A 13-years-old girl with generalized weakness and abdominal lump

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Particulars of the Patient

Name: Nayan Tara

Age: 13 years

Sex: Female

Occupation: Student

Religion: Islam

Address: Islamabad, Keranigonj, Dhaka

Date of admission : 27.12.2021

Date of examination: 28.12.2021

Chief Complaints

Generalized weakness for 10 months

Lump in the left upper abdomen for 7 months

The History of Present Illness

The patient states that she was alright 10 months back when she developed generalized weakness, which increased day by day and now she feels extremely tired even after mild activity. The patient also complains of palpitation on mild exertion and dizziness on standing from lying or sitting position for the same duration.

The History of Present Illness

The patient also complaints of feeling a lump in the left upper abdomen for last 7 months, which is progressively increasing in size and is associated with feeling of heaviness only, without any pain.

History of Present Illness

The patient doesn’t complain of yellow coloration of the eyes or skin, vomiting out of blood, passage of black tarry stool, any bleeding, skin rash, fever, night sweat, bony tenderness, joint pain,contact with TB patient or any weight loss.

The History of Present Illness

On further query, she states no history of travelling to hill tracts or other endemic zones. Her bowel and bladder habits are normal.

The History of Past Illness

She has a history of low trauma fracture of neck of the left femur and was successfully operated 4 years ago.

Drug History

She received 2 bags of whole blood during her fracture neck of left femur operation. She also received another 3 bags of whole blood during our hospital admission.

The Family History

There is a history of consanguineous marriage between her parents.

She has 2 siblings .

Her parents and both of siblings are enjoying good health.

The Developmental History

Her secondary sexual characteristics are age appropriate.

Socio-economic History

She belongs to low socio-economic status.

She lives in a brick build house, drinks water from deep well and uses sanitary latrine.

Immunization History

She was immunized as per EPI schedule.

Menstrual History

Age of menarche: 13 years

Date of last menstrual period: 15th December,2021

Duration: 4 days

Bleeding was average.

General Examination

Appearance- Prominent frontal and parietal boosing
Body built- Average
Co operation- Co operative
Decubitus- On choice
Anemia - Moderate
Jaundice- Mild
Cyanosis
Oedema
Dehydration
} Absent

Picture was taken with consent

General Examination

Clubbing
Koilonychia
Leukonychia
} Absent

Lymph Nodes: Not palpable
Thyroid gland- Not enlarged
Body hair distribution- Normal
Neck veins- Not engorged
Skin survey- BCG mark present

General Examination

Eyes- Lateral squint present of left eye

Stigmata of chronic liver disease: Absent

Bed side urine: No protein or sugar present

Anthropometric measurement :

Weight- 30kg, Height- 122cm

General Examination

Pulse- 84 bpm

Blood pressure- 110/70 mmHg

Temperature- 37 C

Respiratory rate- 12 breaths per minute

Systemic Examination: GI System

Lips, mouth, oral cavity- Moderate pallor, mild yellowish.

Tongue- Pale, smooth, shiny and yellowish in appearance.

Abdomen

Inspection: Left upper abdomen is distended.

Umbilicus is centrally placed, inverted. Flank looks normal. No visible pulsation, peristalsis, scar mark, abnormal pigmentation.

Hernial orifice: Intact

Systemic Examination: Abdomen

Palpation:

Liver- Enlarged, 2 cm from the right costal margin along the mid clavicular line, surface is smooth, margin is sharp, non-tender, firm in consistency, dull on percussion, no hepatic bruit or rub present. Upper border of liver dullness is in 5^{th} right ICS.

Spleen- Hugely enlarged, 20 cm from the left costal margin in the anterior axillary line towards the right iliac fossa, surface is smooth, firm in consistency ,non tender, splenic notch present, finger insinuation not possible, not ballotable, dull on percussion.

Systemic Examination: Abdomen

Kidneys- not ballotable.

No palpable lymph node present.

Percussion: No fluid thrill or shifting dullness present

Auscultation: Bowel sound present.

Per rectal examination: No abnormalities.

Respiratory system

Chest looks normal.
Breath sound- Vesicular all over lung field.
No added sound

Cardiovascular system

Precordium looks normal.
Heart sound: S1, S2 audible in all four areas.
No audible murmur present.

