CASE REPORT
Intisari Sains Medis 2021, Volume 12, Number 1: 334-337
P-ISSN: 2503-3638, E-ISSN: 2089-9084

Intisari Sains Medis
Published by Intisari Sains Medis

Priapism as an initial presentation in *Chronic Myeloid Leukemia (CML)*: a case report

Ni Luh Putu Herawati[1*], Tjokorda Gde Dharmayuda[1]

[1]Hematology and Oncology Division of Internal Medicine Department, Faculty of Medicine, Universitas Udayana, Sanglah General Hospital, Denpasar, Bali, Indonesia

*Corresponding author:
Ni Luh Putu Herawati;
Hematology and Oncology Division of Internal Medicine Department, Faculty of Medicine, Universitas Udayana, Sanglah General Hospital, Denpasar, Bali, Indonesia;
herawatiniluhputu@yahoo.com

Received: 2021-02-03
Accepted: 2021-04-16
Published: 2021-04-30

ABSTRACT

Background: Priapism is a persistent, usually painful erection that lasts for more than four hours and occurs without sexual stimulation. Priapism is a rare clinical sign of Chronic Myeloid Leukemia (CML), with an incidence of 1-5 cases per 100,000 people per year. In men who suffer from CML, ischemic priapism occurs secondary to hyperleukocytosis and venous obstruction by thrombus and microthrombus.

Case Presentation: In this case, a 24-year-old male, a Balinese ethnicity, present with prolonged erectile complaints accompanied by increased pain. From the examination performed, it was concluded that the patients had the ischemic type of priapism. From CBC, the patient was obtained hyperleukocytosis and continued with peripheral blood smear and bone marrow puncture. The patients concluded with CML, and initial intervention includes therapeutic aspiration, irrigation, hydroxyurea and other supportive therapies. It is a urological emergency requiring urgent treatment to prevent long-term complications, in particular erectile dysfunction.

Conclusion: Priapism is an unusual clinical manifestation of CML, whereas priapism is a urological emergency requiring immediate therapy. Treatment delay can cause complications of erectile dysfunction in men.

Keywords: Chronic Myeloid Leukemia, Priapism, Initial Presentation.
Cite This Article: Herawati, N.L.P., Dharmayuda, T.G. 2021. Priapism as an initial presentation in *Chronic Myeloid Leukemia* (CML): a case report. *Intisari Sains Medis* 12(1): 334-337. DOI: 10.15562/ism.v12i1.986

INTRODUCTION

Priapism is a persistent, usually painful erection that lasts for more than four hours and occurs without sexual stimulation.[1] Hematological conditions are responsible for 20% of cases of priapism in men. There are two types of priapism: ischemic and non-ischemic.[1,2] Priapism is a rare clinical sign of Chronic Myeloid Leukemia (CML). Ischemic priapism in CML patients occurs due to hyperleukocytosis resulting in hyper-viscosity and venous obstruction by thrombus and microthrombus.[3]

CML is chronic leukemia which the symptoms arise slowly where the leukemia cells originate from the transformation of myeloid stem cells.[4] The incidence of CML remains worldwide 1-1.5 per 100,000 population. The onset of the age of 40-60 years may also occur in childhood or old age. The incidence rate is higher in men than women, with a prevalence of 1.41.[5] This abnormality occurs due to translocation of the long arm between chromosomes 9 and 22. CML can be hyperleukocytosis, resulting in constitutional, cardiovascular, neurological or vascular (priapism) symptoms.[5-7]

Priapism is a rare condition with an incidence of 1-5 cases per 100,000 people per year.[6,7] Persistent erection occurs in ischemic priapism, a type of compartment syndrome, with a reduced venous flow that causes stasis, acidosis and hypoxia, persistent and prolonged erectile dysfunction or priapism.[6,7] This is an emergency condition in urology that requires immediate management to prevent long-term complications.[2] Delay in management will cause persistent and prolonged erectile dysfunction or priapism. This case study aims to evaluate the priapism as an initial presentation in CML as a case report based on those mentioned above.

