HEMATOSPERMIA SECONDARY TO URETHRAL VARICES: AN UNDERRECOGNIZED CLINICAL ENTITY

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Hematospermia, the presence of red blood cells in semen, has various causes, with urethral varices being a rare and under-researched etiology. This study investigated 54 males presenting with hematospermia and subsequently diagnosed with urethral varices via retrograde urethroscopy. The mean age of the patients was 48 ± 11.11 years old. The most common symptom was hematuria after sexual intercourse, occurring in 90.7% of cases. The average duration of symptoms was 17.46 months. The most common location of varices was between the 4 and 8 o'clock positions (81.5%) and around the external urethral sphincter (90.7%). Patients who received a diagnosis more than six months after symptom onset experienced a significantly higher frequency of symptom recurrence within one month compared to those diagnosed earlier (p = 0.01). These findings suggest that urethral varices should be considered in the differential diagnosis of hematospermia, especially in patients with persistent symptoms and post-coital hematuria, and that early endoscopic evaluation may help reduce symptom recurrence.

Keywords: Hematospermia, hematuria, urethral varices, urethrocystoscopy.

I. INTRODUCTION

Hematospermia, or the presence of blood in semen, is an abnormal manifestation of the male reproductive system.[1] It can be classified into two types: macroscopic hematospermia, which is visible to the naked eye, and microscopic hematospermia, which is detectable only through microscopic examination.[2]

Hematospermia may also be accompanied by other symptoms such as hematuria following ejaculation, urethral bleeding occurring during penile erection or after sexual intercourse. Although hematospermia is often benign and self-limiting, it can lead to significant anxiety and psychological distress in affected individuals. Many patients fear that the condition may indicate a sexually transmitted infection or even malignancy, resulting in prolonged emotional stress. Persistent anxiety can subsequently contribute to erectile dysfunction, decreased libido, and an overall decline in sexual quality of life.[3]

Hemospermia caused by urethral varices is one of the treatable causes of blood in the semen. However, it is still easy to misdiagnose and mistreat due to its atypical clinical manifestations and an overall lack of relevant knowledge in this area.[4] Currently, the diagnosis of urethral varices is primarily based on clinical presentation combined with urethroscopy, which allows direct visualization of dilated venous plexuses within the urethral mucosa.[5] In addition, transrectal ultrasonography (TRUS) and pelvic magnetic resonance imaging (MRI) are essential for excluding other potential causes of hematospermia, particularly those originating from the seminal tract.

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As a rare condition, urethral varices remain poorly characterized in the existing literature, with most reports being anecdotal or lacking detailed clinical and paraclinical descriptions. Therefore, we conducted this study to investigate the clinical and paraclinical characteristics of patients presenting with hematospermia secondary to urethral varices, with the aim of contributing to a better understanding and improved diagnostic approach to this uncommon entity.

II. MATERIALS AND METHODS

1. Subjects

All patients diagnosed with hematospermia caused by urethral varices underwent transurethral endoscopic surgery at the Department of Andrology and Sexual Medicine, Hanoi Medical University Hospital.

Selection criteria

- Male patients presenting with the following symptoms: hematuria after ejaculation, urethral bleeding during penile erection, or hematospermia.

- Diagnosis confirmed by urethrocystoscopy revealing dilated venous varices in the urethra.

Exclusion Criteria

- Presence of an identifiable alternative cause of hematuria, such as urethritis, urinary tract stones, genitourinary tuberculosis, or urologic malignancy.

- Active urinary tract infection at the time of evaluation.

- Coagulopathy or ongoing anticoagulant therapy that could not be temporarily discontinued.

2. Methods

Study design

A cross-sectional study.

Time study

The study was conducted from January 2022 to April 2025.

Sampling and sample size

The sample size of the study was taken by the convenience sampling method. 54 patients who met all the criteria were recruited for the study.

