COMPLICATIONS OF PERCUTANEOUS CYSTOSTOMY AT TERTIARY HOSPITAL

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ABSTRACT

Objective: *This study aims to identify the complications associated with percutaneous cystostomy performed at tertiary hospital.* ***Material &Methods:*** *This study employed a retrospective descriptive design involving patients who underwent percutaneous cystostomy atSaiful Anwar General Hospital from January 2019 to December 2024. Data were collected by reviewing patient medical records, including information on average age, gender, diagnosis, and complications related to the procedure.Complications were classified into intra-procedural and post-procedural categories. This study was approved by the Health Research Ethic Commission of Saiful Anwar General HospitalNo: 400/050/K.3/102.7/2025.* ***Results:*** *A total of 72 patients were included in the study (71 males, 1 female), with an average age of 58.58 years. Early complications observed in 7 patients included catheter obstruction in 6 patients (8.3%) and hematuria in 1 patient (1.4%). Late complications limited to surgical site infection, which occurred in 3 patients (4.2%).* ***Conclusion:****Percutaneous cystostomy is a safe and effective procedure with a low complication rate, making it a viable routine practice in clinical urology.*

Keywords: *Percutaneous cystostomy, urinary retention, complications*

ABSTRAK

Tujuan: *Penelitian ini bertujuan untuk mengidentifikasi komplikasi yang timbul dari prosedur percutaneous cystostomy di rumah sakit tersier.* ***Bahan &Cara:*** *Penelitian ini merupakan studi deskriptif retrospektif terhadap pasien yang menjalani prosedur percutaneous cystostomy di Rumah Sakit Umum Saiful Anwar dari Januari 2019 hingga Desember 2024. Pengumpulan data dilakukan dengan meninjau rekam medis pasien. Data yang dikumpulkan meliputi usia rata-rata peserta, jenis kelamin, diagnosis, dan komplikasi terkait prosedur. Komplikasi diklasifikasikan menjadi komplikasi saat dan pasca prosedural. Penelitian ini telah disetujui oleh komisi etik penelitian kesehatan Rumah Sakit Umum Saiful Anwar dengan No: 400/050/K.3/102.7/2025.* ***Hasil:*** *Sebanyak 72 pasien diikut sertakan dalam penelitian ini (laki-laki=71, perempuan=1). Usia rata-rata seluruh peserta adalah 58,58 tahun. Komplikasi awal yang terjadi berupa sumbatan kateter pada 6 pasien (8,3%) dan hematuria pada 1 pasien (1,4%). Sedangkan komplikasi lambat berupa infeksi luka operasi terjadi pada 3 pasien (4,2%).* ***Simpulan:*** *Percutaneous cystostomy merupakan prosedur yang aman dan efektif dengan tingkat komplikasi yang rendah, sehingga prosedur ini dapat dilakukan rutin dalam praktik klinis urologi.*

Kata Kunci: *Percutaneous cystostomy, retensiurin, komplikasi.*

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INTRODUCTION

Percutaneous cystostomy is an alternative procedure considered when urinary diversion is necessary but urethral catheterization is contraindicated or unsuccessful.[1] Urinary retention is the most common indication for this procedure, which is frequently performed in urological emergencies.[2] This procedure is generally contraindicated in cases of bladder cancer, active skin infections, scarring on the lower abdomen, or an inadequately filled bladder.[3] In the latter scenario, ultrasound (US) guidance can facilitate the successful execution of percutaneous cystostomy.

Although considered a relatively safe option, percutaneous cystostomy is still associated with various peri-procedural, early, and late complications.[4] Peri-procedural complications include bleeding in 1.8% of patients, catheter malposition or false route in 5.7% of patients,[5] and bowel perforation in 2.5-2.7% of patients.[6] Early procedural complications include hematuria in 0.7% of patients and catheter obstruction in 2.3% of patients.[7] Previous studies reported infection rates

ranging from 24.1% at 15 days to 97.8% at 30 days post-procedure.[8] However, no studies have been published in Indonesia addressing the complications related to this procedure.

OBJECTIVE

Therefore, this study aims to identify complications associated with percutaneous cystostomy performed at Saiful Anwar General Hospital in Malang, East Java, Indonesia.

