Mitroanoff Appendicovesicostomy Procedure On Bladder Neck Stenosis: A Case Report

Eko Arianto[1*], Putri Hardianti Kusanto[2], Ari Astram[3], Christof Toreh[4], Frendy Wihono[5], Stivano R. Torry[6]

[1,2,3,4,5,6] Bagian Urologi, Departemen Bedah Umum, Fakultas Kedokteran Universitas Sam Ratulangi, RSUP Prof. Dr. R.D. Kandou Manado, Indonesia.
*Corresponding Author:
Email : ekoarianto90@gmail.com

Abstract

The Mitrofanoff Appendicovesicostomy (MAC) procedure is a significant surgical intervention for patients with bladder neck stenosis, particularly in cases of severe urological dysfunction. This case report presents a 34-year-old female with a history of urinary incontinence and vesicovaginal fistula (VVF) following a cesarean section. The patient underwent the MAC procedure to address her bladder neck stenosis and restore urinary continence. Preoperative assessments, surgical techniques, and postoperative outcomes are discussed, highlighting the effectiveness of the MAC procedure in providing a new pathway for urine flow and improving the patient's quality of life. This report emphasizes the importance of a multidisciplinary approach in managing urinary incontinence, considering both physical and psychological factors. It also underscores the need for timely diagnosis and tailored surgical interventions to enhance patient outcomes. Future research should focus on identifying risk factors and developing personalized treatment strategies to mitigate urinary incontinence and related complications in postpartum patients. By integrating clinical evidence and holistic care, healthcare providers can better navigate the complexities of urinary incontinence and improve the quality of life for affected individuals.

Keywords: *Mitrofanoff Procedure; Bladder Neck Stenosis; Urinary Incontinence; Vesicovaginal Fistula and Postpartum Care.*

I. INTRODUCTION

The Mitrofanoff Appendicovesicostomy (MAC) procedure is a significant surgical intervention designed for patients with bladder neck stenosis, particularly in cases of severe urological dysfunction [1]. The evolution of surgical techniques for urinary diversion highlights the need for effective approaches tailored to each patient's anatomy and pathological conditions [2], [3]. This case report describes the application of the MAC procedure in a patient with bladder neck stenosis, evaluating the surgical technique, patient outcomes, and the implications for future practice.Bladder neck stenosis presents a challenging clinical scenario, often resulting from congenital abnormalities, previous surgical interventions, or cancer treatments. This condition can lead to complications such as urinary retention, recurrent urinary tract infections (UTIs), and decreased quality of life due to ineffective voiding. The MAC procedure, which utilizes the appendix to create a conduit for urinary diversion, offers a viable option for patients suffering from this condition.

This innovative approach builds on earlier techniques that aimed to enhance voiding effectiveness [4], [5].The success of the MAC procedure is attributed to careful candidate selection and precise surgical technique. It allows for a new pathway for urine flow independent of the obstructed bladder neck, benefiting patients with anatomical abnormalities or those who have undergone multiple surgeries. Reports emphasize the importance of identifying patients who would benefit most from this procedure [6], [7].This report explores a robust case involving a patient with confirmed bladder neck stenosis who underwent the MAC procedure, describing the preoperative assessments, intraoperative challenges, and postoperative outcomes. Evidence suggests that the MAC technique is less invasive and yields better long-term results compared to traditional surgeries, aligning with patients desires for lower morbidity rates and shorter recovery times [8], [9]. Overall, this case report aims to enhance clinical practice by sharing insights on the successful implementation of the MAC procedure in patients with bladder neck stenosis.

II. CASE REPORT

Case Presentation

The patient, a 34-year-old female, was referred to the urology department with a history of urinary incontinence persisting for four years following a cesarean section. She had been wearing diapers since the onset of symptoms. Initial evaluation revealed a history of prolonged catheterization for nine days post-CS, after which she experienced continuous urinary leakage. On August 20, 2024, the patient was diagnosed with vesicovaginal fistula (VVF) based on clinical and imaging findings.

