



HOSTED BY



ELSEVIER

Contents lists available at ScienceDirect

Journal of Acute Disease

journal homepage: www.jadweb.orgCase report <http://dx.doi.org/10.1016/j.joad.2015.03.004>

Diagnosis of chronic myeloid leukemia from acute intracerebral hemorrhage: A case report

Chakroun-Walha Olfa^{1*}, Rejeb Imen¹, Kammoun Leila¹, Ksibi Hichem¹, Ayadi Adnane², Chaari Mourad³, Chaari Adel¹, Kallel Choumou³, Rekik Nouredine¹

¹Emergency and SAMU Department, Habib Bourguiba Hospital, Sfax, Tunisia

²Legal Medicine Service, Habib Bourguiba Hospital, Sfax, Tunisia

³Hematology Laboratory, Habib Bourguiba Hospital, Sfax, Tunisia

ARTICLE INFO

Article history:

Received 27 Jan 2015

Received in revised form 11 Feb 2015

Accepted 15 Mar 2015

Available online 10 Jul 2015

Keywords:

Intracerebral hemorrhage

Leukemia

Emergency

ABSTRACT

Intracerebral hemorrhage (ICH) is frequent pathology in emergency departments. Coagulopathies leading to ICH are rare. We describe here the case of diagnosis of a chronic myeloid leukemia from ICH in emergencies.

1. Introduction

Intracerebral hemorrhage (ICH) is frequent pathology in emergency departments. It accounts for 5%–10% of stroke events^[1]. Coagulopathies leading to ICH are rare, and are divided to acquired and congenital disorders of homeostasis including bleeding due to neoplasms^[1]. Chronic myeloid leukemia (CML) is one of these acquired coagulopathies that can be rarely accompanied of ICH in acute or blastic phase. We describe here the case of diagnosis of a CML from ICH in emergencies.

2. Case report

A 26-year-old man, with no medical or surgical history presented to the emergency department for a minor head trauma caused by a drop height.

His symptoms began that morning. He progressively began to have moderate intensity headaches which were no better with paracetamol. He did not complain about vision disorders, but

was nauseous after the meal. His friend decided to bring him to the emergency department to consult. On the way to the hospital, he fell with no loss of consciousness, nor amnesia.

The examination in the Emergency's Intensive Care area found a conscious patient; the Glasgow coma scale was 15 points. A hemiplegia of the left-hand side was objectified. The patient pupils were equal, in miosis and reactive to light. No fever was noted. The patient had a stable hemodynamic and respiratory state. The abdominal palpation noted a diffuse abdominal distension with a splenomegaly beyond the umbilicus and a painless hepatomegaly. Skin examination showed no purpuric spot.

One hour after his arrival to the hospital, right mydriasis was objectified. The patient presented a seizure at the third hour of his arrival in emergency department, and two episodes of vomiting. An anticonvulsant treatment was then indicated; the patient received 15 mg/kg of phenobarbital in 20 min. The patient continued to have headaches despite the analgesic treatment.

A contrast-enhanced computerized tomography (CT) of the head was performed at the third hour after the trauma, which showed a large hematoma in right subcortical parietal lobe (65 mm × 50 mm × 45 mm) without enhancement after injection of contrast and surrounded by edema. The mass effect exerted from this hematoma resulted in a right to left midline shift. There were no vascular abnormalities to explain this ICH, nor bone fracture (Figure 1).

*Corresponding author: Chakroun-Walha Olfa, Hopital Habib Bourguiba Sfax, Avenue Majida Boulila Km 0,5, Sfax 3029, Tunisia.

Tel: +216 20358850

Fax: +216 74241511

E-mail: olfa.walch@hotmail.fr

Peer review under responsibility of Hainan Medical College.



Figure 1. Head CT scan done in emergency department.

The count of complete blood showed leukocytosis (213 000/ μL controlled to 260 000/ μL) with normal platelet count (291 000/ μL controlled to 282 000/ μL). His prothrombin time was to 43%. Examination of blood smears allowed presuming the diagnosis of CML (27% metamyelocytes, 18% myelocytes and 2% promyelocytes) (Table 1).

