Myelofibrosis Case in a Child

ABSTRACT

Complexity of myelofibrosis diagnosis at an early stage is that it takes place under other conditions: anaemia, abdominal pain, enlarged liver and spleen. This article describes a case of myelofibrosis in a child, when the diagnosis was made late, which resulted in a poor prognosis.

KEYWORDS myelofibrosis, myeloproliferative disorders, acute myeloid leukemia

INTRODUCTION

Myelofibrosis (myelofibrosis) is a myeloproliferative disease characterised by fibrosis of the bone marrow, anaemia of varying severity, myeloid metaplasia of the spleen, liver and other organs. The disease results from the proliferation of the mutant clone derived from hematopoietic stem cells, capable of differentiating into erythrocytes, granulocytes and platelets.1,3,4

Also, osteoblast proliferation and new bone formation may occur. Myeloid metaplasia of the spleen, liver and other organs are usually regarded as a compensatory process, but it is possible that, it is the result of stem cell proliferation. Myelofibrosis may occur against the backdrop of polycythemia vera or thrombocytopenia, but it usually develops as a primary process.3–5

Today, there is no doubt of the fact that bone marrow fibrosis that accompanies a number of neoplastic processes, and above all, chronic myeloproliferative disorder is a reactive state.4

It is believed that, it is a disease of middle-aged and older (maximum incidence observed in the age group of 50–70 years), but extremely rare in children. Individuals of both genders suffer equally often. In world practice, there are cases of myeloid transformation of myelofibrosis into various subgroups of acute leukemia, other than M3, M7 (25.4%), M0 (22.4%) and M2 (17.9%) are most common.6

The Scientific Center of Pediatrics and Children Surgery enrolled, 4-year-old child with the complaints of fever, general weakness, weakness in the legs, sweating and coughing.

The debut of the disease is associated with severe manifestation of ossalgia, dynamics condition progressively worsened.

At the time of hospitalisation to Oncohematology department, severity of the condition was caused by severe intoxication symptom, hyperplastic syndrome and clinical manifestations of anemia. Skin and visible mucous membranes were pale, haemorrhagic lesions were visualised in the form of petechiae and ecchymosis at the injection sites. All groups of peripheral lymph nodes were palpable in diameter up to 0.5–1.0 cm. Thick consistency, unsoldered with surrounding tissues, mobile, painless during palpation. In the lungs, breathing was hard, weakened in the lower divisions, crackles were heard. Abdomen increased in volume, soft, painless during palpation. Liver 4.0 cm from the edge of the costal arch, tightly-elastic consistency. Spleen +6.0 cm below the edge of the costal arch, tightly-elastic consistency. Evacuation was regular, free urination.

Blood test: HGB—51 g/L, RBC—2,3 10^{12}/L, PLT—36 10^{9}/L, WBC—9,6 10^{9}/L, prolym—1%, NEUT—49%, 6%, EO—1%, BASO—2%, MONO—2%, LYMPH—37%, ESR—75 mm/h.

Sternal punctuate is uninformative (‘dry punctate’), after repeated sampling of punctate of iliac in myelogram: blasts—69.0%, with marked atypia. Reaction to the MPO is negative in blasts. Estimated conclusion: acute myeloblastic leukemia (AML) (M0) option (Fig. 1).
During immunophenotyping, the bone marrow cytogramme of CD45/SSC revealed abnormal cell population, making up 38% of total nucleated events. Transformed cells are weakly positive for CD45 with low degree of granularity. Summary population of pathological phenotype CD13+CD33+CD117+HLA–DR–CD34+ corresponds to undifferentiated option AML (M0). The co-expression of lymphoid antigen is CD56 (Fig. 2).

Histological examination of bone marrow trephine biopsy revealed that spaces are occupied by fibre-fibrous tissue, in which the loops walled the lymphoid cells. Fat in the bone marrow is missing, effective bone marrow is in the state of hyperplasia, and the cellular composition is monomorphic, represented by the same type of large lymphoid cells with rounded nucleus and a thin rim of cytoplasm (Fig. 3).

Cytogenetic study of bone marrow did not reveal any pathological changes. After verification of the diagnosis, the intensive chemotherapy of AML programme-BFM-1998 was used. Followed by the protocol of induction, expected myelotoxic aplasia of haematopoiensis was observed. In the control myelogram (after aplasia): punctate of bone marrow is extremely meager with blasts of 10%.

Chemotherapy procedure in compliance was satisfactory with the protocol consolidation complications in the form of severe myelotoxic haematopoiesis aplasia, febrile neutropenia, accompanied by anaemic, severe haemorrhagic syndrome, metabolic and electrolyte

Fig. 1 Blasts with severe signs of atypia, there are two-nuclear cells, a negative reaction to myeloperoxidase (M0-FAB). Painting by Romanovsky–Giemsa, ×1000.

Fig. 2 Immunophenotyping. Blast population weakly positive/negative for leukocyte common antigen CD45 PerCP, had a low degree of granularity. Summary population pathological phenotype CD13+CD33+CD117+HLA–DR–CD34+ corresponds to minimally differentiated AML (M0).
disturbances, bilateral pneumonia, and toxic hepatitis were observed. After the syndrome, symptomatic therapy condition improved, the child was discharged for ambulant treatment.

During the next hospitalisation of intensification protocol I, severity of symptoms was due to accruing intoxication, severe hepatosplenomegaly. Blood test: HGB—120 g/L, RBC—3.67 \(10^{12}/L\), PLT—181 \(10^{9}/L\), WBC—22.4 \(10^{9}/L\), NEUT—68%, 6%, MONO—7%, LYMPH—8%, promielo—1%, mielo—11%, EO—3%, ESR—75 mm/h.

The myelogram showed punctate of bone marrow is multicellular, blasts—11.6%, lymphocytes—5.6%, therefore, remission was not achieved. After chemotherapy, protocol of intensification I in addition to myelotoxic hematopoiesis, aplasia, multi organ failure, septic shock, massive gastrointestinal bleeding and DIC-syndrome are developed. The syndromal symptomatic therapy was not effective, as a result of complications, the child died.

The complexity of the diagnosis of the disease is that it is almost impossible to detect myelofibrosis at the early stage. Diagnosis is made when the patient applies complaints about anaemia, abdominal pain, enlarged liver and spleen. The delayed with therapy onset reduces the chances for positive outcome. Also it is difficult to diagnose it because this pathology is rare in children.

In this case, the development of myelofibrosis, making difficult to diagnose the primary disease, led to unclear clinical picture, resulting in late onset and therapy resistance.

REFERENCES