CASE REPORT

Multiple skin chloromas: a rare presentation of chronic myelogenous leukaemia in chronic stable phase

Vivek Kumar,¹ Nirdesh Jain,¹ Shyam Chand Chaudhary,² Sanjay Mishra³

¹Department of Internal Medicine, King George's Medical University, Lucknow, Uttar Pradesh, India

²Department of Medicine, CSM Medical University, Lucknow, Uttar Pradesh, India

³Department of Clinical Hematology and Medical Oncology, King George's Medical University, Lucknow, Uttar Pradesh, India

Correspondence to
Professor Vivek Kumar,
rvivek2@rediffmail.com

SUMMARY

Chloroma, also called granulocytic sarcoma or myeloid sarcoma, is a rare malignant extramedullary neoplasm of myeloid precursor cells that occurs usually in association with acute myeloid leukaemia or blast phase of chronic myeloid leukaemia (CML). The chloromas are regarded as an early herald of a systemic relapse, rather than as a localised process. The author reports a rare case of multiple skin chloromas in the chronic phase of CML. The patient was treated initially with hydroxyurea and chloromas disappeared. Patient has been followed for around three and half years and maintained in chronic stable phase on imatinib therapy.

BACKGROUND

A chloroma is a rare solid collection of leukaemic cells occurring outside of the bone marrow, an extramedullary manifestation of acute myeloid leukaemia (AML). It occurs in 2.5–9.1% of patients with AML and less frequently occurs in patients with chronic myelogenous leukaemia (CML). In autopsy series, granulocytic sarcoma occurs in 2–8% of patients with acute and chronic myelogenous leukaemia.¹ Though often seen in acute myelogenous leukaemia, to date, only few cases of CML presenting as multiple skin chloromas in the chronic phase have been reported.^{2–4} The author describes a rare case of CML in chronic phase presented with multiple skin chloromas that disappeared on treatment with hydroxyurea. The patient has been followed up for 3.5 years and she has been in chronic stable phase of CML.

CASE PRESENTATION

A 25-year-old woman with a history of paralytic polio of right lower limb presented with low-grade fever and abdominal discomfort for 3 months. She also complained of localised swellings over posterolateral aspects of both thighs for 2 months. Examination revealed pallor and multiple subcutaneous nodular swellings over posterolateral aspects of both thighs (figure 1). Abdominal examination revealed splenomegaly (8 cm from left subcostal line). Rest of the systemic examination did not show abnormality.

INVESTIGATIONS

Investigations showed haemoglobin 6.7 g%, total leucocyte counts 665 770/mm³ with differentials of 62% neutrophils, 2% metamyelocytes, 5% myelocytes and 5% monocytes with platelet count of $1.43 \times 10^6/\text{mm}^3$. Bone marrow examination showed hypercellular marrow with myeloid hyperplasia and

3% blast cells suggestive of CML in chronic phase. Fluorescence in situ hybridization (FISH) study was positive for bcr-abl with 97% transcript level. Fine needle aspiration cytology of subcutaneous nodules showed collection of myeloblast (figure 2A,B).

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis, the most important diseases to be considered are non-Hodgkin lymphomas of the lymphoblastic type, Burkitt lymphoma, large-cell lymphoma and small round cell tumours.⁵

TREATMENT

Based on the clinical and laboratory parameters, the diagnosis of multiple skin chloromas in chronic phase of CML was made. Though imatinib had to be started, it could not be taken by the patient that time owing to cost constraints. The patient was started on tablet hydroxyurea 1000 mg twice daily.

OUTCOME AND FOLLOW-UP

Patient showed a dramatic response: skin swelling disappeared, total leucocyte counts decreased to normal value and spleen size regressed to 3 cm from midpoint of subcostal line. Patient has been followed up for 3 and 1/2 year and doing well on imatinib therapy.

DISCUSSION

Granulocytic sarcoma (GS), also called myeloblastoma or myeloid sarcoma is a rare solid tumour composed of immature myeloid cells. Such tumours often display a greenish colour due to the enzymatic action of myeloperoxidase in the tumour cells; hence, the term 'chloroma' was given to this lesion in 1853.² This colour is rarely seen because the green pigment fades readily on exposure to the air and the red colour of the blood masks the green pigment. Therefore, chloromas may also present as reddish-blue, not green, thickenings in the skin.

Figure 1 Subcutaneous nodular swelling on posterolateral aspect of left and right thigh.

To cite: Kumar V, Jain N, Chaudhary SC, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-008626

Figure 2 (A) Fine needle aspiration from the site showing numerous myeloblasts scattered in discohesive pattern (Geimsa and Leishman stain $\times 10$). (B) Fine needle aspiration from the site showing numerous myeloblasts scattered in discohesive pattern (Geimsa and Leishman stain $\times 40$).