CASE REPORT

A 24 years old man, Balinese ethnicity, who works as a restaurant employee, came to the Sanglah General Hospital with a complaint of 16 hours of erection before being admitted to the hospital. After the patient finished sexual intercourse, the erection reoccurred. The patient complained of pain in the penis 3.5 hours after erection occurs and the pain is felt like throbbing and getting worse without any kind of position. The patient did not take vitality drugs or herbal medicine. The patient complained that the body often felt tired, decreased appetite, and lost 5 kilograms of weight in the last 2 months. History of smoking since 8 years ago, approximately finished half a pack per day, history of routine drinking alcohol was denied.

On physical examination, the patient in general weakness, axilla temperature 37.1°C, visual analog scale 4/10. Eye examination revealed anemic conjunctiva. Examination of the abdomen found spleen palpable Schuffner II, 15 cm liver span. Genitalia examination showed an erect penis, no edema, the glans penis was not hardened (Figure 1).

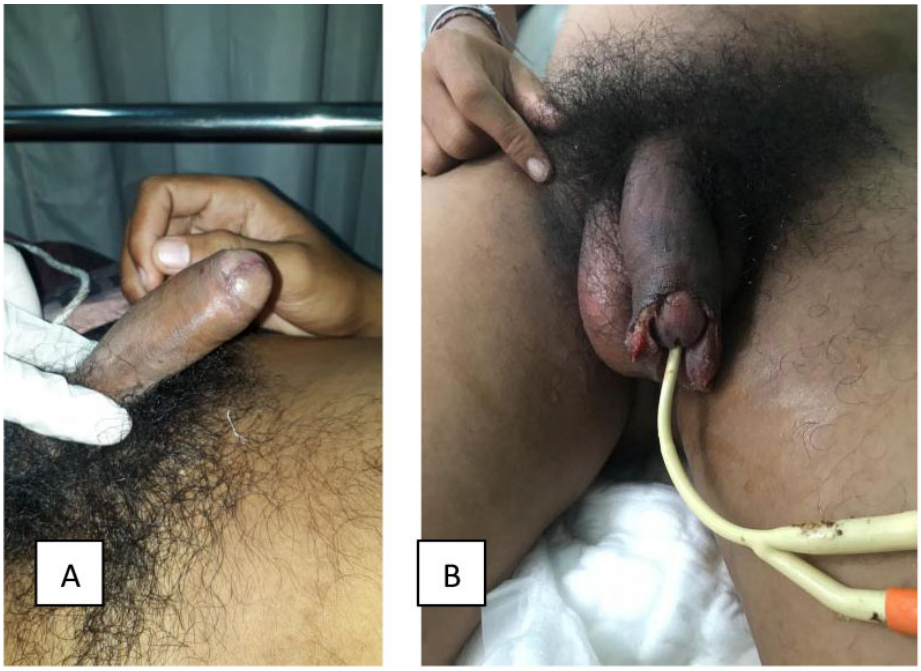

Figure 1. Picture of the patient where (a) the patient has an erection and no edema; (b) the 5th day after drainage and irrigation

