



## Abstract

**Hypothesis/aim of work:** Radical cystectomy and orthotopic diversion is the surgical treatment of choice in men with muscle invasive bladder cancer. Sphincter- deficiency incontinence is a drastic consequence. While not life-threatening, it could have a significantly negative impact on patient's quality of life. The treatment of such complication is daunting. This trial entails the application of highly customizable perineal sling in the treatment of post-cystectomy incontinence.

**Study design, materials and methods:** Men after RCOD with significant daytime incontinence were included. MRI, basic laboratory testing and 1-hour pad test were requested. Tailored to the size of the patient's bulb, Polypropylene mesh is prepared and fixed by 4 No 1. Ethilon sutures, which were fixed to the inferior pubic ramus. Tightening was carried out under cough test.

**Results:** 10 patients have completed 6 months follow up. Patients' mean age was 66 years. (56-80 years). Two of these patients had nerve-sparing cystectomy. No evidence of local recurrence on abdominal-pelvic MRI prior to sling. Mean BMI was 25.62 (range: 22-32.4) Mean pad weight gain was 112.5 gm. (80-200). 6 months after surgery, pad test was negative in 5 patients (50%) and positive in 5. Mean increase of pad weight was 14.1 gm. (range 1-80 gm.). Mean PVR was 17.1 ml (range: 1-82). Average pad use was 2 pads /day (Range:1-3).

**Interpretation of results:** We utilized Polypropylene mesh, being a non-absorbable material that is commonly used in different male slings. Our technique is customizable as it was noted that the size of the bulbospongiosus muscles varies from one to another. Hence, the importance of the sling being "tailored" to the proper size of the muscle of every particular patient. Using direct fixation of the sling using 5/8 circle robust needle of Ethilon 1 suture; with direct bite into the inferior pubic ramus cortex with the help of a curved strong needle holder is more time and money-saving than the use bone screws and a special bone drill

**Concluding message:** At short term and based on small sample, customized perineal sling described is a safe, easy to learn and effective mode of treatment of post- cystectomy incontinence.

## Introduction

The list of adverse events following radical cystectomy and orthotopic diversion includes metabolic acidosis, uretero-ileal stricture, urethro- ileal stenosis, fistula, intestinal obstruction, and QOL-related adverse events; including incontinence and erectile dysfunction in men.

The incidence of incontinence after RCOD varies according to many factors. Literature addressing continence in orthotopic neobladders lacks standardized reporting methods and it is important to keep this in mind when comparing results from different series. In a study by Steers W. D <sup>1</sup> involving 2238 patients with various forms of the orthotopic neobladder, daytime incontinence was reported to be an average of 13% of patients. In another study based on a mailed questionnaire <sup>2</sup>, 139 of 179 responders used pads at least sometimes; *half* of them used pads day and night. 47% used pads in the day, with a third of those using a small one and almost half found that the pad was usually dry or only slightly wet.

Incontinence is usually attributed to distinct anatomical factors <sup>3</sup> i.e. injury of the rhabdosphincter during cystectomy, creation of small pouch, or both <sup>4</sup>.

Besides, the risk of metabolic acidosis after neobladder construction correlated with continence, in the early recovery period, where improvement of continence was an independent risk factor for metabolic acidosis <sup>5</sup>.

Treatment of day-time severe stress to total incontinence is difficult whatever the modality used, and was attended with limited success. Herein, I introduced a simple perineal sling using polypropylene mesh to treat sphincter-deficiency incontinence following RCOD.

## Methods and Materials

Men with RCOD who have significant daytime incontinence; defined as the use of 5 pads more at least or wearing an external collecting device during daytime) were included provided that they showed no evidence of local recurrence on local examination and pelvic MRI.

