Robotic-assisted transperitoneal radical prostatectomy in a patient with pelvic kidney

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ABSTRACT

لاحظنا زيادة استخدام جراحة الرجل الآلي في الآونة الأخيرة وذلك لما له من ميزات وفوائد خصوصا في جراحات إزالة أورام البروستاتا السرطانية وإصلاح ضيق حوض الكلية الخلقي. ولا يخفى أن التشخيص المبكر للعيوب الخلقية في الجهاز البولي والتخطيط المسبق قبل الجراحة هو جانب مهم يجب أن يؤخذ بعين الاعتبار. مع العلم أن وجود كلية حوضية يشكل تحديا تقنيا للجراح في جراحات إزالة أورام البروستاتا بمساعدة الرجل الآلي والصعوبة تكمن في الحفاظ على هذه الكلية دون ضرر مباشر لها أو للأوعية الدموية الممدة لها. ونحن نسجل تجربتنا في عمل إزالة ورم سرطاني في البروستاتا من خلال البريتون بمساعدة الرجل الآلي لمريض لديه كلية حوضية.

Robots are increasingly utilized in urology, due to their favorable performance characteristics especially in prostatectomy and pyeloplasty. However, preoperative diagnosis of urogenital congenital anomalies and preoperative planning are important aspects to be considered. The presence of ectopic pelvic kidney is a challenge for the surgeon to perform robotic-assisted radical prostatectomy (RARP) without injury to the pelvic kidney (PK) or its blood supply. We report our experience of performing RARP in a patient with a PK.

Saudi Med J 2008; Vol. 29 (2): 288-290

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Received 27th May 2007. Accepted 18th July 2007.

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Congenital abnormalities in urology are very common. Variations may be noticed in the number, position, shape, and size, or in rotation of kidney(s), calyces, ureter(s) or bladder,[1] the mature kidney fails to reach its normal location in the renal fossa is known as ectopic kidney (EK). The EK is generally situated in the pelvis although it may be found in iliac, abdominal, thoracic, and crossed.[1] Patients with clinically organ-confined prostate cancer (PC), reasonable life expectancy, and no, or minor co-morbidities are candidates for radical prostatectomy (RP). This can be carried out by robotic, laparoscopic, or open technique. Robotic-assisted radical prostatectomy (RAP) in patients with pelvic kidney (PK) can be considered as a challenge to the surgeon. The technical challenge is in avoiding injury of the PK and not obstructing the surgical field. Successful management is dependant on preoperative recognition of the renal anomaly and careful operative preservation of renal vasculature. We report the second documented case of RAP in a patient with PK. This is the first documented case of RAP performed in a transperitoneal fashion. We report our experience in performing RAP in a patient with PK. The case is presented to highlight the importance of anticipating anatomic anomalies at time of robotic prostatectomy and to describe how to manage such an obstacle when encountered.

Case Report. A 66-year-old man with no chronic medical illness presented with lower urinary tract symptoms (LUTS). The digital rectal exam findings were a mild prostate enlargement and a suspicious right lobe nodule. His preoperative creatinine was 60 mmol/L, prostate specific antigen was 13.6ng/ml, trans-rectal ultrasound guided biopsy revealed prostate adenocarcinoma with Gleason grade 6 (3+3). Workup was otherwise unremarkable, except for CT, which demonstrated a pelvic kidney on the left side (**Figure 1**). After counseling the patient, we embarked on a Da Vinci robot RAP.