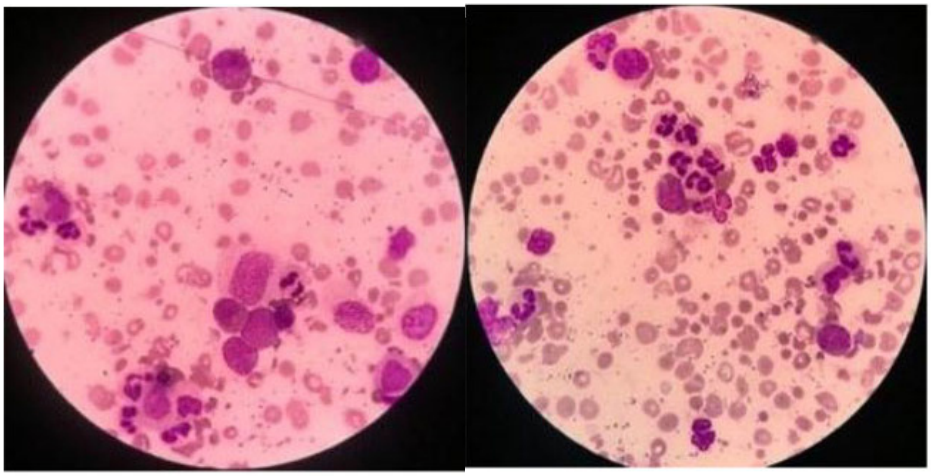

Figure 2. Bone marrow biopsy concluded with CML

Laboratory examinations at the Emergency Room valuated was white blood cell (WBC) (783x10^3/µL), Hemoglobin (Hb) (7.34 g/dL), Hematocrit (24.77%), MCV (78.16 fL), MCH (24.10 pg), MCHC (30.80), and platelets (315x10^3/µL). Based on the differential count this case study evaluated the neutrophil (708x10^3/µL), lymphocytes (33.5x10^3/µL), monocytes (22.60x10^3/µL), eosinophil (10.90x10^3/µL), basophil (7.73x10^3/µL), and reticulocytes (6.7%). Other parameters assessed were uric acid (8.8 mg/dL), Lactate Dehydrogenase (LDH) (3206 U/L) and blood gas analysis (pH: 6.44; pCO2: 72.4 mmHg; pO2: 11.50 mmHg; HCO_3^-: 4.70; SO2c: 2.1%; TCO_2: 7.00 mmol/L). Peripheral blood examination of erythrocytes, most of the cell population, hypochromic microcytic, anisopoikilocytosis, highly increased impression leukocytes found all myeloid series (myeloblast to segment neutrophils), 4% myeloblast, vacuolization (+), toxic granular (+), normal platelet impression count, suspicion of chronic myelocytic leukemia (Figure 2). Based on clinical data and supporting data, the working diagnosis of the patient was a suspected CML with an additional diagnosis of priapism.

Aspiration and irrigation were performed on the patient, Packed red cell (PRC) transfusion, allopurinol and hydroxyurea. The patient was examined for repeated blood gas analysis taken from the corpus cavernosum. Then BMP was carried out and it was found that the hematopoietic cell group consisted of a few normoblast cells, dwarf megakaryocytes, and most of them were myeloid series with maturation and no visible increase in the number of blast cells. Conclusion: Bone marrow appearance corresponds to chronic phase CML.

After the 10th day of treatment, the patient had no complaints of reoccurring erections and no complaints of pain in the penis, and there's no difficulty in urination and normal urine volume. Laboratory tests show a decrease in leukocytes to 21.05 x10^3/µL. Patients are given 1x100 mg allopurinol therapy, 2x100 mg cefixime, 1x80 mg acetosal, 2 x 2 mg folic acid, postponed hydroxyurea, and their condition monitored at the hematology polyclinic, and Philadelphia chromosome examination is carried out.

DISCUSSION

Chronic myeloid leukemia is chronic leukemia characterized by an increased number of leukocytes and all forms of granulocytes from mature to immature, where the dominant cells are myeloid cells.[4] Specific abnormality was found in the karyotype, in which the Philadelphia chromosome is present.[8] The diagnosis of CML, cytogenetic identification was performed, or molecular clonal expansion of hematopoietic stem cells was obtained through a reciprocal translocation process between chromosomes 9 and 22. Classically, CML is one of the myeloproliferative disease groups characterized by the proliferation of the granulocyte series without impaired differentiation. The peripheral blood smear can be found in all series of granulocytes.[9]

In the chronic phase, the patient only experiences feelings full quickly due to the enlarged spleen.[9] Splenomegaly is

the most common clinical sign in 40% -50% of cases.[10] Other atypical symptoms include: feeling tired, weakness of the body, fever, night sweats. Weight loss begins to occur after long-term disease, it occurs due to hypermetabolism, due to proliferation of leukemia cells.[9,10] Rare clinical manifestations include bleeding, thrombosis, gout, retinal hemorrhage and gastrointestinal tract.[11]

Routine hematological examination in the chronic phase showed that hemoglobin levels are generally normal or slightly decreased, leukocytes between 20,000-60,000/mm^3. Increased presentation of eosinophils and/or basophils. Platelets usually increase between 500,000-600,000/mm^3. The peripheral blood smears are mostly normochromic normocytes. The leukocytosis is severe and appears throughout all levels of differentiation and maturation of the myeloid series, from blast to neutrophil. The predominant ones are myelocytes and neutrophils, and the bone marrow features are highly hypercellular with myeloid hyperplasia, similar to those of peripheral blood. Megakaryocytes can be increased and the neutrophil phosphatase score is low to negative. The presence of a Philadelphia chromosome (Ph) in 95% of cases showed a reciprocal translocation of chromosomes 9 and 22.[4]