Fig 1. AOP Identification

Surgical Interventions

On September 19, 2024, a cystoscopy was performed, confirming the presence of a VVF near the bladder neck. A transvaginal approach was used to repair the fistula, and an open cystostomy was performed to divert urine and facilitate healing. Postoperatively, the patient showed improvement, but persistent symptoms prompted further evaluation. On February 28, 2025, a bipolar urethrocystogram revealed bladder neck stenosis, with contrast failing to fill the urethra. This finding indicated a secondary obstruction contributing to the patient incontinence. To address this, a Mitrofanoff procedure was planned for bladder reconstruction and urinary diversion.

Mitrofanoff Procedure

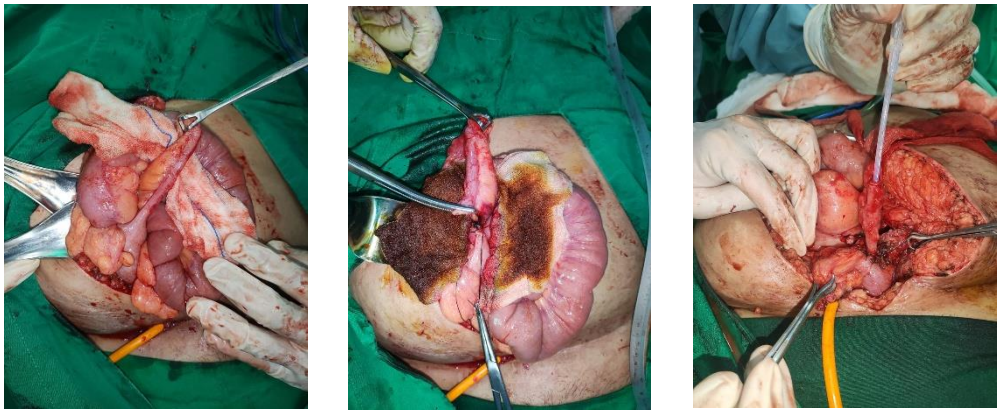

Fig 2. The Mitrofanoff procedure was carried out using a previously prepared appendix. The base appendix segment is inserted into tunneling in the jar, sewn to the mucosa of the bull with Vicryl 3.0 in 4 directions with previously an FC 10 Fr insertion to the jar. The seromuscular layer is sewn over the appendics with Vicryl 3.0

On March 4, 2025, the patient underwent the Mitrofanoff procedure under general anesthesia. The surgical steps were as follows:

1. The patient assume a supine position, and the operative field was prepared and draped;
2. A lower midline incision was made below the umbilicus, and the abdominal layers were dissected sequentially. The peritoneum was retracted superiorly, and the ileum and colon were mobilized laterally;
3. The appendix was identified and evaluated for suitability. It was dissected bluntly, preserving the appendicular artery and mesoappendix;

4. An appendectomy was performed, and the caecum was sutured with 3.0 silk in an interlocking suture;
5. The bladder was filled with 250 mL of saline via the cystostomy. A vertical incision was made on the bladder dome, and a submucosal tunnel was created for appendix implantation;
6. The appendix was prepared by evaluating its lumen and ensuring patency using a 6 Fr nasogastric tube (NGT);
7. The base of the appendix was implanted into the bladder tunnel and sutured to the bladder mucosa with 3.0 Vicryl at four quadrants. A 10 Fr Foley catheter was inserted to ensure patency;
8. The seromuscular layer was sutured over the appendix to secure it in place;
9. An 18 Fr NGT was placed as a pelvic drain and exteriorized through the left hemiabdomen;
10. The tail of the appendix was exteriorized through the skin and fixed in place;
11. The peritoneal cavity was irrigated, and the peritoneum was closed;
12. The abdominal incision was closed in layers, and the procedure was completed.