MATERIAL&METHODS

This retrospective descriptive study was conducted at Saiful Anwar General Hospital, Malang, East Java, Indonesia, focusing on patients admitted with urological emergencies who underwent percutaneous cystostomy. The study aimed to analyze complications associated with the procedure over a five-year period, from January 2019 to December 2024. This study was approved by the Health Research Ethic Commission of Saiful Anwar General HospitalNo: 400/050/K.3/102.7/2025.

The inclusion criteria for this study were patients who underwent percutaneous cystostomy at Saiful Anwar General Hospital between January 2019 and December 2024. Exclusion criteria included incomplete medical records or patients lost to follow-up.

Data were meticulously gathered from hospital and patient medical records, ensuring the inclusion of various parameters relevant to the study. Collected variables included patient identification number, age, gender, and diagnosis. Procedural details, such as the date of the percutaneous cystostomy, and complications occurring during and after the procedure, were also documented.

The primary outcome assessed in this study was the occurrence of complications resulting from the percutaneous cystostomy procedure. These complications were classified into three categories: procedural complications, early complications, and late complications. Procedural complications referred to those occurring during the cystostomy procedure itself, early complications were defined as those arising within the first 30 days post-procedure, and late complications were those observed after 30 days.

Collected data were analyzed using descriptive statistical methods. The distribution of complications was presented in tables, detailing the number and percentage of participants affected by each type of complication. This approach enabled a clear and concise representation of the frequency and types of complications observed during and after the percutaneous cystostomy procedure.

RESULTS

In this descriptive study, a total of 72 patients were included over a five-year period. The mean age of the study population was 58.58 ± 18.33 years, with an age range of 8 to 94 years. Of the 72 participants, 71 individuals (97.22%) were male, indicating that the study population was predominantly male. All patients underwent percutaneous cystostomy using latex catheters. The primary indication for the procedure was urinary retention caused by urethral stricture, which represented the most common etiology in this cohort. Detailed demographic and clinical characteristics of the patients are presented in Table 1.

The distribution of complications associated with percutaneous cystostomy is outlined in Table 2. Notably, no procedural complications such as bleeding, false passage formation, or peritoneal perforation were observed. However, early post-procedural complications were reported in 7 participants (9.7%). Specifically, catheter obstruction occurred in 6 participants (8.3%), while hematuria was noted in 1 participant (1.4%). Additionally, late complications were recorded in 3 participants (4.2%), all of whom experienced surgical site infections following the cystostomy procedure.

Table 1. Characteristic of the Patients.

Characteristic	N (%)	Mean ± SD
Age (years old)		
<20	4(5.88)	
20 - 30	4(5.88)	
31 - 40	4(5.88)	58.58 ±18.37
41 - 50	5(7.35)	
51 - 60	11(16.18)	
61 - 70	25(35.21)	
>70	19(26.39)	
Gender		
Male	71(98.61)	
Female	1(1.41)	
Etiology		
Urethral Stricture	63(87.5)	
Cancer	5(6.94)	
Bladder neck stenosis	2(2.77)	
Fournier Gangrene	2(2.77)	

Table 2. Complication of Percutaneous Cystostomy in all Participant.

Complication		N (%)
Procedural	Bleeding	0
	False route	0
	Peritoneal perforation	0
Early	Catheter blockage	6 (8.3)
	Hematuria	1 (1.4)
Late	Surgical site infection	3 (4.2)
Total		10 (13.9)

DISCUSSION

This study aimed to evaluate complications associated with the percutaneous cystostomy procedure in patients with urinary retention at Saiful Anwar General Hospital, Malang, East Java, Indonesia, over a five-year period. The findings provide critical insights into the safety and efficacy of percutaneous cystostomy as a management option for urological emergencies, particularly in a predominantly male patient population. The absence of procedural complications in this study is a significant finding, suggesting that percutaneous cystostomy is a relatively safe procedure when performed under appropriate clinical conditions. Procedural risks commonly reported, such as bleeding, false passage formation, or peritoneal perforation, were not observed in any of the 72 participants in this study.

