

## Vertebra Plana Caused by Malignant Lymphoma (A case report)

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### Abstract

Vertebra plana is a radiological diagnosis that indicates complete compression of the vertebral body.<sup>(1,2)</sup> This condition was reported in Langerhans cell histiocytosis including eosinophilic granuloma,<sup>(3, 12)</sup> Ewing's sarcoma,<sup>(2,13,14)</sup> tuberculosis,<sup>(15,16)</sup> vertebral osteomyelitis,<sup>(17)</sup> aseptic necrosis,<sup>(18)</sup> aneurysmal bone cyst,<sup>(19)</sup> osteosarcoma,<sup>(20)</sup> neuroblastoma,<sup>(21)</sup> acute leukemia,<sup>(22)</sup> rhabdomyosarcoma<sup>(23)</sup> and some other diseases.<sup>(25-30)</sup>

There have been rare reports of vertebra plana due to malignant lymphoma.<sup>(23,24)</sup> Herein, we report a case of a 13 year-old boy with vertebra plana due to malignant lymphoma and describe his clinical manifestations, histological features, diagnosis, management and clinical course.

### Case report

In March, 2003, a 13 year-old boy was referred to us from the department of neurosurgery with progressive kyphosis, decreased force of lumbar muscles and disability to stand and walk.

In their investigations, in plain radiographs and magnetic resonance imaging (MRI), collapse of some thoracic vertebral body was seen (Fig-1. a, b, c)

A CT guided biopsy from one of the involved vertebrae confirmed the diagnosis of "malignant lymphoma" and the patient was referred to us for treatment. In our physical examination, we observed that the patient had kyphosis and disability to stand and walk without help, but neurological examinations were normal.

The patient has no splenomegaly and lymphadenopathy. Laboratory studies (CBC, LDH, ESR, liver function tests and renal function tests) were normal.

A bone marrow aspiration and a trephine biopsy were performed. The aspiration was dry tap but

biopsy revealed lymphomatous involvement. Immunohistochemistry studies were done on the specimens, which confirmed the diagnosis of T-cell lymphoma (CD3: positive, CD20: negative, CD45: positive) (Fig- 2.a, b, c).

Because of bone marrow involvement, we started chemotherapy for acute lymphoblastic leukemia (Daunorubicine 45mg/m<sup>2</sup>/day for 3 days, Vincristin 1.4 mg/m<sup>2</sup>/week for 4 weeks, Cyclophosphamide 1.2 g/m<sup>2</sup> in day 21, Prednisolone 60 mg/m<sup>2</sup>/day for 28 days) followed with CHOP protocole every 3 weeks for 6 consecutive cycles (Cyclophosphamide 750 mg/m<sup>2</sup>, Adriamycine 45 mg/m<sup>2</sup>, Vincristin 1.4 mg/m<sup>2</sup> and Prednisolone 60 mg/m<sup>2</sup>/day for 5 days).

With chemotherapy, our patients condition improved, and now, he can stand and walk without help, but control X-rays still show the collapse of thoracic vertebrae.

### Discussion

Vertebra plana was first reported by Calve in two children with aseptic necrosis.<sup>(25)</sup> From that time till now, most reported cases had been in Langerhans cell histiocytosis and Eosinophilic granuloma.<sup>(2, 12)</sup> This condition was also reported in Trauma,<sup>(26)</sup> Juvenile osteochondritis,<sup>(27)</sup> Gaucher disease,<sup>(28)</sup> Vertebral osteomyelitis,<sup>(17)</sup> Coccidiomycosis,<sup>(29)</sup> Tuberculosis,<sup>(15,16)</sup> Myofibromatosis,<sup>(30)</sup> Neurofibromatosis,<sup>(26)</sup> Hemangioma,<sup>(21)</sup> and Aneurysmal bone cyst.<sup>(19)</sup> Malignant disorders which can cause vertebra plana are *Ewing sarcoma*,<sup>(2,13,14)</sup> *Osteosarcoma*,<sup>(20)</sup> *Neuroblastoma*,<sup>(21)</sup> *Acute leukemia*,<sup>(22)</sup> and *Rhabdomyosarcoma*.<sup>(23)</sup>

According to Buchman's definition of 1927, vertebra plana is used to describe total collapse in only one vertebra.<sup>(31)</sup> In our patient, this con-

dition was seen in all of the thoracic vertebrae. Some references called it *Platyspondyly*.<sup>(26,32)</sup> In most reported cases of vertebra plana, pain was the chief complaint of the patient<sup>(2)</sup> but in our patient pain was not an important complaint, and progressive kyphosis with disability to walking and stand were the main complaints.

Among the reported cases of vertebra plana, only two cases were due to malignant lymphoma. Therefore, there was room for doubt in our diagnosis. To omit this doubt, we performed a immunohistochemistry study on the specimens, which confirmed the diagnosis in spite of a normal complete blood count and peripheral blood smear. Because of the involvement of bone marrow, we decided to initiate

Plain radiographs and MRI clearly revealed collapse of thoracic vertebrae. CT guided biopsy confirmed the diagnosis of malignant lymphoma in our patient. Because fine-needle sampling often yielded an inadequate tissue specimen, some authors recommended open biopsy.

treatment such as that for acute lymphoblastic leukemia and then followed therapy such as that for lymphoma. The patient had a good response to chemotherapy, and now, he can stand and

walk without help, but control X-rays still show the collapse of thoracic vertebrae.

### **Conclusion**

In conclusion, malignant lymphoma can cause vertebra plana and we should include this diagnosis in the differential diagnosis of a child with rapid progressive kyphosis and disability to stand and walk. Because of the malignant nature of this disease, rapid diagnostic work, including MRI and biopsy, should be performed, and chemotherapy should be started as soon as possible.

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