Since one-third of these tumours have brown, white or grey colour, the term granulocytic sarcoma (or myeloid sarcoma) is considered more appropriate. GS is a rare occurrence with an estimated incidence of 0.7/million in children and 2/million in adults.⁶ They occur most commonly in bone, periosteum, soft tissues, lymph nodes and skin, but can occur virtually anywhere.⁷

Chloromas may also be the initial manifestation of leukaemia. CML presenting as multiple skin chloromas is an extremely rare manifestation. The development of GS was a strongly negative prognostic factor for AML. Overall, the median survival of 7–20 months after the diagnosis of GS is reported.^{7–8} GS is a tumour that is also frequently misdiagnosed especially in a negative clinical setting (ie, with no previous history of myeloid malignancy). In one series, the initial diagnosis was correct in only 44% of 61 cases with the most common other histological diagnoses including malignant lymphoma, small cell carcinoma, sarcoma (ES and PNET) and undifferentiated neoplasm.⁴

The case presented here showed suggestive evidence linking the manifestation to the disease. Therefore, all other possible causes as Burkitt lymphoma, large-cell lymphoma and small round cell tumours were ruled out by the parameters detected in the CBC which highly suggest CML chronic phase, then the confirmation of the diagnosis of CML chronic phase by FISH and eventually the pathognomonic fine needle aspiration cytological examination of the subcutaneous nodules. Moreover, the positive dechallenge response acquired when the patient showed a dramatic clinical and laboratory response when she started on hydroxyurea 1000 mg twice a day.

FISH analysis for chromosomal aberrations may also aid in the diagnostic workup with slightly greater than half of the cases exhibiting a common leukaemic aberration. For the treatment of the GS, radiation therapy or surgical resection had been found less effective than chemotherapy for improving the disease-free interval or disease-free survival.^{2–9}

Learning points

- This rare manifestation should alert a clinician to include chronic myelogenous leukaemia in chronic phase in the differential diagnosis of patients presenting with multiple non-pigmented, non-pruritic skin nodules.
- Fine needle aspiration cytology with ancillary studies can provide a rapid diagnosis and should be performed before surgery, radiation or chemotherapy.
- The case is also important because when the chloromas manifest the patient usually have gone into leukaemic phase or within a span of 7–20 months reached to it, but the case remained in stable phase till the follow-up of 42 months. Therefore, it contradicts the notion that chloromas augurs poor prognosis.

Contributors The concept of the case was arose by VK, literature was searched by NJ and SCC and pathological confirmation of the finding was made by SM. The manuscript was reviewed by all the authors.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Baer MR. Management of unusual presentations of acute leukemia. *Hematol Oncol Clin North Am* 1993;7:275–92.
- 2 Nagarajao HS, Akhtar I, Heard K, *et al*. Unusual presentation of chronic myelogenous leukemia as multiple skin chloromas: report of a case with clinical and cytologic correlation. *Acta Cytol* 2009;53:235–8.
- 3 Neiman RS, Barcos M, Berard C, *et al*. Granulocytic sarcoma: a clinicopathologic study of 61 biopsied cases. *Cancer* 1981;48:1426–37.
- 4 Menasce LP, Banerjee SS, Beckett E, *et al*. Extra-medullary myeloid tumor (granulocytic sarcoma) is often misdiagnosed: a study of 26 cases. *Histopathology* 1999;34:391–8.
- 5 Breccia M, Mandelli F, Petti MC, *et al*. Clinicopathological characteristics of myeloid sarcoma at diagnosis and during follow-up: report of 12 cases from a single institution. *Leuk Res* 2004;28:1165–9.
- 6 Hutchison RE, Kurec AS, Davey FR. Granulocytic sarcoma. *Clin Lab Med* 1990;10:889–901.
- 7 Brunnung RD, Matutes E, Flandrin G, *et al*. Acute myeloid leukemias. In: *World Health Organization Classification of Tumors. Pathology and Genetics of Tumours of Haematopoietic and Lymphoid Tissue*. Edited by: Jaffe ES, Harris NL, Stein H, Vardiman JW. IARC Press;2001:77–105.
- 8 Paydas S, Zorludemir S, Ergin M. Granulocytic sarcoma: 32 cases and review of the literature. *Leuk Lymphoma* 2006;47:2527–41.
- 9 Tsimberidou AM, Kantarjian HM, Estey E, *et al*. Outcome in patients with nonleukemic granulocytic sarcoma treated with chemotherapy with or without radiotherapy. *Leukemia* 2003;17:1100–3.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow