

Case Report

Marfan syndrome a rare genetic disorder: - A case report

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Abstract

Marfan syndrome (MFS) is an inherited connective tissue disorder. The severity of Marfan syndrome varies from one individual to another and it typically progresses over time. A tall, slender stature is characteristic of Marfan syndrome. It affects the skeleton, eyes, heart, nervous system, skin and respiratory system. It is caused by a defect or mutation in the gene that determines the structure of fibrillin-1, a protein that is an important part of connective tissue. Cardiovascular complications are the most common cause of patient death. Aortic dissection and congestive heart failure due to aortic and mitral valvular anomalies accounted for over 90% of the known causes of death. Here, we report a case of this rare genetic connective tissue disorder.

Keywords: - Marfan syndrome, Ectopia lentis, Skeletal system,Aortic regurgitation.

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INTRODUCTION

Marfan syndrome (MFS) is a spectrum disorder caused by a heritable genetic defect of connective tissue that has an autosomal dominant mode of transmission.¹⁻³ The defect itself has been isolated to the FBN1 gene on chromosome 15, which codes for the connective tissue protein fibrillin.^{1,4} Abnormalities in this protein cause a myriad of distinct clinical problems, of which the musculoskeletal, cardiac and ocular system problems predominate.^{2,5,6} The skeleton of patients with MFS typically displays multiple deformities including arachnodactyly (i.e. abnormally long and thin digits), dolichostenomelia (i.e. long limbs relative to trunk length), pectus deformities (i.e.

pectus excavatum and pectus carinatum) and thoracolumbar scoliosis.⁷ In the cardiovascular system aortic dilatation, aortic regurgitation and aneurysms are the most worrisome clinical findings.^{1,3} Mitral valve prolapse that requires valve replacement can occur as well. Ocular findings include myopia, cataracts, retinal detachment and superior dislocation of the lens. Here, we present a case report of this rare genetic disorder.

CASE REPORT

A 25 years, tall male patient was admitted with dyspnea and palpitations, since 6 months. Symptoms were gradual in onset and progressive.

Initially patient used to have dyspnea at more than routine activities and during exercise. At presentation he was in class II NYHA dyspnea. History of palpitations and occasional chest pain was also present. Progressive loss of vision was present since childhood and diminishing vision was also compromising the quality of life of patient. No similar history was present in any family member. He was tallest member of his family. Physical examination revealed him to be a tall, thin man with disproportionately long limbs compared to trunk (dolichostenomelia) with long tapering fingers (arachnodactyly) and hammer toes (Figure 1). His arm span was more than height (Figure 2). He also had a reduced upper to lower segment ratio. Pectus excavatum was also present (Figure 3). Wrist (Walker) sign was positive (Figure 4). Ocular examination was suggestive of bilateral ectopia lentis. The palatal arch was high with dental crowding (Figure 5). Blood pressure in right upper limb was 140/50 mm of Hg. Pulse was 98/min in right radial artery. Patient was tachypneic with respiratory rate 26/minute. Chest examination revealed pectus excavatum with bilateral basal crepitations. Cardiovascular examination revealed grade IV diastolic murmur best heard over the aortic area, third intercostal space and left sternal border.



Figure 2: Arm span greater than height and reduced upper to lower body segment ratio



Figure 1: Tall and thin built adult



Figure 3: Pectus Excavatam

Figure 5: High arched palate

Peripheral signs of aortic regurgitation were present. The liver edge was felt two finger breadth below the right costal margin. Routine investigations showed Hb =13.3gm%, BUN =31 mg/dl, S. creatinine =1.0 mg/dl, S. uric acid =7mg/dl, S. Billirubin =2.8 mg/dl SGOT =44 IU/L, SGPT =91 IU/L, ALP =80 IU/L and normal Urine examination .Chest X ray showed normal lung fields with cardiomegaly. 2D Echo cardiography was suggestive of Severe Aortic Regurgitation with severe dilatation of the aorta and sinus of valsalva with left ventricular dilatation, global hypokinesia and ejection fraction of 35%. Eye examination revealed bilateral Ectopia lentis. He was treated symptomatically and was referred to cardiothoracic surgeon for Bentall's procedure.

DISCUSSION

Marfan's syndrome is an autosomal dominant condition with an estimated prevalence of one in 10,000 to 20,000 individuals. It is a rare hereditary connective tissue disorder that affects many parts of the body. There is no geographic, ethnic or gender predilection.⁸ Patients with Marfan's syndrome have very tall slender body statures with extremities that are very long and disproportionate to the trunk. The fingers and toes of a Marfan patient are characteristically long and spindly, resembling the legs of a spider and giving rise to the moniker arachnodactyly (spider-fingers). The fingers can be wrapped completely around the opposing wrist, frequently overlapping (positive Walker's sign) and when enclosed within the clenched fist, the thumb protrudes beyond the ulnar border (positive Steinberg sign).⁹ The present patient on physical examination revealed to be a tall, thin man with disproportionately long limbs compared to trunk (dolichostenomelia), with long tapering fingers (arachnodactyly) and with positive wrist walker sign. Most patients who have Marfan syndrome are usually diagnosed incidentally when they present for a routine physical examination for various reasons, such as a pre-employment physical or screening examination prior to participation in sports. Marfan syndrome primarily involves the skeletal, ocular, and cardiovascular systems.¹⁰ The major sources of morbidity and early mortality relate to the cardiovascular system. Cardiovascular manifestations include dilatation of

**Figure 4: Positive Wrist sign**

the aorta at the level of the sinuses of Valsalva, a predisposition for aortic tear and rupture, mitral valve prolapse (MVP) with or without regurgitation, tricuspid valve prolapse, and enlargement of the proximal pulmonary artery. Aortic dilatation in the Marfan syndrome tends to progress over time.¹¹ In the present case, 2D Echo cardiography of the patient suggested diagnosis of severe aortic regurgitation with severe dilatation of the aorta and sinus of valsalva with left ventricular dilatation, global hypokinesia and ejection fraction of 35%. Management aims to prevent the various complications of this condition. Medications to lower blood pressure are often used to decrease stress on the wall of the aorta. Surgery may be necessary to repair the aorta and to replace a faulty heart valve or to repair eye abnormalities, such as retinal detachments or cataracts. Regular monitoring is key to the early detection, prevention and treatment of complications.¹² The diagnosis of a genetic disorder in a family and the possibility of testing for the disorder can reduce the incidence of genetic disorders. Involvement of genetics professionals (clinical geneticists and genetic counsellors) should be considered. All family members potentially at risk should receive genetic counselling, lifestyle modification advice and where appropriate, counselling with regard to carrier options.¹³

CONCLUSION

Marfan syndrome is a rare genetic disorder that can be inherited from an affected parent or may occur through a spontaneous genetic mutation and affects connective tissue in the body. Since it is found throughout the body, many different organs can be affected by the disorder and it can lead to serious complications and may be life-threatening. Genetic counseling, early diagnosis and treatment are mandatory to prevent life threatening complications associated with this disorder.

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