Osmotherapy by a 20% mannitol was started as soon as the CT scan was done. Corticosteroid therapy was also administered (1 mg/kg dexamethasone intravenously).

An abdominal ultrasound was performed, showing an enlarged spleen to 27 cm height with regular contours and an increased kidneys size (right kidney = 13.8 cm, left kidney = 14.0 cm).

Transfer to neurosurgery department has been agreed with the neurosurgeon to continue his supervision; no urgent surgical treatment has been decided. However, the patient became comatose with a Glasgow coma scale at 11 points followed after few minutes by a sudden circulatory arrest; his pupils were unresponsive bilateral mydriasis. Cardiopulmonary resuscitation was then carried without recovery of spontaneous circulation. The patient was died in the 12 h of his arrival to the emergency.

The patient's autopsy showed a hemorrhagic brain mass in right parietal brain lobe. Abdominal autopsy examination has objectified an important splenomegaly with homogeneous hepatomegaly.

Table 1

Results of laboratory exams on admission in emergency department.

Variable	Value	Reference range
White blood cell count (per mm^3)	260 000	4 500–11 000
Hemoglobin (g/dL)	8.4	13.5–17.5
Platelet count (per mm^3)	291 000	150 000–350 000
Differential count (%)		
Neutrophil	38	40–70
Lymphocytes	2	22–44
Blasts	4	0
Erythroblasts	6	0
Metamyelocytes	27	0
Myelocytes	18	0
Promyelocytes	2	0
Monocytes	2	4–11
Eosinophiles	1	0–4
Prothrombin rate (%)	43	70–100

3. Discussion

Spontaneous ICH accounts for 5%–10% of stroke events and has a high mortality^[2]. Multiple pathological processes can cause ICH including trauma, cerebrovascular disease, and coagulation disorders^[3]. The medical history with unusual headache, changes in mental status or focal neurological deficits leads to practice non contrast head CT which shows the ICH. It was the case of our patient. Therefore the cause of ICH must always be elucidated.

CML accounts for approximately 15% of adult leukemias, with a male to female ratio of 1–1.3. It's a rare myeloproliferative disease, with an annual incidence estimated at 1 to 1.5 case per 100 000 inhabitants^[4]. The median age of disease discovery is 45–55 years^[5]. The only confirmed predisposing factor is exposure to ionizing radiation^[4]. CML is a disease characterized by a specific cytogenetic marker, the Philadelphia chromosome, which results from a balanced translocation of segments of chromosomes 9 and 22. The evolution of this disease may go through three phases: chronic phase, often prolonged and less severe, followed by the accelerated phase also called blastic phase and finally the acceleration phase. One-quarter of patients present with the blastic phase, without the preexisting chronic phase being diagnosed^[6], in our case, discovery of the CML was immediately in the acceleration phase.

The most common clinical signs of CML are loss of weight, sweating and episodes of abdominal pain due to splenic infarction or weight of spleen. Priapism was described in rare cases. In fact, clinical manifestations are mostly absent in chronic phase^[4]. The median time to development of blastic phase is approximately 36 months before the advent of interferon therapy, 48 months with interferon therapy and 5 years after allogenic bone marrow transplantation^[6]. Recently the treatment with tyrosine kinase inhibitors can control the clinical features for years or even decades (10–20 years) in the majority of patients^[4,7]. The onset of additional clinical findings, such as fever, adenopathy, splenic enlargement, general cachexia and progressive immaturity of marrow and blood granulocytes, is of the blast phase^[4,6]. Some atypical presentation of CML was reported in literature like neurological involvement including deafness, blindness and tinnitus.

Leukostasis is clinically suspected when neurological or respiratory disorders appear in a patient with an important leukocytosis (>100 000/ μL for CML). This leukostasis is much rare in the CML compared to its rate in acute leukemias^[3]. The pathophysiological mechanism of ICH is not yet well determined; disorders of hemostasis would be implicated, as well as vascular microthrombosis by leukocytes^[3] and it seems to occur in the accelerated or blastic phase more than in chronic phase^[8]. While ICH is often identified in autopsy studies of leukemic patients or in patients diagnosed with acute leukemia, it is rare for ICH to be the presenting sign that ultimately leads to the diagnosis of leukemia^[3]. The prognosis at this stage is often fatal the first 10 days^[3]. ICH is a grave prognosis indicator in either myelogenous or lymphoblastic leukemia and is second only to infection as the most common cause of death^[3]. Such is the case of our patient.

