



## Surgery in Motion

# Radical Cystectomy and Orthotopic Bladder Replacement in Females

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### Abstract

**Introduction:** More than 15 years ago, several centers started to offer urethra-sparing cystectomy and orthotopic urinary diversion for female patients with bladder malignancies. Several studies have been published, outlining both the anatomical and oncological aspects of such an approach.

**Methods:** In this contribution, the main aspects regarding the surgical technique of cystectomy and orthotopic urinary diversion in female patients, including technical variations which have been derived over the years, are presented.

**Results and Conclusion:** The video shows a detailed description of the surgical technique, and the main steps of the procedure are demonstrated in schematic drawings as well as in animations to facilitate understanding. Emphasis is given on important anatomical and physiological aspects, which have influenced the current surgical steps. Possible sequelae on oncological and functional outcome, which play an important role in the evaluation of this procedure, are also discussed.

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## 1. Introduction

More than 15 years ago, several centers started to offer urethra-sparing cystectomy and orthotopic urinary diversion also to female patients diagnosed with bladder cancer [1–4]. Up to this point in time, removal of the female urethra was considered an integral part of cystectomy. It was argued that renunciation of a urethrectomy would be associated with an increased risk for the development of intraurethral tumor

recurrences. In addition, because of specific complications associated with the latter procedure, such as fistulation to the vagina or postoperative micturition problems either in the form of urinary retention or the subsequent development of urinary incontinence, orthotopic bladder replacement in females was not introduced into the clinical routine as rapidly as in male patients. After it was demonstrated that, with respect to certain oncologic prerequisites, the urethra could be safely preserved, we now have a better

understanding of the female continence mechanism. In addition, with the establishment of several technical modifications and the availability of a broader spectrum of clinical experience, creation of an orthotopic neobladder after a cystectomy can be routinely offered to female patients as well. This observation is outlined by several studies that have focused on both the anatomic aspects and the oncologic risks that have to be recognized and respected during this surgical approach [5-13]. However, whereas contraindications for the creation of an orthotopic neobladder in females from an oncologic point of view (e.g., tumor involvement of the bladder neck and widespread carcinoma in situ) are similar to those in males, functional deteriorations such as sphincter insufficiency should be excluded by a preoperative urodynamic evaluation. Consequently, contraindications to orthotopic bladder substitution are clinically relevant forms of stress incontinence, high-dose preoperative irradiation, intolerance to postoperative incontinence in preoperatively continent patients and refusal of self-catheterization. With regard to the latter considerations, younger patients with a strong demand for physical integrity who are motivated to cope with the functional disorders that might result from an orthotopic bladder replacement are good candidates for this surgical approach. In the present contribution, we outline the surgical technique of cystectomy and orthotopic urinary diversion in female patients, together with technical variations that have been derived from our experience over the years.

## 2. Technical aspects

### 2.1. Patient preparation and incision

We do not routinely position the patients in a lower lithotomy position; rather we place them on a normal straight table unless they are extremely obese or have a tumour possibly invading the pelvic floor.

Preoperatively, a transurethral catheter is inserted.

Since the vagina will be opened during anterior exenteration, it must be included in the sterile preoperative prepping and should be accessible for sterile inspection during the operation. The vagina is marked with a large sponge or sponge stick soaked in disinfectant.

The approach is through a lower midline or Pfannenstiel incision. A modified Balfour retractor with two blades to retain the bowel cephalad is used for optimal exposure. The abdominal cavity is palpated for adhesions and metastatic disease.

### 2.2. Anterior exenteration in the female patient

#### 2.2.1. Lymphadenectomy

To gain access to the pelvic lymph nodes, we may leave the overlying peritoneum intact and dissect it off the pelvic sidewall in toto, or we may incise the peritoneum in an inverted V-shaped fashion starting at the umbilicus. From there, the peritoneal incision is continued downward along the medial umbilical ligament towards the avascular plain of Toldt.

The overlying round ligament will have to be dissected to gain a good exposure to the external, obturator and internal nodes, which are then dissected. The ovaries do not have to be removed routinely for oncologic reasons. In case of preservation of one or both of them, only their distal attachments mainly to the fallopian tubes are dissected, allowing the ovaries to be rotated laterally.

Lymphadenectomy should include the internal iliac, the obturator fossa, the external iliac and approximately half of the common iliac lymph nodes (Fig. 1). Although the value of pelvic lymphadenectomy for both staging and, under certain circumstances, therapeutic purposes has clearly been demonstrated, there is still an ongoing debate about the extent, especially cranially. Recent papers have demonstrated the low incidence of positive lymph nodes above the aortic bifurcation with microscopic pelvic lymph node involvement



**Fig. 1 – Extend of pelvic lymphadenectomy in malignant disease of urinary bladder (adapted from Rohen/Yokochi, Color Atlas of Anatomy: A Photographic Study of the Human Body; I. Gaku-Shoin, 1984).**

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