Nervous system

Higher psychic function- Normal

Cranial nerves:

Optic nerve

Visual aquity: No PL or PR on left eye

Colour vision: Absent on left eye

Normal findings on right eye

Nervous system

Oculomotor, Trochlear, Abducens- Squint present.

Pupil: Mid dilated, reactive to light.

Opthalmoscopy:

Left fundus: Disk is pale with clear margin and no change in the retina.

Right fundus: Normal

Function of other cranial nerves are intact.

Nervous system

Motor system- Normal

Sensory function- Intact

Signs of meningeal irritation- Absent

Cerebellar sign- Absent

Locomotor system

Left limb appear shorter.

No muscle wasting present.

Motor and sensory system of lower limb intact.

Gait- Limp present on left leg.

Salient feature

Ms. Noyon Tara, 13-years-old, female, student, hailing from Keranigonj , got admitted into our hospital 27-12-2021 with the complaints of weakness for 10 months, which increased day by day and now she feels extremely tired even after mild activity. The patient complained of palpitation with mild exertion and dizziness on standing from siting or lying position for same duration. The patient also states that she feels a lump in the left upper abdomen, which is progressively increasing in size over last 7 months .

Salient feature

It is not associated with pain but heaviness only. The patient doesn’t complain of any yellow coloration of the eyes or skin, vomiting out of blood, passage of black tarry stool, any bleeding, skin rash, fever, night sweat, bony tenderness, joint pain,contact with TB patient, any weight loss or history of travelling to hill tracts or other endemic zones.

Salient feature

She has a history of low trauma fracture neck of left femur and was treated by internal fixation. She needed 2 units of whole blood transfusion during her surgery.

Her parents give history of consanguineal marriage.

On general examination, there is prominent frontal and parietal boosing, she is moderately anemic, mildly icteric, pulse 84 bpm, BP 110/70 mmHg, respiratory rate 12 breaths per minute and normal body temperature. Bed side urine negative for protein.

Salient feature

Alimentary system examination reveals huge splenomegaly, 20cm from left costal margin towards right iliac fossa, surface is smooth, firm in consistency ,non tender, splenic notch present, finger insinuation not possible, not ballotable and dull on percussion. There is also enlarged liver, 2cm below right costal margin, surface is smooth, margin is regular, non tender, dull on percussion, no hepatic rub or bruit present, upper border of liver dullness on right 5th intercostal space.

Salient feature

Examination of cranial nerve reveals absent PL and PR and absent colour vision in left eye. Lateral squint present on left eye.
Other system reveals no abnormalities.

Problem list

Anemia

Jaundice

Frontal and parietal boosing

H/O of consanguinity of marriage between parents

Hepato-splenomegaly

No fever,weight loss,night sweat

No TB contract or travel history

Provisional Diagnosis

Hereditary hemolytic anemia

Differential Diagnosis

1. Chronic liver disease with portal HTN
2. Lymphoma
3. Disseminated Tuberculosis

Investigation:

Complete blood count:

Hemoglobin- 6.3 g/dL

ESR- 26 mm in 1st hour

MCV- 78 fl (Ref:76-96 fl)

MCH- 23 pg (Ref: 27-32pg)

MCHC- 29 g/dl (Ref: 32-36 g/dl)

RDW- 25% (Ref: 11.6-14%)

Total WBC count- 5,400/cmm

Platelet count- 1,28,000/cmm

Peripheral blood film:

Microcytic hypochromic anemia with thrombocytopenia.

Investigation:

Serum ferritin: 140 ng/mL (Ref: 7-142 ng/mL)

Direct and Indirect Coombs test: Negative

LDH: 550 U/L (Ref: 120-300 U/L)

Reticulocyte: 1.70% (Ref: 1-2%)

Serum creatinine: 0.8 mg/dL (Ref: 0.6-1.2 mg/dL)

Serum bilirubin: 2.60 mg/dL (Ref- Up to 1.0 mg/dL)

