

Priapism in Chronic Myeloid Leukemia: Meeting at the Crossroads and Heading in Different Directions

Abstract

Chronic myeloid leukemia (CML) is the most common leukemia presenting with priapism. Due to social stigma or shyness, the real incidence of priapism in our population is difficult to estimate. Since the successful development of tyrosine kinase inhibitors, the life expectancy of CML-chronic phase (CML-CP) has been comparable to the healthy population, and the importance of priapism has further magnified. As of now, the long-term outcome and fertility issues are not very well known. We present the case of a 24-year-old previously healthy gentleman who presented with priapism and was diagnosed as CML-CP. He achieved major molecular response at 18 months. On follow-up at 2 years since the diagnosis, he offers no complaint except moderate erectile dysfunction (International Index of Erectile Function score 11), compromising his quality of life.

Keywords: Chronic myeloid leukemia, erectile dysfunction, imatinib, priapism

Introduction

For more than a century, priapism has been reported to be associated with leukemia.^[1] Hematological disorders constitute the etiology of almost 20% of cases of priapism. It is most commonly seen in sickle cell disease (40%–50% of cases) followed by leukemia (5% of cases). The most common leukemia presenting with priapism is chronic myeloid leukemia (CML), and the incidence varies from 2% to 25%.^[2-4] Priapism has also been reported at presentation in acute myeloid leukemia and multiple myeloma.^[4,5] Due to social stigma or shyness, the real incidence of priapism in our population is difficult to estimate. Since the successful development of tyrosine kinase inhibitors (TKIs), the life expectancy of CML-chronic phase (CML-CP) has been comparable to the healthy population, and the importance of priapism has further magnified, as the long-term outcome and fertility issues are not very well known.

Case Report

A 24-year-old previously healthy gentleman presented with painful erection of the penis for 5-day duration. He was married for 1 year and was sexually active. There was no history of any injury, illicit drug use, or

sexual intercourse before the occurrence of priapism. He had a history of multiple such episodes which remitted on their own after a couple of hours which he had attributed to his newly married life and sexual activity. He denied any history of constitutional symptoms. His examination revealed “Triple P” (pallor – pale conjunctiva, palpable spleen – 8 cm below the left costal margin, and priapism – rigid and edematous penile shaft with soft glans penis) [Figure 1]. His hearing and visual acuity were normal along with no evidence of papilledema. There was no evidence of perineal injury, and rest of the examination was unremarkable. His blood investigation showed hemoglobin $10^7 \times 10^9/L$, white blood cell (WBC) $207 \times 10^9/L$, and platelet count $545 \times 10^9/L$. Peripheral blood smear showed immature cells of granulocytic lineage with 3% blasts. Biochemical profile was normal. Bone marrow examination was consistent with CML-CP, and real-time-polymerase chain reaction for breakpoint cluster region–Abelson murine leukemia (BCR-ABL) transcript was positive. Penile biopsy revealed infiltration by leukemia [Figure 2].

He was started on hydroxyurea (50 mg/kg/day), intravenous hydration (3 L/m²), and daily leukapheresis (total five sessions). He also required opioid analgesics to relieve

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Figure 1: Clinical image of the persistently erected, edematous penis

his pain but with little benefits. Penile aspiration with a large-bore needle was performed on three occasions to decrease penile swelling. There was a gradual decline in total leukocyte count over 5 days, but in view of persistent penile swelling and pain, he underwent surgery for distal penile shunt (corpus cavernosa–glans shunt). After 7 days of hospital stay and continued symptomatic care, his penile swelling and pain gradually reduced, and the opioid was discontinued. His WBC was $24 \times 10^9/L$ on day 8 of hospital stay. Hydroxyurea and leukopheresis were discontinued, and imatinib 400 mg once a day was started after confirming the diagnosis of CML-CP. He had a complete hematological response after 3 weeks of therapy and a suboptimal molecular response at 3 months of imatinib (BCR-ABL transcript 15%). A kinase domain mutation assay was negative, and he was nonaffording for second-generation TKI, and therefore, continued on imatinib albeit at a higher dose of 800 mg daily. He achieved major molecular response at 18 months. Two years since the diagnosis, he offers no complaint except moderate erectile dysfunction (International Index of Erectile Function [IIFE] score 11), but he can ejaculate and has been blessed with a son 2 months back.

