

Marfan syndrome: A case report with review of literature

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Abstract

Marfan syndrome is a systemic condition involving the connective tissue. The syndrome is inherited by autosomal dominant trait. Affected persons carry a mutation in the gene that encodes fibrillin-1 which is a connective tissue protein. The incidence of this syndrome is one in ten thousand live births with an equal predilection for both the genders. The syndrome is a collection of generalized manifestations involving the skeleton, eyes, heart, lungs, and the large blood vessels. The individual affected by this syndrome is usually tall and lean with various systemic abnormalities. A case of Marfan syndrome is reported here with review of literature.

Keywords: Marfan; Case; Skeleton; Oral.

INTRODUCTION

Marfan-archad syndrome is a hereditary connective tissue disorder of hereditary origin and with an autosomal dominant characteristic.¹ Antoine Bernard Jean Marfan a French pediatrician first termed this syndrome in 1896. ² The incidence of this syndrome is one out of ten thousand live births with an equal predilection for both the genders. This syndrome affects many different parts of the body.³ The patients affected with this syndrome usually are lean and tall, having arachnodactyly, scoliosis and deformities of the chest, or abnormalities in the eyes. ⁴ The intra-oral findings include high palatal vault resulting from a narrow maxilla.^{5,6,7,8} If unnoticed, patients affected with this syndrome possibly develop cardiac abnormalities. Therefore, it is significant to recognize this condition to prevent any complications.⁹ The paper presented here highlights a case of Marfan syndrome with review of literature.

CASE REPORT

A female aged twenty came to the outpatient department of Oral Medicine and Radiology with

forwardly placed upper anterior teeth as a complaint since childhood. The patient disclosed that she was diagnosed with epilepsy and was on medication for the same since 10 years. The patient had diminished vision for which she had consulted an ophthalmologist. The patient had a negative family history. The patient was tall, had slender limbs, thin body and with an increased arm span-to-height ratio (Figure 1) long and slender fingers (arachnodactyly) (Figure 2), chest deformity, abnormal curvature of the spine (scoliosis),tempero-mandibular joint hypermobility and flat feet. The patient demonstrated a positive wrist sign (Walker's sign) (Figure 3) and positive thumb (Steinberg) sign (Figure 4).

The extra oral examination showed a convex facial profile, long face and tempero-mandibular joint hypermobility. The intra-oral findings were small mouth, incompetent lips, forwardly placed upper incisor teeth with a high palatal vault (Figure 5).

A panoramic radiograph was made which revealed bilateral hyperplastic mandibular condyle & multiple root stumps (Figure 6). A provisional diagnosis of Marfan's syndrome was made based on the history and striking clinical features. An ophthalmology reference was given and the patient was diagnosed with bilateral ectopia lentis which is caused by weakening or rupture of suspensory ligaments and myopia. A cardiology reference was also given and the cardiologist concluded that the patient did not have any abnormalities. As part of the treatment, oral prophylaxis was carried out and the root stumps were extracted followed by replacement of missing teeth. theorthodontic treatment was later initiated. The patient has been kept on a regular follow up since then.

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Figure 1. Clinical photograph of the patient showing tall stature with thin body habitus.



Figure 2. Clinical photograph of the patient showing long slender upper limbs and fingers.



Figure 3. Clinical photograph of the patient showing wrist sign (Walker Sign positive).



Figure 4. Clinical photograph of the patient showing Steinberg's sign.



Figure 5. Clinical photograph of the patient showing high arched palate.

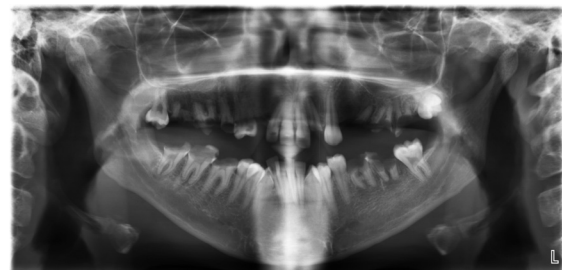


Figure 6. Orthopantomogram showing bilateral hyperplastic mandibular condyle and multiple root stumps

