Crouzon syndrome with acanthosis nigricans

Crouzon syndrome with acanthosis nigricans is a disorder characterized by the premature joining of certain bones of the skull (craniosynostosis) during development and a skin condition called acanthosis nigricans.

The signs and symptoms of Crouzon syndrome with acanthosis nigricans overlap with those of a similar condition called Crouzon syndrome. Both conditions involve premature fusion of the skull bones, which affects the shape of the head and face. Other common features of both conditions include wide-set, bulging eyes due to shallow eye sockets; eyes that do not point in the same direction (strabismus); a small, beaked nose; and a flat or sunken appearance of the middle of the face (midface hypoplasia). Less common features that can occur in either disorder include an opening in the roof of the mouth (cleft palate), dental problems, or hearing loss. People with Crouzon syndrome or Crouzon syndrome with acanthosis nigricans usually have normal intelligence.

Crouzon syndrome with acanthosis nigricans is distinguished from Crouzon syndrome by several features, including skin abnormalities. Acanthosis nigricans is a skin condition characterized by thick, dark, velvety skin in body folds and creases, including the neck and underarms. People with Crouzon syndrome with acanthosis nigricans may also have other skin abnormalities; for example, scars in the thick, dark areas of skin are flat and pale. These scars are usually from surgical procedures that are commonly needed in affected individuals. Additionally, in some people with the condition, one or both nasal passages are narrowed (choanal stenosis) or completely blocked (choanal atresia), which can cause difficulty breathing. A buildup of fluid in the brain (hydrocephalus) can also occur. Nasal passage abnormalities and hydrocephalus are rare in Crouzon syndrome. Less common features of Crouzon syndrome with acanthosis nigricans include subtle changes in the bones of the spine (vertebrae), abnormalities of the finger bones, and noncancerous growths in the jaw called cementomas.

Frequency

Crouzon syndrome with acanthosis nigricans is rare; this condition occurs in about 1 person per million. For unknown reasons, it affects females more than twice as often as males.

Causes

A mutation in the FGFR3 gene causes Crouzon syndrome with acanthosis nigricans. This gene provides instructions for making a protein that is involved in the development and maintenance of bone and other tissues. The genetic change involved in this
disorder causes the FGFR3 protein to be overly active, which disrupts the normal growth of skull bones and affects skin pigmentation. These changes lead to the features of Crouzon syndrome with acanthosis nigricans.

**Inheritance Pattern**

This condition is inherited in an autosomal dominant pattern, which means one copy of the altered gene in each cell is sufficient to cause the disorder.

In some cases, an affected person inherits the mutation from one affected parent. More commonly, this condition results from new (de novo) mutations in the gene. These cases occur in people with no history of the disorder in their family.

**Other Names for This Condition**

- CAN
- Crouzonodermoskeletal syndrome

**Diagnosis & Management**

**Genetic Testing Information**

- What is genetic testing? [primer/testing/genetictesting](https://www.ncbi.nlm.nih.gov/gtr/conditions/C2677099/)

**Research Studies from ClinicalTrials.gov**

- [ClinicalTrials.gov](https://clinicaltrials.gov/ct2/results?cond=%22Crouzonodermoskeletal+syndrome%22+OR+%22Craniofacial+Dysostosis%22+OR+%22Crouzon%27s+Disease%22+OR+%22Crouzon%22+OR+%22Craniosynostosis%22+OR+%22Crouzon+Disease%22)

**Other Diagnosis and Management Resources**

Additional Information & Resources

Health Information from MedlinePlus

- Encyclopedia: Acanthosis Nigricans  
  https://medlineplus.gov/ency/article/000852.htm
- Encyclopedia: Craniosynostosis  
  https://medlineplus.gov/ency/article/001590.htm
- Health Topic: Craniofacial Abnormalities  
  https://medlineplus.gov/craniofacialabnormalities.html
- Health Topic: Skin Pigmentation Disorders  
  https://medlineplus.gov/skinpigmentationdisorders.html

Additional NIH Resources

- National Institute of Neurological Disorders and Stroke: Craniosynostosis Information Page  
  https://www.ninds.nih.gov/Disorders/All-Disorders/Craniosynostosis-Information-Page

Educational Resources

- American Academy of Dermatology: Acanthosis Nigricans  
- Center for Craniofacial Development and Disorders, Johns Hopkins Medicine: Craniosynostosis  
  https://www.hopkinsmedicine.org/neurology_neurosurgery/centers_clinics/pediatric_neurosurgery/conditions/craniosynostosis/
- KidsHealth from Nemours: Acanthosis Nigricans  
- MalaCards: crouzon syndrome with acanthosis nigricans  
  https://www.malacards.org/card/crouzon_syndrome_with_acanthosis_nigricans
- Orphanet: Crouzon syndrome-acanthosis nigricans syndrome  
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=93262
- Seattle Children's Hospital and Regional Medical Center: Crouzon Syndrome  
  https://www.seattlechildrens.org/conditions/chromosomal-genetic-conditions/crouzon-syndrome
- UC Davis Children's Hospital: Craniofacial Anomalies--Crouzon Syndrome  
Patient Support and Advocacy Resources

- Children's Craniofacial Association
  https://ccakids.org/
- Resource List from the University of Kansas Medical Center: Facial Anomalies/ Craniofacial Conditions
  http://www.kumc.edu/gec/support/craniofa.html

Clinical Information from GeneReviews

- FGFR-Related Craniosynostosis Syndromes
  https://www.ncbi.nlm.nih.gov/books/NBK1455

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28%28crouzonodermoskeletal+syndrome%29+OR+%28crouzon+syndrome+with+acanthosis+nigricans%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22%5Bdp%5D

Catalog of Genes and Diseases from OMIM

- CROUZON SYNDROME WITH ACANTHOSIS NIGRICANS
  http://omim.org/entry/612247

Sources for This Summary

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17935505

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/21536014
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3110564/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/23437153
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3577887/

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10213050

  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/23571469
Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/20301628

Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/11426459

Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10696568

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