Milroy disease

Milroy disease is a condition that affects the normal function of the lymphatic system. The lymphatic system produces and transports fluids and immune cells throughout the body. Impaired transport with accumulation of lymph fluid can cause swelling (lymphedema). Individuals with Milroy disease typically have lymphedema in their lower legs and feet at birth or develop it in infancy. The lymphedema typically occurs on both sides of the body and may worsen over time.

Milroy disease is associated with other features in addition to lymphedema. Males with Milroy disease are sometimes born with an accumulation of fluid in the scrotum (hydrocele). Males and females may have upslanting toenails, deep creases in the toes, wart-like growths (papillomas), and prominent leg veins. Some individuals develop non-contagious skin infections called cellulitis that can damage the thin tubes that carry lymph fluid (lymphatic vessels). Episodes of cellulitis can cause further swelling in the lower limbs.

Frequency

Milroy disease is a rare disorder; its incidence is unknown.

Causes

Mutations in the \( \text{FLT4} \) gene cause some cases of Milroy disease. The \( \text{FLT4} \) gene provides instructions for producing a protein called vascular endothelial growth factor receptor 3 (VEGFR-3), which regulates the development and maintenance of the lymphatic system. Mutations in the \( \text{FLT4} \) gene interfere with the growth, movement, and survival of cells that line the lymphatic vessels (lymphatic endothelial cells). These mutations lead to the development of small or absent lymphatic vessels. If lymph fluid is not properly transported, it builds up in the body’s tissues and causes lymphedema. It is not known how mutations in the \( \text{FLT4} \) gene lead to the other features of this disorder.

Many individuals with Milroy disease do not have a mutation in the \( \text{FLT4} \) gene. In these individuals, the cause of the disorder is unknown.

Inheritance Pattern

Milroy disease 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 many cases, an affected person inherits the mutation from one affected parent. Other cases may result from new mutations in the \( \text{FLT4} \) gene. These cases occur in people with no history of the disorder in their family. About 10 percent to 15 percent of people with a mutation in the \( \text{FLT4} \) gene do not develop the features of Milroy disease.
Other Names for This Condition

- congenital familial lymphedema
- hereditary lymphedema type I
- Milroy’s disease
- Nonne-Milroy lymphedema

Diagnosis & Management

Genetic Testing Information

- What is genetic testing? [primer/testing/genetictesting]
- Genetic Testing Registry: Hereditary lymphedema type I

Research Studies from ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22Milroy+disease%22

Other Diagnosis and Management Resources

- GeneReview: Milroy Disease
  https://www.ncbi.nlm.nih.gov/books/NBK1239
- MedlinePlus Encyclopedia: Lymphatic Obstruction
  https://medlineplus.gov/ency/article/001117.htm

Additional Information & Resources

Health Information from MedlinePlus

- Encyclopedia: Lymphatic Obstruction
  https://medlineplus.gov/ency/article/001117.htm
- Health Topic: Lymphatic Diseases
  https://medlineplus.gov/lymphaticdiseases.html

Genetic and Rare Diseases Information Center

- Milroy disease
  https://rarediseases.info.nih.gov/diseases/7220/milroy-disease
Educational Resources

- Boston Children's Hospital: Lymphedema
  http://www.childrenshospital.org/conditions-and-treatments/conditions/l/lymphedema

- Cincinnati Children’s Hospital: Lymphedema
  https://www.cincinnatichildrens.org/health/l/lymphedema

- Merck Manual Home Edition for Patients and Caregivers: Lymphedema
  https://www.merckmanuals.com/home/heart-and-blood-vessel-disorders/lymphatic-disorders/lymphedema

- Orphanet: OBSOLETE: Congenital primary lymphedema
  https://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=2416

Patient Support and Advocacy Resources

- Lymphatic Research Foundation
  https://lymphaticnetwork.org/

- Lymphoedema Support Network
  https://www.lymphoedema.org/

- National Organization for Rare Disorders (NORD)
  https://rarediseases.org/rare-diseases/hereditary-lymphedema/

Clinical Information from GeneReviews

- Milroy Disease
  https://www.ncbi.nlm.nih.gov/books/NBK1239

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Lymphedema%5BMAJR%5D%29+AND+%28%28milroy+disease%5BTIAB%5D%29+OR+%28hereditary+lymphedema+type+i%5BTIAB%5D%29+OR+%28nonne-milroy+lymphedema%5BTIAB%5D%29+OR+%28primary+congenital+lymphedema%5BTIAB%5D%29+OR+NOT+%28elephantiasis%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+3600+days%22+AND+LOMMA%5B5D

Catalog of Genes and Diseases from OMIM

- LYMPHATIC MALFORMATION 1
  http://omim.org/entry/153100
Sources for This Summary

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15689446
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1735984/

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/20301417

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/17458866

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/12960217
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1735587/

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/16965327

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10856194
  Free article on PubMed Central: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1287178/

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10835628

  
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/12838201

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