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Robot-assisted Radical Prostatectomy and Extended Pelvic Lymph Node Dissection in Patients with Locally-advanced Prostate Cancer

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Abstract

Background: Limited data are available on the role of robot-assisted radical prostatectomy (RARP) in patients with locally advanced prostate cancer (PCa).
Objective: To describe our surgical technique of extrafascial RARP and extended pelvic lymph node dissection (ePLND) in locally advanced PCa.
Design, setting, and participants: Ninety-four patients with clinical stage ≥T3 undergoing RARP with ePLND at three European centers between 2011 and 2015 were retrospectively evaluated.
Surgical procedure: Surgery was performed using the DaVinci Si system. The anatomically defined ePLND included nodes overlying the external iliac axis, those in the obturator fossa, and around the internal iliac artery up to the ureter. RARP was performed using an extrafascial approach where the Denonvillers' fascia was dissected free and left on the posterior surface of the seminal vesicles.
Measurements: Perioperative outcomes consisted of operative time, blood loss, length of hospital stay, and complications occurred within 30 d after surgery. Biochemical recurrence (BCR) was defined as two consecutive prostate-specific antigen values ≥0.2 ng/ml. Kaplan-Meier analyses assessed time to BCR and clinical recurrence. Multivariable Cox regression analyses assessed predictors of BCR.
Results and limitations: Median operative time, blood loss, and length of hospital stay were 230 min, 200 ml, and 6 d. Overall, 12 (12.7%) patients experienced complications and five (5.3%), four (4.3%), and three (3.2%) patients had Clavien I, II, and III/IV complications. Overall, 72 (76.6%), 35 (37.2%), and 30 (32.3%) patients had pT3/4, pN1, and positive margins. The median number of nodes removed was 16. Overall, 19 (20.2%) and 21 (22.3%) patients received adjuvant radiotherapy and hormonal therapy. The median follow-up was 23.5 mo. At 3-yr follow-up, the BCR- and clinical recurrence-free survival rates were 63.3% and 95.8%. Pathologic stage, Gleason score, and positive margins represented predictors of BCR (all $p \leq 0.03$). Our study is limited by its retrospective nature and by the follow-up duration.
Conclusions: RARP represents a well-standardized, safe, and oncological effective option in patients with locally advanced PCa. Pathologic stage, Gleason score, and positive margins should be considered to select patients for multimodal approaches.

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Patient summary: Robot-assisted surgery represents a well-standardized, safe, and oncological effective option in men with locally advanced prostate cancer. Two out of three patients treated with this approach are free from recurrence at 3-yr follow-up. Pathologic stage, Gleason score, and positive surgical margins represent predictors of BCR and should be considered to select patients for multimodal approaches.

1. Introduction

Although the introduction and diffusion of prostate-specific antigen (PSA)-based screening dramatically increased the proportion of patients diagnosed with low-risk prostate cancer (PCa) [1], up to 10% of contemporary individuals still present with locally advanced disease [2]. These men should be deemed at very high risk of recurrence according to clinical guidelines [3]. For this reason, they were historically considered as ideal candidates for the administration of systemic therapies upfront [2–4]. However, recent studies demonstrated that surgery alone or in combination with additional treatments such as radiotherapy and androgen deprivation therapy might represent oncologically safe options even in this setting, where the 5-yr cancer-specific mortality-free survival rates of patients with high-risk PCa treated with laparoscopic or open radical prostatectomy (RP) exceeded 90% [4–7].

Robot-assisted radical RP (RARP) currently represents the most commonly performed surgical procedure in men with localized PCa [8]. Although concerns related to the increased risk of complications and poor oncologic control related to the lack of haptic feedback initially limited the diffusion of this approach to patients with high-risk disease, recent investigations demonstrated that RARP represents a safe and effective procedure even in this setting [9–12]. However, none of the currently available reports focused specifically on men with locally advanced disease. Under this light, we sought to describe our surgical technique of extrafascial RARP and extended pelvic lymph node dissection (ePLND) in patients with a clinical stage ≥T3 treated at three high-volume European centers. Moreover, we aimed at reporting perioperative and oncologic outcomes of these patients.