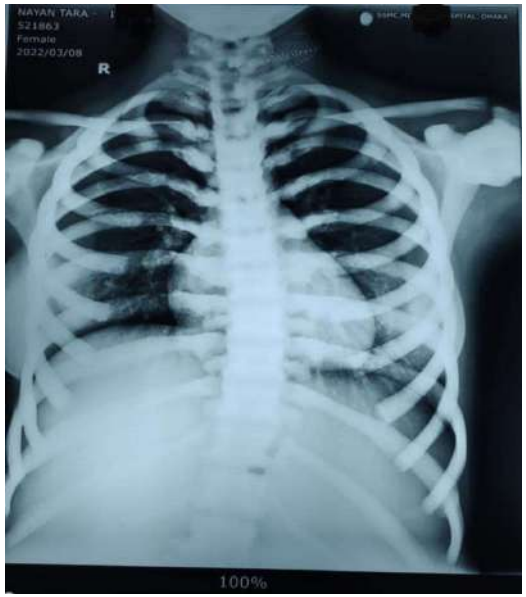
Direct- 0.55 mg/dL

Indirect- 2.05 mg/dL

Investigation:

USG of W/A: Huge splenomegaly measuring about 18cm and mild hepatomegaly

Chest X-ray: Normal study



Investigation:

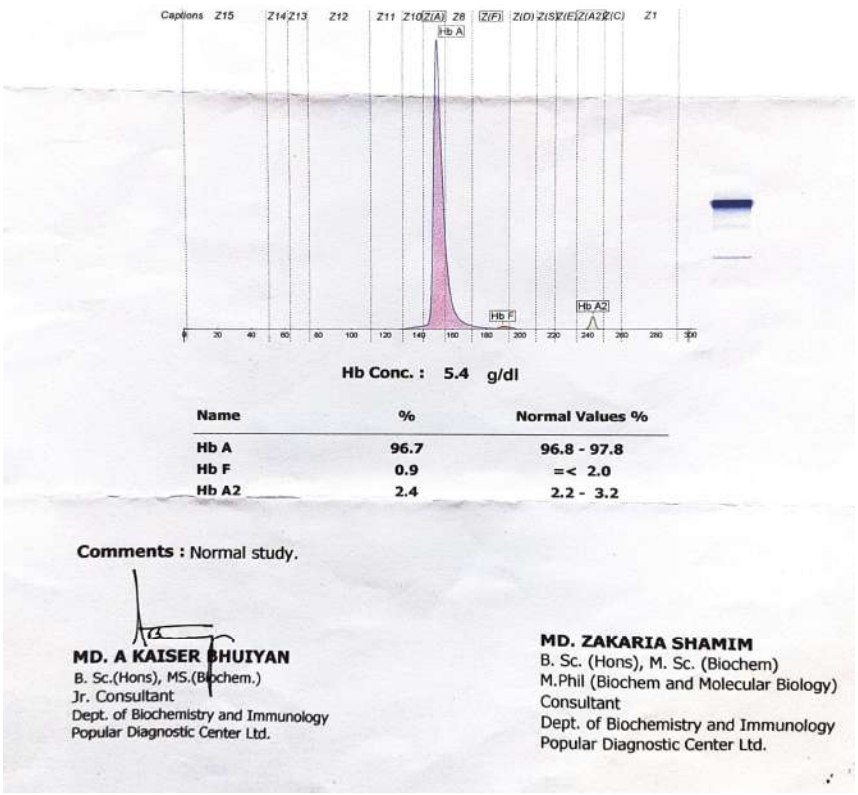
Hb capillary electrophoresis:

Normal study

Hb A- 96.7%

Hb F-0.9%

Hb A2- 2.4%



Hb Conc. : 5.4 g/dl

Name	%	Normal Values %
Hb A	96.7	96.8 - 97.8
Hb F	0.9	=< 2.0
Hb A2	2.4	2.2 - 3.2

Comments : Normal study.

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Investigation:

HbsAg: Negative

Anti HCV: Negative

Serum ceruloplamin: 390 mg/L (Ref: 200-600 mg/L)

Blood group: A(+ve)

Investigation:

ICT for malaria: Negative

ICT for Kala-azar: Negative

S. Calcium - 8.8mg/dL (Ref: 8.6-10.3 mg/dL)

Inorganic Phosphate- 5.5 mg/dL (Ref: 3.4 to 4.5 mg/dL)

PTH- 32.7 pg/dL (Ref: 14 to 65 pg/mL)

25(OH) Vitamin D level- 20.3ng/ml (Ref: 25-80 ng/mL)

Investigation:

A referral was sent to Department of Ophthalmology, SSMC & MH regarding slit lamp of examination of eye to confirm our ophthalmoscope findings and exclusion of KF ring.

