

# Complications of Continent Cutaneous Catheterizable Channel in Adult

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## ABSTRACT

**Aim:** To determine the frequency of postoperative complications related to continent cutaneous channel.

**Study Design:** Descriptive study

**Place and duration of study:** Department of Urology, Sindh Institute of Urology & Transplantation, Karachi, Pakistan from 1<sup>st</sup> August 2019 to 30<sup>th</sup> November 2021

**Methodology:** One hundred and seven patients underwent continent catheterizable channel formation via Mitrofanoff principle were included. Each patient was followed in OPD up to 6 months post-procedure to assess the complications i.e. stomal stenosis, stomal incontinence and surgical site infection.

**Results:** Mean age was 31.07±12.78 years. Out of 107 patients, 85(79.4%) were males while 22(20.6%) were females. Postop stenosis was found in 26(24.3%), incontinence in 3(2.8%) while surgical site infection was noted in 48(44.9%) patients.

**Conclusions:** Surgical site infection is the most common postoperative complication that warrants attention followed by stenosis and incontinence.

**Keywords:** Continent cutaneous channel, Mitrofanoff, Stomal stenosis, Stomal incontinence

## INTRODUCTION

In 1972, Lapides first described per urethral clean intermittent catheterization (CIC), and in 1980, Mitrofanoff proposed appendicovesicostomy for CIC<sup>1,2</sup>. Clean intermittent catheterization, as defined by Lapides, is the gold standard for ensuring complete bladder emptying in neurourological patients. Treatment to restore low-pressure bladder must be combined with CIC management in cases of low compliance or neurogenic detrusor over activity in order to protect the upper tract, establish continence, and improve quality of life<sup>3,4</sup>.

Mitrofanoff's concept is proposed to patients with a neurourological condition who are unable to execute CIC through native urethra due to difficulty reaching or detecting urethra, or urethral damage<sup>5</sup>.

The Mitrofanoff technique has showed reoperation rate of 8% for bleeding, anastomotic leak, conduit disintegration, intestinal obstruction, with the most prevalent long-term consequence being stomal stenosis, which causes difficult conduit catheterization.<sup>7</sup>

Documented complications associated with the continent cutaneous channel in studies are stenosis (11.2%)<sup>8</sup>, postoperative incontinence (44.8%)<sup>5</sup> and surgical site infections (22.2%)<sup>9</sup>. Bladder augmentation is a simple idea for patients with overactive, small-capacity, and/or low compliance bladder and a normal upper urinary tract, as well as in situations with coupled sphincteric incompetence with supplementary sphincteric function support (e.g., a fascial sling surgery)<sup>10</sup>. However, continent cutaneous channel (CCC) formation had been a major invasive surgery with high risk of post-operative short and long term complications.

Being country's largest public health facility for urological problems, we have high influx of patients with bladder dysfunction referred for continent cutaneous diversion.

The objective of the study was to observe the complication rate of continent cutaneous diversion in our patient population to improve the current standard of care accordingly to reduce the complications after surgery.

## MATERIALS AND METHODS

This descriptive study was conducted at Department of Urology, Sindh Institute of Urology & Transplantation, Karachi, Pakistan from 1<sup>st</sup> August 2019 to 30<sup>th</sup> November 2021 after getting permission from Institutional Ethical Committee. A total of 107 patients underwent continent catheterizable channel formation via Mitrofanoff principle were enrolled. The sample size was calculated

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by using WHO calculator using frequency of stenosis (11.2%)<sup>8</sup>, margin of error (d=6%, confidence level (C.I.=95%). Informed written consent was obtained from each participant. Each patient was followed in OPD up to 6month post procedure to assess the complications i.e. stomal stenosis, stomal incontinence and surgical site infection. All the data was entered and analyzed in SPSS-22.

## RESULTS

Eighty five (79.4%) were male and 22(20.6%) were female (Table 1). The means were of age 31.07±1.23 years, weight 59.20±10.35 kg, height 1.62±0.07 meters and body mass index 22.69±4.47 kg/m<sup>2</sup>(Table 2). Twenty six (24.3%) developed stomal stenosis requiring endoscopic intervention, incontinence through stoma was noted in 3(2.8%) patients, while 48(44.9%) patients developed surgical site infection (Table 3).

