Czech dysplasia

Czech dysplasia is an inherited condition that affects joint function and bone development. People with this condition have joint pain (osteoarthritis) that begins in adolescence or early adulthood. The joint pain mainly affects the hips, knees, shoulders, and spine and may impair mobility. People with Czech dysplasia often have shortened bones in their third and fourth toes, which make their first two toes appear unusually long. Affected individuals may have flattened bones of the spine (platyspondyly) or an abnormal spinal curvature, such as a rounded upper back that also curves to the side (kyphoscoliosis). Some people with Czech dysplasia have progressive hearing loss.

Frequency

The prevalence of Czech dysplasia is unknown; at least 11 families have been affected. Most of these families reside in the Czech Republic.

Causes

Czech dysplasia is caused by a particular mutation in the \textit{COL2A1} gene. The \textit{COL2A1} gene provides instructions for making a protein that forms type II collagen. This type of collagen is found mostly in the clear gel that fills the eyeball (the vitreous) and in cartilage. Cartilage is a tough, flexible tissue that makes up much of the skeleton during early development. Most cartilage is later converted to bone, except for the cartilage that continues to cover and protect the ends of bones and is present in the nose and external ears. Type II collagen is essential for the normal development of bones and other connective tissues that form the body's supportive framework. Mutations in the \textit{COL2A1} gene interfere with the assembly of type II collagen molecules, which prevents bones and other connective tissues from developing properly.

Inheritance Pattern

Czech dysplasia is inherited in an autosomal dominant pattern, which means one copy of the altered \textit{COL2A1} gene in each cell is sufficient to cause the disorder.

All known individuals with Czech dysplasia inherited the mutation from a parent with the condition.

Other Names for This Condition

- Czech dysplasia, metatarsal type
- progressive pseudorheumatoid dysplasia with hypoplastic toes
- SED with metatarsal shortening
• spondyloarthropathy with short third and fourth toes
• spondyloepiphyseal dysplasia with metatarsal shortening

Diagnosis & Management

Genetic Testing Information
• What is genetic testing?
  /primer/testing/genetictesting
• Genetic Testing Registry: Czech dysplasia metatarsal type

Other Diagnosis and Management Resources
• GeneReview: Type II Collagen Disorders Overview
  https://www.ncbi.nlm.nih.gov/books/NBK540447

Additional Information & Resources

Health Information from MedlinePlus
• Health Topic: Connective Tissue Disorders
  https://medlineplus.gov/connectivetissuedisorders.html
• Health Topic: Osteoarthritis
  https://medlineplus.gov/osteoarthritis.html

Genetic and Rare Diseases Information Center
• Czech dysplasia metatarsal type
  https://rarediseases.info.nih.gov/diseases/10220/czech-dysplasia-metatarsal-type

Additional NIH Resources
• National Institute of Arthritis and Musculoskeletal and Skin Diseases: Heritable Disorders of Connective Tissue
  https://www.niams.nih.gov/health-topics/heritable-disorders-connective-tissue
• National Institute of Arthritis and Musculoskeletal and Skin Diseases: Osteoarthritis
  https://www.niams.nih.gov/health-topics/osteoarthritis

Educational Resources
• MalaCards: czech dysplasia
  https://www.malacards.org/card/czech_dysplasia
• Orphanet: Czech dysplasia, metatarsal type
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=137678
Patient Support and Advocacy Resources

- International Skeletal Dysplasia Registry, UCLA
  https://www.uclahealth.org/ortho/isdr

- Resource list from the University of Kansas Medical Center: Hard of Hearing
  http://www.kumc.edu/gec/support/hearing.html

Clinical Information from GeneReviews

- Type II Collagen Disorders Overview
  https://www.ncbi.nlm.nih.gov/books/NBK540447

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28czech+dysplasia%5BTIAB%5D%29+OR+%28progressive+pseudorheumatoid+dysplasia+with+hypoplastic+toes%29+OR+%28spondyloarthropathy+with+short+third+and+fourth+toes%29+AND+english%5Bla%5D+AND+human%5Bmh%5D

Catalog of Genes and Diseases from OMIM

- CZECH DYSPLASIA
  http://omim.org/entry/609162

Sources for This Summary

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17726487

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15266623

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/14730409

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/18553548

Reprinted from Genetics Home Reference:

Reviewed: July 2008
Published: May 26, 2020