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Case Report

Successful non-operative management of cauda equina syndrome in a case of thalassemia major[☆]

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ABSTRACT

Thalassemia is associated with several challenging comorbidities. Here we report a 20 year old thalassaemic who presented with cauda equina syndrome due to paraspinal extra medullary hematopoiesis (EMH) and was treated with hydroxyurea, repeated blood transfusions, and radiotherapy. Thus compressive myelopathy due to EMH was successfully managed conservatively.

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1. Introduction

Thalassemia major is a haemoglobinopathy characterized by ineffective erythropoiesis, extramedullary hematopoiesis (EMH) and transfusion dependency. Chronic hemolytic anemia and iron overload are responsible for several morbidities in thalassaemics. Regular transfusions, timely and adequate chelation, and good follow up are known to improve the quality of life of these patients. Whereas under-transfusion, high body iron load and excessive EMH may result in various complications. One such infrequently reported complication is compressive myelopathy arising as a result of EMH within the vertebral column. Here we report a case of beta thalassemia major presenting with cauda equina syndrome due to EMH that was successfully managed non-operatively.

2. Case report

A 20-year-old male, known case of thalassemia major, presented to the emergency with inability to pass urine for the last 24 h associated with lower abdominal discomfort. He also complained of heaviness in the perianal region and the sensation of pins and needles in bilateral soles. He was on regular transfusion therapy along with oral iron chelator deferasirox. There was no history of fever, backache or trauma to spine.

On examination vitals were stable, higher mental functions normal and cranial nerve examination was unremarkable. The power was decreased (3/5) in both the lower limbs. There was loss of sensations to pin prick and soft touch in the perianal area suggestive of saddle anesthesia. Anal reflex was absent and the rectal tone was decreased. The deep tendon reflexes were just elicitable at both the knees whereas bilateral ankle reflex were absent. The plantar reflex was equivocal bilaterally. Skull and spine examination was normal. Per abdomen examination revealed distended bladder that required catheterization for drainage. The liver was palpable 7 cm below costal margin with a span of 16 cm and spleen was 8 cm palpable. A provisional diagnosis of cauda equina syndrome (CES) was made.

The serum ferritin levels of the patient were 8464 µg/L. Skia-grams of lumbosacral spine were unremarkable. MRI spine revealed extra-medullary hematopoiesis in D11 to L5 vertebral levels in posterior epidural space indenting the posterior thecal sac

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¹ RK, SKA, AH and SA were involved in the clinical management of the patient. RK, SKA and SA searched for literature and drafted the manuscript. AH gave critical inputs. RK, SKA, AH and SA approved the final manuscript.

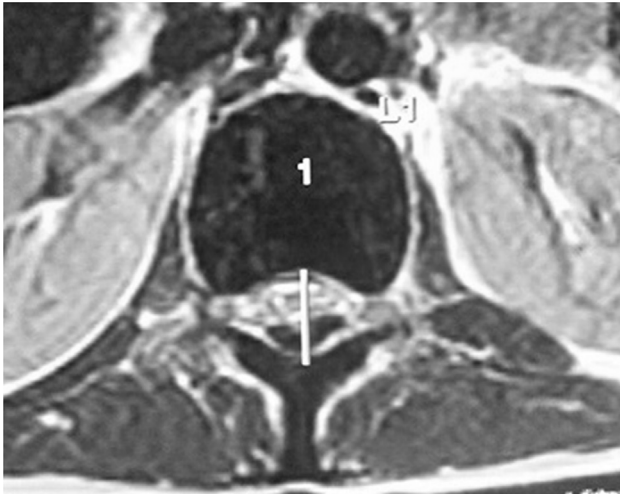


Fig. 1. MRI spine demonstrating severe extramedullary hematopoiesis at L1 vertebra with markedly reduced AP thecal sac diameter.

and compressing spinal roots. AP thecal sac diameter was reported to be measuring 6.1 mm at L1–2 disc level and 4.4 mm at L2–3 disc level (Fig. 1).

Orthopedic and neurosurgical opinion were sought and the patient was advised conservative management. He was given multiple blood transfusions in order to keep the haemoglobin level above 12 g/dL. Deferoxamine infusion was given every alternate day. Oral hydroxyurea was initiated in order to suppress EMH. The patient was also administered radiotherapy over 10 sittings spanning over 2 weeks with the total dose of 2000 cGy.

After 30 days the power in lower limbs started improving, paresthesia decreased but bowel and bladder incontinence persisted. He was discharged on subcutaneous deferoxamine, oral deferasirox and hydroxyurea. Regular transfusions continued. Repeat MRI done after 2 months showed considerable improvement with reduction in the EMH (Fig. 2). After 6 months he had

normal power and sensations in bilateral lower limbs; was free of any paresthesias and had achieved full bladder and bowel control. He was shifted back to moderate transfusion regimen but hydroxyurea continued.

3. Discussion

Extramedullary hematopoiesis (EMH) is known to occur in many hematological disorders. EMH occurs more commonly in non-transfusion dependent thalassemia (NTDT) patients, incidence being around 20% [1,2]. But it is reported to occur in <1% of regularly transfused thalassemia major patients [1,2]. Risk factors for EMH are increasing age; male sex; lower fetal hemoglobin levels; and presence of severe ineffective erythropoiesis [1,2]. The usual sites involved are liver, spleen, bone marrow and lymph nodes. Paraspinal involvement occurs in 11–15% of all the cases of EMH, but 80% of these are asymptomatic [2].

