



EMERGENCY IN UROLOGY: OUR EXPERIENCE WITH EVALUATION AND MANAGEMENT AT A TERTIARY CARE CENTER

General Surgery

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ABSTRACT

Background: Urologic emergencies comprise a diverse array of acute conditions affecting the genitourinary system, which, while individually uncommon, pose the risk of considerable morbidity, functional impairment, or even mortality if not promptly identified and addressed. A lot of tertiary care centers, especially those in rural or semi-urban areas, don't have big published case series to help them figure out how to do things. Knowing the range of situations, how to handle them, and what the results are helps with making protocols and deciding how to use resources. **Aim:** To present a prospective single-institution experience of urologic emergencies managed at a tertiary care centre (SVNGMC, Yavatmal) over a three-year period (Jan 2022 to Dec 2024), analyzing presentation patterns, management strategies, and short-term outcomes. **Methods:** All patients, regardless of age or sex, who presented with acute urological emergencies to the emergency department or surgical/urology ward during the study period were enrolled. Prospectively collected data encompassed demographics, presenting characteristics, laboratory and imaging results, emergency and definitive interventions, perioperative care, and outcomes until hospital discharge. Conditions included emergencies of the penis, scrotum, kidneys, and bladder. The analyses were descriptive, correlating the timeliness of intervention with the outcome. **Results:** There were eleven patients in total, nine of whom were male and two of whom were female. Their ages ranged from 5 to 70 years. Diagnoses included intraperitoneal bladder rupture (n=2), paraphimosis (1), priapism (1), testicular torsion (1), Fournier's gangrene (1), pyonephrosis/pyelonephritis (1), acute urinary retention (1), and penile injury/gangrene (2 combined). Based on how bad the condition was, quick resuscitation, imaging (ultrasound, CECT, cystography when possible), and quick intervention (surgical repair, drainage, debridement, catheterisation) were done. The cases of bladder rupture were treated with exploratory laparotomy, a two-layer repair, catheterisation, and drainage. All patients survived discharge; functional outcomes (e.g., maintenance of testicular viability, resolution of infection, urinary drainage) were satisfactory usually. **Conclusions:** Even though urologic emergencies don't happen very often at one place, the wide range of diagnoses and the need for quick action mean that everyone needs to be ready, work together, and follow institution-specific rules. Our case series demonstrates that prompt identification and compliance with established management principles result in positive short-term outcomes. We support the creation of standard emergency routes in settings with similar resources.

KEYWORDS

INTRODUCTION

Urologic emergencies, characterised as acute conditions that may be life-threatening or jeopardise organ function within the urinary and genital tracts, present a distinct challenge to clinicians due to their diagnostic variability, expedited timelines, and risk of irreversible harm. Common presentations encompass acute scrotum (torsion, epididymo-orchitis), penile emergencies (paraphimosis, priapism), obstructive uropathy with infection (e.g., pyonephrosis), traumatic injuries to the bladder/urethra, and severe soft-tissue infections such as Fournier's gangrene. Although numerous urologic issues in outpatient contexts are benign, the specific cases that present in the emergency department require immediate identification and conclusive treatment to prevent lasting consequences (e.g., infertility, erectile dysfunction, urosepsis). (1)

In global urologic practice, the incidence and characteristics of emergent urologic presentations differ by region, referral patterns, and available resources. There are a lot of retrospective studies from tertiary centres in developed areas, but not many from semi-urban or rural areas, especially in places where resources are limited. (2) More localized case series help us understand how delays in referrals, access to imaging, surgical capability, problems with follow-up, and outcomes are affected by local conditions.

Recent literature has revealed multiple emerging trends. For example, the COVID-19 pandemic caused a big drop in emergency urological visits at some centres. This was probably because of lockdowns and patients not wanting to go to the hospital. Some studies say that during the peak of the lockdowns, ER visits for urinary retention, haematuria, or renal colic dropped by 37–54%. despite fewer patients, the acuity often stayed high. (3,4) Other researchers have called for careful triage of urologic emergencies during a pandemic, stressing that real emergencies (like torsion, sepsis, or trauma) should not be delayed. (5,6)

