Antireflux Ureteroileal Anastmosis For Orthotopic Ileal Neobladder Using Wallace Technique In A Single Trough

Thesis

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Sherif Osama Abdel Fattah

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List of Abbreviations

Abb.	Full term

BUN.....*Blood urea nitrogen*

CT scan.....*Computed tomography scan*

Fr .....*French*

GFR.....*Glomerular filtration rate*

HS.....*Highly Significant*

IVP.....*Intravenous Pyelogram*

MRI.....*Magnetic resonance imaging*

NPO .....*Nil per os*

NS.....*Non-Significant*

PAUS.....*Pelviabdominal Ultrasound*

SPSS.....*Statistical Package for Social Science*

Abstract

Background: The formation of antireflux method for ureteroileal anastomosis in a low- pressure pouch is debatable, and usefulness should be weighted by possible side effects. Different methods were used as antireflux to keep the upper urinary tract.

Aim Of The Work: to assess a modification of the subserous extramural tunnel for antirefluxing uretero-ileal anastomosis in orthotopic diversion by using Wallace technique in a single trough after 2-year-duration follow up in terms of uretero-ileal anastomosis stricture, reflux and urinary tract infections.

Patients and Methods: In all, 100 patients underwent orthotopic urinary diversion after radical cystectomy. Inclusion criteria included age from 30 to 65 years old, negative positive urethral margin, serum creatinine less than 2 mg/dl and tumor stage T2-T3. Exclusion criteria were stricture urethra, single kidney and poor performance status. Patients were followed up by serum creatinine, pouchogram, renal ultrasound and intravenous pyelogram if serum creatinine below 1.5 mg/dl.

Results: In all, 2 patients missed follow up and 98 patients were evaluable over 24 months. Mean serum creatinine raised from 1.16 preoperative to 1.20 after 2 years. Reflux has been detected in 3 patients while stricture has affected 3 patients. 9 patients had symptomatic urinary tract infections or being infected with organism other than E.coli that necessitated admission and parenteral antibiotics; three of which were advised to do clean intermittent catheterization.

Conclusion: Combining serous-lined extramural tunnel and Wallace techniques is an effective technique and has a comparable result to the other antirefluxing techniques in terms of ureteroileal stricture, reflux and acute pyelonephritis.

Keywords: Radical Cystectomy, Urinary Diversion, Antireflux, Single Trough.

INTRODUCTION

Cancer of bladder is second to prostate cancer as the most common urological malignancy in men, and urothelial carcinoma (UC) constitutes 90% of all bladder malignancies. Among UC, 70%-80% are non-muscle-invasive and the rest are muscle-invasive ***(Shang et al., 2018).***

Radical cystectomy is the gold standard interference for muscle-invasive urothelial cancer of the bladder. But, it is associated with high morbidity (20-50% immediate and up to 90% long-standing morbidity) and noteworthy mortality rate (0-5%). Another complicating factor is determining the urinary diversion and its effect on the quality of life ***(Ali et al., 2015)***.

Orthotopic neobladders are now recognized as the best method bladder substitution. The procedure includes creating a reservoir with a big capacity and low pressure, which is attained by detubularizing and reconfiguring the bowel segment. Controversy still presents about optimum way of uretero-intestinal anastomosis and the necessity of an antireflux mechanism ***(Ghoneim and Osman, 2007).***

Orthotopic neobladders denote internal reservoirs anastmosed to the native urethra that depend on the external striated sphincter for continence. Reservoirs are typically created from detubularised small intestine and then anastomosed to the native urethra. Orthotopic neobladders were

primarily limited to men, as women were believed to have a high risk of local recurrence and dysfunction of voiding with orthotopic diversion. However, with practice and better understanding of the female sphincteric mechanism, orthotopic diversion became more common in women. It became the procedure of choice for most patients after radical cystectomy ***(Lee et al., 2014).***

Some urinary diversions, use an anti-reflux method to limit urine backflow from the reservoir into the kidneys. Although this mimics the physiological anti-refluxing condition of the native ureters and bladder, the necessity of anti-refluxing anastomoses in urinary diversions is controversial. Advocates report the detrimental upper tract effects detected in patients 10 years post creation of either freely refluxing ileal conduits or ureterosigmoidostomy. But, it should be noted that reflux-associated morbidities with orthotopic neobladder have been predominantly detected in patients with high pressure reservoirs; current neobladder designs depend on detubularised bowel segments fashioned to provide low filling pressures. Moreover, some neobladder designs, e.g. the Studer reservoir, depend on a long isoperistaltic proximal limb, that provides resistance to backflow and subsequently additional anti-reflux protection ***(Steven et al., 2000).***

Aim of the Work

The aim of the study is to evaluate a modification of the subserous extramural tunnel for non-refluxing uretero-pouch anastomosis in orthotopic diversion using Wallace technique in a single trough in a long term follow up regarding uretero-ileal anastmosis stricture, reflux, pyelonephritis and renal impairment.