Priapism is caused by disruption of the outflow mechanism (veno-occlusion), blood cannot get out of the erectile tissue, or an increased inflow of arteriolar blood flow into the erectile tissue. Hemodynamically, priapism is divided into veno-occlusive or low-flow or ischemic-type priapism and arteriolar-type or high-flow or non-ischemic priapism. Vascular symptoms, one of which manifests as priapism, is one of the symptoms of hyperleukocytosis in CML patient.[6] Hypercatabolic symptoms, anemia syndrome, splenomegaly, hepatomegaly, were found in this case report. Complaints of an erection more than 4 hours without sexual stimulation and the pain increased after 3.5 hours.

In male patients suffering from CML, the occurrence of hyperleukocytosis causes hyper-viscosity and obstruction due to thrombus and microthrombus.[2] Other studies suggest that increased cytokines and molecular adhesion by leukemic cells caused activation of endothelial cells resulting in increased sequestration of cells at the microvascular.[3] Sexual stimulation causes an increase in parasympathetic nerve activity, which results in dilatation of the arterioles and constriction of the venules, that inflow (blood flow to the corpora) increases while the outflow (blood flow leaving the corpora) decreases; this causes an increase in the volume of blood filling the sinusoid cavities and causes penile tension. Likewise, in the flaccid phase, there is a contraction of the arterioles, contraction of the cavernous muscles, dilation of the venules to drain blood to the penile veins, and the sinusoid cavity decreases in volume. Priapism is caused by disruption of the outflow mechanism (veno-occlusion) that blood cannot get out of the erectile tissue or an increased inflow of arteriolar blood into the erectile tissue.[12]

Ischemic priapism is a persistent painful erection in which there is decreased intracavernous blood flow. It is a type of compartment syndrome, with reduced venous flow leading to stasis, acidosis and hypoxia. Ischemic is an emergency case. Delay treatment within 24-28 hours can result in permanent damage and fibrosis, leading to persistent and prolonged problems with erectile dysfunction or priapism. After 12 hours of priapism, there will be trabecular edema, and the penis looks edema at 24 hours, platelets stick to the sinusoidal basement membrane, and after 48 hours, there is necrosis of cavernous smooth muscle with sinusoidal thrombi and proliferation of fibroblasts. Ischemia lasts 24-48 hours, causing endothelial and trabecular damage, with irreversible fibrosis and calcification, leading to erectile dysfunction.[6,13] The main mechanism is the accumulation of leukemia cells in the corpus cavernosum and dorsal vein of the penis.[14,15]

Assessing malignancy and trauma in genitalia and perineum have to be done in the physical examination. The glans penis is usually not affected by priapism. In the ischemic priapism type, the corpus cavernosum is stiffer than the non-ischemic type. Hepatosplenomegaly is found in the CML patient, and for hyper-viscosity conditions, neurological examination and fundoscopy can be performed. Genital examination revealed an erect penis, no edema. From the history and physical examination, it was highly suspected that the patient had ischemic type priapism.

Blood gas analysis is taken from the corpus cavernosum, at the type of ischemic hypoxia condition will be obtained. Color duplex ultrasonography examination can be used to help differentiate ischemic and non-ischemic priapism. Ischemic type, there is no or little blood flow through the cavernous arteries.[16] Beside the history, physical examination, laboratory test and imaging, it can be concluded that this patient has ischemic type priapism. Philadelphia chromosome examination is planned to be carried out at the polyclinic.

Priapism in CML is ischemic type, data on management based on guidelines from expert panel discussions and a review of the limited data available from the American Urological Association include: CML systemic therapy, intracavernous sympathomimetic aspiration, penile shunt and prosthesis procedures, oral sympathomimetics.[17] In this case, the patient was treated for aspiration and irrigation less than 24 hours after the onset of symptoms. After irrigation and aspiration, the penis is flaccid and painless. For systemic treatment, given cytoreductive and hydration to overcome hyper-viscosity. Tyrosine kinase inhibitors (TKIs) such as Imatinib, dasatinib, and nilotinib were immediately administered when the diagnosis of CML was confirmed. Clinically the patient improves the leukocyte count decreased, there is no thrombocytopenia, and after ten days of treatment, the patient is allowed outpatient care.