Bladder rupture is not very common among urological emergencies, but it can be very dangerous. It is generally divided into intraperitoneal

and extraperitoneal injuries. Extraperitoneal ruptures, which are often linked to pelvic fractures, are usually treated conservatively with catheter-based drainage in stable patients who don't have any other injuries at the same time. (7) On the other hand, intraperitoneal bladder ruptures usually need surgery to fix because there is a risk of urinary peritonitis, ongoing contamination, and the defect not healing on its own. (7,8) Nevertheless, emerging literature documents infrequent instances of effective conservative management of intraperitoneal tears under rigorous supervision, although these cases are still uncommon. (9) Choosing between conservative and operative management is complicated and depends on things like haemodynamic stability, the size of the rupture, other injuries, and the ability to monitor. (10)

Testicular torsion is another important emergency, as it can cause irreversible ischaemia within 6 to 8 hours of starting. Clinical suspicion necessitates immediate scrotal exploration instead of extended imaging delays. (11) Priapism, especially the ischaemic variety, necessitates prompt intervention (aspiration, intracavernosal agents, shunting) to maintain erectile function? Paraphimosis is a urological emergency characterised by foreskin retraction that can result in venous congestion and glans ischaemia if not addressed immediately. (12) Fournier's gangrene is a rare but severe necrotising infection of the perineum and genitalia that necessitates aggressive debridement, broad-spectrum antibiotics, and critical care support. (13)

A recent epidemiological review from tertiary care centres emphasised the fluctuating incidence of urologic emergencies, with obstructive uropathy, urinary retention, haematuria, urolithiasis, and scrotal emergencies being the most prevalent. Hamza et al. in Nigeria reported a diverse range of urological emergencies addressed at a tertiary hospital, highlighting resource limitations and delays as significant challenges. (14)

MATERIALS AND METHODS:

This was a prospective observational case series conducted at Shri

Vasantrao Naik Medical College (SVNGMC), and super speciality hospital, Yavatmal, Maharashtra, India. The study period spanned from January 2022 to December 2024. All patients presenting with acute urological emergencies to the emergency department or admitted to surgical/urology wards were included. Institutional ethical approval was obtained from the SVNGMC Ethics Committee. Informed consent was obtained from all patients or legal guardians, especially in pediatric cases. All patients of any age and either sex presenting with urological emergencies (requiring immediate or urgent evaluation/intervention) during the study period; consent given for participation were included in the study. Patients who declined consent were excluded from the study. For each participant, the following data were recorded prospectively using a standardized proforma which included, demographic data, clinical presentation, physical examination findings, laboratory investigations, imaging studies, treatment provided was recorded. (Table 1)

RESULTS:

Throughout the three-year trial period (January 2022 – December 2024), 11 patients exhibited acute urological crises. The study sample consisted of 9 males (81.8%) and 2 females (18.2%), with ages spanning from (required to mentioned) Table 1 summarises the distribution of cases and their accompanying therapies. Table 2 displays the distribution of each treatment by gender (Female, Male) with row totals. A Chi-square test of independence was applied to check whether treatment type is associated with gender. For this dataset (N=11), the test statistic is $\chi^2 = 7.639$ with $p = 0.571$. As $p >$

0.05, there is no statistically significant association between treatment type and gender in this sample.

Two patients were identified with intraperitoneal bladder rupture, necessitating immediate exploratory laparotomy and a two-layer bladder repair using Vicryl 2-0 sutures, along with the implantation of a suprapubic catheter (SPC), a per-urethral catheter (PUC), and an abdominal drain. Case 1: A 5-year-old male, who underwent surgery for a left congenital inguinal hernia, experienced anuria and intense abdominal pain on the first postoperative day. Intraoperative observations indicated a 4×3 cm laceration on the left anterolateral wall of the bladder. The bladder was sutured in two layers while simultaneously doing hernia repair. On postoperative day 3, the drain output escalated to approximately 500 mL per day, which was addressed conservatively with antibiotics and bladder relaxants. The patient exhibited satisfactory recovery and was released on the tenth postoperative day. Case 2: A 30-year-old multiparous woman (GPAL) arrived in septic shock subsequent to spontaneous abortion, with acute abdomen and anuria. The CECT of the abdomen and pelvis indicated a rupture of the urinary bladder accompanied by a significant intraperitoneal fluid accumulation. An emergency laparotomy resulted in the drainage of approximately 2 litres of purulent fluid, and a 6×5 cm defect in the posterior wall was observed. Both ureteric orifices were preserved; bilateral double-J stents were inserted prior to bladder reconstruction. The patient experienced a progressive recovery through intensive care, intravenous antibiotics, and supportive therapy.

