

ORIGINAL RESEARCH

Clot retention - A retrospective evaluation to identify various etiologies and management outcomes of patients presented in emergency at a tertiary care centre of Northern India

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ABSTRACT

Objective: Retrospective evaluation of patients presented with haematuria and clot retention due to various etiologies and assessing the management outcomes in a tertiary care centre. **Methods:** Between 2011 to 2021, patients presented with retention of urine due to blood clots in emergency ward were included in the present study. After initial stabilisation of vital parameters, clot evacuation was performed under regional or general anaesthesia. Patients with active bleeding from bladder underwent fulguration of bleeding points. Post operatively continuous saline irrigation was started till urine became clear. Definitive management of the patients was done once patient was stabilised. **Results:** The mean patient age was 55 years (38-80 years) and mean duration of hematuria was 24 hours (8-96 hours). Males were more common sufferers than females (4:1). Of 418 patients, 397(90%) were managed by resuscitation with intravenous fluids, blood transfusion and emergency clot evacuation. The most common etiology for bladder clots was bladder tumour (39.23%) followed by prostatic bleed (25.11%) including benign prostatic hyperplasia and carcinoma prostate, renal and upper tract tumours, kidney stones, chylohematuria, urinary tract infection and rarely hemorrhagic cystitis. **Conclusion:** Initial resuscitation followed by emergency cystoscopy and clot evacuation is life saving procedure in patients presenting with gross hematuria with clot retention. Definitive management of causative factor can prevent further episodes of such painful and life threatening condition.

Keywords: Blood clot, Hematuria, Cystoscopy, Retention.

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INTRODUCTION

Gross hematuria with retention of blood clots in urinary bladder is a urological emergency. Many of such patients present with painful acute retention, supra pubic pain with bladder lump, inability to pass urine due to obstruction of urine flow by large clots and varying degree of hemodynamic instability. Emergency cystoscopy and clot evacuation is warranted followed by management of cause of bleeding and supportive treatments in these patients. A careful history and examination is prudent to identify the cause of hematuria. We retrospectively evaluated the patients who presented with clot retention in our emergency department to identify various etiologies,

management and overall outcomes of such patients in a tertiary care centre.

MATERIAL AND METHODS

Between 2011 and 2021, all patients presented with hematuria and clots with retention of urine managed in our hospital were included. Demographic and clinical parameters, etiology of clot retention and outcome of patients were analyzed retrospectively. Assessment included clinical history, physical examination, assessment of vitals and fitness to undergo emergency surgery, presence or absence of renal failure, details of previous urological surgery, co-morbidities and history of drug intake. Hemogram, renal and liver

function test, serum albumin and total protein, urine examination and culture, serum electrolytes and detailed coagulation profile were recorded.

Imaging studies including X ray and ultrasound kidney, ureter and bladder (KUB), computed tomography scan (CT scan) and magnetic resonance imaging (MRI) whichever was available in our records were seen. Patients underwent clot evacuation with cystoscope under regional or general anaesthesia after stabilisation of vital parameters and proper consent for the operation. Patients with active bleeding from bladder underwent fulguration of bleeding points. A Foley catheter was placed and continuous saline irrigation was started in post-operative period till urine became clear. The patients who were on suprapubic catheter were managed by clot evacuation after putting amplatz sheath, through their cystostomy, a technique reported by us earlier.¹

Blood transfusion was given in patients with drop of haemoglobin < 8 gm%. Patients were given broad spectrum antibiotics and fresh frozen plasma if coagulation profile was deranged. Patients with upper tract haematuria were evaluated by contrast enhanced computed tomography scan of kidney, ureter and bladder after stabilisation of general condition and clot evacuation. Definitive treatment of cause was done in different operative session.

RESULTS

The present study included 418 patients from 2011 to 2021, presented with gross hematuria with clot

retention and underwent clot evacuation as initial primary treatment in emergency department. The clinical characteristics are shown in table 1. Mean patient age was 55 years (range-18 to 80 years). Majority of patients were males (81%). Mean duration of hematuria was 24 hours ranging from 8 to 96 hours. In 162 (38.7%) patients initial blood transfusion was required because of low hematocrit and fresh frozen plasma was administered in 44 (10.5%) patients due to deranged coagulation profile. In 95 patients the renal function was deranged in whom ultrasonography was suggestive of bilateral moderate to severe upper tract dilatation or unilateral upper tract dilatation with contralateral echogenic and small kidney.

