Mucopolysaccharidosis with ocular manifestations- A case report

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Abstract : A 13 years old male patient presented with abdominal pain , joints pain and blurring of vision. systemic examination revealed delayed mile stones, joint deformities, hepatosplenomegaly, broad face, prominent jaw, polydactyly and short stature . Ocular examination revealed visual acuity of 6/24 in both eyes, telecanthus, clouding of cornea with mild diffuse infilteration in stroma & partial optic atrophy. Urine revealed increased Glycosaminoglycans. Blood testing showed no measurable a-L- iduronidase enzyme activity. Patient was advised enzyme replacement to ameliorate further progress of the disease. Early detection & appropriate management through a multidisciplinary approach is recommended to improve quality of life.

Key words : Mucopolysaccharidosis (MPS), Glycosaminoglycans (GAG's), Polydactyly, a - L - iduronidase Enzyme.

Introduction : The mucopolysaccharidoses (MPSs) are a heterogeneous group of lysosomal storage disorders that are characterized by defective breakdown of glycosaminoglycans (GAGs)[1]. Musculoskeletal and ocular manifestations are often early presenting features[2].Ocular manifestations are very common in all types of mucopolysaccharidoses (MPS) and often lead to visual impairment[3,4]. Many patients with MPS remain undiagnosed for years and progressively develop irreversible pathologies, which ultimately lead to premature death[5,6]. To foster timely treatment and ensure a better outcome, it is of utmost importance to recognize and evaluate the typical ocular features that present fairly early in the course of the disease in many children with MPS.

Case report : A 13 years old male patient came to paediatric OPD with complaints of abdominal pain, joint pain and blurring of vision. He had delayed milestones, joint deformities, hepatosplenomegaly as reported by paediatrician. He also had an abnormal appearance with a broad face, telecanthus, prominent jaw, polydactyly and short stature (Fig1). Contracture in all four limbs was present (Fig2a &b). He was referred to us for ophthalmic check up. Patient complained of diminution of vision and light sensitivity and tearing of his eyes upon exposure to bright light.

❖ **On ocular examination :**

- The patient was having visual acuity 6/24, improving to 6/18 with pinhole, in both eyes.
- Telecanthus was present
- Eyelids, eyebrows and eyelashes were normal.
- Ocular movements were normal .
- Conjunctiva was normal.
- Clouding of cornea with mild diffuse infiltration in stroma present (Fig 3).
- Anterior chamber and Iris was normal.
- IOP (AT) OU was 12.0mm of Hg.
- Pupil was circular and reacting to light.
- Lens appeared normal.
- Optic disc changes in form of partial optic atrophy and arteriolar attenuation were seen on fundus examination (Fig4).

❖ **Investigations** :

- Routine investigations were normal.
- X-ray view of hands and legs showed bone and joint abnormalities (Fig5 a & b).
- A urine screen for GAGs was requested. It showed increased dermatan and heparin sulphate concentrations.
- Further blood testing showed no measurable -L-iduronidase enzyme activity.

Result :

- After thorough systemic and ocular examination the 13 years old male patient was diagnosed with Mucopolysaccharidosis I-S (Scheie syndrome).
- He was given refractive correction and his best corrected visual acuity (BCVA) in both eyes was 6/18.
- His parents were told that there won't be any further deterioration in his vision neither any improvement.
- His parents were counseled about the severity and prognosis of the disease and future aspects of his life with this vision
- The patient was further referred to a rheumatologist for bone and joint abnormalities and contractures.

- He was also referred to geneticist and endocrinologist for analysis of his short stature.
- He was advised enzyme replacement to ameliorate further progress of the disease.
- Regular eye checkup was advised.

Discussion :

Early and accurate recognition of the disease allows timely therapy that prevents, reverses or ameliorates disease manifestations and as such maximizes clinical outcome and enhances the patient's quality of life. Patients with MPS and especially those with attenuated phenotypes, frequently escape diagnosis when symptoms appear and are often referred from expert to expert without an accurate diagnosis being made. The rarity of MPS, its multi-organ involvement and clinical heterogeneity may contribute to relatively low disease awareness and delayed diagnosis.[7,8,9]

The role of the rheumatologist in the early diagnosis of patients with MPS (generally children or young adolescents) cannot be overstated. These individuals may consult a rheumatologist because of characteristic joint problems (pain, contractures and/or stiffness without signs of inflammation), before the diagnosis is made[10,11,12,13].