While our clinical report presents an additional case of spontaneous acute hematoma and describes its association with

CML, it also demonstrates some conclusions. First, a careful medical history and non-contrast head CT are often necessary for any patients presenting with symptoms suggestive of potential intracranial pathology and leads often to a diagnose of ICH. Second, the presence of acute hematoma in the absence of head trauma should warrant further investigation like the practice to obtain basic blood work up that includes a complete blood count, a complete metabolic panel and coagulation studies for every patient admitted to the emergency^[9]. The management of ICH in cases with coagulopathy is largely medical^[3]. Current recommendations from the American Heart Association give consideration to surgical evacuation of hemorrhage that is located within 1 cm of the cortical surface and associated with substantial mass effect, edema or midline shift^[3]. In our case, treatment was medical because the hematoma was located within more than 1 cm, so he received transfusion of plasma regarding his low rate of prothrombin time, and phenobarbital to seizures.

In conclusion, initial leukemic involvement of the central neurologic system is perhaps not so unusual in the acceleration or blastic phases of CML but as emergency physicians, we need to be aware of this diagnosis. It should be considered in the differential diagnosis of any situation in which intracerebral or subarachnoid hemorrhage, epidural and subdural hematomas^[10] are detected prior to the diagnosis of leukemia with unknown etiology, particularly in the setting of hyperleukocytosis, and a characteristically abnormal peripheral blood smear.

Conflict of interest statement

The authors report no conflict of interest.

References

- [1] González-Duarte A, García-Ramos GS, Valdés-Ferrer SI, Cantú-Brito C. Clinical description of intracranial hemorrhage associated with bleeding disorders. *J Stroke Cerebrovasc Dis* 2008; **17**(4): 204-7.
- [2] Broderick J, Connolly S, Feldmann E, Hanley D, Kase C, Krieger D, et al. Guidelines for the management of spontaneous intracerebral hemorrhage in adults: 2007 update: a guideline from the American Heart Association/American Stroke Association Stroke Council, High Blood Pressure Research Council, and the Quality of Care and Outcomes in Research Interdisciplinary Working Group. *Circulation* 2007; **116**(16): e391-413.
- [3] Naunheim MR, Nahed BV, Walcott BP, Kahle KT, Soupir CP, Cahill DP, et al. Diagnosis of acute lymphoblastic leukemia from intracerebral hemorrhage and blast crisis. A case report and review of the literature. *Clin Neurol Neurosurg* 2010; **112**(7): 575-7.
- [4] Goldman JM. Chronic myeloid leukaemia. *Medicine* 2009; **37**(4): 195-7.
- [5] Gokce M, Unal S, Bayrakçı B, Tuncer M. Chronic myeloid leukemia presenting with visual and auditory impairment in an adolescent: an insight to management strategies. *Indian J Hematol Blood Transfus* 2010; **26**(3): 96-8.
- [6] Dutcher JP, Wiernik PH. Accelerated and blastic phase of chronic myeloid leukemia. *Curr Treat Options Oncol* 2000; **1**(1): 51-62.
- [7] Seiter K. Update of recent studies in chronic myeloid leukemia. *J Hematol Oncol* 2009; **2**(Suppl 1): A2.
- [8] Shiber JR, Fines RE. Cerebral hemorrhage due to hyperleukocytosis. *J Emerg Med* 2011; **40**(6): 674-7.
- [9] Abdulhamid MM, Li YM, Hall WA. Spontaneous acute subdural hematoma as the initial manifestation of chronic myeloid leukemia. *J Neurooncol* 2011; **101**(3): 513-6.
- [10] Maynor ML. Neurological manifestations as the initial presentation of acute myelogenous leukemia. *Am J Emerg Med* 1989; **7**(5): 481-4.