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CASE REPORT

A rare cause of aortic stenosis in a sibling – Morquio syndrome – Case report

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Abstract

Morquio syndrome is an uncommon variant of autosomal recessive disorder caused by the deficiency of N acetyl galactosamine 6 sulfatase (GALNS) – a lysosomal enzyme, causing dental, cardiac and skeletal abnormalities. A male patient, 29 years of age came with complaints of difficulty in breathing since one month. He was born of a second degree consanguineous marriage and has no mental retardation. On clinical examination he was short in stature, had corneal clouding, widely spaced teeth, genu valgum, joint hypermobility, pectus carinatum and kyphoscoliosis. He had an ejection systolic murmur in aortic area on cardiovascular examination. He has one 26 year old sister with similar physical appearance and cardiac abnormalities. In Echocardiography they both found to have aortic valve calcification with severe aortic stenosis with mild aortic regurgitation. X-ray findings of the hand showed shortening of the metacarpal with hypoplasia of the carpal bones, platyspondyly of the cervical and thoracic vertebra, genu valgum and coxa valga defect. So, he was diagnosed as mucopolysaccharidosis type IV-A (Morquio syndrome), which was confirmed after genetic analysis.

Keywords: Mucopolysaccharidosis, Lysosomal defect, Echocardiography

Case report

A 29-year-old male presented with complaints of breathlessness on exertion (NYHA class II) since one month with no associated palpitation or chest pain and syncope. He gives a history of difficulty in walking since 5 years of age which was accompanied by sensorineural hearing loss for which he has been using hearing aid in right ear.

His sibling was found to have similar history regarding development and also had a similar appearance. Both were born of second degree consanguineous marriage, birth history was normal, motor milestones were delayed. Detailed clinical examination showed short stature (Dwarfism), joint hypermobility, corneal clouding, widely spaced teeth, pectus carinatum, Genu valgus and kyphoscoliosis. On cardiovascular examination there was an apico – carotid delay, small volume, slow rising and late peaking pulse and a crescendo-decrescendo late peaking ejection systolic murmur heard in the aortic area in both sibling.

Echocardiography of the male revealed aortic valve calcification with severe aortic stenosis and mild aortic regurgitation with a mean gradient of 67 mm of Hg, aortic valve area of 0.6 cm^2/m^2 and left ventricular hypertrophy with a normal LV systolic function. Echocardiography of his sister showed aortic valve calcification with mild aortic stenosis with a mean gradient of 18 mm of Hg and

a normal aortic valve area and LV systolic function with no regurgitation.

Wrist radiograph showed widened metacarpals with proximal pointing and irregular carpal bones. The pelvic X ray revealed irregularly outlined square shaped head of femur due to accumulation of abnormal cartilage and coxa valgus defect. The molecular genetic testing of GALNS gene was done which showed a possible pathological variant of morquio syndrome. The contemplated Aortic value replacement couldn't be proceeded in view of gross skeletal deformities. The treatment is only palliative.

Discussion

Morquio syndrome is a rare autosomal recessive disorder due to the deficiency of different lysosomal enzyme – N-acetylgalactosamine-6-Sulfate sulfatase (GALNS) in MPS Type IV A and Beta-Galactosidase in MPS Type IV B. Thus, leads to the accumulation of glycosaminoglycans (GAGs), keratin sulfate and chondroitin 6-sulfate in the body causing skeletal and dental abnormalities.

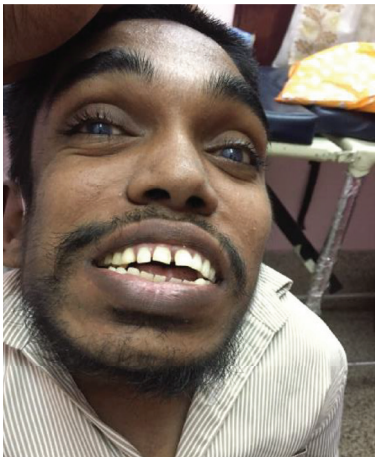
The MPS Type IV B has milder symptoms with less clinical features than MPS Type IV A. Cardiac involvement in Morquio Syndrome is due to the deposition of storage materials within the cardiac valves and coronary arteries.

Involvement of aortic valve is more common than mitral leading to structural defects causing Regurgitation than stenosis. Right sided valvular changes are uncommon. Our case had severe stenotic pathology than valve insufficiency lesion involving the aortic valves with normal mitral valve apparatus and right sided cardiac structures were normal.

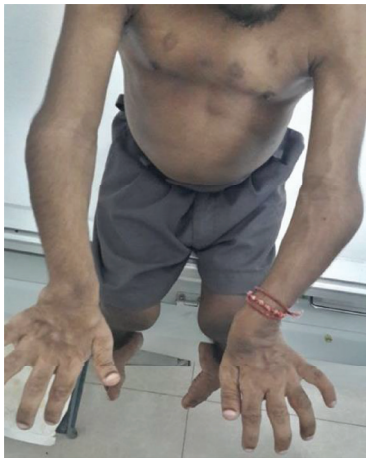
Morquio syndrome with cardiac involvement is usually silent so its needs to be vigilantly followed up by echocardiography to see the cardiac valves, heart wall thickness and ventricular function. Bacterial endocarditis prophylaxis is advised in patients those with cardiac abnormalities.