The causes of hematuria are shown in table 2. The most common cause of hematuria was bladder tumour (39.2%). Other causes were benign prostatic hyperplasia and carcinoma prostate (25.11%), renal and upper tract tumours (5.26%), haematuria following TURP and TURBT (4.78%), urinary tract infection (3.58%) and chylohematuria (3.58%). Less common causes included renal and urethral trauma, radiation cystitis, operated nephrolithotomy and cystolithotomy at other hospitals and patients with chronic history of taking antiplatelet and anticoagulant drugs. Two patients presented with clots in orthotopicneobladder due to pouchitis and were managed by cystoscopic clot evacuation, intravenous fluids and antibiotics. The cause of hematuria in such patients was severe pouchitis.

Table 1: Demographics and clinical characteristics

No of pts	418
Age in yrs(mean±SD)	55 (18-80 yrs)
Sex(M;F)	339;79
Co morbidities(DM, HTN, CAD, Drugs including anti coagulants) if any	140
Duration of hematuria(mean±SD)	24 hrs(8-96 hrs)
Blood transfusion(n)	162
Deranged Coagulation profile(n)	44
Deranged renal function(n)	95

Table 2: Various etiologies of hematuria

Etiology of haematuria	No of patients
Bladder tumour	164
Benign prostatic hyperplasia(BPH)	70
Carcinoma prostate	35
Renal and upper tract tumours	22
Post TURP and TURBT(done at other hospitals)	20
Chylohematuria	15
Urinary tract infection	15
Radiation cystitis	10
History of Nephrolithotomy with residual stones	10
Renal/urethral trauma	10
Glomerulonephritis and uraemia	10
Decompression hematuria following catheterisation for chronic retention	9
Antiplatelet/anticoagulant drug induced	7
Staghorn renal stones	6
Open cystolithotomy	4

Post percutaneous nephrolithotomy(done at other hospitals)	4
Hematuria in neobladder/conduit	2
Cyclophosphamide haemorrhagic cystitis	2
Unknown	3

Of 164 cases of bladder tumour, 160 patients were subjected to trans-urethral resection of bladder tumour (TURBT) under regional or general anaesthesia and their disease was staged according to TNM classification. Four patients could not be resuscitated and died before taken for emergency clot evacuation. Single perioperative dose of Mitomycin C was instilled in 70 patients within 6 hours with superficial looking tumour. Superficial bladder tumour (Ta or T1) was found in 106 patients whereas 54 had muscle invasive disease on histopathological examination. 44 Patients with muscle invasive bladder tumour underwent radical cystectomy and urinary diversion. Patients with haematuria of prostatic origin (BPH, carcinoma prostate) were given 5 α reductase inhibitors to reduce prostatic vascularity and then underwent transurethral resection of prostate (TURP) in BPH and channel TURP for carcinoma prostate.

Forty four patients had deranged coagulation profile at the time of admission. Besides initial resuscitation, there coagulation profile was optimized by transfusion of deficient clotting factors, fresh frozen plasma and vitamin K injection. It was followed by clot evacuation. 3 (10) patients with haematuria following nephrolithotomy were subjected to nephrectomy due to persistent bleeding. Super selective angioembolisation was done in 2 (4) patients who had persistent bleeding after PNL. Patients with complete staghorn calculus and large stone burden (6) were managed by anatrophicnephrolithotomy.

DISCUSSION

Hematuria is defined as a clinical condition of presence of blood in urine which can be either due to benign or malignant diseases of the urinary system. Spectrum of hematuria varies from microscopic to gross hematuria with passage of blood clots and varying degrees of hemodynamic instability.^{2,3} The source of the blood in urine can be from any part of urinary system like kidneys, ureter, bladder, urethra, or prostate gland. Patients usually presents in emergency department once they notice blood in urine. Hematuria of any degree should be regarded as a sign of malignancy until proved otherwise.

Hematuria with passage of blood clots indicates that hematuria is of significant degree and it increases the chance of detecting major urological disease. It may or may not be painful. The prevalence of gross hematuria is 2.5-3 % and it accounts for 4-20% of all urological visits.^{4,5}

Patients presenting with bladder clot retention in the emergency department should be completely evaluated with blood investigations such as hemogram, renal function test, urine examination and imaging studies including X ray and ultrasound kidney, ureter, bladder

(KUB). Once patient is haemodynamically stable further imaging with intravenous urography (IVU), contrast enhanced computed tomography (CECT) scan or magnetic resonance urography (MRU) should be done to identify the etiology of hematuria. Cysto-urethroscopy is although invasive procedure but it is most vital in assessment of patients with bladder clots and simultaneously it allows clot evacuation.