Investigation:

Their findings were-

-Mild proptosed left eye with outward deviation

-PLR: Sluggish reaction on left eye

-RAPD: Present on left eye

-No KF ring present

-Anterior segment: Within normal limit on both eye

-Fundus: Primary optic atrophy on left eye

-Optic disk: Temporal pallor on right eye

Dx: Primary optic atrophy on left eye

Investigation:

Serum SGPT: 57 U/L (Ref: Upto 40 U/L)

Serum albumin: 4.5 g/dL (Ref: 3.5-5.8 g/dL)

Endoscopy of upper GIT: Normal

Investigation:

Colour doppler study of portal vein, IVC, hepatic and splenic vein:

-Normal diameter of portal vein with hepatopetal flow

-No sign of reverse flow is seen in portal vein

-No thrombus in portal vein

-Normal Doppler study of IVC, hepatic and splenic vein.

Investigation:

After all possible investigations we couldn’t reach a conclusion. We reviewed the patient again. Keeping in mind her hematological disorder we planned to perform bone marrow biopsy.

Aspiration of Bone Marrow- Dry Tap (18.01.22)

Investigation:

Then Trephine Biopsy was done on 19.01.22

Histopathology report of bone marrow- Section shows cores of trephine biopsy, showing bony trabeculae with fragmentation. The intact areas show irregular thick sclerotic bony trabeculae. Focal area shows calcified cartilaginous tissues. The intertrabecular space contain fibrovascular tissue with very few marrow cells.

Dx- Osteopetrosis.

Investigation:

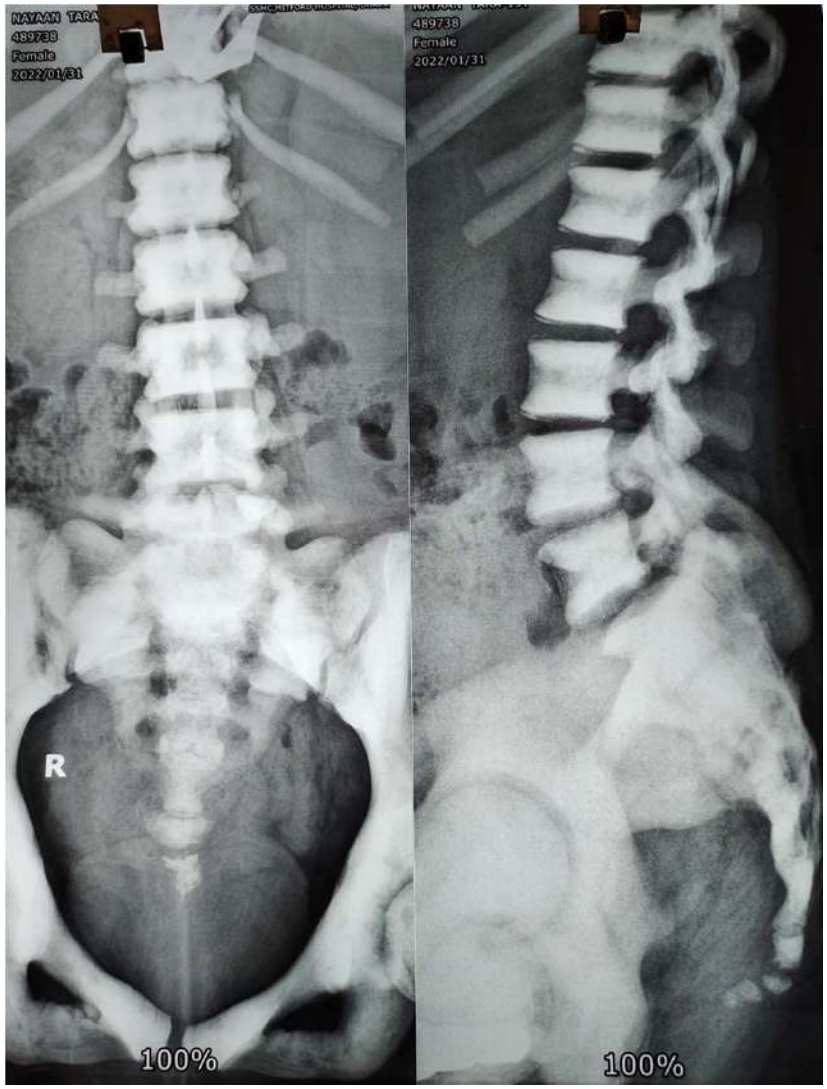
X-ray lumbo-sacral spine:

Diffuse thickening and increased density of lower dorsal and lumbosacral vertebral bodies, creating sandwich vertebrae appearance.

