



Case Report of Fanconi Anemia

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ABSTRACT

Fanconi anaemia is a rare and most common form of inherited aplastic anaemia. It is mostly autosomal except one x link recessive disorder characterized by diverse congenital malformations, progressive pancytopenia, and predisposition to both haematological malignancy and solid tumours. Congenital malformation varies from patient to patient and may affect the skeletal system as well as organ systems. Highly variable phenotypic presentation with clinical manifestations makes difficult for diagnosis in some cases. Chromosomal breakage study induce by Mitomycin-C (MMC)/Diepoxybutane(DEB) provide a unique cellular marker for the diagnosis.The incidence of FA is approximately 1 in 200000 in most population. A 7year old male child was admitted to pediatric ward with a complaint of fever and abdominal pain for 6 days. On routine CBC (complete blood count) and PBS (peripheral blood smear cell morphology) there was a finding of pancytopenia, hypochromic microcytic anemia with relative lymphocytosis. Bone marrow aspirate shows hypocellular with adequate erythroids, myeloids and reduced megakaryocytes.

KEYWORDS: Fanconi anemia, chromosomal breakage study, karyotyping, marrow failure

I. INTRODUCTION:

Fanconi anemia (FA) is a rare, multisystem hereditary disorder resulting in the development of bone marrow failure by mutation in 21 genes called FANC genes. Inherited as autosomal recessive disorder and uncommon form of X-link recessive characterize by congenital malformations, hematological problems and predisposition to malignancies with a prevalence of 1 in 200000 in most population. Higher in Ashkenazi jews (1: 30,000) and Afrikaners (1: 22,000). Fanconi anemia (FA) was first described and named as a disease in 1927 by the Swiss pediatrician Guido Fanconi, 3 brothers with a specific combination of bone marrow failure and

various physical abnormalities, short stature, hypogonadism and hyperpigmentation. FA is classified into the chromosomal instability syndromes (Ataxia telangiectasia, Bloom syndrome and Werner syndrome) by its genetic pathological characteristics. Chromosomal instability syndromes are groups of disorders due to the defects in DNA repair, increased risk of cancer, and other phenotypic changes. FA is also classified into another group of syndromes, inherited bone marrow failure syndromes by its hematologic abnormalities. Bone marrow failure syndromes are defined as the failure of the hematopoietic function of the bone marrow and they are: Amegakaryocytic thrombocytopenia, Diamond Blackfan anemia, Shwachman Diamond syndrome, thrombocytopenia with absent Radie. Care should be taken not to confuse it with Fanconi's syndrome which is a kidney disease.

II. CASE REPORT:

A 7year old male child was admitted to pediatric ward with a complaint of fever and abdominal pain for 6 days. On routine CBC(complete blood count) and PBS (peripheral blood smear cell morphology) there was a finding of pancytopenia, hypochromic microcytic anemia with relative lymphocytosis. Bone marrow aspirate shows hypocellular with adequate erythroids, myeloids and reduced megakaryocytes. Left ectopic kidney on USG abdomen. Chromosome analysis(stress induce cytogenetic study)100% breaks, triradials and quadrilateral were observed in mitomycin induce culture. Karyo type(46XY) is normal in 72hr stimulate culture-GTG banding. Patient was once admitted in NRC (nutritional rehabilitation centre) for not gaining adequate weight. Development milestone is within normal, no history of blood transfusion, no cardiac disease and mental retardation.Symptomatic treatment was given along with folic acid and multivitamin supplementation. LCDC reference was done and viral marker sent during hospital stay.



Figure 1. Chromosomal Study (Stress Cytogenic Study)

