital, 1,411 consecutive patients who underwent RRP or RALP were included (2). The cumulative risk of IH development at 48 months was 12.2% and 5.8% for RRP and RARP groups, respectively ( $p < 0.05$ ) suggesting that RARP leads to a decreased risk of IH development (2).

It is important to make a proper physical examination preoperatively to identify asymptomatic and subclinical inguinal hernias before the RARP procedure. A preoperative abdominal computed tomography or ultrasound might also be helpful in identifying asymptomatic inguinal hernias before surgery. It might be difficult to diagnose inguinal hernias preoperatively particularly in obese patients. It was suggested that men with preoperative lower urinary tract dysfunction have an increased risk of a hernia at RARP and should be counseled about the potential need for concurrent hernia repair (3). Therefore, due to the preoperative evaluation if the inguinal hernia(s) is/are diagnosed before RARP the patients could then also be preoperatively counseled and informed about the possibility of repairing hernia at the same session.

In published literature, many colleagues reported that inguinal hernias are a common intraoperative finding during RARP, and concurrent hernia repair with the use of a mesh material is a safe and effective additional procedure with reasonable increased operative time (4-8). If the inguinal hernia is not repaired at the same session following the completion of the RARP procedure, it might be more difficult to repair it via laparoscopic or robotic surgery in the following months after the RARP procedure since there might be severe intra-abdominal adhesions due to the RARP procedure. In addition, this would be a second surgical impact on the patient with additional anesthesia exposure.

A first-generation cephalosporin is administered for antibiotic prophylaxis. Following completion of the RARP procedure, a robotic trans-abdominal preperitoneal (rTAPP) inguinal herniorrhaphy is performed by using a mesh material.

For those who are not experienced in performing a robotic/laparoscopic inguinal hernia repair, it might be useful to participate in hands-on training courses in this field to acquire training and experience. In addition, it might be useful to have a general surgeon colleague to supervise the initial cases if needed.

### Surgical anatomy

It is important to understand and know the surgical anatomy to properly repair the inguinal hernias. Inguinal canal is lined by the aponeuroses of the abdominal oblique musculature that runs the deep (internal) inguinal ring to the superficial (external) inguinal ring. The deep inguinal ring is formed by an opening in the transversalis fascia. The superficial ring is formed by a gap in the external oblique aponeurosis.

Normally, inguinal canal includes spermatic cord (vas deferens, testicular artery, testicular veins, genital branch of the genitofemoral nerve) and ilioinguinal nerve. Hernias protruding through a weakness in the transversalis fascia lateral to the rectus abdominis, medial to the inferior epigastric vessels and above the inguinal ligament is named as direct inguinal hernia. The hernia protruding through the deep inguinal ring, lateral to the inferior epigastric vessels and anteromedial to the spermatic cord is regarded as indirect hernia.

Before starting the rTAPP procedure, it is important to obtain a watertight urethro-vesical anastomosis that is confirmed by distending the bladder intraoperatively with sterile saline solution (Photo 2). In addition, it is also important to have a good hemostasis that could be tested by decreasing the intra-abdominal pressure to 5 mmHg before starting the hernia repair. Likewise, a preoperative sterile urine culture should also be confirmed.

Our technique of rTAPP inguinal hernia repair was reported and presented previously at the EAU ERUS 2016 Meeting (9). During the transperitoneal RARP procedure a large peritoneal incision is made on the lateral sides of both medial umbilical folds, below the level of umbilicus opening the preperitoneal space. If bilateral extended pelvic lymph node dissection is also performed then the lymphatic tissues around external iliac arteries and veins up to the ureters are all cleared giving the console surgeon a good anatomical exposure of the important vascular structures. It is important to include the peritoneal dissection lateral to the internal inguinal ring. It is also important to particularly pay attention to vascular and pain triangles during dissection. Vascular triangle includes external iliac vein, external iliac artery, femoral branch of genitofemoral nerve and femoral nerve, whereas pain triangle includes femoral branch of genitofemoral nerve, femoral nerve and lateral cutaneous nerve of thigh.



Photo 1: Appearance of an inguinal hernia during RARP (Courtesy of Author's Photo Archive).



Photo 2: Appearance of a water-tight urethro-vesical anastomosis following the completion of the RARP procedure (Author's Photo Archive).