Ocular features are common and like musculoskeletal symptoms, often arise fairly early in the course of the disease.[4] Photosensitivity, night blindness, corneal clouding, pseudo-exophthalmos, strabismus and reduced vision can be readily noted or discovered by interviewing the patient or parents and by observing the patient, raising the suspicion of MPS7-[15]. These patients should be referred to a geneticist, metabolic specialist or paediatrician specialized in MPS for diagnostic evaluation. In addition, they should see an ophthalmologist familiar with MPS for initial assessment and regular follow-up of ocular manifestations within the framework of integrated care (even if no ocular symptoms are immediately evident).

Fundoscopy examination has revealed arteriolar attenuation with mild optic atrophy in our patient. GAG accumulation with in the ganglion cell may cause optic atrophy by neuronal degeneration.[16,17,18] optic disc /nerve pathologies have mostly been reported in patients with MPS-1 and MPS-6[17,19]. Arteriolar attenuation suggests the presence of retinal degeneration,which can contribute to the optic atrophy. Ocular features in MPS very often lead to visual impairment[17].Condition that affects vision in patients with MPS includes refractive errors like hypermetropia or astigmatism. Reduced visual acuity and refractory errors resulting in the need for spectacle wear for the majority of the patients, have been especially reported in patients with MPS-1 and MPS-6[18,19]. In our patient also there was refractory error and its correction has lead to improvement in vision. A more rigid and flattened cornea and shortened axial length have been postulated as potential GAG mediated casues of farsightedness.[20,21]

Patient could have photosensitivity or even severe photophobia which hampers general examination.20corneal clouding can hinder visualization of the fundus. Severe corneal clouding can impede assesment of drainage angle and may mask glaucoma.[14,20,21]

Images:


Figure -1


Figure -2a

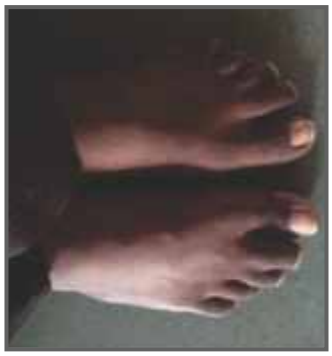
Figure -2b

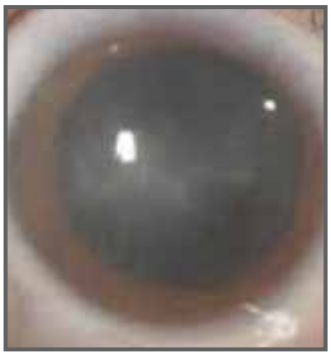
Figure -3


Figure 4

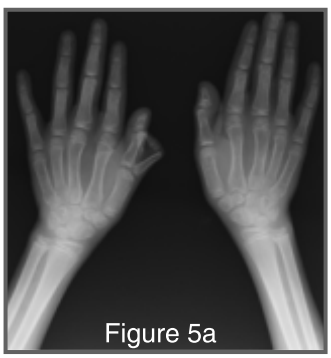
Figure 5a

Figure 5b

Legends:

1. Broad face, telecanthus and prominent jaw.
2. a. Contracture upper limbs.
   b. Contracture lower limbs.
3. Clouding of cornea with diffuse infiltration in stroma.
4. Partial optic atrophy and arteriolar attenuation.
5. a. bone and joint deformities hands.
   b. bone and joint deformities legs.

Conclusion : We report a case of Mucopolysaccharidosis I-S(Scheie syndrome).

With the advent of hematopoietic stem cell transplantation and more recently enzyme replacement therapy, there exists a need for early diagnosis, better disease recognition and management.

Early detection of the disease and appropriate management through a multidisciplinary approach is recommended to improve the quality of life.

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