



Radical cystectomy and urinary diversion in women

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In North America and Europe, the incidence for bladder cancer in males is approximately 20 per 100,000 per year and approximately 4.5 per 100,000 per year in females (1). About 25% of these patients present with muscle invasive bladder cancer (MIBC) (2,3). For MIBC and very high-risk non-muscle invasive bladder cancers (NMIBC) standard of treatment is radical cystectomy (RC) accompanied by pelvic lymph node dissection and neoadjuvant cisplatin-based chemotherapy when possible (4). Still only 27% of these patients receive RC (2). In women RC historically includes the surgical removal of the bladder along with the complete urethra and the anterior vaginal wall as well as the uterus and the ovaries. The need for removing the complete urethra has been challenged by various investigations showing urethral recurrence being a rare event and preserving it in the absence of bladder neck involvement does not compromise oncological safety (5-7). While the risk for developing bladder cancer is about four-fold higher in men than in women, women more often present with more advanced disease at the time of diagnosis (8,9). This delay largely seems to be caused by a diagnostic delay due to misinterpreting hematuria as a symptom of urinary tract infection not performing the necessary diagnostics to rule out cancer (9). The gender disparity is also recognized regarding survival, where women compared to men have an excess mortality during the first two post treatment years. It is assumed, that tumor biology, choice and efficacy of treatments and again delay in sufficient treatment account for impaired survival (9).

Looking at treatment modalities for MIBC a recent study on a contemporary European series in The Netherlands between 2018 and 2020 of interest, showed no significant differences between women and men (9). Concerning reconstruction, a significant difference was observed regarding the choice of urinary diversion. Although overall very low, men received continent diversion in twice as many cases as women (6% *vs.* 3%) (9). Among an older series in the United States again men were chosen to receive continent diversion twice as often as women (9.1% *vs.* 4.4%) (10). In recent years, there appears to be a trend towards performing continent diversions less frequently during cystectomy shown by the contemporary study from The Netherlands and another recent study evaluating high-quality surgery for MIBC in the United Kingdom (9,11). In the latter study from Great Britain continent urinary diversion was only performed in 6.3% of 4,654 cases and was significantly associated with lower quality surgery ($P < 0.001$). High quality surgery on the contrary, was associated with high surgeon operating volume and minimally-invasive approach ($P < 0.001$, each). The more frequent use of minimally-invasive approaches in RC result in less frequent constructions of continent diversions having a higher risk of complications (11). The feasibility of minimal-invasive RC and urinary diversion either intracorporeally or extracorporeally is well proven and may offer advantages in outcome (11,12).

The development into the less frequent use of continent urinary diversions is questionable as it may not necessarily

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reflect patient's desires and may be surgeon and health care system driven. Although, health related quality of life studies showed no significant differences concerning the application of a continent or a wet urinary diversion (13), the construction of a continent urinary diversion with preservation of urethra and vagina as well as nerve-sparing harbor advantages in preserving or restoring urinary continence, sexual function, physical activity, and body image. Von Deimling *et al.* put great emphasis on elaborately counseling female patients before performing RC to correctly assess the individual desires (4). Here it is indispensable to offer women the complete information on surgical techniques, risks, postoperative limitations and especially on all urinary diversions possible. If a urology department or certain surgeon is not capable of offering all alternatives regarding the forms of urinary diversion possible, she/he has the duty to inform about surgical centers experienced in all types of diversions for correct and unbiased decision making. Physically active and otherwise healthy patients, to my experience, most often desire a continent urinary diversion owing to the above possible advantages. Here again an orthotopic bladder substitute is the diversion of choice. But if not possible due to cancer at the bladder neck, pre-existing stress incontinence or not desired because of the risk of the need for urethral intermittent self-catheterization (ISC) a suprapubic continent urinary diversion as for example the MAINZ-I-, Indiana-, Miami- or Kock-Pouch is a viable option other than the most commonly offered wet Ileum-Conduit (14,15). Although, decreasing in number these continent urinary diversions may represent the only diversion more often constructed in women than in men (16). Surgeons performing this form of urinary diversion sometimes even choose this technique in obese patients where fatty tissue excludes the formation of an orthotopic bladder substitute and IC has many risks due to the thick abdominal wall. The umbilicus in these cases offers free access to the abdominal wall for the catheterizable efferent limb of the pouch.

In summary, gender disparity in the therapy of MIBC should not lead to disadvantages for the female patient concerning oncological outcome and the possibility of receiving a continent urinary diversion, preferably an orthotopic bladder substitute ideally preserving urethral continence, sexual function, and perfect body image. Here critical patient selection and especially the patient's desire are essential for the best choice of a diversion. The patient's decision making in choosing the most convenient urinary diversion strongly relies on correct counselling

by the surgeons supplying all information needed without being biased by limited capabilities or health care system regulations. With the gaining impact of minimally invasive robot-assisted surgery for MIBC more efforts should be made, and emphasis put into preserving the challenging ability in reconstructive surgery to perform continent urinary diversions.

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