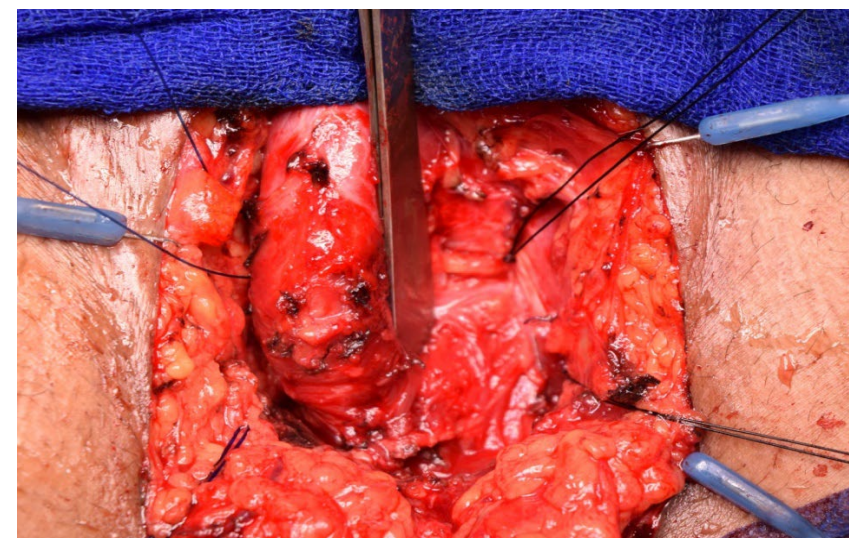
Written informed consent was obtained and all men underwent basic laboratory investigations as well as blood electrolytes and gases. Any metabolic acidosis or electrolyte disturbance was corrected a priori.

Normal kidney function, as defined by normal serum creatinine, was an inclusion criterion as well as normal pelvi-abdominal MRI, to exclude recurrence. Histopathology was transitional cell carcinoma in all.

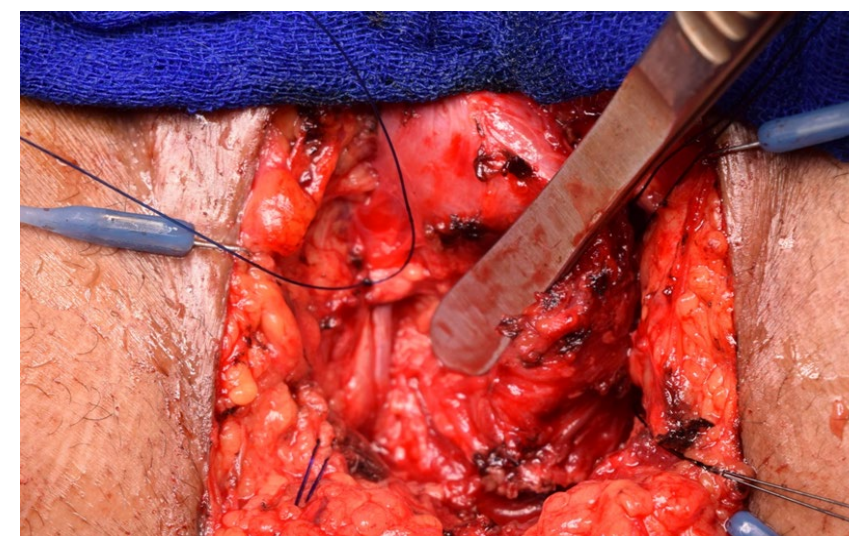
A 1-hour pad test was requested. The procedure was carried out under spinal anesthesia, in an extended lithotomy position. Urethroscopy was the initial step of the procedure to exclude urethral pathology (recurrence/ stricture)