Data analysis

The collected data were entered and analyzed using SPSS version 20. All variables were presented as mean ± standard deviation for quantitative data or as frequency (percentage) for qualitative variables. Continuous variables are described as mean ± standard deviation, the difference between the two groups is estimated by the algorithm T-student test for normally distributed variables and Mann Whitney test for nonnormally distributed variables. Categorical variables were described as numbers and percentages, the difference between the ratios was estimated using algorithm X^2 or Fisher's exact tests. p-value < 0.05 was considered to be statistically significant.

3. Research ethics

This study received approval from the Directorate of Hanoi Medical University's Hospital for using patients' medical records. The patients' information was protected. Results from this study would be only used for research purposes to serve and protect community health.

III. RESULTS

The mean age of the study population was 48 ± 11.11 years old, with the 40–59 age group accounting for 68.5%. This represents the middle-aged male population. The condition was commonly observed among men living in rural areas, where manual labor is predominant. Three patients had a history of previous surgical treatment for urethral varices but experienced recurrence. Regarding substance use history, 27.8% of patients were smokers, and 57.4% reported alcohol consumption.

Table 1. General characteristics of the study subjects

Characteristics	n	%
Age (year) (Mean ± SD = 48 ± 11.11)		
< 40	10	18.6
40 - 49	18	33.3
> 49	26	48.2
Area	*54*	
Rural	19	35.2
Urban	35	64.8
History of surgical cauterization of urethral varices	*54*	
Surgically treated	3	5.6
Not surgically treated	51	94.4
History of tobacco and alcohol use		
Tobacco	54	
Current smoker	15	27.8
Non-smoker	39	72.2
Alcohol	54	
Alcohol user	23	57.4
Non-drinker	31	42.6

Table 2. Clinical characteristics of the study subjects

Characteristics	n	%	Mean	Medium	IQR
Reason for Hospital Admission	54				
Hematuria after sexual intercourse	30	55.5			
Urethral bleeding during penile erection	14	25.9			
Hematospermia	10	18.5			
Clinical Symptoms of Urethral Varices					
Hematuria after sexual intercourse	54				
Yes	49	90.7			
No	5	9.3			

Characteristics	n	%	Mean	Medium	IQR
Clinical Symptoms of Urethral Varices					
Urethral bleeding during penile erection	54				
Yes	42	77.8			
No	12	22.2			
Hematospermia	54				
Yes	34	63			
No	20	37			
Symptom frequency over a one-month period (in episodes)					
Once	5	9.3			
2 to 5 episodes	4	7.4			
More than 5 episodes	45	83.3			
Duration from symptom onset to medical consultation (months)	54		17.46	8	35
≤ 6 months		48.1			
> 6 months		51.9			

The primary reason for hospital admission in most patients was postcoital hematuria, accounting for 55.5% of cases. In addition, penile bleeding during erection was observed in 25.9% of patients, while hematospermia was reported in 18.5%.In the study, 90.7% of patients presented with hematuria following ejaculation, 77.8% experienced urethral bleeding during penile erection, and 63% reported the presence of blood in the semen. The majority of patients experienced these symptoms with high frequency, with 83.3% having more than five episodes during the course of the condition. The average time from symptom onset to clinical evaluation was 17.46 months. Of these, 25% of patients exhibited symptoms for less than 1 month, while 75% had symptom durations of less than 36 months.

Table 3. Laboratory and imaging findings of the study subjects

	n	%
The location of the varix was described according to clock-face orientation	54	
From the 12 to 4 o'clock position	6	11
From the 4 to 8 o'clock position	44	81.5
From the 8 to 12 o'clock position	4	7.5
Varix location relative to urethral segments	54	
Around the verumontanum	5	9.3
At the external urethral sphincter	49	90.7

	n	%
Classification of varix size based on diameter measured during endoscopy		
(< 5mm)	19	35.2
(≥ 5mm)	32	64.8
Red blood cells in urinalysis		
Red blood cells present	27	50
No red blood cells detected	27	50
Transrectal ultrasound and prostate MRI imaging findings		
Abnormality of the vas deferens	3	5.5
Abnormality of the seminal vesicles	7	13
Normal imaging findings	44	81.5

In this study, the most common location of urethral varices was between the 4 and 8 o'clock positions, accounting for 81.5% of cases. Anatomically, the varices were most frequently found in the external sphincter region of the posterior urethra, observed in 90.7% of patients. The size of the varices was greater than 5 mm in 64.8% of cases.

