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**Case Report**

# Subdural Hematoma in Chronic Myelocytic Leukaemia

**Rizaldy Taslim Pinzon,[1] Gusti Ayu Jacinda Amanda Fedora[2*]**

## ABSTRACT

Chronic subdural hematoma is an old collection of blood between the arachnoid and dura mater that covers the brain surface. This condition is a common neurological emergency and commonly caused by craniocerebral trauma. Chronic subdural hematoma caused by leukaemia was rarely reported, and its pathogenesis and strategies for clinical treatment remain controversial. We report a rare case of chronic subdural hematoma caused by chronic myelocytic leukaemia (CML) in blast crisis. The patient was diagnosed as CML 8 months ago after ischemic stroke. The bone marrow cytology, flow cytology, and haematology consultation suggested chronic myelocytic leukaemia. The patient admitted again with headache and right side weakness. The routine blood examination showed blast crisis. The emergency neurosurgical consultation was performed, but the patient's condition deteriorated quickly after admission. The platelet levels continued to decrease after admission. In this case, early diagnosis and multidisciplinary treatment are important to minimalized the outcome and poor prognosis.

**Keywords:** subdural hematoma, leukaemia, CML

Chronic subdural hematoma is an old collection of blood between the arachnoid and dura mater that covers the brain surface. It is a common neurosurgical emergency and mostly found in elderly men.[1] The incidence of tumour-associated subdural hematoma was 0.5–4% and is higher in patients with leukaemia.[2,3] Previous studies showed that chronic subdural hematoma caused by leukaemia either chronic myeloblastic leukaemia and acute myelocytic leukaemia (AML) are rare.[3,4] We report a rare case of spontaneous subdural haematoma related to blast crisis in CML patient.

## CASE REPORT

A 70-year-old male patient was admitted to our hospital with headache and right side weakness 3 hours before admission. The patient has a chief complaint of headache and dizziness for 1 month without apparent cause. Physical examination revealed that the patient had Glasgow coma scale 15. His pupils were 3.0 mm in diameter bilaterally, with sensitive direct and indirect light reflexes on both sides. The muscle strength in right side was grade 4, with a normal muscle tone and a negative bilateral Babinski sign. He had the previous history of hypertension, diabetes, and cardiac problem. The patient has previous history of ischemic stroke 8 months ago. (Figure 1) The routine blood test previously showed very high leucocyte count (> 50 x $10^9$/L). The bone marrow cytology, flow cytology, and haematology consultation suggested chronic myelocytic leukaemia (CML). The patient treated with chemotherapy and Tyrosine Kinase Inhibitor (TKI). The patient was treated with imatinib 100 mg per day. No anti platelet was consumed in 2 months because low platelet count. No significant psychosocial and family history related with current presentation.

Brain computed tomography (CT) suggested chronic subdural hematoma on the left temporal-parietal lobe. (Figure 2) On admission, routine blood tests suggested blast crisis. The haemoglobin level was 9 g/dL, leucocyte count 1,01 x $10^9$/L (normal 4,5-11 x $10^9$/L), neutrophil only 6,9% (normal: 50-70%), a platelet count of 2000 (normal: 150,000 to 450,000 platelets per microliter of blood). Other laboratory tests showed no abnormalities. The

* *Corresponding author* : drpinzon17@gmail.com
[1] Neurology Department, Universitas Kristen Duta Wacana, Bethesda Hospital Yogyakarta, Indonesia
[2] Universitas Kristen Duta Wacana Yogyakarta, Indonesia

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patient treated with steroid (methylprednisolone 125 mg every 12 hours), mannitol (0.5 mg/ kg BB divided every 6 hours), and anti-seizure medication (phenytoin 100 mg in 100 cc NaCl every 12 hours). Urgent haematological consultation performed.

The patient's condition worsened, and his consciousness deteriorated (Eye : 2 Verbal 2: Movement 4). The neurosurgical consultation was performed. No trepanation and drainage were performed because of very low platelet count. Platelet transfusion (thrombocyte infusion 4 bags) and steroid (methylprednisolone 125 mg every 12 hours for 1 day) do not give significant improvement of platelet count. The platelet count still 2000 per microliter blood after the platelet transfusion. The patient worsened quickly and deceased in the 6 days after admission due to acute respiratory distress.

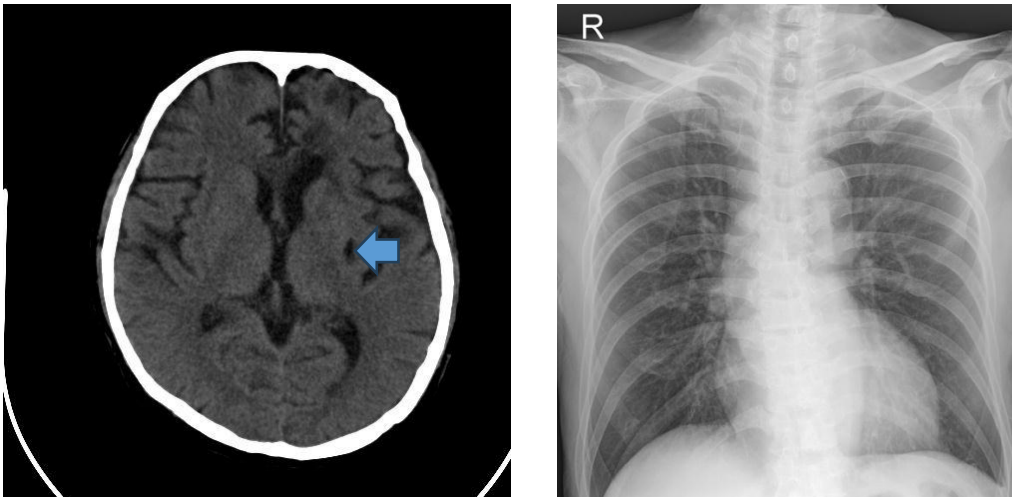


Figure 1. Acute left parietal lobe infarction and normal chest x ray 8 months ago. The diagnosis of CML was obtained.