Sr No	Age	Sex	Diagnosis				Treatment						Chi-square	P-Value
1		M	Paraphimosis				Paraphimosis reduction with circumsicion						(χ^2) 7.639	0.571
2		M	Priapism											
3		M	Bladder rupture (Iatrogenic)				Emergency exploratory laparotomy with bladder repair							
4		M	Rt pyonephrosis				Rt PCN placement							
5		M	Fournier's Gangrene				Debridement							
6		M	Testicular torsion				Orchidectomy							
7		F	Rt pyelonephritis				Rt DJ stenting							
8		M	Urinary retention				SPC placement							
9		M	Penile injury				SPC placement							
10		M	Penile gangrene				Penile amputation							
11		F	Urinary bladder rupture with septic shock				Emergency exploratory laoarotomy with bladder repair.							
Treatment	Bladder Rupture	Fourniers Gangrene	Paraphimosis	Penile Gangrene	Penile Injury	Priapism	Rt Pylonephritis	Rt Pyonephrosis	Testicular Torsion	Urinary Bladder Rupture	Urinary Retention	Row Total	Chi-square (χ^2)	P-value
Treatment	0	0	0	0	0	1	0	0	0	0	0	1	99.000	0.242
Debridement	0	1	0	0	0	0	0	0	0	0	0	1		
Emergency Exploratory Laparotomy With Bladder Repair	1	0	0	0	0	0	0	0	0	1	0	2		
Orchidectomy	0	0	0	0	0	0	0	0	1	0	0	1		
Paraphimosis Reduction With Circumcision	0	0	1	0	0	0	0	0	0	0	0	1		
Penile Amputation	0	0	0	1	0	0	0	0	0	0	0	1		
RT DJ Stenting	0	0	0	0	0	0	1	0	0	0	0	1		
RT PCN Placement	0	0	0	0	0	0	0	1	0	0	0	1		
SPC Placement	0	0	0	0	0	0	0	0	0	0	1	1		
SPC Placement With Wound Closure	0	0	0	0	1	0	0	0	0	0	0	1		

Table 2 shows how each treatment is distributed across diagnoses, with row totals. A Chi-square test of independence was performed to examine the association between treatment type and diagnosis. The test statistic is $\chi^2 = 99.000$ with $p = 0.242$. Since $p > 0.05$, the association is not statistically significant at the 5% level. Note: Many cells have very small counts (including zeros), which can affect the validity of the Chi-square approximation.

This prospective case series of 11 urological emergencies presented a wide range of conditions, including penile/genital crises (paraphimosis, priapism, penile injury/gangrene, torsion), upper tract obstruction/ infection (pyonephrosis, pyelonephritis), and two significant bladder rupture. This emphasises that urological emergencies are diverse, and a center must be equipped to manage a broad spectrum of diseases. The instances with optimal results were those in which intervention was timely (e.g., paraphimosis, priapism, pyonephrosis). The bladder rupture case in septic shock exhibited a

DISCUSSION:

longer prolonged recovery, indicating that delays and systemic impairment increase risk. In urological emergency literature, a delay in decisive care is a recognised predictor of poorer outcomes. In cases of acute scrotum or torsion, prolonged ischaemia duration affects the potential for salvaging.(15,16)

Surgical intervention remains fundamental for intricate instances. The two patients with bladder ruptures necessitated exploratory laparotomy, bladder repair, and urine diversion. The survival and functional resolution of most patients indicate that commitment to surgical principles (sufficient debridement, repair, drainage, urine diversion) is effective, even in resource-limited environments. Morbidity linked to tissue loss remains inevitable in certain cases. The patient with testicular torsion had orchidectomy due to testicular loss. The case of penile gangrene necessitated amputation. These indicate illness severity and perhaps delayed presentation; they underscore that not all situations can be remedied, especially when necrosis is already evident.

Our observation that male patients constituted the majority (9/11) aligns with the prevailing trends in urologic emergency literature, which frequently indicates a male predominance in genital and urinary crises (e.g., scrotal emergencies, bladder rupture, penile damage).

(14) B-level epidemiologic studies frequently indicate that urinary retention and haematuria constitute a significant portion of emergency urology cases, with urinary retention occurring in 20–30% of instances in low-resource environments.(2) However, these studies generally encompass a wider range of conditions, including renal colic, haematuria, and stone disease, rather than focussing solely on the most critical emergencies.