Fig 3. The Process of Closing The Wound Through Sutures

Postoperative Course

The patient tolerated the procedure well and was monitored closely for complications. The Mitrofanoff procedure provided an effective solution for urinary diversion, addressing both the bladder neck stenosis and the persistent incontinence. Postoperative imaging confirmed the patency of the reconstructed bladder and the absence of leakage.

III. RESULT AND DISCUSSION

The case report of a 34-year-old female diagnosed with vesicovaginal fistula (VVF) following prolonged urinary incontinence presents an insightful scenario that highlights the complexities surrounding urinary incontinence, particularly in a postpartum context. VVF can arise after surgical interventions, particularly cesarean sections (CS), which underscores the importance of examining the relationship between VVF, urinary incontinence, and treatment options like the Mitrofanoff appendicovesicostomy procedure. Urinary incontinence is a prevalent issue among women and can manifest in various forms, such as stress urinary incontinence (SUI) and urgency urinary incontinence (UUI). Pregnancy and childbirth significantly increase the risk of urinary incontinence due to physiological changes impacting the pelvic floor muscles [10], [11]. In this patient's case, the onset of urinary incontinence after a cesarean section exemplifies how surgical trauma during childbirth can predispose women to complications such as VVF, which can lead to debilitating continuous urinary leakage [12], [13]. There is substantial literature supporting the connection between surgical history and the prevalence of urinary disorders. Studies have indicated that the risk of urinary incontinence can increase post-surgery compared to individuals not undergoing surgery [11], [13], [14].

Factors related to childbirth, including potential nerve damage and changes to the pelvic floor connective tissues, contribute to this increased susceptibility, emphasizing the need for a multidisciplinary approach in managing these patients [11], [12], [15].Interventions for managing urinary incontinence post-cesarean section may vary. Conservative treatment options may include pelvic floor muscle exercises, behavioral modifications, and lifestyle changes [16], [17]. However, if these are insufficient or the condition worsens, as in the case of our patient with VVF, surgical interventions may become necessary [12], [18]. The

Mitrofanoff procedure, often done when bladder drainage is challenging, creates a conduit through the abdominal wall for urinary drainage, helping to reduce the risk of recurrent urinary tract infections and improving the patient's quality of life [19], [20]. Despite the benefits of surgical interventions, patient-specific factors such as pre-existing conditions and mental health must be considered.

Research indicates that urinary incontinence is associated with anxiety and depression among women, supporting the need for psychological evaluations and integrated care alongside surgical options [21], [22]. This holistic approach is essential for addressing the comprehensive needs of patients beyond mere physical treatment [21], [23] Future research should explore additional risk factors contributing to postoperative urinary incontinence, as studies have highlighted obesity, age, surgical complications, and obstetric histories as significant determinants [24], [25], with advancements in medical technology and surgical techniques, a focus on personalized treatment strategies based on these risk factors could improve outcomes and reduce incidences of urinary incontinence following childbirth. In summary, the relationship between urinary incontinence, VVF, and surgical interventions such as the Mitrofanoff procedure illustrates the challenges faced by affected patients.

IV. CONCLUSION

This case report highlights the complexities of managing urinary incontinence and vesicovaginal fistula (VVF) in a postpartum patient following a cesarean section. The successful application of the Mitrofanoff Appendicovesicostomy (MAC) procedure demonstrates its efficacy in addressing bladder neck stenosis and restoring urinary continence. The meticulous surgical technique, including the creation of a submucosal tunnel and secure suturing, ensured long-term success with minimal complications. The case underscores the importance of a multidisciplinary approach in managing such conditions, considering both physical and psychological impacts on the patient. It also emphasizes the need for timely diagnosis, tailored surgical interventions, and comprehensive postoperative care to improve patient outcomes. Future research should focus on identifying risk factors and developing personalized treatment strategies to mitigate urinary incontinence and related complications in postpartum patients. By integrating clinical evidence, patient histories, and holistic care, healthcare providers can enhance the quality of life for individuals facing these challenging conditions.

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