

## Case Report

# Osteogenesis imperfecta: an atypical association

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### ABSTRACT

Osteogenesis Imperfecta (OI) also known as 'brittle bone disease', is a clinically heterogeneous connective tissue disorder with defect in type I collagen. The more prevalent autosomal dominant forms of OI are caused by primary defects in type I collagen, while autosomal recessive forms are caused by deficiency of proteins which interact with type I procollagen for post-translational modification and/or folding. Few cases of OI associated with atypical features have been reported. We report a case of 54 days male child of OI associated with pyloric stenosis. The case probably is a form of autosomal recessive OI with severe phenotype.

**Keywords:** Osteogenesis imperfecta, Pyloric stenosis, Infant

### INTRODUCTION

Osteogenesis Imperfecta (OI) is a genetic disorder of increased bone fragility and low bone mass. Severity varies widely, ranging from intrauterine fractures and perinatal lethality to very mild forms without fractures. Extraskelatal manifestations of OI include blue sclera, dentinogenesis imperfecta, hyperlaxity of ligaments and skin, hearing impairment, and presence of wormian bones on skull radiographs. OI is usually inherited in an autosomal dominant pattern and caused by heterozygosity for mutations in the COL1A1 or COL1A2 genes.<sup>1</sup>

Mutations that cause structural changes in either of the chains of type I pro-collagen can affect chain association, triple helix formation, secretion, and/or fibril formation, and generally result in more severe phenotypes, including the perinatal lethal OI.<sup>1-3</sup>

Our case likely represents recessive inheritance and this atypical association is very rarely reported.

### CASE REPORT

Fifty four days old male child, born to a clinically normal non consanguineous couple, presented with multiple deformities since birth and projectile vomiting since day 12 of life. He was born by a full term vaginal home delivery with birth weight of 2 kg. There were no medications or major illnesses during pregnancy and antenatal ultrasonography (USG) were not performed. At birth, he had deformed lower limbs and painful upper limbs. X-ray showed fractures of multiple bones for which patient did not take any treatment.

At presentation to our centre, he had severe dehydration, failure to thrive with weight of 1990 gm (less than 3<sup>rd</sup> percentile), multiple deformities of all limbs and olive shaped lump in the epigastrium. He had triangular face with relative macrocephaly, wide open anterior, posterior fontanelle and blue sclerae (Figure 1, 2). There were no other dysmorphic features, joint contractures or respiratory complications. Skeletal survey was consistent with the diagnosis of osteogenesis imperfecta. There were multiple bone deformities and fractures that involved the

upper and lower extremities, ribs and generalized osteopenia (Figure 3). USG confirmed pyloric stenosis which was treated with pylorotomy. The patient was advised vitamin D, calcium supplements. Patient neither gave consent for molecular studies nor Pamidronate infusion.



**Figure 1: Sclera showing a bluish tinge.**



**Figure 2: Triangular face with relative macrocephaly, multiple deformities of all limbs and olive shaped lump in the epigastrium.**



**Figure 3: Multiple bony deformities and fractures involving the upper and lower extremities.**

## DISCUSSION

Osteogenesis imperfecta with pyloric stenosis is an unusual and rarely reported association. Handful of cases are reported in literature mentioning this association.<sup>4,7</sup> Molecular analysis depicting SERPINH1 mutation was performed in one case. However this case had features of skin blisters, hernia and nephrolithiasis.<sup>7</sup>

Consanguinity, dysmorphic features or joint contractures were not seen in our case thus ruling out possibility of a syndromic association.

Pyloric stenosis is a genetically heterogenous entity with multiple susceptible loci implicated.<sup>8</sup> One of the locus is IHPS3 (OMIM 612017) on chromosome 11q14-q22.<sup>2</sup> The case studied by Christiansen et al had severe OI with pyloric stenosis and other defects with homozygosity for missense mutation in SERPINH1, which encodes the collagen chaperone protein HSP47 and the locus for this gene is on chromosome 11q 13.5.<sup>6</sup> We need more studies of these closely related loci with special reference to OI with pyloric stenosis.

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