

HOW TO MANAGE A DYSFUNCTION OF THE EFFERENT SEGMENT IN CONTINENT CUTANEOUS URINARY DIVERSION (HYDRAULIC RESERVOIR)? A RETROSPECTIVE STUDY OF 10 CASES

F. Khalil^a; A. Barki^a; H. El Sayegh^b; A. Iken^b; L. Benslimane^b; Y. Nouini^b

a: urology department, Mohammed the sixth university hospital, Oujda, Morocco

b: urology A department, IBN SINA university hospital, Rabat, Morocco

Corresponding author:

Dr Fahd Khalil

Urology department, Mohammed the sixth university hospital, Oujda, Morocco

Email: drf.khalil@hotmail.fr

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Abstract

Continent cutaneous reservoirs after cystectomy remain an invaluable treatment option for a well-defined subset of indications. The continence mechanism largely determines the treatment success in terms of patient satisfaction and quality of life. Any dysfunction is considered a failure by both patients and surgeons.

A retrospective study was made from 2003 to 2013 (13 years) with the aim to characterize the hydraulic valve dysfunction in patients who underwent a cystectomy with continent urinary pouch. A total of ten patients were included in this study.

The main age was 44 years. The indications of cystectomy were pelvic tumors (62%), vesico-vaginal fistulas (20%), bladder extrophy (10%), hypospadias (4%) and complicated urethral strictures (4%). An hydraulic continent valve according the Benchekroun process was made for all our patients. After a median follow-up of 36 months, the main related efferent segment complications were fistulas in the top of the valve or "pinhole fistula" in 25% of cases, the externalized prolapse of disinserted valve in 25% of cases, and the progressive desinvagination with urinary incontinence in 50% of cases

Continent catheterizable urinary diversion remains a treatment option for a well-defined subset of indications. There is little consensus regarding the different options for the efferent segment, which has the greatest influence on patient satisfaction.

Keywords: Continent urinary diversion, efferent segment, hydraulic valve

INTRODUCTION

The goals of urinary diversion after cystectomy have evolved from simple diversion and protection of the upper tracts to functional and anatomic restoration as close as possible to the natural preoperative state [1]. While the ileal conduit and orthotopic neobladder are the most commonly used diversions today, continent cutaneous reservoirs remain an invaluable treatment option for a well-defined subset of indications. The continence mechanism largely determines the treatment success in terms of patient satisfaction and quality of life [2]. Any dysfunction is considered a failure by both patients and surgeons. At present, no

consensus has been reached on an optimal technique.

MATERIAL AND METHODS

A retrospective study was made from 2003 to 2013 (13 years) with the aim to characterize the hydraulic valve dysfunction in patients who underwent a cystectomy with continent urinary pouch. A total of ten patients were included in this study. A literature review was made using the Medline search database.

RESULTS

The main age was 44 years with a sex ratio of 2 men for one woman. The indications of cystectomy were pelvic tumors (62%), vesico-vaginal fistulas (20%), bladder extrophy (10%), hypospadias (4%) and complicated uretral strictures (4%). An hydraulic continent valve according the Benchekroun process was made for all our patients. After a median follow-up of 36 months, the main related efferent segment complications were fistulas in the top of the valve or "pinhole fistula" in 25% of cases, the externalized prolapse of disinserted valve in 25% of cases, and the progressive desinvagination with urinary incontinence in 50% of cases (Table II). The treatment options in our trial varied from a simple catheterization of the ileal pouch for the pinhole fistula, to the refection of another continent hydraulic valve for total desinvagination with urinary incontinence (Table III). Two patients received a simple contention for externalized prolapse.