Discussion

Priapism is defined as persistent (>4 h), painful erection of the penis in the absence of sexual stimulation. Priapism is classified as low flow (ischemic) and high flow (nonischemic). Low-flow priapism involves poor muscle contraction resulting in venous congestion and is commonly caused by intracavernosal injections for impotence or erectile dysfunction. Other causes include sickle cell disease, hematological malignancy, malignant infiltration of the penis, drugs, and alcohol. High-flow priapism is usually associated with trauma, either blunt trauma to the perineum or iatrogenic during local injection of urological procedure creating a shunt resulting in an excess flow of oxygenated blood. All cases of priapism

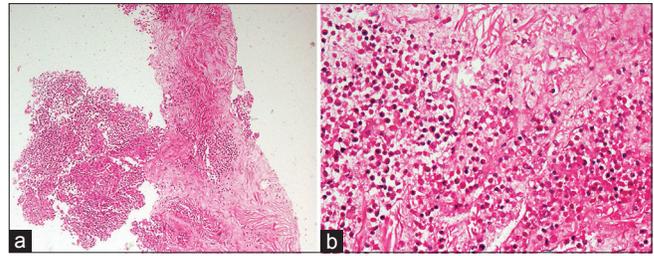


Figure 2: (a) Penile biopsy (H and E, $\times 10$) shows fibroconnective tissue with marked neutrophilic infiltration and focal necrosis. (b) Penile biopsy (H and E, $\times 40$) shows numerous admixed myelocytes and metamyelocytes

must be considered as medical emergencies, particularly low-flow priapism, which has a worse prognosis with 50% of cases developing subsequent impotence.

In CML, priapism is seen as the initial presentation, and usually patients have a history of recurrent episodes of self-remitting priapism (stuttering priapism) before reporting to the physician. The mechanism of priapism in CML is thought to be due to leukostasis and hyperviscosity. Therefore, such patients may also have other features of hyperviscosity in the form of hearing difficulty, breathlessness, visual blurring, or giddiness.^[6]

Unlike the other common complications of CML, priapism is more commonly seen in chronic phase than in blast crisis. Therefore, the response to first-generation TKI is optimal.^[7] The treatment modalities recommended include immediate medical management (hydroxyurea and analgesia), hydration, and TKI (imatinib) (on confirmation of CML).^[8] Apart from systemic treatment, it has been described that local intracavernous therapy in the form of penile aspiration, instillation of sympathomimetic drugs such as phenylephrine, and penile shunt procedures are also beneficial in bringing down the penile swelling.^[9,10] Penile biopsy is not recommended in CML with priapism. In the index case, penile biopsy was the tissue which was obtained during shunt (corpus cavernosa–glans shunt) surgery for the priapism.

The erectile dysfunction in the index patient as measured by the IIEF-5 score was 23 (i.e., no erectile dysfunction) before and 11 (moderate erectile dysfunction) after the episode of priapism.^[11,12] However, it is pertinent to note that potency and fertility were preserved although he presented late (5 days) after the onset of priapism. The reported incidence of impotence on detumescence in patients presenting late with low-flow priapism is >50%.^[8] The present finding suggests that though priapism is low flow (ischemic) in CML, it has a milder phenotype and better outcome in comparison to other types of low-flow priapism.

Conclusion

We conclude that although detection of priapism as the presenting manifestation of CML is rare, it is a medical

emergency, putting male patients at risk for developing significant erectile dysfunction, affecting the quality of life. In the modern era of TKI, where the life expectancy of CML-CP is comparable to that of the healthy population, the importance of awareness regarding intensive management of priapism is an absolute necessity to preserve the quality and productivity of young males.

Informed consent

Informed signed written consent was taken from the patient involved.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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