CONCLUSION

Priapism is an unusual clinical manifestation of CML, whereas priapism is a urological emergency requiring immediate therapy. Treatment delay can cause complications of erectile dysfunction in men. CML patients with priapism manifestations require multidisciplinary management and involve several disciplines: emergency team, urology, and hematology. The American Urological Association strongly recommends a combined approach to the management

of priapism with CML and highlights the importance of direct local intracavernous therapy and systemic therapy for CML.

CONFLICT OF INTEREST

There is no competing interest regarding the manuscript.

FUNDING

None.

AUTHOR CONTRIBUTIONS

All authors equally contribute to the study from the conceptual framework, data acquisition, evaluating the intervention to the priapism until reporting the outcome through publication.

REFERENCES

1. Gogia A, Sharma A, Raina V, Gupta R. Priapism as an initial presentation of chronic lymphocytic leukemia. Leuk Lymphoma. 2012;53(8):1638-1639.
2. Mulhall JP, Honig SC. Priapism: etiology and management. Acad Emerg Med. 1996;3(8):810-816.
3. Stucki A, Rivier AS, Gikic M, Monai N, Schapira M, Spertini O. Endothelial cell activation by myeloblasts: molecular mechanisms of leukostasis and leukemic cell dissemination. Blood. 2001;97(7):2121-2129.
4. Frazer R, Irvine AE, McMullin MF. Chronic Myeloid Leukaemia in The 21st Century. Ulster Med J. 2007;76(1):8-17.
5. Höglund M, Sandin F, Simonsson B. Epidemiology of chronic myeloid leukaemia: an update. Ann Hematol. 2015;94 Suppl 2:S241-S247.
6. Rodgers R, Latif Z, Copland M. How I manage priapism in chronic myeloid leukaemia patients. Br J Haematol. 2012;158(2):155-164.
7. Adams BD, Baker R, Lopez JA, Spencer S. Myeloproliferative disorders and the hyperviscosity syndrome. Emerg Med Clin North Am. 2009;27(3):459-476.
8. Kang ZJ, Liu YF, Xu LZ, Long ZJ, Huang D, Yang Y, et al. The Philadelphia chromosome in leukemogenesis. Chin J Cancer. 2016;35:1-15.
9. Ghane N, Vard A, Talebi A, Nematollahy P. Classification of chronic myeloid leukemia cell subtypes based on microscopic image analysis. EXCLI J. 2019;18:382-404.
10. Hochhaus A, Saussele S, Rosti G, Mahon FX, Janssen JJWM, Hjorth-Hansen H, et al. Chronic myeloid leukaemia: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Ann Oncol. 2018;29(Suppl 4):iv261.
11. Hoffmann VS, Baccarani M, Hasford J, Castagnetti F, Di Raimondo F, Casado LF, et al. Treatment and outcome of 2904 CML patients from the EUTOS population-based registry. Leukemia. 2017;31(3):593-601.
12. Steinberg MH. Sickle cell anemia, the first molecular disease: overview of molecular etiology, pathophysiology, and therapeutic approaches. Scientific World Journal. 2008;8:1295-1324.
13. Mc Aninch J. Disorders of the penis & male urethra. Smith's General Urology. 2008;1(1):1-10.
14. Jameel T, Mehmood K. Priapism An unusual presentation in chronic myeloid leukaemia: case report and review of the literature. Biomedica. 2008;25(2):197–199.
15. Chaux A, Amin M, Cubilla AL, Young RH. Metastatic tumors to the penis: a report of 17 cases and review of the literature. Int J Surg Pathol. 2011;19(5):597-606.
16. Muneer A, Ralph D. Guideline of guidelines: priapism. BJU Int. 2017;119(2):204-208.
17. Levey HR, Segal RL, Bivalacqua TJ. Management of priapism: an update for clinicians. Ther Adv Urol. 2014;6(6):230-244.