

Advancing Patient Care: The Use of Flexible Cystoscopy for Bedside Procedures in Severely Ill Patients

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ABSTRACT

Introduction: Flexible cystoscopy has emerged as an essential tool in the management of urological conditions, particularly in critically ill patients where traditional cystoscopy may pose significant risks. The bedside application of flexible cystoscopy offers a minimally invasive, practical solution, allowing for prompt evaluation and intervention without the need to transfer unstable patients to the operating room. This study aims to assess the efficacy, safety, and outcomes of bedside flexible cystoscopy in critically ill patients, focusing on its utility in diagnosing and managing hematuria, catheter-related complications, and lower urinary tract injuries.

Methods: A retrospective analysis was conducted on critically ill patients who underwent flexible cystoscopy at the bedside in an intensive care unit (ICU) setting in the past one year. The indications for cystoscopy included persistent hematuria, suspected bladder injuries, and catheter-related issues. Data were collected on patient demographics, indications for the procedure, procedural success rates, complications, and the impact on subsequent clinical management. The flexible cystoscopy was performed using a portable cystoscope under local anaesthesia or sedation, depending on the patient's condition.

Results: A total of 158 flexible cystoscopy procedures were performed at the bedside on 142 critically ill patients. The most common indications were hematuria (45%), catheter malfunctions (32%), and suspected bladder injuries (23%). Procedural success was achieved in 94% of cases, with immediate diagnostic findings in 82% of patients. Interventions based on cystoscopic findings included catheter adjustments, clot evacuation, and, in some cases, stent placement. The complication rate was low (4%), with no major adverse events reported. The bedside procedure eliminated the need for patient transfer to the operating room in 89% of cases, significantly reducing the risk of transportation-related complications.

Conclusion: Bedside flexible cystoscopy is a safe, effective, and practical approach for the evaluation and management of urological issues in critically ill patients. It allows for immediate diagnostic and therapeutic interventions with a minimal complication profile. The ability to perform this procedure at the bedside not only improves patient safety by avoiding transport but also enhances clinical outcomes by facilitating timely and targeted treatment. These findings support the routine use of flexible cystoscopy in the ICU setting as an invaluable tool for managing urological emergencies in critically ill patients.

Keywords: flexible cystoscopy, in critically ill patients, diagnostic, bedside, ICU, emergencies

INTRODUCTION

Flexible cystoscopy has emerged as a critical intervention in managing urological conditions in ICU settings, where patients often present with unique challenges that make traditional cystoscopy impractical or risky. Transporting critically ill patients to the operating room (OR) for invasive procedures can expose them to significant risks, including hemodynamic instability and respiratory complications. In this context, bedside flexible cystoscopy presents a minimally invasive, safe alternative for promptly diagnosing and managing urological complications, including hematuria, catheter malfunction, and lower urinary tract injuries [1]. Prior studies underscore the value of bedside cystoscopy in reducing transport-associated risks, particularly for patients who are hemodynamically unstable [2].

MATERIALS & METHODS

Study Design

This study is a retrospective analysis of flexible cystoscopy procedures performed at the bedside in the ICU setting. Data collection spanned from April 2023 to March 2024.

Place of Study

The study was conducted in the Urology Department of B.J. Medical College and associated hospitals in Ahmedabad, specifically focusing on procedures performed in the ICU for critically ill patients.

Study Subjects

A total of 142 critically ill patients who required bedside flexible cystoscopy in the ICU were included. Patients presented with persistent hematuria, suspected bladder injury, or catheter-related complications. The inclusion criteria involved patients deemed unfit for transfer to the OR due to their critical status.

Primary Endpoints

1. Procedural success rates.
2. Immediate diagnostic findings.
3. Rate of transport avoidance to the OR.

Secondary Endpoints

1. Complication rates and types.
2. Changes in clinical management based on cystoscopy findings.
3. Patient outcomes and length of ICU stay post-cystoscopy.

Method of Data Analysis

Data were analysed using SPSS Version 26. Descriptive statistics were used to summarize patient demographics, indication frequencies, and procedural outcomes. Chi-square tests evaluated associations between cystoscopy findings and clinical outcomes. P-values <0.05 were considered statistically significant.

RESULT

Table 1 Patient Demographics

Age	58.3±12.1
Gender male/ female	92(65%)/50(35%)
ICU admission diagnosis	Respiratory failure 50 (35%) Sepsis 40 (28%) Cardiac failure 31 (22%) Trauma 21 (14%)

Table 2: Indications for Bedside Cystoscopy

Indication	Frequency (%) (n)
Hematuria	45% (71)
Catheter related issues	32% (51)
Bladder injury	23% (36)

Table 3: Procedural Success

Indication	Success rate (%) (n)
Hematuria	96% (68)
Catheter related issues	90% (46)
Bladder injury	95% (34)

Table 4: Immediate Diagnostic Findings

Diagnostic Findings	Causes (%) (n)
Clots	30% (48)
Mucosal lesions	25% (40)
Bladder trauma	18% (29)
Obstruction	10% (16)

Table 5: Intervention

Intervention	Causes (%) (n)
Catheter adjustment	55% (87)
Clot evacuation	20% (32)
Stent placement	5 % (8)

Table 6: Complications

Complication Type	Frequency (%)
Major	0%
Minor	4%

Out of 158 bedside cystoscopy procedures conducted, the overall procedural success rate was 94%. The majority of cases (82%) yielded immediate diagnostic findings, which guided clinical management, including catheter adjustment, clot evacuation, or stent placement [3]. Notably, the procedure avoided the need for OR transport in 89% of cases [4]. The complication rate was minimal (4%), with no severe adverse events, aligning with findings from Zhou and Li [5], who reported low complication rates in similar settings.

DISCUSSION

Bedside flexible cystoscopy has proven to be a valuable, minimally invasive tool in ICU settings. This study demonstrates its potential to facilitate prompt, effective diagnosis and intervention for common urological complications in critically ill patients. The high procedural success rate and low complication rate suggest that bedside cystoscopy is not only safe but also beneficial in preventing transport-associated risks [6]. Additionally, immediate interventions based on cystoscopy findings enhanced patient outcomes and reduced ICU length of stay.

The primary advantage of bedside cystoscopy is the mitigation of risks linked to transferring critically ill patients [7]. Prior research underscores that prompt intervention in ICU settings is crucial for improving patient outcomes, as delays can lead to complications [8]. Recent innovations in portable cystoscopy devices have further increased the feasibility of conducting this procedure at the bedside [9]. A meta-analysis confirms these findings,

showing improved patient outcomes with bedside cystoscopy in ICU settings [10].

Despite the positive outcomes observed in this study, certain limitations exist, such as its retrospective nature and the single-center setting, which may limit generalizability. Future prospective, multicenter studies are recommended to further validate these findings and assess long-term outcomes.

CONCLUSION

This study highlights the effectiveness and safety of bedside flexible cystoscopy for critically ill ICU patients, providing immediate diagnostics and therapeutic interventions with a minimal complication profile. By eliminating the need for patient transport to the or in most cases, this procedure enhances patient safety and allows for timely, targeted urological management. Given these benefits, the routine implementation of bedside flexible cystoscopy in ICU settings is recommended to optimize patient outcomes.

Declaration by Authors

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