Technique. He was placed in Trendelenburg position with adequate padding of the pressure points. After the draping, we created a pneumoperitoneum using Veress needle through periumbilical puncture. The needle was pointed in the right pelvic direction away from the area of the left PK. Care was taken during the port placement so as not to apply pressure or touch the PK. All ports were placed under vision, including the first port that was placed using a visual obturator port. The

visualization of the operative field was not affected by the PK due to the maneuverability and magnification detail of the robotic camera. A lymphadenectomy was not performed. This decision was based on tumor characteristics and low yield depending on the Partin tables and the Kattan nomograms. The peritoneum was widely incised, with subsequent development of the preperitoneal and Retzius space. The presence of the PK did not compromise the extent of mobilization of the bladder from the anterior abdominal wall. We avoided applying any retraction of the PK to avoid damage. Although its location was truly pelvic, it did not interfere with our very distal dissection within the pelvis. The endopelvic fascia was opened. The bladder neck was resected, and the anterior layer of Denonvilliere's fascia, covering the vas, and the seminal vesicle was exposed. We proceeded with dissection of seminal vesicle and posterior dissection to identify the lateral pedicle, and clips were applied to it; the neurovascular bundle was preserved. The dorsal vein was ligated, and dissection of apical prostate was carried out. A plane between urethra and dorsal venous complex was created, and the urethra was transected followed by vesicourethral anastomosis. The location of the kidney did not interfere with the anastomosis, however, it did require extra attention while passing the anastomotic needles in and out of the peritoneal cavity by keeping the left EK in sight at all times (**Figure 2**). The operative time was 320 minutes with estimated blood loss of 200 ml. This was comparable to similar cases carried out by the same surgical team. His postoperative creatinine was 63 mmol/L. Histopathology exam showed prostate adenocarcinoma Gleason grade 7 (3+4) involving the right side of the gland with free surgical margin and no seminal vesicle involvement. The patient was discharged home on the 3rd day post operatively.

Figure 1 - Computed tomography showing left pelvic kidney.

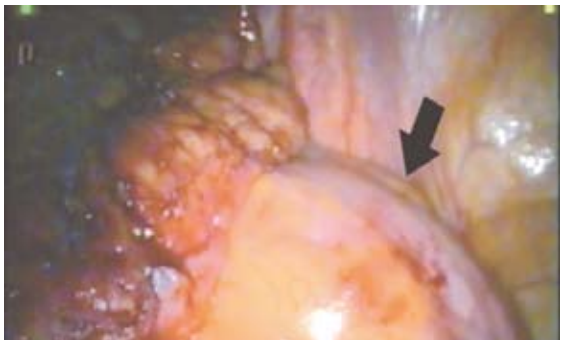

Figure 2 - Intraoperative picture during dissection showing the left pelvic kidney.

Discussion. Approximately one third of all congenital abnormalities affect the genitourinary tract (GT). Congenital pelvic kidney (CPK) results from failure of the embryological kidney to ascend during the 4th-8th weeks of gestation.[2] Since the kidneys are not in their normal position, their blood supply (BS) is also not the same as it should be in a normal kidney. Ectopic kidneys take their BS from the vessels closest to them at the end of their limited ascent.[1] Most urinary tract congenital abnormalities are silent even though potentially significant. Therefore, accurate preoperative planning and diagnosis are an important aspect to be considered to avoid some serious complication during the operation or during the postoperative period. Laparoscopic radical prostatectomy (LRP) was developed as a minimally invasive alternative to open RP. The introduction of robotics added a new dimension to minimally invasive surgery with 3 dimensional visual capabilities and advanced instrumentation with a freedom of movement similar to that of the human wrist.[3] Patients undergoing robotic-assisted surgery were shown to have fewer postoperative analgesia requirements and a short postoperative stay.[4] The transperitoneal approach is comparable to the extraperitoneal, with similar favorable outcomes. Surgeon preference will likely play a significant role in the approach used.[4]

In the review of previous experience in laparoscopy or robotic surgery for a patient with PK, most authors focused on performing nephrectomy, percutaneous nephrolithotomy, and pyeloplasty in PK without complication.[5-10] A review of the literature showed this to be the second reported case of prostate carcinoma and PK treated by RAP. The first one was carried out using the extraperitoneal technique.[11]

With our experience in performing RAP transperitoneal technique in a patient with PK, we conclude that it can be carried out safely within the same operative time without incurring any excessive blood loss.

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