Previous studies reported procedural complication rates of approximately 1.8% for intraoperative bleeding, 5.7% for false route,[5] and 2.5–2.7% for bowel perforation.[6] History of surgical abdominal procedures are considered the most significant risk factor for bowel perforation following percutaneous cystostomy.[9] Notably, none of the patients in this study had a history of abdominal surgery, which supports the absence of bowel perforation observed. These findings align with the existing literature, which highlights percutaneous cystostomy as a minimally invasive technique with low procedural risks, particularly when performed by experienced practitioners.[10]

Early complications were observed in 9.7% of patients, with catheter obstruction being the most common issue, occurring in 8.3% of participants. Catheter obstruction is a well-documented complication caused by factors such as blood clot formation, debris, or poor hygiene. Bacteriuria often leads to biofilm formation and catheter encrustation, contributing to catheter blockage.[11] While various bladder irrigation solutions have been explored as preventive measures for catheter obstruction, current evidence remains insufficient to recommend routine bladder irrigation as a standard practice.[12] Previous studies by Ahluwalia reported catheter blockages in 25% of patients undergoing percutaneous cystostomy.[7] Increasing oral fluid intake and monitoring urine output may help reduce the incidence of catheter obstruction.[11] In this study, all patients with catheter blockage were diagnosed with urethral stricture.

Hematuria occurred in 1.4% of participants, underscoring the need for close post-procedural monitoring. Although this complication often resolves spontaneously, it can cause patient anxiety and require intervention if persistent. A previous review by Muhammad AS, et al., reported hematuria during percutaneous cystostomy due to hematuria ex-vacuo or post-obstructive hematuria, which typically resolves within 24 hours.[3] In this study, hematuria was observed in patients with urinary retention caused by urethral strictures and bladder tumors. While bladder cancer is considered a contraindication for cystostomy, the procedure was necessary due to the inability to access the urethra, highlighting its role in managing urinary retention in such cases.[13]

Late complications, primarily surgical site infections, were recorded in 4.2% of participants. Surgical site infections are common complications of percutaneous cystostomy and can significantly impact clinical outcomes if left untreated.[14] Previous studies reported infection rates ranging from 24.1% at 15 days to 97.8% at 30 days post-procedure.[8] The infection rate observed in this study falls within the range reported in similar studies, emphasizing the importance of strict aseptic techniques during catheter insertion and meticulous postoperative care to minimize infection risks.[15]

There is a significant correlation between healthcare costs related to surgical site infections (SSI) and increased hospital stays, readmissions, reoperations, and poor clinical outcomes. The financial burden varies depending on the severity of the infection, wound size, and patient comorbidities. SSI is more prevalent in low- and middle-income countries, where limited resources often hinder the implementation of effective preventive measures,

resulting in poorer clinical outcomes.[16] Catheter blockage is closely associated with post-cystostomy infections. Wilde et al. reported that 34% of patients with urinary tract infections had a prior history of catheter blockage.[17] In this study, catheter blockage and subsequent infections were attributed to delayed follow-up visits exceeding two weeks and poor hygiene.

Based on Clavien-Dindo Classification[18-19], hematuria and surgical site infection were categorized into classification Grade II. Patients with hematuria were treated by Tranexamic Acid 500 mg three times daily for 1 week's duration. Meanwhile, the surgical site infection was cured by administration of definitive antibiotic based on its culture for 1 week's duration. Catheter blockage as an early complication categorized into classification Grade I because it was treated only by active irrigation of NaCl 0,9% and catheter replacement.

While this study provides valuable insights, several limitations must be acknowledged. The retrospective design and reliance on medical records may lead to data inaccuracies or incomplete information. Additionally, the study was conducted at a single center, which limits the generalizability of the findings to other populations or settings. Future studies would benefit from prospective designs, multicenter collaborations, and larger sample sizes to validate the findings and explore additional factors influencing complications in percutaneous cystostomy.

CONCLUSION

Percutaneous cystostomy is generally a safe and effective procedure with a low rate of immediate complications. However, the risks of early and late complications, such as catheter blockage, hematuria, and surgical site infection, remain significant concerns. These findings highlight the importance of thorough patient monitoring and meticulous post-procedure care to ensure optimal outcomes and minimize complications in patients undergoing this procedure. Mastery of this technique is essential in urological practice to reduce the risk of complications and enhance procedural safety.

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