

Renal Rickets with Bone Deformity: A Case Report

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Abstract

Various terminology is used to refer to a syndrome that combines chronic kidney illness and bone deformities, including renal rickets, renal pseudo rickets, renal dwarfism, and renal infantilism. A bone deformity is an abnormal structural deviation or distortion of the bone's shape, length, or size from its normal alignment, length, or size. A malignant fracture or dietary deficits are two examples of probable causes of Renal Rickets. Birth defects, like congenital bone malformations, can lead to deformities. Many of these can straighten out over time with the growth of the child. A 9 years old male patient has been admitted to Paediatric Ward. In the previous year, the patient had presented with a chief complaint of bone deformities. According to the mother, the child appeared to be in good health until he was eight years old, when he had a high-grade fever, difficulties walking, and eventually bone deformities. Due to a high-grade fever, the patient was admitted to the hospital for further assessment and suitable therapy to improve his health.

Keywords: Bone disorders polydactyly, dislocation of patella, osteopetrosis, chronic kidney disease, renal pseudo rickets..

INTRODUCTION

Renal Rickets is a syndrome characterized by a combination of chronic kidney failure and a bowed leg deformity. Bone mineralization requires regular amounts of calcium and phosphorus. Rickets or osteomalacia are the results of inadequate mineralization. Deficient mineralization at the growth plate is a feature of rickets. Rickets can be roughly categorized as either calcitic or phosphonic. Low serum calcium levels are frequently linked to calcific rickets, while low phosphorus levels are linked to phosphonic rickets. Calcipenic rickets is brought on by a calcium deficit, which is frequently brought on by inadequate vitamin D intake or metabolism or, in rare cases, by poor calcium absorption. Renal phosphate wasting is typically the cause of phosphonic rickets. (1)

In end-stage renal disease, renal 1-hydroxylase is diminished or lost, and excretion of phosphate is defective.

This leads to low levels of vitamin D, hypocalcemia, and failure of osteoid calcification. Osteodystrophy i.e., renal rickets is the only type of rickets with a high serum phosphate level. It can be dynamic or hyperdynamic. (2) A deformed bone does not have the normal shape or size. It could also be positioned wrongly, resulting in depraved placement. Bones might be slanted for a variety of reasons. These are some of them: Inborn, abnormal growth during childhood, and, post-traumatic. Bones can distort in four different ways: angulation, rotation or torsion, translation or displacement, or limb length discrepancy. (3)

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Although many of the several types of bone abnormalities can arise on their own, two or more of these deformity components are frequently found together. Identifying a bone malformation is simple if the bone is twisted or curled in such a way that anybody looking at it can tell that something is wrong. (4) Kidney damage makes it more difficult for the body to excrete phosphorus. Less calcium in the blood and the secretion of parathyroid hormone by the parathyroid gland are both related to phosphorus accumulation. The hormone parathyroid causes calcium to leave your bones and enter your blood. The bones may suffer if calcium is lost. When calcium, parathyroid hormone, phosphorus, and activated vitamin D are out of equilibrium, these bone cells become out of balance. (5)

CASE PRESENTATION

We are presenting a 9-year-old male patient who was brought by his mother with a major complaint of bone deformity and high-grade fever for 15 days. Due to a high-grade fever, the patient was admitted for more evaluation and suitable therapy to improve his health. The patient has Renal Rickets, which have been ruled out after multiple investigations.

According to the mother, the patient was healthy until he was eight years old, when he suffered a high-grade fever, became unable to walk, and developed a bone deformity. Except for colds and fevers, diarrhea, and other communicable diseases, which are quickly healed following proper medicine. He also updated all of his immunizations as per his age.

Blood investigations have been done and find out that the patient has a high risk of acquiring a condition linked to renal issues, according to the clinical data, as the serum creatinine level was 7.4mg/dl and the Total Leucocytes were also increased to 16,200 cells/cumm that causes fever to the patient.

On radiological examination, ultrasonography shows heterogeneous echotexture of both kidneys with few hyperechoic foci. Minimal fullness of PCG on the left side. He is currently being treated for the disease with Syrup Zincovit 5ml two times a day, Capsule Aquasol (Vitamin A) 1 capsule once a day, Tablet Calcium 500mg 1 tablet once a day, Injection of Ceftriaxone 500mg Intravenous twice a day.

DISCUSSION

An overview of rickets in children was the topic of a study undertaken by Rahul Chanchlani and his colleagues. A prevalent condition that affects people all over the world, rickets has a significant negative impact on children and adolescents' health, growth, and development. It is caused by growth plate cartilage anomalies, which primarily affect longer bones. It causes abnormal mineralization, poor bone

development, and skeletal abnormalities such as knock-knees and bow legs. Due to their importance for healthy bone growth and mineralization, calcium and phosphorus deficits are typically secondary to this. Calcium and vitamin D supplements can be used to treat the majority of renal rickets cases. observing the dose recommendations of the doctor. Vitamin D overdose can be dangerous. Blood tests and x-rays will be used to track the child's development by the doctor. Supplements and medication may be provided if the child has a rare genetic condition that results in low levels of phosphorus. The doctor may advise using specialized bracing to arrange the child's body correctly as the bones mature in some bowleg or spinal deformity instances. Surgery can be necessary for more serious skeletal abnormalities. (6-18)

Maha F. Faiden researched "The Erlenmeyer flask bone malformation in skeletal dysplasias." The term Erlenmeyer flask bone deformity (EFD) has been used to characterize a particular anomaly of the distal femur for a long time. Using a literature analysis and cohort study of 12 diseases, the author discovered that EFD is linked to 20 different conditions. He looked at the radiography database of the International Skeletal Dysplasia Registry (ISDR) from 1988 to 2007 to see whether skeletal dysplasias or syndromes were highly related to EFD if it was a consistent finding in these illnesses and if different types of EFD could be distinguished. (19-28)

CONCLUSION

Renal Rickets is a syndrome characterized by a combination of chronic kidney failure and a bowed leg deformity. Bone mineralization requires regular amounts of calcium and phosphorus. Rickets or osteomalacia are the results of inadequate mineralization. Deficient mineralization at the growth plate is a feature of rickets. Calcium and vitamin D supplements can be used to treat the majority of renal rickets cases. observing the dose recommendations of the doctor. Vitamin D overdose can be dangerous. Blood tests and x-rays will be used to track the child's development by the doctor. Kidney damage makes it more difficult for the body to excrete phosphorus. Less calcium in the blood and the secretion of parathyroid hormone by the parathyroid gland are both related to phosphorus accumulation.

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