DISCUSSION

Marfan syndrome is considered as an autosomal dominant hereditary connective tissue disorder involving various systems of the body (1). The incidence of this syndrome is believed to be one in every ten thousand live births and twenty-seven percentage of cases occur due to new mutations (2). A wide range of phenotypes have been associated with the mutations in FBN1 gene (3). Fibrillin-1 which is a protein forms an integral component of microfibrillin. It is a glycoprotein produced as a precursor which is secured in the extracellular matrix (2,4). It polymerizes to form microfibrillin which helps in stabilizing the latent transforming growth factor-β binding protein (LTBPs) (5). LTBPs embraces the Transforming Growth Factor-β in an inactive stage. The failure of communication amid fibrillin-1 and LTBPs is accredited to the excess TGF-β signaling (6). The majority of the mutations in Fibrillin-1 are actually a missense suggesting a major negative effect on the microfibrillar assembly (7). For the maintenance of elastin fibers and the formation of extracellular matrix, fibrillin-1 protein is very vital. The

areas which are most affected by this syndrome have elastin fibers and the sites include ligaments, eyes and the aorta in the heart.

The diagnosis of this syndrome is usually well thought-out in a youth with a tall and thin body shape, long limbs, arachnodactyly, chest and spine deformity. The additional features include high palatal vault, malocclusion, skin striation, recurrent hernia or pneumothorax. The findings like tall stature with thin body shape, high arched palate, and malocclusion were found in our patient. In some cases, there will be a remarkable individual changeability in the clinical features of this syndrome (7,8). There could be functional impairment and demise in early childhood if it is a rapidly progressing form of the syndrome based on the mutation (9). The diagnosis could be further challenging by the age dependency of signs and symptoms which lead to a fluctuating clinical presentation in youth affected by this syndrome (10,12). Berlin's classification given in 1986 was used extensively to diagnose this syndrome initially. The classification was later revised by Ghent in 1996 (Table:1).

Table 1. Ghent's Criteria for Diagnosing Marfan's Syndrome ⁸

| System affected | Major criteria | Minor criteria |
|------------------------------|---|--|
| Familial history | First-degree relative in the family who has these diagnostic criteria meeting independently - FBN1 gene mutation - Mutated FBN1 gene which is inherited by parents | Nothing |
| Skeletal | Presence of at least four of the following findings: Chest deformity Upper-to-lower segment reduced, ratio being less than 0.85. Greater than 1.05 arm span to height ratio Wrist and thumb signs Abnormal curvature of spine Extensions at the elbows less than 170° Displacement of the medial malleolus in the medial direction Protrusion acetabuli | Joint hypermobility of moderate severity High palatal vault and irregular placement of teeth Facial features which include dolichocephaly, malar hypoplasia, enophthalmos, retrognathia and downward slanting of the palpebral fissures |
| Ocular or eye changes | Dislocated lens | Flat cornea in an abnormal fashion |
| Cardiovascular | Ascending aorta dilatation with presence or absence of aortic regurgitation | Mitral valve prolapse with presence or absence of mitral valve regurgitation Dilatation of the main pulmonary artery in patients age less than 40 years Mitral annulus calcification in patients age less than 40 years Dilatation of dissection of the descending thoracic or abdominal aorta in patients age less than 50 years |
| Pulmonary | Nothing | Spontaneous pneumothorax |
| Skin and Integument | Nothing | Apical blebs Stretch marks which are not due to pregnancy or stress Repeated incisional hernias |
| Dura | Lumbosacral dural ectasia as appreciated in computed tomography or magnetic resonance imaging data | Nothing |

The Ghent classification recommends the existence of two major features and one minor feature or the existence of one major and four minor features to diagnose a case of Marfan's syndrome (11) This

syndrome is also associated with mental retardation and lumbo-sacral meningocele as reported by Goenka et al (9). Ten to twenty percentages of these patients have vascular anomalies which could be a cause of cerebral

and spinal ischemia (7,10). The off-springs are at a risk to inherit this condition from the parents who have this syndrome and hence genetic counselling has to be given.⁶ The newer means of diagnosis includes exploration of mutated FBN1 gene analysis. By the year 1972, the expectancy of life of those affected with this syndrome has increased to seventy two years up from forty eight years, which is credited to the enhanced diagnosis, better surgical techniques, and latest advancement in medical treatment (12,13).

CONCLUSION

In this report we have highlighted the features of a rare case of Marfan's syndrome as early diagnosis of this condition can prevent fatal complications.

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