Table 1: Frequency of genders (n=107)

Gender	No.	%
Male	85	79.4
Female	22	20.6

Table 2: Descriptive statistics of the patients (n=107)

Variable	Mean±SD
Age (years)	31.07±12.78
Weight (kg)	59.20±10.35
Height (cm)	1.62±0.07
Body mass index (kg/m <sup>2</sup> )	22.69±4.47

Table 3: Frequency of postoperative complications (n=107)

Postoperative complication	No.	%
Stomal stenosis	26	24.3
Stomal incontinence	03	2.8
Surgical site infection	48	44.9

## DISCUSSION

When clean intermittent catheterization cannot be achieved through the urethra due to tetraplegia, urethral stricture, or problems with placement due to obesity and/or spinal cord injury, continuous catheterizable channels can help.<sup>11-13</sup> The bowel segment chosen, as well as the way of developing a continence mechanism, are also factors to consider while building a catheterizable channel. The appendix, a Monti-Yang configuration of small or big bowel, and a tapering ileum are all common bowel segments. There are a variety of techniques for developing the continence mechanism, but tunnelling the bladder channel between the mucosa and the detrusor muscle is frequently used to

form a flap valve that prevents urinary leakage when the bladder fills. A plicated ileocecal valve can also be used like in continent cutaneous ileal cecocystoplasty.<sup>14</sup>

A catheterizable canal is frequently required while building a continent urinary reservoir. The Mitrofanoff approach has been successfully used to several conduit types, with success rates exceeding 95%. Since the first description of appendicovesicostomy in 1980, a number of researchers have shown long-term success and modified the procedure<sup>14-20</sup>.

Given that children born with congenital genitourinary disorders have longer life expectancies, transitional urology is becoming more important.<sup>21</sup> Neurogenic bowel and bladder patients make up the majority of the transitional urology population. In this study, the mean age was noted as 31.07±12.78 years. Ugalde-Resano et al<sup>26</sup> stated age as 49.48±14.1 years. Kumar et al<sup>27</sup> reported mean age as 47 years, Das et al<sup>28</sup> noted as 42.36±14.66 and Hussain et al<sup>29</sup> as 45.5±19.8 years.

In our study, mean weight was 59.20±10.35 kg. Vorrakitpokatorn et al<sup>30</sup> reported a mean weight of 58.1±10.05 kg. In present study, body mass index was 22.69±4.47 kg/m<sup>2</sup>. Ugalde-Resano et al<sup>26</sup> noted mean BMI as 28.54±5.6 kg/m<sup>2</sup>. The study of Simon et al<sup>31</sup> noted BMI as 26.8 kg/m<sup>2</sup>. Gonen et al<sup>32</sup> noted as 26.8±5.0 kg/m<sup>2</sup> whereas Draga et al<sup>33</sup> noted body mass index as 25.4±4.1 kg/m<sup>2</sup>. The studies of Jimenez-Romero et al<sup>34</sup> and Park et al<sup>35</sup> reported the BMI as 27.31 kg/m<sup>2</sup> and 24.4±2.4 kg/m<sup>2</sup> respectively.

In current study, 85(79.4%) were male while 22(20.6%) were female. The study of Vorrakitpokatorn et al<sup>30</sup> also noted to have 78(60.9%) male and 50(39.1%) female patients. Draga et al<sup>33</sup> reported that there were 54(60%) male and 36(40%) female patients.

Postoperative stomal stenosis was identified in 26(24.3%) patients, incontinence in 3(2.8%) patients, and surgical site infection in 48(44.9%) patients in this study. Hampson et al<sup>8</sup> discovered that 11.2% had stenosis. In a research by Arber et al<sup>9</sup> stenosis was found in 31.6% of patients. In another study, Thomas et al<sup>36</sup> found stenosis in 23% of patients and incontinence in 14% of patients.

## CONCLUSION

The most prevalent postoperative consequence was surgical site infection, which was followed by stenosis and incontinence. Furthermore, our findings highlight the need for additional study to improve surgical techniques and provide more scientific patient counselling.

**Conflict of interest:** Nil

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