Desbuquois Syndrome

Alternative Names
DBQD
Micromelic Dwarfism with Vertebral and Metaphyseal Abnormalities and Advanced Carpotarsal Ossification
Desbuquois Dysplasia

WHO International Classification of Diseases
Congenital malformations, deformations and chromosomal abnormalities

OMIM Number
251450

Mode of Inheritance
Autosomal recessive

Gene Map Locus
17q25.3

Description
The Desbuquois syndrome is a rare autosomal recessive chondrodysplasia. It has a wide clinical spectrum characterized by short stature of prenatal onset with rhizomelic and mesomelic shortness, joint laxity, and characteristic facial dysmorphism including a round face, prominent, bulging eyes, and midface hypoplasia. Radiologically, Desbuquois syndrome is characterized by a “Swedish key” or “monkey wrench” appearance of the proximal femur and advanced carpal and tarsal bone age. Other characteristic hand changes include an extra ossification center distal to the second metacarpal, delta phalanx, bifid distal phalanx of the thumb, and phalangeal dislocations, but these typical features are only reported in a third of the patients. The pathogenesis of Desbuquois syndrome is unknown, but histological and transmission electron microscopy studies are suggestive of an impairment of the extracellular matrix.

Molecular Genetics
A gene for the disease has been mapped to 17q25.3 in the subgroup of patients with typical hand abnormalities only. It seems that this locus does not account for patients with Desbuquois syndrome and “normal hands”, suggesting genetic heterogeneity of the disease.

Epidemiology in the Arab World

Morocco
Gillessen-Kaesbach et al. (1995) reported a male from a consanguineous family from Morocco with Desbuquois syndrome. The patient presented with micromelic short stature, flat midface, irregular ossification of the vertebral bodies and an advanced bone age. Faivre et al. (2003) further conducted a genome wide search on the patient of Gillessen-Kaesbach et al. (1995). An ancestral recombination event between loci D17S1806 and D17S1822 in the family defined the distal boundary of the genetic interval (9.5 cM). Nine genes were considered as possible candidates genes by their position and two more genes were considered as possible candidates by their function [See also: United Arab Emirates > Faivre et al. (2003)]. Faivre et al. (2003) concluded that the gene responsible for Desbuquois syndrome in the Moroccan family maps to chromosome 17q25.3.

Tunisia
Al Kaissi et al. (2005) reported three Tunisian siblings with a rare assortment of clinical and radiographic abnormalities closely resembling Desbuquois dysplasia. The patients were the result of a second-degree consanguineous marriage. Two other siblings died of unknown causes soon after birth. The first patient was of an 8-year-old girl who had joint laxity and walking difficulties. At the age of 8 years she had a normal face, a very short neck, and narrow thorax. The second case was the brother
of patient 1. At 7 years he had a short stature, multiple joint dislocations, kyphoscoliosis, and a normal face similar to that of his older sister. The third case was the sister of patients 1 and 2. She had hypotonia and joint laxity muscular dystrophy. All siblings had normal hands and were mentally normal. Radiographic examinations showed a generalized osteopenia with narrowing of the joint spaces and intervertebral discs. They also had prominent posterior cranial fossa and narrow cranial sutures. In addition, the patients had an additional remarkable radiographic feature not reported in Desbuquois dysplasia—multiple carpal ossification centers. A 27-year-old brother refused to be investigated. He had a similar face to the affected siblings but no kyphoscoliosis or joint dislocations. Al Kaissi et al. (2005) proposed that the condition of their patients represents a novel Desbuquois-like syndrome.

**United Arab Emirates**

In 1996, Al-Gazeli [should be: Al-Gazali] et al. (1966) reported a consanguineous Arab Bedouin family with Desbuquois syndrome. Affected members of the family had typical Desbuquois syndrome features including a midface hypoplasia and joint laxity. This was probably the first report on Desbuquois syndrome in Arab Bedouins. Faivre et al. (2003) further conducted a genome wide search in an affected male of the family of Al-Gazeli et al. (1996). The proband turned out to be homozygous for the marker D17S784. Nine genes were considered as possible candidates genes by their position, namely the STAT induced inhibitor-3 gene (SSI-3), the phosphatidylglycerophosphate synthase gene (PGS1), the dynein axonemal heavy polypeptide 17 gene (DNAH17), the Pleckstrin homology Sec 7 and coiled/coil domains 1 gene (PSCD1), the human tissue inhibitor of metalloproteinases 2 gene (TIMP2), the C1q and tumour necrosis factor related protein 1 gene (C1QTNF1), the apyrase gene (SHAPY), the lectin, galactoside-binding, soluble, 3 binding protein gene (LGAL3BP), and the chromobox homologue 8 gene (CBX8). TIMP2 was regarded as a good candidate gene by its function as the clinical features in Desbuquois dysplasia were consistent with a disorder of the extracellular matrix. Similarly, C1QTNF1 was also considered as a candidate gene because of the presence of a collagenic domain and its expression in bone and cartilage. Direct sequencing on genomic DNA in TIMP2 and C1QTNF1 failed to detect any deleterious mutations in the patient. Faivre et al. (2003) concluded that the gene responsible for Desbuquois syndrome maps to chromosome 17q25.3 with a possible genetic homogeneity of the clinical subtype with hand anomalies.

**References**


**Contributors**

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