

## UNUSUAL CLINICAL MANIFESTATION OF LYMPHANGIOMATOSIS

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**A 6-year-old boy presented with disseminated intravascular coagulation and was diagnosed with lymphangiomas. Disseminated intravascular coagulation develops in a minority of cases. Bone lesions were present on his left shoulder. The authors discuss the diagnostic findings and medical management.**

**Key-word:** Lymphangiomas.

Lymphangiomas is a condition of lymphatic tissue malformation with diffuse involvement of soft tissues, lungs, abdominal organs, and bones. The clinical presentation is varied and can be confusing, with diagnosis made at autopsy. We report a case of this rare disease, emphasizing on its clinical presentation, diagnosis, radiographic findings and potential treatment options.

### Case report

A 6-year-old boy was brought to the emergency department of our hospital for abdominal pain and bloody vomits.

His past history reveals bruises on the lower limbs and multiple petechiae on the thorax, face and neck for 2 weeks.

Clinical examination excluded hepatosplenomegaly and acute surgical disease.

Biological tests showed pancytopenia, prolonged coagulation times (activated partial thromoplastine APTT) and a low fibrinogen level. He was transferred to the intensive care unit. Hematological tests normalized over a few days after management of disseminated intravascular coagulation (DIC) and pancytopenia with blood and fresh frozen plasma transfusion. Bone aspiration showed a rich bone marrow without blastic infiltration. Bacteriological tests and a search for a primitive coagulopathy were negative.

The child was discharged and followed-up monthly in the outpatient oncology clinic.

During one of his visits, clinical examination found a painful cough, which motivated the realization of chest X-ray.

The biology results revealed a high level of D-Dimers and a prolonged APTT.



*Fig. 1.* — X-ray of the left humerus showing multiple lytic lesions in the left humerus extending to the shoulder blade.

Chest X-ray showed no pulmonary or pleural lesion, but unveiled major lytic lesions in the left humerus extending to the shoulder blade (Fig. 1). These geographic bone lesions had sharply defined border with thick or thin sclerotic rim (Lodwick IA and IB). Abdominal ultrasound didn't showed lesions in the spleen or the liver. A complementary whole-body investigation

with magnetic resonance imaging (MRI) was indicated.

MRI of the left humerus and shoulder blade showed multiple lacunar lesions involving the cortical and medullary bones of the glenoid fossa, the metaphysis and diaphysis of the proximal humerus. The lesions were hyperintense on T2, hypointense on T1-weighted images and enhanced after intravenous gadolinium injection (Fig. 2). No similar lesions were seen in the all body. Bone biopsy excluded malignancy as well as Langerhans cell histiocytosis.

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Fig. 2. — Sagittal STIR (A), sagittal T2 (B), coronal T1 (C), and Gadolinium enhanced axial T1 with fat saturation MR-images showing multiple lacunar lesions involving the cortical and medullary bones of the left humerus, enhancing after injection.

Management consisted of surveillance of lesions and blood analysis.

### Discussion

Lymphangiomas is a rare, benign disease resulting from abnormal development of the lymphatic system. Unlike lymphangiomas, in which there is a focal proliferation of lymphatic tissue (30% at the head and neck level), lymphangiomas is a disease of diffuse infiltration via lymphatic channels involving one or more soft tissue organs and the skeleton. The disease can occur at any age, but commonly is found in patients 20 years of age

or younger, and has no sex predilection. In 65% of the patients there is affection of soft organs (mostly in the spleen, the liver, and the lungs) and the skeleton (the long bones, the pelvis, the skull and the vertebrae). The diagnosis of lymphangiomas is made through clinical suspicion combined with radiographic and pathologic findings (1).

Bony lesions may present as solitary or multiple. On radiography, bone lesions have a well-defined rim of sclerosis that varies in size. Medullary involvement usually predominates. Bony infiltrates are commonly seen at the diaphysis or metaphysis of the tibia and humerus

as well as the ilium, skull, mandible and vertebrae. The lesions, in our case, present with these features.

Differential diagnoses include histiocytosis, hemangiomas, infection in children. If the lesion is solitary, it is necessary to exclude fibrous dysplasia, aneurysmal bone cyst, Langerhans cell histiocytosis, giant cell tumor, chondromyxoid fibroma or non ossifying fibroma.

Bone biopsy is often negative and enables especially to exclude a neoplastic process. Biopsy of the ribs yields better results. Macroscopically, the lesion looks like multiple communicating cysts which are either empty or contain some blood or a clear fluid or proteins. These cysts are separated by partitions. Histologically, these lesions do not differ from cavernous or capillary angiomas and even lymphangiomas.