The procedure is similar to what has been previously described <sup>6</sup>. However, given a completely different patient population and indication, the retropubic route of the sling was replaced by a perineal approach. Polypropylene mesh of sufficient size is double-breasted. Tailored to the size of the bulbospongiosus muscles, Polypropylene mesh is fastened by 4 sutures (Ethilon, 1), 2 on each side. Ethilon sutures were fixed to the inferior pubic ramus, one to a proximal and the other to a distal location; about 3-4 cm apart. Sutures were passed through the ischiocavernosus muscles near its origin (Figures 1 & 2). The sling is adjusted to cover the bulbar urethra within its muscle coverings (Figure 3). The tightening of the sling is achieved by making a complete surgical and leaving the final knot be tightened as the final step (Figure 4). Bladder was completely emptied and then filled with 200 ml of saline. Afterwards, the patient was asked to cough as strenuous as he can. An excessive tightening is avoided as the sling is designed to work against the pressure generated in the pouch by Crede voiding; not the voiding pressure of a functioning detrusor muscle. In final adjustment, the sling looks as compressing the bulb of the urethra. The closure of the wound then ensues after insertion of a Foley catheter for 1 day and Yeates drain for 48 hours (Figure 4).

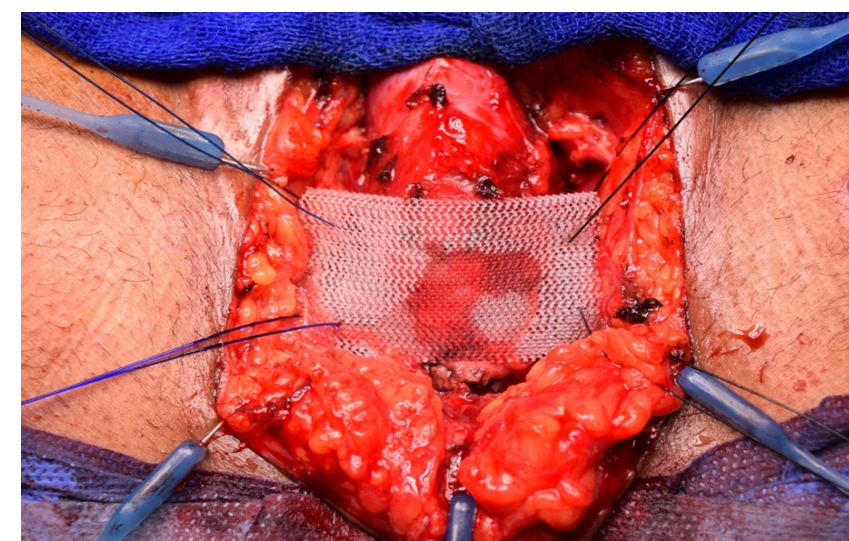
## Results



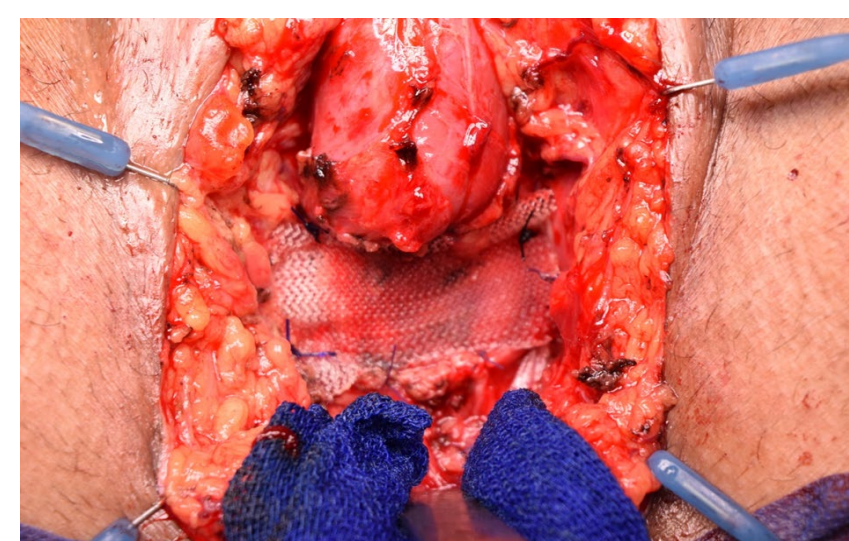
**Figure 1:** Two Nylon 1 sutures (Ethilon, Ethicon ®) on left side are fixed to the inferior pubic ramus, one to a proximal and the other to a distal location; about 3 cm apart.



