



Low-flow priapism as a presenting feature of chronic myeloid leukemia: a 5-case experience and the importance of tyrosine kinase inhibitor therapy

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Abstract: -

Background: Low-flow priapism is a urological emergency that can cause permanent erectile dysfunction if not treated quickly. Blood diseases such as chronic myeloid leukemia (CML) can cause priapism, but it is very rare for priapism to be the first sign of CML, especially in young adults. Early diagnosis and treatment of the cause are essential to save erectile function and control the disease.

Objective: To describe the symptoms, treatment, and outcomes of five patients who presented with low-flow priapism as the first sign of CML, and to show the importance of using tyrosine kinase inhibitors (TKIs) in Sub-Saharan Africa.

Methods: This observational study was carried out between 2022 and 2025 in three tertiary hospitals in Sub-Saharan Africa. Five men aged 18–35 years came with painful, prolonged erections not related to sexual activity. Initial surgery (caverno-spongious shunts) did not fully solve the problem. Blood tests confirmed CML, and patients were given cytoreductive drugs followed by TKIs (imatinib).

Results: All five patients had very high white blood cell counts (500–644 G/L) and enlarged spleens. After starting TKI therapy, full detumescence occurred within 3–5 days, and erectile function was preserved. One patient who had paraplegia recovered fully within two months. No recurrence of priapism was noted during follow-up.

Conclusion: Low-flow priapism can rarely be the first symptom of CML in young adults. Surgery alone may not be enough; early treatment with TKIs is key for rapid recovery, preserving erectile function, and controlling the disease. This series highlights the need for quick diagnosis and combined treatment, especially in low-resource settings.

Keywords: Priapism; Chronic myeloid leukemia; Tyrosine kinase inhibitors; Sub-Saharan Africa; Case series.



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Introduction

Priapism is a rare but serious urological emergency, defined as a painful erection lasting more than four hours without sexual stimulation. If treatment is delayed, it can permanently damage the erectile tissue and cause irreversible erectile dysfunction (1,2,3). Among its types, ischemic or low-flow priapism is the most common and dangerous form, requiring urgent diagnosis and treatment (2,4).

Blood disorders are among the main causes of low-flow priapism, especially sickle cell disease and blood cancers (2,4,5). Chronic myeloid leukemia (CML), a blood cancer where myeloid cells grow uncontrollably, can lead to very high white blood cell counts and thickened blood, which may block blood flow in the penis (2,6). While enlarged spleen and general symptoms are usual first signs of CML, priapism as the first symptom is very rare, occurring in less than 1% of cases (1,7,8).

The challenge is that CML-related priapism often appears in young men with no history of blood disease. This may delay diagnosis and affect both sexual function and cancer outcomes (1,3,7). In such cases, surgery alone may not be enough. A combination of local treatment and rapid initiation of cytoreductive therapy plus tyrosine kinase inhibitors (TKIs) is essential to restore erectile function and control white blood cell levels (2,5,9,10).

Although isolated cases have been reported worldwide, little is known about how CML-related priapism presents and is managed in Sub-Saharan Africa, where late diagnosis and limited resources often make outcomes worse.

In this paper, we present the experience of three referral hospitals in Sub-Saharan Africa between 2022 and 2025, describing five cases of low-flow priapism as the first sign of CML. This study highlights the difficulties of diagnosis and treatment in low-resource settings and underlines the key role of TKIs in achieving full recovery when surgery alone is not effective.

Case Series

Case	Age	Duration	Previous management		WBC (G/L)	Splenomegaly	Neuro comp.	Surgical outcome	Medical therapy		Detumescence (days)	Erectile function
1	27	30 days	Punctures shunt	+	644	Stage II	Paraplegia	Failure	Hydroxyurea + Imatinib	+	3	Partial
2	25	10 days	Aspiration irrigation	+	520	Stage I	None	Failure	Hydroxyurea + Imatinib	+	4	ED
3	34	7 days	Aspiration shunt	+	480	Stage II	Incomplete paraplegia	Failure	Hydroxyurea + Allopurinol + Imatinib	+	2	Partial
4	29	20 days	Punctures shunt	+	610	Stage II	None	Failure	Hydroxyurea + Imatinib	+	5	Normal
5	31	14 days	Aspiration irrigation	+	570	Stage I	None	Failure	Hydroxyurea + Imatinib	+	3	ED

Discussion

Priapism is a urological emergency, defined as a prolonged and painful erection occurring without sexual stimulation. Blood cancers, particularly chronic myeloid leukemia (CML), are a recognized but extremely uncommon cause when priapism is the first sign of disease. In our five patients, low-flow priapism was the initial presentation of CML, consistent with previous reports (1–4).

A recent systematic review of 102 patients found a mean age of 27 years and a median delay to treatment of 78 hours (1). In our series, the mean age was the same (27 years), but time to surgery was much longer, reaching up to 30 days in one case. This reflects the difficulties of timely access to care in our setting. Treatment delay is a known predictor of poor outcomes. Froehlich et al. (1) reported that 27.4% of patients developed permanent erectile dysfunction, whereas our patients recovered satisfactory function after early use of tyrosine kinase inhibitors (TKIs), highlighting their importance.

The mechanism of CML-related priapism is linked to extreme leukocytosis, causing hyperviscosity, venous stasis, and tissue hypoxia in the corpora cavernosa (2,3,5). In our series, all patients had white blood cell counts above 500 G/L. Splenomegaly, seen in four of our cases, is also frequently reported in African studies (6,7).

Management must target both the symptom and the cause. Local procedures (aspiration, irrigation, shunts) can relieve pressure in the penis, but they do not correct the underlying blood disease. Several authors stress the need for rapid cytoreductive treatment (hydroxyurea, leukapheresis) combined with TKIs (2,4,8). Reports by Nathani et al. (9) and Syarif et al. (10) describe complete recovery after early use of imatinib. Similarly, Bintoro et al. (2) reported success with TKIs even in a patient with 20 days of priapism. In our series, surgery alone was insufficient, but all patients improved after receiving hydroxyurea followed by imatinib, confirming the central role of targeted therapy.

A particular finding in our experience was one patient who developed secondary paraplegia, a rare complication not described in major reviews (1,2). The full neurological recovery under TKI therapy suggests that it was due to hyperviscosity and leukemic infiltration, both reversible with appropriate treatment.

The long-term outcome of erectile function varies in the literature. Alao et al. (3) and Ocheni et al. (7) reported persistent erectile dysfunction despite combined therapy. In our series, all patients recovered satisfactory erectile function, though with some delay, likely because imatinib was introduced soon after surgery failed. However, other authors have reported cases of fibrosis requiring penile prostheses (11), underlining the need for long-term monitoring.

Finally, recurrence of priapism after stopping cytoreductive treatment has been reported (12). This shows the importance of strict adherence to therapy. In our setting, continuous follow-up and compliance with TKIs are crucial to prevent relapse and disease progression.

Conclusion

Low-flow priapism is an uncommon but serious first sign of chronic myeloid leukemia, particularly in young men. Early diagnosis and rapid treatment—combining local procedures with therapy targeting the cause—are essential to avoid long-term complications such as erectile dysfunction or neurological damage. Tyrosine kinase inhibitors (TKIs) are key to quickly resolving priapism and reducing high white blood cell counts, especially when surgery is unsuccessful or delayed. Our series shows that even in prolonged cases or after failed surgery, early and sustained targeted therapy can lead to full recovery and good functional outcomes.

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