Derek hicks et al⁶ in a review article on management of macroscopic haematuria in the emergency department suggested the need for complete evaluation to find out the cause of hematuria and also the treatment pathway for such patients. Goonewardena SA and Abeygunasekera AM in their prospective study in 174 consecutive patients to examine the causes of macroscopic hematuria and to evaluate the role of cystoscopy in their investigation found that gross hematuria in a patient over the age of 40 years could be due to bladder cancer and merits cysto-urethroscopy in them.⁷

In our study the most common cause of hematuria with clot was bladder tumor. These patients need early diagnosis of their disease so that they can be managed with curative intent. The characteristic of haematuria due to bladder tumour is the presence of clots which predispose to clot retention and needs emergency admission. The definitive management of bladder cancer is TURBT and tumour staging by TNM classification. In non-muscle invasive tumours (Tis, T_a, T₁), intravesical BCG/Mitomycin C instillations are recommended.^{8,9} For muscle invasive bladder tumours standard treatment is radical cystectomy with urinary diversion.¹⁰ This treatment was done in 44 patients in the present series.

Haematuria of prostatic origin may be gross and may lead to clot retention. The causes of prostatic haematuria are due to BPH, prostatitis, carcinoma prostate, following prostate biopsy or it can also complicate prostatic surgery like open prostatectomy, transurethral resection of prostate (TURP), brachytherapy for carcinoma prostate or transurethral vaporisation of prostate.^{13,14} The proposed cause of prostatic hematuria is secondary to an increased sub urethral microvessel density (MVD) in patients with BPH.¹⁵

Initial management is consisting of bed rest to avoid increased pelvic venous pressure and placement of a Foley catheter and continuous bladder irrigation. The various medical management options proposed in English literature are 5-alpha reductase inhibitors, antiandrogens, luteinizing hormone-releasing hormone (LHRH) agonists or antagonists and aminocaproic acid. Hyperbaric oxygen, alum, and silver nitrate irrigations have also been described in English literature.^{16,17} The therapeutic surgical and minimally

invasive endoscopic treatments are TURP, transurethral fulguration and vaporization of the prostate with laser and prostatectomy (open, laparoscopic or robotic) and urinary diversion. Interventional radiologic techniques involving trans arterial embolization, specifically selective arterial prostatic embolization (SAPE) have been performed for prostatic hematuria by Ardeshir et al.¹⁸ In the present study prostatic hematuria was the second most common cause and these patients were managed by one or more of the above mentioned methods. None of these patients underwent prostatic embolization to control hematuria.

The initial management of post PCNL haematuria is resuscitation, hydration and bed rest. The blood transfusion may be required for severe haematuria with hemodynamic instability. The incidence of post PCNL haematuria requiring blood transfusion varies from 6-20 % and the cause could be due to arterio venous fistula or pseudo aneurysm.^{11,12} CECT is the method of choice for diagnosis of these entities and super selective angioembolization is the treatment of choice in such cases. The management of post nephrolithotomy haematuria is similar to the post PCNL haematuria. In settings where there is lack of facility for angioembolization, nephrectomy is life-saving procedure in severe haematuria with hemodynamic instability.

Haemorrhagic cystitis (HC) can be either acute or chronic and can be caused by chemotherapeutic agents like cyclophosphamide and ifosfamide, radiation therapy (RT) or exposure to chemicals.¹⁹ Initial management consist of hydration, clot evacuation followed by bladder irrigation and cystoscopic fulguration of bleeding sites. Severe cases are associated with increased morbidity, prolonged hospitalisation and may require aggressive measures like supravescical urinary diversion, vesical artery selective embolization, and cystectomy.²⁰ In the present study 12 cases presented with haemorrhagic cystitis were managed by hydration, blood transfusion, clot evacuation and fulguration of bleeding sites.

Chylohematuria is the passage of milky white urine mixed with blood. Severe degree of chylohematuria is associated with passage of clots and sometimes may cause urinary retention. Management of such cases include emergency clot evacuation followed by definitive management with dietary modifications, diethyl carbamazine, sclerotherapy and surgery. Surgery is the treatment of choice for severe chyluria associated with passage of clots.²² In our limited experience of such cases, dietary modification and sclerotherapy was done in all 15 cases of chylohematuria with success rate of 66.6 %. Lympho-venous dissection was done in 7 cases with persistent symptoms of chylohematuria after sclerotherapy.

Other causes of hematuria in the present study were post traumatic hematuria, renal and upper tract tumors, antiplatelet and anti-coagulant induced and decompression hematuria.

The major limitation of the present study is that it is retrospective in nature.

CONCLUSION

Initial resuscitation, emergency cystoscopy and clot evacuation are life saving procedures in patients presenting with gross hematuria with clot retention. Definitive management of the causative factor can prevent the further episodes of such painful and life threatening condition.

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