Forward displacement of L5 over S1 vertebra.

-Suggestive of osteopetrosis

-Spondylolisthesis of L5 over S1.



Investigation:

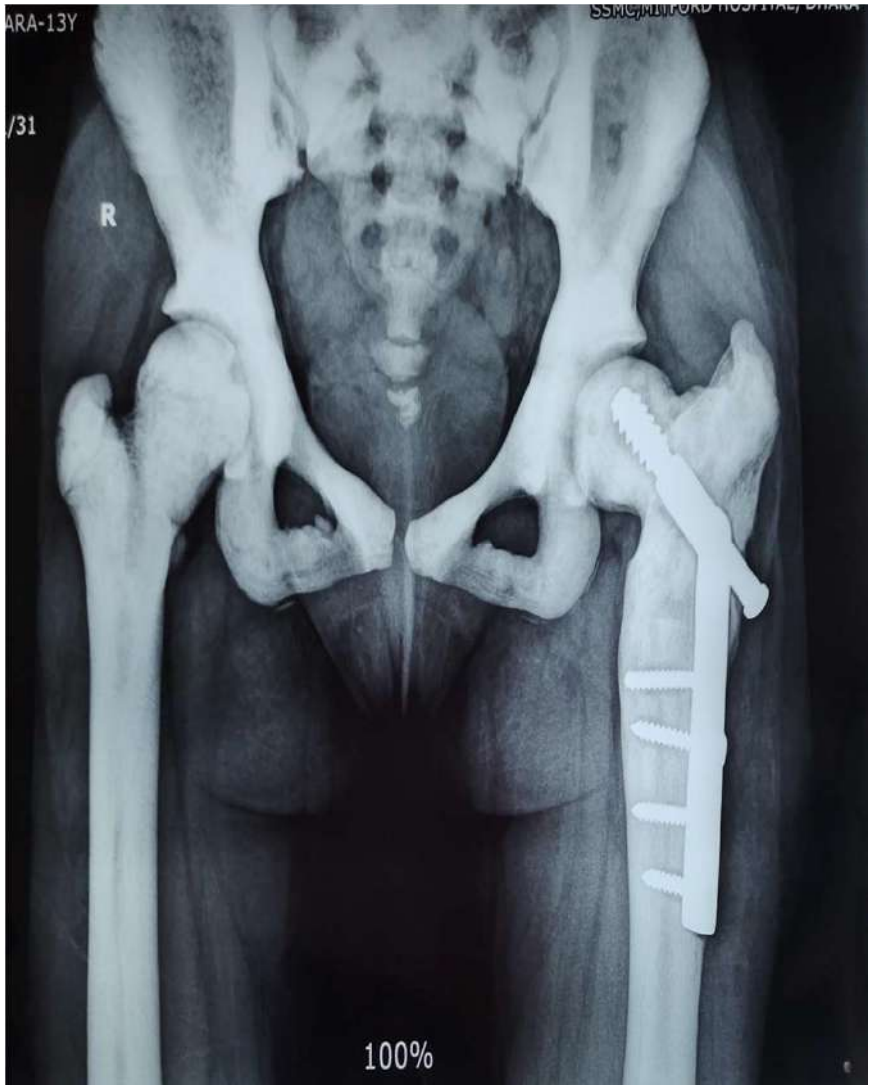
Xray of hip joint:

Diffuse increased density of bone involving lower pelvis and upper part of both femur.

Evidence of Internal fixation is noted at neck of left femur.

Soft tissue looks normal.