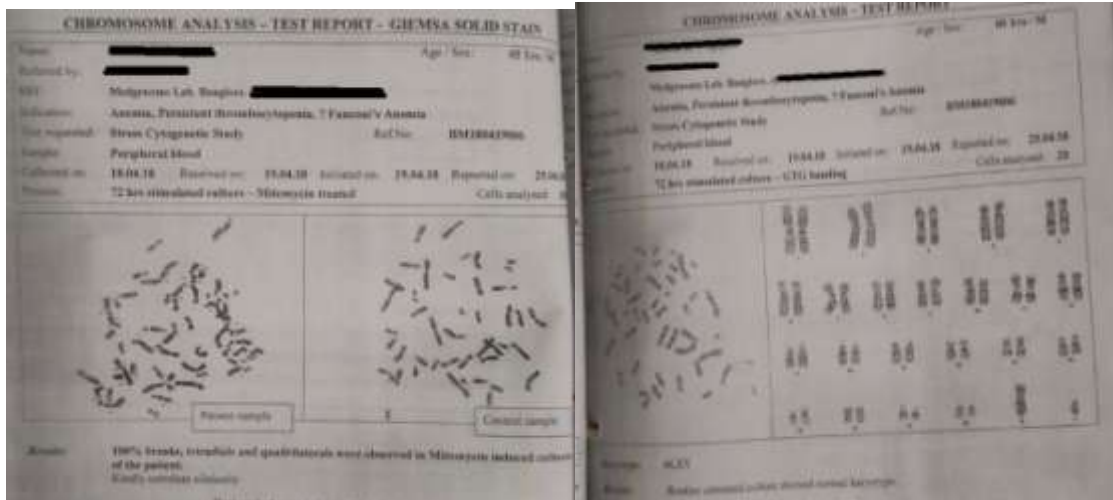
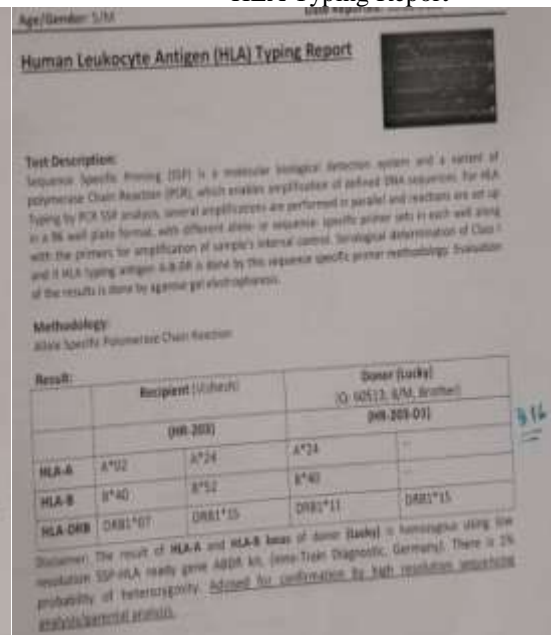


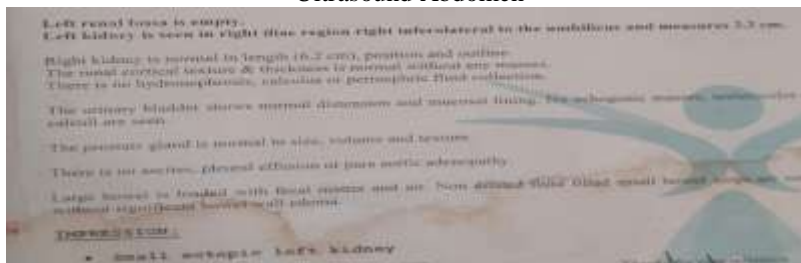
Figure 2. Bone marrow aspirate report



HLA Typing Report



Ultrasound Abdomen



III. DISCUSSION:
This case was diagnosed based on blood and bone marrow investigation. Confirmed by chromosomal breakage studies. Conservative treatment given is

packed red cells, other includes androgen to raise hemoglobin and platelet count, G-CSF and GM-CSF for neutropenia. Definitive treatment includes bone marrow transplant for marrow failure patient. Treatment of FA



should be multidisciplinary approach and pediatric hemato-oncologist should play the pivotal role. Hematologic management can be given by blood transfusion, infection control by antibiotics, androgen therapy and stem cell transplant FA is significantly responsive to androgen therapy. Unfortunately the hematologic response is very short when this therapy is stopped thus showing androgen dependency. On the other hand androgen therapy has some side effects such as hirsutism and hepatic dysfunction. Nutritional management, hormone therapy and management of other organ involvement when required is important part of management. If FA is confirmed, a set of preventive strategy can be applied. These include carrier detection (parents and sibling), antenatal diagnosis (anomaly scan by ultrasonography, amniocentesis or chorionic villous sampling for chromosome break study) and family planning.

IV. CONCLUSION:

It is important to diagnose FA accurately so that appropriate investigation can be planned, relevant intervention can be given. Chromosomal breakage studies with DEC (Diepoxybutane)/ MMC(mitomycin C) and family planning. Registry of Fanconi anemia in India (REFAIN) maintain the details of diagnosed case of Fanconi anemia in India. General awareness about such organization needs to be established and government should take initiative to support the parents. assessed and counselled accordingly. With typical features, FA can be diagnosed with certainty, but with atypical presentation diagnosis of FA can be challenging. FA is a genetically and phenotypically heterogeneous disease and also because FA shares many clinical features with several group of diseases/syndromes. Early diagnosis and appropriate management is very important for Fanconi anemia.

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