Table I: Principal indications of cystectomy

pelvic tumors	62%
Vesico-vaginal fistulas	20%
Bladder extrophy	10%
Hypospadias	4%
Complicated uretral strictures	4%

Table II: complications of the efferent ileal pouch segment

Complications	%
pinhole fistula	25
externalized prolapsed	25
Progressive desinvagination	50

Table II: Treatment options of complicated valves

Catheterization	3 cases
New valve refection	5 cases
Simple contention	2 cases

DISCUSSION

Flap valves are probably the most commonly used continence mechanisms in heterotopic urinary diversion [3, 4]. A classic flap-valve technique is the so called 'Mitrofanoff' procedure, which was first described in 1908 by Verhoogen and de Graeue [5] and popularised by the French urologist, Paul Mitrofanoff, in 1980. Several variations have been developed since. Its acclaimed versatility allows the use of several tissues and

structures such as the vermiform appendix, ureter, small and large bowels, Fallopien tubes, foreskin, skin flaps, stomach, and bladder wall [6–9, 10- 13]. Without a doubt, the appendix flap valve is the most popular variation of the Mitrofanoff procedure. The appendix has a predictable and clearly identifiable vasculature, an adequate diameter, and a convenient localization in the right-lower quadrant. It is used reversed, in situ, tunnelled, imbricated or as a free segment [9, 14]. Catheterization problems are frequent, and unused stomas will inevitably obliterate completely. A simple but efficient device for preventing recurrent stenosis at the appendico-cutaneous level is described by Köhl et al. [15]; a short conical metal dilator is used to dilate only the critical part of the stoma. The Yang-Monti tube offers a Mitrofanoff based alternative [16, 17]. About 3 cm of ileum are incised longitudinally opposite the mesenterium and subsequently transversally retubularized to create a pedicled tube of 18 F lumen up to 9-cm long. This procedure is technically easy, and the small part of ileum it requires is almost always available. However, Up to 60% of patients had catheterization difficulties that were probably due to transversal mucosa pleating and a tendency of this tube to develop eccentric dilation [8].

Stomal stenosis and urinary leakage have been reported in up to 32% of cases [8, 18-20]. Further outlet techniques use bowel flaps (or in continent vesicostomy, bladder flaps) to form a tube in the absence of the appendix [21–26]. Lampel et al. [21] reported initially promising results with the use of seromuscular and full-thickness bowel flap tubes. The serosal lining of the seromuscular bowel flap tube reduces mucus discharge compared with other efferent segments with mucosa lining, although it requires more lubricant for catheterization due to its dryer surface. Stoma incontinence and stenosis occurred in 11% and 13% of cases, respectively, after a mean follow-up of 57 months. Several authors have performed urodynamic studies of Mitrofanoff tubes and reported that the length of intramural embedding determines the functional profile length; the latter is directly correlated with continence [2]. A functional length of 2 cm is the minimal requirement. It is interesting to note that reservoir contraction does not significantly contribute to UI. Bissada and Marshall [3] performed intraoperative leak-point pressure measurements to improve continence rates. In all, 32 of 77 patients undergoing cutaneous urinary diversion required intraoperative correction; there was a 100% continence rate during the follow-up

(up to 100 months). However, this method was never implemented in daily routine.

In hydraulic valves, increasing reservoir filling pressure is transmitted via a separate tubular system onto the sphincter zone of the actual efferent tube to achieve continence. A well-known yet completely abandoned representative of this is the technique outlined by Benckroun et al. [27]. The valve is made by isolating a 14-cm long intestinal loop with attached mesenteries. The isolated ileal segment then is folded inward on itself throughout its entire length. Continence is achieved by allowing the urine to flow into the space between the inner and outer ileum walls while compressing the inner lumen. Initial results showed 75% continence and a 17.6% valve failure rate with a mean follow-up of 38 months (122 patients). However, long-term results were disappointing due to high stenosis and total complication rates [13]. The high rates of stenosis are attributed to the serosal inner lining of the valve.

CONCLUSION

Continent catheterizable urinary diversion remains a treatment option for a well-defined subset of indications. The past few decades gave rise to a large variety of diversion techniques. There is little consensus regarding the different options for the efferent segment, which has the greatest influence on patient satisfaction. Each procedure exhibits a unique list of advantages and disadvantages.

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