Urinalysis revealed the presence of red blood cells in 50% of patients. Notably, 81.5% of patients had no abnormality detected on transrectal ultrasonography or pelvic MRI.

Table 4. Characteristic comparison by duration of illness

Disease duration / Characteristics	≤ 6 months		> 6 months		p
	Mean ± SD	n (%)	Mean ± SD	n (%)	
Age	45.6 ± 9.8		49.1 ±12.2		0.26
Classification of varix size based on diameter measured during endoscopy					0.5
(< 5mm)		30.8		39.3	
(≥ 5mm)		69.2		60.7	
Symptom frequency over a one-month period (in episodes)					0.01
Once		19.2		0	
2 to 5 episodes		11.5		3.6	
More than 5 episodes		69.2		96.4	
The location of the varix was described according to clock-face orientation					0.74
From the 12 to 4 o'clock position		7.7		14.3	
From the 4 to 8 o'clock position		84.6		78.6	
From the 8 to 12 o'clock position		7.7		7.1	

Characteristics \ Disease duration	≤ 6 months		> 6 months		p
	Mean ± SD	n (%)	Mean ± SD	n (%)	
Varix location relative to urethral segments					0.58
Around the erumontanum		11.5		7.1	
At the external urethral sphincter		88.5		92.9	

The data table shows no significant difference in age, varix size observed via urethroscopy, or the location of the varices between the groups with symptom duration of more or less than 6 months. However, the frequency of symptom occurrence within one month was significantly higher in the group diagnosed after more than 6 months. (p = 0.01)

IV. DISCUSSION

Hematospermia and urethral bleeding during erection caused by urethral varices represent a rare clinical condition. According to a comprehensive review, only 23 male cases were reported between 2000 and 2023.[6] Mos t recently,Papp reported that urethral varices accounted for 4 – 7% of 122 cases of urethral bleeding.[7]

Our results showed that the mean age at diagnosis was 48 ± 11.11 years old, with the highest prevalence observed in the 40 – 59 age group. Saito reported a series of 20 patients aged between 38 and 82 years old (mean age 63), with 90% of cases occurring in individuals over 50 years old.[8] Another study by Zhao Ming Huang found a mean age of 44.1 ± 10.2 years old.[5] These findings suggest that the condition predominantly affects middle-aged men. To explain this, middle age is a period during which sexual activity is generally still maintained. However, vascular wall integrity naturally declines with age. Concurrently, testosterone levels gradually decrease over time. This decline in testosterone contributes to impaired function and reduced structural strength of the veins.[9,10] Regular tobacco use was reported by 27.8% of participants, and 57.4% indicated frequent alcohol consumption. A study by Ahti T.M. found that regular alcohol intake was associated with an increased risk of developing varicose veins in general. However, tobacco use did not show a clear association with this condition.[11] Three patients in our study had a history of endoscopic coagulation surgery for urethral varices but experienced recurrence. All three reported habitual alcohol consumption both before and after the procedure and did not attend follow-up visits postoperatively. This suggests that urethral varices have the potential to recur, especially in cases where contributing risk factors such as elevated venous pressure or compromised vascular integrity are not adequately addressed.

The majority of patients were admitted due to postcoital hematuria (55.5%) and urethral bleeding during penile erection prior to intercourse (25.9%). These symptoms tend to be more noticeable than hematospermia, which patients often only detect incidentally such as when wearing a condom or during masturbation. This finding aligns with evidence that vascular lesions in the posterior urethra, frequently manifest as postejaculatory or posterection hematuria, with hematospermia being secondary and often underreported.[5] The clinical presentation of hematospermia in this study demonstrated considerable heterogeneity: 90.7% of patients experienced hematuria following sexual activity, 77.8% reported urethral bleeding during penile