2. Materials and methods

2.1. Patient population

After Ethical Committee approval, 94 patients with locally advanced PCa as defined by clinical stage T3 or higher at digital rectal examination (ie, tumor extended through the prostatic capsule with or without involvement of the seminal vesicles or adjacent structures) and/or preoperative multiparametric magnetic resonance imaging were retrospectively identified. Patients were treated with RARP and ePLND at three high-volume European centers between January 2011 and June 2015.

2.2. Surgical technique

All procedures were performed through a six-port transperitoneal approach using the four-arm Da Vinci Si (Intuitive Surgical, Sunnyvale, CA, USA) Robotic Surgical System. The following robotic instruments were used: monopolar scissors, fenestrated bipolar forceps or Maryland bipolar forceps, prograsp forceps, and large needle driver. After incision of the peritoneum, release of the bladder laterally to the endopelvic fascia, and localization of the ureter, the dissection of the lymphatic tissue was performed adopting the *split and roll* technique. The external iliac artery was localized behind the peritoneum. The peritoneal incision was prolonged following the external iliac artery up to the vas deferens, which was exposed and then cut. The fibrofatty tissue along the external iliac vein was dissected, the lateral limit being the genitofemoralis nerve and the distal limit being the deep circumflex vein. Proximally, ePLND was performed up to and included the crossing between the ureter and common iliac vessels. Once the external iliac vessels were freed, the obturator nerve was approached. The dissection was performed from lateral to medial up to the umbilical artery and the bladder wall that represented the medial limit of the ePLND. Lymph nodes along as well as medially and laterally to the internal iliac vessels were also removed (Fig. 1). The obturator fossa was also accessed lateral to the external iliac artery and the lymphatic tissue freed from the pelvic wall. Smaller vessels were coagulated and cut and dissection was continued until the deep obturator fossa was reached. All fibrofatty tissue within the obturator fossa was removed. The Marcille's triangular lumbosacral fossa was dissected free (Fig. 2). This area was delimited laterally by the medial border of the psoas, medially by the body of the fifth lumbar vertebra, and inferiorly by the border of the sacral wing [13].

Bladder detachment, endopelvic fascia incision, bladder neck incision, ligation of the dorsal venous complex, apical dissection, posterior reconstruction, and urethro-vesical anastomosis were then performed according to previously described techniques [14–16]. During isolation and dissection of seminal vesicles the Denonvillers' fascia was incised. The perirectal fatty tissue was then entered and dissection was performed following the plan between the rectum and the posterior aspect of the Denonvillers' fascia. As a result, the Denonvillers' fascia was

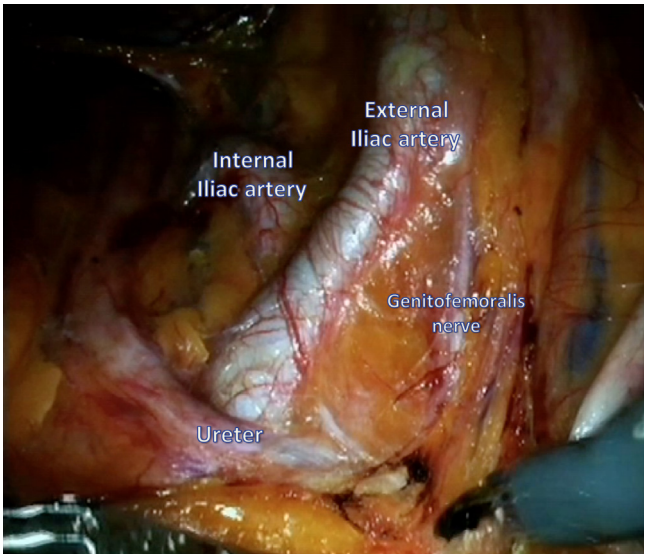

Fig. 1 – The external and internal iliac arteries, the ureter, and the genitofemoralis nerve were localized before performing an extended pelvic lymph node dissection.

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