Paraspinal compression due to EMH can present as back pain, leg pain, paraesthesias, exaggerated deep tendon reflexes, extensor plantar response, spastic gait, paraparesis, bladder or bowel involvement [2]. The clinical severity and the progression of these symptoms depend on the anatomical location and the extent of EMH. The appearance of neurologic symptoms in a patient with such underlying blood dyscrasias should prompt a high clinical suspicion for cord compression or thecal sac compression by an extramedullary hematopoietic process. Though there have been some reports of compressive myelopathy due to EMH in hemoglobinopathies, cauda equina syndrome secondary to EMS has rarely been reported [2–5].

The diagnosis is based on strong clinical suspicion in the presence of diffuse bone marrow hyperplasia along with symmetric paraspinal and epidural masses. Most authors do not favor a tissue biopsy in this situation. The diagnostic procedure of choice is magnetic resonance imaging (MRI). The active lesions show intermediate signal intensity in both T1 and T2 weighted images. Gadolinium enhancement is minimal or absent differentiating it from other epidural lesions such as abscesses or metastases [2]. Older inactive lesions show high signal intensity in both T1 and T2

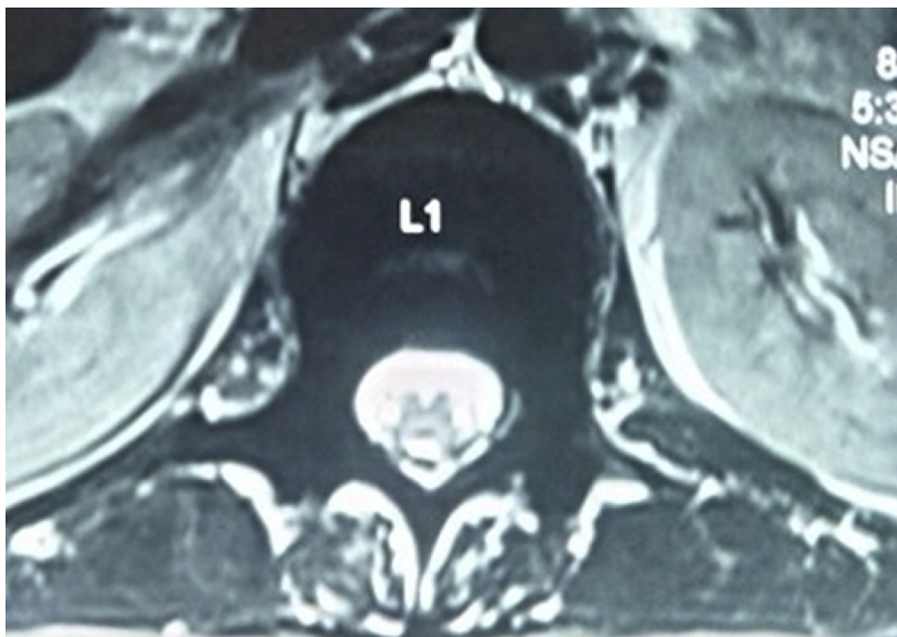


Fig. 2. Follow up MRI spine showing considerable reduction in extramedullary hematopoiesis at L1 vertebra.

weighted MR images due to fatty infiltration or low signal intensity in both T1 and T2 weighted MR images due to iron deposition.

The treatment modalities available for compressive myelopathy due to EMH are limited. Intervention options include oral hydroxyurea, multiple blood transfusions, radiation therapy, and surgical decompression. The relative benefit of one treatment over another has not been clearly established due to the rarity of this disorder. The management of paraspinal EMH has to be individualized. Previous authors have used these treatment modalities, either alone or in combinations [4–10].

Repeated transfusions to maintain hemoglobin above 12 g/dL helps reduce EMH by downregulating erythropoietin production. Hydroxyurea is a ribonucleotide reductase enzyme inhibitor that acts by reducing the globin chain imbalance through stimulating synthesis of fetal hemoglobin and cytochrome reduction. It decreases the ineffective erythropoiesis and the associated EMH in hemoglobinopathies. Patients with spinal EMH have been successfully treated with hydroxyurea alone, especially those patients who are unable to receive blood transfusions due to alloimmunization [4,5]. Radiotherapy halts the production of overgrown marrow tissue and its advantages include ready availability, effectiveness in the resolution of symptoms in a short period of time as well as reduction of local recurrence. The disadvantages include lack of any tissue for histologic diagnosis and the risks of radiation exposure [9]. Surgical intervention is not always possible due to the diffuse nature of the mass and the possibility of recurrence. The risks of surgical treatment include excessive bleeding due to increased vascularity and likelihood of development of deformity following multilevel laminectomy [10]. The only benefit of surgery includes immediate resolution of compression and its symptoms upon decompression. Laminectomy may be attempted in cases with acute presentation or the ones who do not respond to adequate transfusion or radiotherapy.

Thus one needs to have a high index of suspicion in a diagnosed case of hemoglobinopathy presenting with paraparesis to detect

paraspinal EMH at an early stage. Provision of timely, tailor made therapy may improve neurological outcome and limit disability.

Conflicts of interest

None.

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