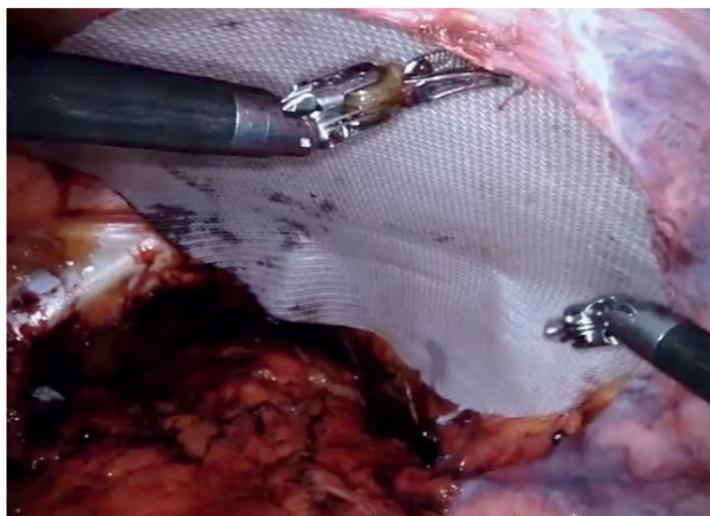


Photo 3: Appearance of the introduced and located mesh material covering the inguinal hernia defect in the abdomen (Author's Photo Archive).

### Mesh materials

Before repairing the inguinal hernia defect with a mesh material, lateral and superior edges of the peritoneum are freed creating a space to locate the mesh. There are different mesh types available on the market to use for hernia repair. In addition to the polypropylene mesh materials, bio-absorbable coated permanent mesh materials are also available to cover the defect. Mesh size could be adjusted according to the size of the defect. Before inserting the mesh material through the assistant port into the abdominal cavity, the bedside surgeon and the nurse always change gloves before handling and manipulating the mesh material to decrease the risk of contamination. Thereafter, the mesh material is introduced into the abdomen through the 11 mm sized assistant port (Photo 3).

Rarely, omentum, bowel segments or even urinary bladder could be found as herniated into the hernia sac and these structures should be carefully decompressed. Following the application of the mesh material over the defect, laparoscopic applied tacks (absorbable or non-absorbable) could be used to secure the mesh over the hernia defect (Photo 4). Alternatively, a suture material could be also used for this purpose. Attention should be paid not to injure spermatic cord, testicular artery, genitofemoral nerve, epigastric artery or external iliac vessels during mesh application and securing.

If a bio-absorbable coated permanent mesh is used, peritoneum could be left open otherwise it should be closed over the mesh by using a running absorbable suture (Photo 5). An abdominal drain is introduced and is removed during the postoperative follow-up. On postoperative Day 7, urethral catheter is removed following a confirmation of no leakage on cystography.

Robotic repair of the inguinal hernias by using mesh materials following

the completion of the RARP seems to be a safe and easy procedure to perform by taking specific precautions and having the proper training and knowledge to avoid a further operative procedure for the patient.