**Figure 2:** Nylon Sutures are seen passing through the right inferior pubic ramus, through Ischiocavernosus muscle



**Figure 3:** The sling is being adjusted to cover the bulbar urethra within its muscle coverings



**Figure 4:** The sling is being tightened while the patient is asked to cough with his bladder filled with 200 ml of saline.

## Discussion

The incidence of day-time continence ranged from 87% to 100% <sup>7,8,9,10</sup> in men after radical cystoprostatectomy and orthotopic reservoir.

The cause of incontinence is usually nerve (parasympathetic) or rhabdosphincter injury. The treatment options included pelvic floor muscle training, empirical use of Duloxetine, perineal sling, artificial urinary sphincter (AUS), pubovaginal sling or adjustable continence therapy.

AUS was tried with modest success in the treatment of incontinence following radical cystectomy <sup>11</sup>. Vainrib et al <sup>12</sup> retrospectively studies 36 men with radical cystectomy and orthotopic diversion in whom AUS was fixed on average 28 months after the cystectomy. Incontinence data was available for 29 patients only. Significant improvement was reported in 17 at a mean follow up of 40 months. The authors concluded that AUS provided good continence with an "acceptable" complication rate. However, the authors stated that 38 revision procedures were necessary in 21 patients, including 12 explantations. Only 2 out of 10 patients in our series had bothersome pain, 1 had superficial wound dehiscence that required secondary sutures under local anesthesia.

The result of pubovaginal rectus fascia sling was not promising when tried in 4 women after RCOD <sup>13</sup> and the authors recommended against its further use while Pro Act was tried in a one case- report

Our sample size is quite small as well as our follow up period. Albeit, we felt that the technique is promising and is attended with low adverse events rate. We thought of early publication of the results so that other urologists might make use of it in the treatment of such a cumbersome problem that yet remains untackled.

**Table 1.** Patients' characteristics

#	Age	Co morbid	Date of cystectomy	Histopathology	MRI	Pre Pad test	date of sling	Post pad test	PVR	Complications
1	62	DM,Hypertension	3/1/2014	TCC, pt2a	Free	89	22/6/2019	1	10	Wound dehiscence
2	63	-	30/3/2014	TCC, pt3b	Free	71	4/2/2020	0	8	
3	56	Hepatic, IDDM	27/12/2010	TCC, pt3a	Free	82	19/2/2020	20	5	Wound dehiscence
4	71	-	21/6/2017	TCC, pt2b	Free	160	29/7/2019	20	82	Nil
5	72	-	11/6/2005	TCC, pt 2a	Free	120	7/6/2020	20	6	Nil
6	80	Hypertension	26/2/2012	TCC, pt3b	Free	100	4/1/2020	0	10	Nil
7	62	-	15/4/2017	TCC, pt4a	Free	90	7/6/2020	0	45	Nil
8	57	-	17/4/2014	TCC, pt3b	Free	130	5/7/2020	0	1	Nil
9	65	-	8/9/2003	TCC, pt2b	Free	200	27/9/2020	80	1	Nil
10	72	Hypertension, IDDM	10/6/2015	TCC, pt2a	Free	15	14/10/2020	0	3	Nil
11	59	Hypertension	12/5/2016	TCC, pt3b	Free	180	15/11/2020	0	18	Nil
12	55	-	01/8/2018	TCC, pt3a	Free	110	21/12/2020	30	55	Nil

## Conclusions

**Our study shows that a customizable bone-fixed Polypropylene sling is a reasonably safe and effective modality in the treatment of post-radical cystectomy incontinence.**

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