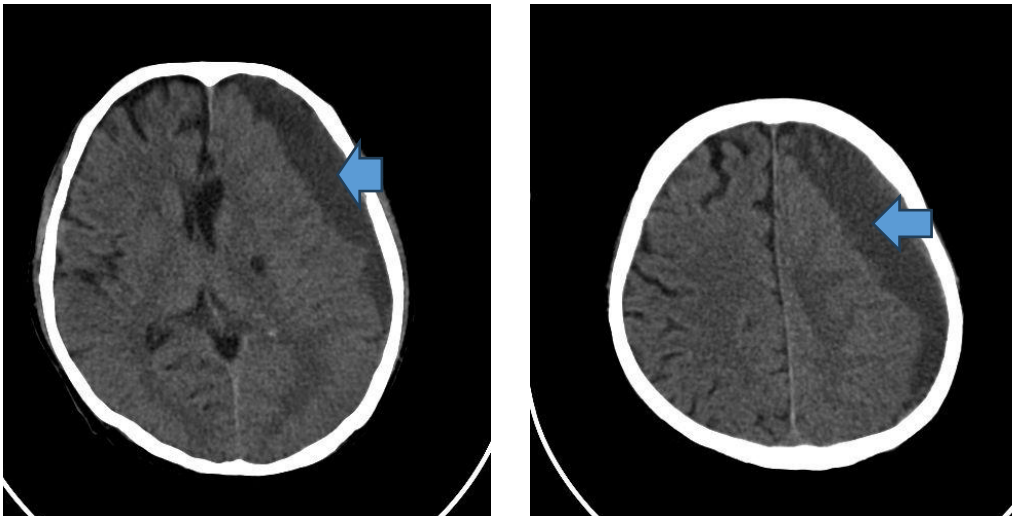

Figure 2. The chronic subdural hematoma with midline shift on recent admission

## DISCUSSION

We report a rare case of spontaneous subdural hematoma related with very low platelet count in CML. Subdural hematoma (SDH) is a collection of blood between the arachnoid and dura mater that covers the brain surface.[2] In most cases of SDH, brain trauma causes tearing of bridging veins and consequent bleeding, resulting in the aggregation of blood in the subdural space.[4] The vessel walls of the bridging veins are thin and susceptible to bleeding. Blood continuously leaks from these immature vessels into the subarachnoid space, resulting

in chronic subdural hematomas.[5] SDH patients usually present with headache, confusion, reduced state of consciousness, and rare manifestations including seizures.[5,6] The above mechanism fails to comprehensively explain the cause of SDH in our case since our patient had no obvious history of head trauma. This case is rare and only very few cases reported in literature.[7,8] The incidence of chronic subdural hematoma ranges from 1–20/100.000 cases per year and mostly seen in elderly, males and patients with anticoagulants and antiplatelets medication. [1,7]

The possible risk factors of ICH caused by leukaemia include thrombocytopenia, platelet dysfunction, disseminated intravascular coagulation (DIC), coagulation factor deficiency, hyperleukocytosis, vessel wall abnormalities, hypertension and sepsis.[9] Our patient had severe thrombocytopenia all the time, which is very common in chronic myelocytic leukaemia. CML is a myeloproliferative neoplasm that is sometimes asymptomatic, especially in early stages and often diagnosed during a routine physical examination or blood tests. Common signs and symptoms of CML including fatique, weight loss, malaise, easy satiety and left upper quadran fullness or pain are result from anemia and splenomegaly. Unexplained leukocytosis (or sometimes thrombocytosis) and Philadelphia chromosome abnormality can determined the diagnosis of CML.[10]

Chronic subdural hematoma can be treated with surgical and pharmacological treatment. Surgical treatment like craniotomy can be done to remove the hematoma, but now it is rarely used because of higher risk of trauma and postoperative complications.[7] With long-term clinical practice, the safety and efficacy of trepanation and drainage in chronic subdural hematoma is now widely recognized, and this method is currently the most widely used procedure in clinical practice.[11] This procedure cannot be performed in our patient because of very low thrombocyte count.

Previous study had shown high mortality (50 %) among SDH patients with haematological malignancies.[12] Patients with hematologic disorders show higher rates of SDH recurrence, surgical morbidity and mortality compared with SDH patients caused by trauma, tumor-related or anticoagulation-related SDH.[13] Each SDH, caused by haematological malignancy, may be also associated with a higher possibility of neurosurgery and potential adverse outcomes.

## CONCLUSION

To summarize, we report a challenging and rare case of SDH in patient with CML in blast crisis situation. Thrombocytopenia in CML patients is one of the possible risk factors causing SDH. Trepanation and drainage in chronic subdural hematoma are widely used in clinical practice but cannot be performed in the CML patients with low thrombocyte count. Mortality and recurrence rates of SDH are higher in SDH patients with hematological malignancy. Early diagnosis and multidisciplinary treatment are important to minimalized the outcome and poor prognosis.

## ETHICAL STATEMENT

Due to the nature of this case report, this study did not require ethical committee approval. However, this study has obtained permission from the Bethesda Hospital Research and Development Department. Verbal informed consent was carried out and the patient's identity is kept private in compliance with the Declaration of Helsinki.

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