### References

1. Nielsen ME, Walsh PC. Systematic detection and repair of subclinical inguinal hernias at radical retroperitoneal prostatectomy. *Urology* 2005;66:1034-7.
2. Stranne J, Johansson E, Nilsson A, Bill-Axelsson A, Carlsson S, Holmberg L, Johansson JE, Nyberg T, Ruutu M, Wiklund NP, Steineck G. Inguinal hernia after radical prostatectomy for prostate cancer: results from a randomized setting and a nonrandomized setting. *Eur Urol*. 2010 Nov;58(5):719-26.
3. Sánchez-Ortiz RF, Andrade-Geigel C, López-Huertas H, Cadillo-Chávez R, Soto-Avilés O. Preoperative International Prostate Symptom Score Predictive of Inguinal Hernia in Patients Undergoing Robotic Prostatectomy. *J Urol*. 2016 Jun;195(6):1744-7.
4. Lee DK, Montgomery DP, Porter JR. Concurrent transperitoneal repair for incidentally detected inguinal hernias during robotically assisted radical prostatectomy. *Urology*. 2013 Dec;82(6):1320-2.
5. Kaler K, Vernez SL, Dolich M. Minimally Invasive Hernia Repair in Robot-Assisted Radical Prostatectomy. *J Endourol*. 2016 Oct;30(10):1036-1040.
6. Teber D, Erdogru T, Zukosky D, Frede T, Rassweiler J. Prosthetic mesh hernioplasty during laparoscopic radical prostatectomy. *Urology*. 2005 Jun;65(6):1173-8.
7. Finley DS, Rodriguez E Jr, Ahlering TE. Combined inguinal hernia repair with prosthetic mesh during transperitoneal robot assisted laparoscopic radical prostatectomy: a 4-year experience. *J Urol*. 2007 Oct;178(4 Pt 1):1296-300.
8. Finley DS, Savatta D, Rodriguez E, Kopelan A, Ahlering TE. Transperitoneal robotic-assisted laparoscopic radical prostatectomy and inguinal herniorrhaphy. *J Robot Surg*. 2008;1(4):269-72.
9. Canda AE, Atmaca AF, Bedir F, Ozer M, Ardicoglu A. Concurrent robotic trans-abdominal pre-peritoneal (TAPP) inguinal herniorrhaphy during robotic-assisted radical prostatectomy. ERUS Video abstract. *European Urology Supplements*, Volume 15 Issue 7, September 2016.

**Monday 27 March**  
**10.30-10.50: Thematic session 18, Masterclass RARP Semi-Live; Management of inguinal hernias during robot assisted radical prostatectomy**

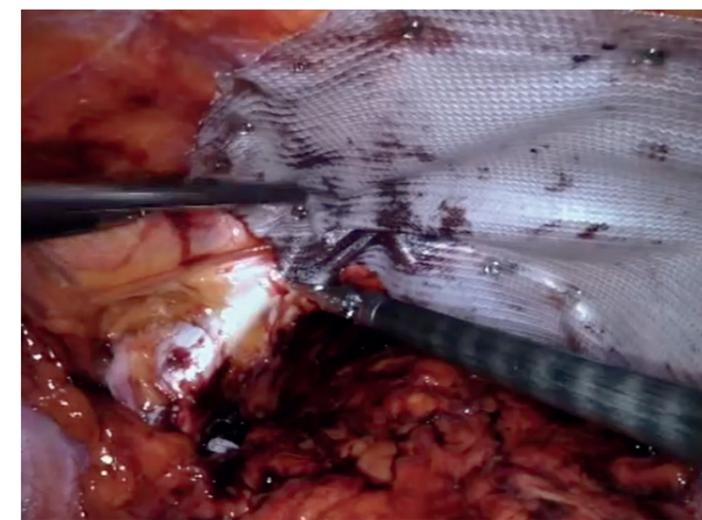


Photo 4: Application of titanium tacks on the sides of the mesh material to secure it over the defect by laparoscopic applier (Author's Photo Archive).

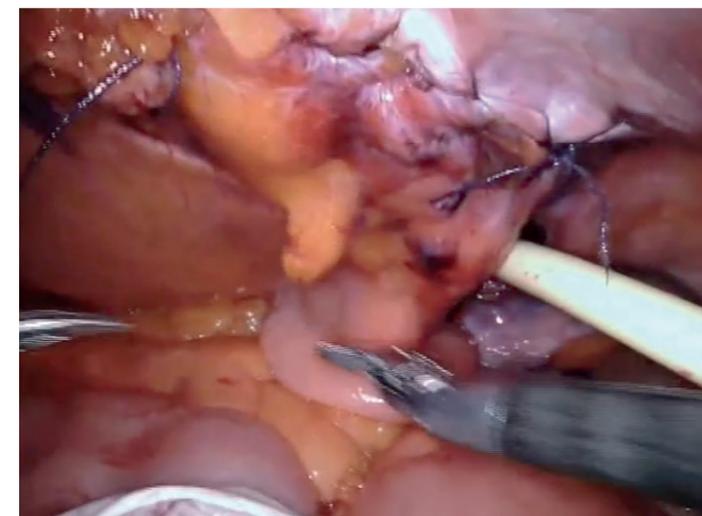


Photo 5: Peritoneum is closed over the mesh using a running absorbable suture and a drain is introduced (Author's Photo Archive).