Chapter 1

SURGICAL PRINCIPLES OF NEOBLADDER

Development of a Low-Pressure System

The major principle of the continent urinary diversion is the formation of a low-pressure reservoir which saves the upper urinary tracts and optimizes continence. Sufficient compliance is attained by detubularization of an intestinal segment and cross-folding into a spheroid configuration. Detubularization interrupts the rhythmic peristaltic intestinal movements, hence shielding the upper and lower urinary tracts from intermittent increases in pressure ***(Pietzak et al., 2018)***.

The reservoir must have suitable capacity to permit reasonable micturation intervals which is attained by the spherical configuration. Generally, capacity should be at minimum 300 to 500 mL ***(Lee et al., 2014).***

The spherical configuration also decreases the surface area which is in contact with the urine, so decreasing reabsorption and metabolic morbidities. Using too long ileal segment in creating the neobladder must be avoided as this can end in a too large, flaccid reservoir with elevated postvoiding residual urine amounts that needs intermittent self-catheterization to evacuate. Large reservoirs also put patients at increasing risk for metabolic morbidities and infections from

chronic colonization and bacteriuria. If this happens, patients are usually treated with medical therapy and possible long-term intermittent or chronic catheterization ***(Madersbacher et al., 2002).***

Maintenance of Continence Mechanism:

An understanding of the anatomy of the continence mechanism in men and women is essential to preserve continence at the time of radical cystectomy. The dissection at the prostatic apex in men and bladder neck in females must be meticulously and precisely performed to attain optimum continence. Male rhabdosphincter is a muscular coat situated ventral and lateral to the membranous urethra and prostate, the principal of which is an omega-shaped loop which surrounds the membranous urethra. The nerve supply of the male rhabdosphincter was also found to arise from the pudendal nerve. Branches of the pudendal nerve which are coursing under the levator muscle can be tracked to the rhabdosphincter. Delicate fibers from the perineal part of the pudendal nerve run underneath the urogenital diaphragm, entering the caudal part of the urethra laterally ***(Hinata et al., 2012).***

In woman, the urethra and uninvolved bladder neck are saved. Also, the plane of dissection can be carried posterior to the bladder and immedicately above the anterior vaginal wall so as to keep urethral nerve supply. Hence, the levator muscle, the endopelvic fascia and periurethral tissue anteriorly shouldn't be

troubled to preserve continent mechanism ***(Hinata et al., 2012).***

If too small bowel segment is chosen, this will end in a low capacity reservoir and avoidable incontinence ***(Suriano et al., 2013).***

Ureterointestinal anastomosis:

As the function of the vesicoureteral junction of the native bladder, the core behind creating antirefluxing ureteral anastomoses is to protect upper tract from sustained elevations in pressures during micturation and to limit ascending bacteriuria. advocates of antireflux methods in orthotopic diversions claim that there are elevated rates of bacteria colonization, and intraluminal pressures can significantly increase during micturation. There are many different antireflux methods described, including transmural and extramural tunneling, besides creating nipple valve mechanisms using ileum or the ureter directly ***(Pietzak et al., 2018).***

Antirefluxing anastomosis:

1- **Krynski** is the first to try to construct an antirefluxing method using a submucosal tunnel but in 1911 Coffey reported the first successful anastomosis of the ureters into an intact distal colon by a technique to tunnel the ureters through the intestinal wall to avoid reflux of fecal flora. With Coffey, the modern age of urinary diversion started.

However, a downside of the Coffey ureterosigmoidostomy was that, instead of a direct mucosal anastomosis, the end of each ureter was left to hang free into the lumen of the intestine, which resulted in ureteral stenosis from fecal contamination and inflammation in some patients ***(Studer, 2015).***

2- In 1951 **Leadbetter and Clarke** created a combined technique with a long, extracolonic, seromuscular Coffey-type tunnel with the Nesbit direct mucosal anastomosis. In 1953 Goodwin et al reported a similar kind of combined method but created a tunnel from within the intestine by means of an open, transcolonic ureterointestinal anastomosis that could be done under direct vision ***(Baky et al., 2015).***

3- Tunneled small bowel anastomosis:

The tunneled small bowel anastomosis technique attempts to create a non-refluxing anastomosis by means of constructing submucosal tunnel. Two 0.5-cm incisions are performed in the antimesenteric border of serosa at right angles in relation to the long axis of the bowel. Then, the seromuscular layer is gently disconnected from the mucosa by a blunt hemostat. The ureter is drawn through one incision, a button of mucosa is removed over the other incision, and the ureter is spatulated and fixed to the mucosa by means of interrupted sutures. Then, the serosa is closed with interrupted sutures, and