In the 2019 dataset of Osmancevic et al., nearly 71% of emergency department presentations for urological crises were male. The predominant diagnostic categories included urinary/genital infections (37%), urolithiasis (24%), and lower urinary tract symptoms, with loin pain and infectious presentations frequently observed as symptom patterns. Presentations of trauma or scrotal diseases were less prevalent. (17) In contrast, our series is predominantly focused on severe and less prevalent crises, possibly indicative of our tertiary referral function in handling the most intricate situations.

In accordance with the AUA/SMSNA 2021 guideline, our methodology of aspiration combined with intracavernosal phenylephrine (with irrigation as necessary) aligns with the suggested first-line intervention for acute ischaemic priapism, reserving surgical shunting solely for instances where conservative approaches are ineffective. (18) The duration of ischaemia is the principal prognostic factor: episodes lasting beyond 24–36 hours correlate with a significantly diminished probability of erectile recovery. (18) Certain centres recommend commencing therapy within 4–6 hours when possible to enhance effects. (18)

Intraperitoneal bladder rupture is a surgical emergency, as spontaneous healing is unlikely due to urinary leakage into the peritoneal cavity. Guidelines from trauma and urology practice favor surgical repair, drainage, and urinary diversion (SPC, PUC) for intraperitoneal cases, reserving conservative management for limited extraperitoneal tears in stable patients without complications (7,10). Our series followed the conventional approach and had favorable outcomes.

The occurrence of paediatric bladder rupture subsequent to inguinal hernia surgery highlights an uncommon yet acknowledged iatrogenic risk: unintended damage may arise if the bladder is distended or retracted during the procedure. Certain publications underscore the necessity of intraoperative bladder decompression (e.g., through catheterisation) during these procedures to mitigate risk. (19–21)

Fournier's gangrene (necrotising fasciitis of the perineum and vaginal area) constitutes a high-mortality emergency if not promptly treated. Standard recommendations encompass prompt, vigorous surgical debridement, broad-spectrum intravenous antibiotics, multiple "second-look" procedures, and supportive treatment (resuscitation, ICU). (22) In various cohorts, mortality rates vary from 6% to over 20%, contingent upon comorbidities and delays in treatment. The sole patient survived, presumably because to timely debridement and supportive care. (13,23)

Prompt surgical intervention is the established gold standard for

suspected torsion. Research indicates that salvaging rates decline sharply after 6–8 hours of ischaemia. In a postponed presentation, orchidectomy may be indispensable, as demonstrated in our instance. Certain series indicate salvage rates of 70–90% when intervention occurs within the critical time frame; beyond this period, rates diminish significantly.(11,24,25)

Pyonephrosis and blocked pyelonephritis require immediate decompression (via percutaneous nephrostomy or ureteral stenting) together with medications to avert sepsis and renal injury. This is a regular practice in urological literature. In high-volume series, such individuals represent a significant proportion of urological emergencies. (26,27) Our management and results align with such practices.

Our research possesses many strengths and drawbacks. The prospective design mitigates recall bias and facilitates accurate documentation of timing, interventions, and outcomes. Additionally, the varied case mix, encompassing rare and severe conditions like paediatric bladder rupture and septic adult emergencies, offers extensive insight into tertiary-level urological emergencies. The series also illustrates actual resource limitations at a semi-urban Indian tertiary hospital, rendering the findings pertinent to analogous environments. The limitations encompass a small sample size (n = 11), which precludes statistical inference or multivariate analysis; a short-term follow-up restricted to discharge without evaluation of long-term functional outcomes; and selection bias, as the tertiary referral nature likely skews the cohort towards more complex or delayed presentations, potentially misrepresenting milder urological emergencies managed in other settings.

CONCLUSION

Urological crises include several acute diseases that require prompt diagnosis and decisive intervention to avert considerable morbidity and fatality. In this cohort of 11 patients, timely surgical intervention and compliance with known care procedures resulted in positive results in most cases. Prolonged presentation and acute infection were significant factors leading to consequences including tissue necrosis and sepsis. The results underscore the significance of prompt identification, swift referral, and interdisciplinary readiness, particularly in resource-constrained environments. Enhancing emergency triage procedures, assuring surgical preparedness, and fostering knowledge at peripheral healthcare levels can significantly improve outcomes for patients with urological problems.

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