erection preceding intercourse, and 63% exhibited hematospermia. In a study by Zhao Ming Huang involving 39 patients, 100% had hematuria after ejaculation, and 48.7% experienced bleeding during erection.[5] These findings indicate that hematuria following intercourse is the most commonly observed symptom. A possible explanation for this pattern is that sexual activity and ejaculation increase pelvic blood flow and intracavernosal pressure, which may exacerbate the fragility of urethral varices, leading to bleeding into the urethra and bladder neck area, resulting in visible hematuria post-intercourse.[8,10] A total of 83.3% of patients reported experiencing symptoms on more than five occasions within a one-month period. The mean duration of the condition was 14.48 ± 16.92 months, ranging from 1 to 60 months. In comparison, a previous study reported that 61.5% (24/39) of patients had a disease history of more than one year, and 23.1% (9/39) had been affected for over five years. These findings suggest that most of these patients continued to suffer despite multiple episodes, likely due to delayed diagnosis and suboptimal or inappropriate treatment.[5]

Variceal clusters were most commonly observed at the 4 – 8 o'clock position, accounting for 81.5% of cases, which is consistent with previous findings reporting frequent localization at the 6 o'clock position and around the external urethral sphincter (87.2%).[5] In our cohort, 90.7% of the varices were located at the level of the external urethral sphincter. Saito suggested that increased intraluminal urethral pressure around the external sphincter, along with elevated venous pressure, contributes to the development of urethral varices.[8] The most commonly observed size of the variceal clusters in this study was greater than 5 mm, accounting for 64.8% of cases. The size was estimated by comparing it to the depth of the electrosurgical loop (4 – 5mm).[5] This finding is consistent with the study by Saito, which reported that varices larger than 5 mm are typically identified during cystoscopic examination.[8]

Red blood cells were detected in the routine urinalysis of 50% of patients. This indicates that the absence of hematuria does not rule out the presence of urethral varices. However, urinalysis remains useful for excluding other potential causes of hematuria, such as urinary tract infections or glomerulonephritis. On transrectal ultrasound and pelvic MRI, no abnormality was detected in 81.5% of cases. Abnormalities of the vas deferens, including stones or blood-tinged fluid, were observed in 5.5% of patients. Additionally, 13% showed thickening of the seminal vesicle wall accompanied by hemorrhagic fluid. There were 13 out of 22 cases with red blood cells detected in the semen analysis. Among 9 patients who underwent histopathological examination after surgery, all results confirmed venous dilation with fibrosis. This is consistent with previous studies, indicating that cavernous hemangioma is the most commonly encountered type in the urinary system, characterized by dilated venous structures.[13] In the study by Zao-Ming Huang, histopathological examination revealed venous dilation in 15 out of 18 case.[5]

Prolonged symptom duration (> 6 months) was significantly correlated with increased recurrence of urethral varices symptoms ($p = 0.01$). This suggests that a longer duration of untreated or undiagnosed urethral varices may contribute to more persistent or recurrent clinical manifestations, particularly gross hematuria and post-ejaculatory urethral bleeding. The delayed diagnosis of urethral varices has been previously reported in the literature, with some case reports noting diagnostic delays ranging from several months to over a decade.[4,14] This diagnostic latency is often attributed to the non-specific nature of symptoms, under-recognition of the condition, and the lack of routine

urethrocystoscopic evaluation in patients with isolated hematuria or hematospermia. A longer disease duration may contribute to an increased frequency of symptoms, potentially due to repeated sexual activity preventing adequate vascular healing, thereby leading to reduced vascular wall integrity. In contrast, hematospermia associated with seminal vesiculitis and ejaculatory duct inflammation typically presents acutely and tends to resolve with appropriate antibiotic and anti-inflammatory therapy.[15]

V. CONCLUSION

Urethral varices represent a rare but important cause of recurrent hematuria and hematospermia in male patients. Due to their nonspecific clinical presentation and under-recognition in clinical practice, diagnosis is often significantly delayed. Greater awareness among urologists and broader implementation of endoscopic assessment in patients with unexplained post-ejaculatory hematuria may help reduce diagnostic delays and associated morbidities.

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