In the case of a focal bone lesion the evolution is generally favorable with stabilization or spontaneous regression. Gorham-Stout syndrome is characterized by a massive osteolysis associated with extended proliferation of bone lymphatic vessels. The disease is often diagnosed after a pathological fracture and widespread bone resorption can lead to delayed extensive fibrosis. One death caused by skull base collapse and spinal cord impingement as a result of massive osteolysis of the first vertebra and skull base has been reported (2).

Spleen lesions appear as variable-sized cysts, from millimeters to centimeters. On sonograms, well-defined hypoechogenic masses with occasional internal septations and intralocular echogenic debris can be seen. On computed tomography (CT) scanner, they are seen as single or multiple thin walled, low-attenuation masses with sharp margins that are typically subcapsular in location. No significant contrast enhancement is seen. MRI is the most reliable diagnostic modality for detecting both soft tissue and bony lesions. Lymphatic vascular channels had mostly low signal on T1-weighted sequences and high or isosignal intensity on T2-weighted images. Some had high signal on T1 presumably because of high protein, fat, or blood content (3). Küpeli et al. recommend the surveillance of these lesions without treatment (4).

Disseminated pulmonary lymphangiomas (DPL) is characterized primarily by multifocal proliferation of pulmonary lymphatic vessels and increased number of complex

anastomosing channels. These channels tend to dilate with time. This is the only affection considered as a proliferative disease as compared with other lung lymphatic pathologies such as lymphangiomyomatosis, lymphangiectasia and lymphangiomas.

Patients often present with dyspnea and wheezing, which may be misdiagnosed as asthma.

Chest radiographs often show bilateral interstitial infiltrates with pericardial or pleural effusions. This disease evolves and progressively new interstitial infiltrates appear on X-rays.

CT scanner evokes the diagnosis by revealing sub-pleural thickening of the interlobular septas and peribronchovascular spaces, a parahilar and mediastinal thickening of liquid density (due to a lymphatic proliferation and excess of lymph) and a bilateral pleural effusion which is sometimes associated with pleural calcifications (5). The diagnosis of certainty of DPL is based on pathological analysis. It defines itself histologically by a diffuse proliferation of lymphatic vessels and smooth muscle in the lung, in the pleural and the mediastinal lymphatic territories. On macroscopic examination of the lung slices, the pleura, the bronchovascular axes and the interlobular septas are all thickened. Immunohistochemical studies reveal the phenotype of the lymphatic cells as being endothelial with a positive response to the vascular markers. The spindle-shaped stromal cells co-express vimentin, desmin and actin (6).

The prognosis for lymphangiomas is usually poor, particularly among patients with pulmonary involvement and chylothorax. The natural history tends to be that of slow progression with recurrent chylous accumulations and associated mediastinal compression. The main cause of death in most patients is respiratory failure secondary to infections and rapid chylous accumulation.

Patients with recurrent chylothorax may benefit from a medium-chain triglyceride and high protein diet. Surgical treatment may be indicated for resection of solitary mediastinal or lung lesions in rare cases. Cases of recurrent thoracic lymphorrhagia and disseminated lymphangiomas have been successfully treated with somatostatin. Recurrent chylothorax can be treated with percutaneous drainage and pleurodesis with talc or bleomycin. Interferon- $\alpha$  therapy has been used with limited success. Significant clinical and radiologic improvement of a 3-year-old patient with disseminated lymphangiomas after 1 month of treatment using recombinant interferon- $\alpha$ -2b has been reported. Three patients with extensive thoracic lymphangiomas have been successfully treated with irradiation (7).

DIC is a hemorrhagic syndrome characterized by the disappearance of fibrinogen in the circulating blood. This has been reported previously with or without associated splenic lymphangiomas. The literature reports that this coagulopathy is rare and the mechanism is poorly understood. It may be similar to coagulation abnormalities associated with venous malformations. Decreased fibrinogen, increased D-Dimers and soluble fibrin complex without severe thrombocytopenia have been described in the blood component of these lesions. Eventually, this so-called intravascular coagulation could develop into a systemic disease, giving rise to bleeding due to blood factors consumption and multi-organ failure related to micro-vascular thrombosis (8). Lymphangiomas of the spleen can result in splenomegaly with left upper quadrant pain and a risk of bleeding from splenic rupture or consumptive coagulopathy. In these cases, total splenectomy is warranted. Accessory spleens should be removed because they may be a source of disease recurrence. A beneficial effect of partial

splenic embolization to treat disseminated intravascular coagulopathy associated with lymphangiomas has been reported.

## Conclusion

DIC in a young child should be investigated. Imaging plays an important role in the determination of its cause. Lytic bone lesions on X-rays associated with affection of soft organs on sonogram or CT should evoke the diagnosis of lymphangiomas. Total body MRI enables assessment of lesions in multiple locations. Confirmation is based on pathologic findings.

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