Suggestive of osteopetrosis



Investigation:

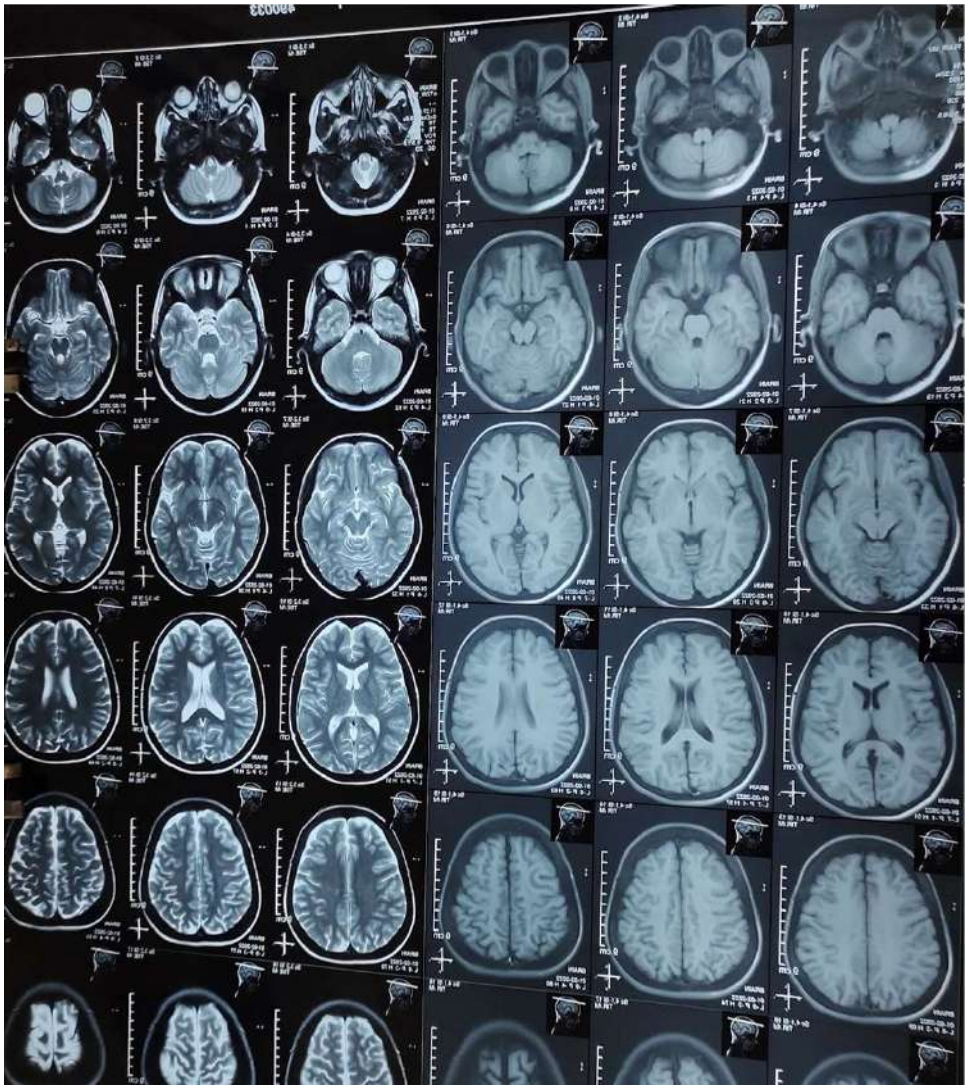
MRI of Orbit and Optic canal:

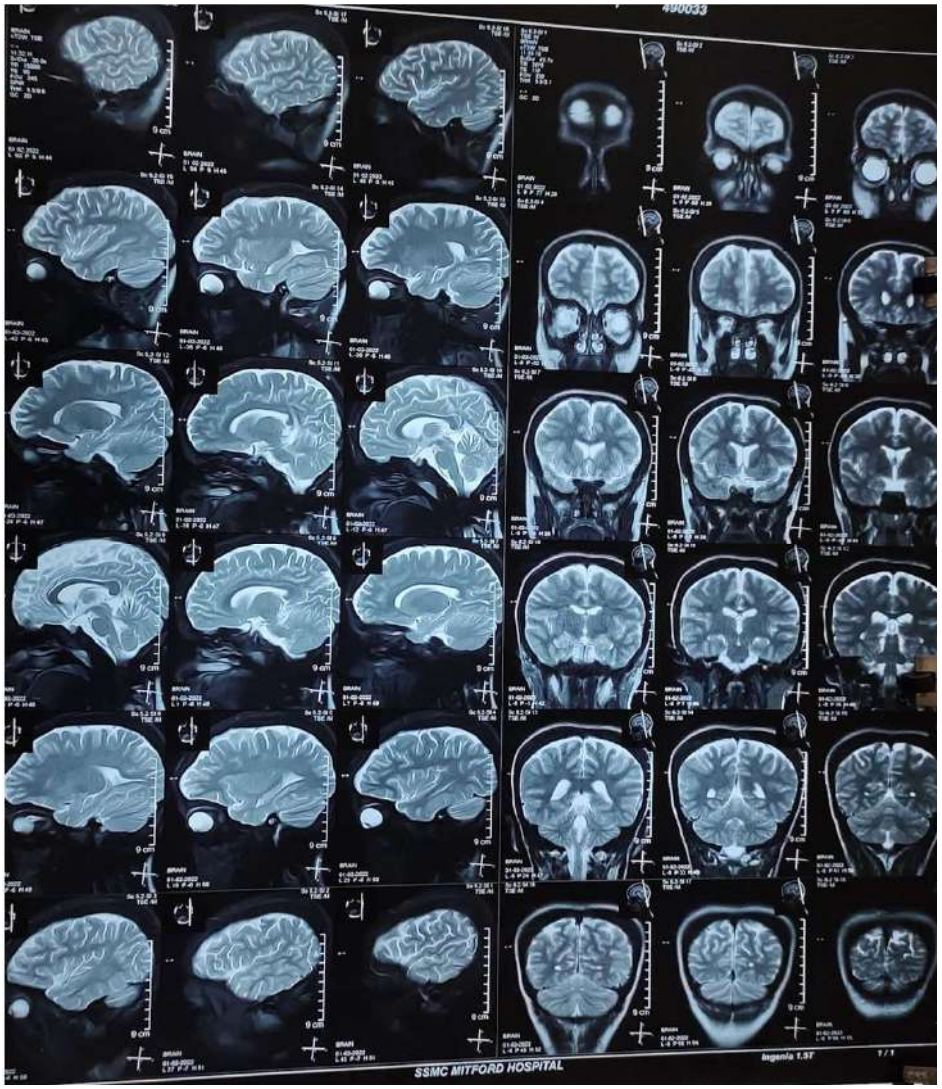
Optic canal- Narrow in calibre on both sides, measuring about 3mm (Normal 3-4mm)

Optic nerve- Intracanalicular part of both optic nerve(more on left side) narrowing is noted.

Bony calvarium shows sclerotic change (absent diploic space narrow signal)

Comment: Narrowing of the optic canal with optic nerve atrophy (more on left side)

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Confirmatory Diagnosis:

Osteopetrosis

Treatment:

Supportive treatment is given

1. Folic acid supplementation
2. Calcium and Vit-D supplementation
3. Vit-C supplementation

3 units of whole blood was transfused during this admission.

Advice: Review after 1.5 months with color fundus photograph.

Follow up

On 8th March,2022

On examination

She is severely anemic, non-icteric.

Spleen in enlarged measuring about 22 cm from left costal margin in anterior axillary line towards right iliac fossa.

Follow up

We advised

-Complete blood count

Result:

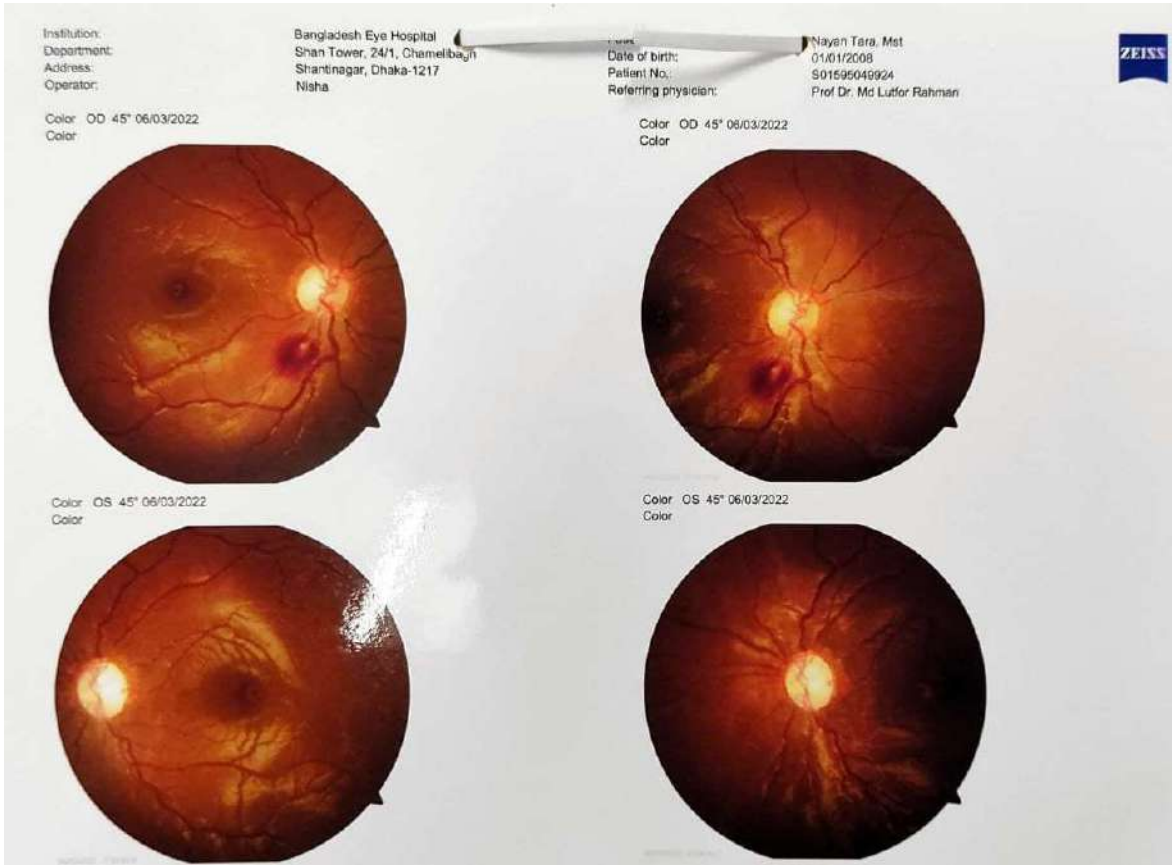
Hemoglobin**-** 4.9 g/dL (Ref: 11-16 g/dL)

Total WBC count- 6,200/cmm

Platelet count- 1,00,000/cmm

Follow up

Colour fundus photograph:



Plan

Prepare the patient for splenectomy.

Genetic testing

Hematopoietic stem cell transplantation

Acknowledgement

-Department of Medicine, SSMC & MH
-Department of Pediatrics, SSMC & MH
-Department of Ophthalmology, SSMC & MH
-Department of Hematology, SSMC & MH
-Department of Endocrinology, SSMC & MH


THANK
YOU

Osteopetrosis

The term osteopetrosis is derived from the Greek 'osteo' meaning bone and 'petros', stone. Osteopetrosis is variably referred to as 'marble bone disease’

Epidemiology: Autosomal recessive osteopetrosis has an incidence of 1 in 250,000 births and autosomal dominant osteopetrosis has an incidence of 5:100,000 births.

Aetiology: Osteopetrosis is caused by failure of osteoclast differentiation or function and mutations in at least 10 genes have been identified as causative in humans.

Autosomal recessive ("malignant") osteopetrosis (ARO):

- Classic: TCIRG gene mutation
- Neuropathic: CLCN7, OSTMI gene mutation
- ARO with RTA: Carbonic anhydrase II gene mutation

X-linked osteopetrosis: *IKBKG (NEMO)* gene mutation

Intermediate osteopetrosis (IRO): *CLCN7, PLEKHM1* gene mutation

Autosomal dominant osteopetrosis: *CLCN7* gene mutation

Clinical feature: The increased bone mass can result in phenotypic features such as macrocephaly and altered craniofacial morphology, but more importantly impacts on other organs and tissues, notably the bone marrow and nervous systems.

Diagnosis: Because of the pathognomonic radiographic features of osteopetrosis, a skeletal survey is sufficient to make the diagnosis.

Treatment:

Calcium and ergocalciferol/cholecalciferol

Red blood cell transfusion

Interferon ɣ -1b

Corticosteroids

Hematopoietic stem cell transplantation

Prognosis: The severe infantile forms of osteopetrosis are associated with diminished life expectancy, with most untreated children dying in the first decade as a complication of bone marrow suppression. Life expectancy in the adult onset forms is normal.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