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Advantages of an Intracorporeal W-shaped Neobladder

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Radical cystectomy (RC) with pelvic lymph node dissection (PLND) and urinary diversion is the gold standard for surgical management of muscle-invasive bladder cancer and recurrent or refractory high-risk non-muscle-invasive bladder cancer [1]. Among the diversion approaches, an ileal conduit is most commonly used; however, an orthotopic neobladder offers higher quality of life (QoL) mainly because of preserved body image and near-normal voiding [2]. Such a diversion is usually offered and performed in younger patients suitable for a longer procedure with a risk of greater morbidity. The implementation of robotic surgery for urological cancers during the past decade has also benefited RC, allowing similar oncological outcomes with the benefits of a minimally invasive approach compared to open surgery, as supported by randomized trials. Using a robotic approach for intracorporeal orthotopic neobladder (INB) may provide potential for lower morbidity and enhanced postoperative recovery because of the minimally invasive approach [3]. Regarding the type of INB, several pouches have been described as intracorporeal urinary diversions adapted or modified from those originally described for an open approach. To date, there is a lack of evidence regarding which type of pouch created robotically offers the best functional result for patients.

We strongly believe that robotic creation of an intracorporeal W-shaped neobladder is an excellent option that should be offered to patients from both a technical and functional point of view. Here we describe a synthesis of the evidence underlying this hypothesis.

Robotic INB creation is technically challenging, in particular because of the extensive suturing, the orientation, and exposure of the detubularized ileum. In order to extend the indications for robotic INB while simplifying the surgical procedure, several techniques for adapting open pouches for robotic techniques with promising functional outcomes have been described, albeit with a limited level of evidence [4]. However, as the main objective for an INB is to offer good functional outcomes, the robotic intracorporeal approach should follow the principles inherited from open surgical experience without modification. The aim for an orthotopic neobladder is to form a spherical, low-pressure, large-volume pouch to allow low-pressure storage for urinary continence and upper tract preservation, as well as voiding without clean intermittent self-catheterization and good neobladder emptying.

For open surgery, the Studer and the Hautman W-shaped neobladders are the most common [5]. According to numerous large studies, these two types of pouch provide excellent outcomes, including 95% continence for the W-shaped pouch, explaining their wide use [6,7]. On the basis of these considerations, we strongly believe that the Studer and Hautman pouches are excellent neobladders and the same techniques described for an open approach should also be performed when creating a robotic INB.

Strictly replicating the open techniques when creating these neobladders intracorporeally may be challenging for different reasons. A major factor is the tension that limits complete folding of the pouch to the urethra intracorporeally. Several techniques for intracorporeal neobladder formation have been inspired by the Studer neobladder [8].

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However, creating a proper Studer neobladder intracorporeally remains technically highly challenging, and complete folding of the neobladder is rarely performed. This simplification of the original pouch to make it suitable for a robotic approach creates pouches that are closer to a J shape than to the S shape described for the original Studer neobladder. In turn, this may not transfer the well-documented high-quality functional outcomes seen with open Studer reconstruction to the modified robotic approaches. Indeed, the modifications applied to the pouch may influence the urodynamics and functional outcomes of the resulting neobladder in a way that has not yet been properly assessed.

Conversely, creating a Hautman W-shaped neobladder intracorporeally in an identical manner to that described originally for open surgery is entirely feasible and does transfer the well-documented high-performing functional neobladder to patients. However, such a neobladder has often been considered too challenging to create intracorporeally because of the extended suturing and potentially challenging bowel orientation to fashion the W shape. Nevertheless, standardized reproducible intracorporeal techniques to simplify the procedure for a robotic W-shaped INB in a step-by-step approach have recently been reported [9,10]. In particular, progressive detubularization of the ileum performed limb by limb of the W is highly helpful in fashioning the shape when sewing the posterior wall. This greatly simplifies the orientation and allows for efficient pouch creation. In addition, unlike the Studer intracorporeal INB, the posterior wall is only folded part way down the pouch rather than completely, allowing for tension-free spherical pouch creation. It is this step in the robotic approach for Studer neobladders that requires modifications, as there is almost universally too much tension to allow complete folding of the posterior wall to the urethra. This very significant point highlights why W-shaped neobladder formation is more appropriate for intracorporeal pouches than for the Studer pouch. Use of previously described intracorporeal INB techniques is essential for efficiency, including regular application of stay sutures and tightening of sutures by the assistant using a laparoscopic hook. When applying these technical tips with a standardized approach, creating a W-shaped INB in a manner similar to the open technique originally described by Hautman is

feasible and provides excellent functional outcomes and patient satisfaction.

Minimally invasive creation of a proper Hautman INB as originally described appears more feasible in routine than for a Studer INB. In motivated patients who are eligible, we surmise that creating a W-shaped robotic INB might be superior to a Studer neobladder or, as is more often seen, a modified Studer INB.

Conflicts of interest: The authors have nothing to disclose.

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