At the onset of severe valvular heart disease with worsening of systolic function, the mainstay

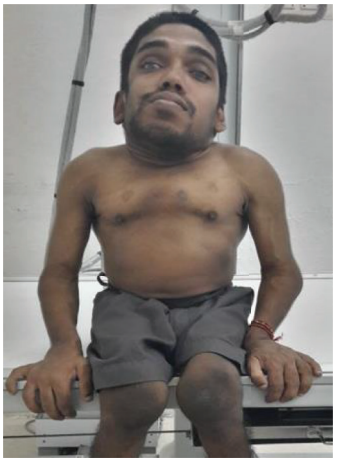
Widely spaced teeth



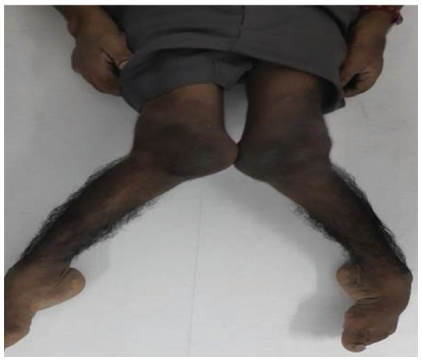
Hypermobile fingers



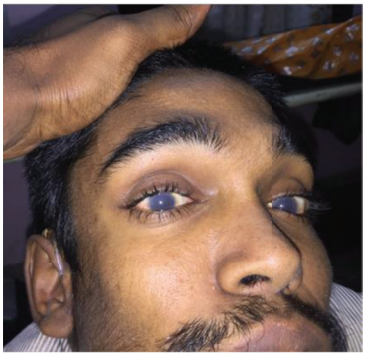
Pectus carinatum



Genu valgum deformity



Corneal clouding



of treatment is valvular replacement. Most patients are managed conservatively with Anti-failure measures due to the greater risk of perioperative complications associated with surgery.

Death in morquio syndrome is usually occurs in the third or fourth decades of life and it is mostly due to Corpulmonale, valvular heart disease or cardiomyopathy.

Early detection and treatment will help in preventing mortality and improves the quality of life. Skeletal abnormalities will usually mask the detection of cardiac abnormalities, hence a high degree of suspicion is needed. Enzyme replacement therapy and hematopoietic stem cell therapy is available and it will help to extend the lifespan of the patients with morquio syndrome.

References

1. Muenzer J. The mucopolysaccharidoses: a heterogeneous group of disorders with variable pediatric presentations. J Pediatr. 2004;144(5 Suppl): S27–S34.
2. Schieken RM, Kerber RE, Ionasescu VV, Zellweger H. Cardiac manifestations of the mucopolysaccharidoses. Circulation 1975; 52: 700–5.
3. Wilcken DE, Hickey AJ. Lifetime risk for patients with mitral valve prolapse of developing severe valve regurgitation requiring surgery. Circulation. 1988;78(1):10–14
4. Braunlin EA, Harmatz PR, Scarpa M, Furlanetto B, Kampmann C, Loehr JP, et al. Cardiac disease in patients with mucopolysaccharidosis: presentation, diagnosis and management. J Inherit Metab Dis. 2011;34: 1183–1197. 10.1007/s10545-011-9359-8
5. McKusick VA, Kaplan D, Wise D, et al. The genetic mucopolysaccharidoses. Medicine (Baltimore) 1965; 44: 445-83.
6. Gross DM, Williams JC, Caprioli C, Dominguez B, Howell RR. Echocardiographic abnormalities in the mucopolysaccharide storage diseases. Am J Cardiol. 1988;1;61(1):170–176.
7. Hendriksz CJ, Harmatz P, Beck M, Jones S, Wood T, Lachman R, et al. Review of clinical presentation and diagnosis of mucopolysaccharidosis IVA. Mol Genet Metab. 2013;110
8. Montaño AM, Tomatsu S, Brusius A, Smith M, Orii T. Growth charts for patients affected with Morquio A disease. Am J Med Genet A. 2008;146A: 1286–1295. 10.1002/ajmg.a.32281
9. Ireland MA, Rowlands DB. Mucopolysaccharidosis type IV as a cause of mitral stenosis in an adult. Br Heart J. 1981;46(1): 113–115.
10. John RM, Hunter D, Swanson RH. Echocardiographic abnormalities in type IV mucopolysaccharidosis. Arch Dis Child. 1990;65: 746–749.
11. Barry MO, Beadslee MA, Braverman AC. Morquio's syndrome: severe aortic regurgitation and late pulmonary autograft failure. J Heart Valve Dis. 2006;15: 839–842.
12. Nicolini F, Corradi D, Bosio S, Gherli T. Aortic valve replacement in a patient with Morquio syndrome. Heart Surg Forum. 2008;11: E96–E98. 10.1532/HSF98.20071197
13. Pagel PS, Almassi GH. Perioperative implications of Morquio syndrome in a 31-year-old woman undergoing aortic valve replacement. J Cardiothorac Vasc Anesth. 2009;23: 855–857. 10.1053/j.jvca.2008.12.009.