Cutis Marmorata Telangiectatica Congenita

Contents

In 1922, Van Lohuizen (Van Lohuizen 1922) first described cutis marmorata telangiectatica congenita (CMTC) as a pattern of reticulate erythema and telangiectasia, skin atrophy, and/or ulceration.

Synonyms and Related Disorders

Adams-Oliver syndrome; CMTC phakomatosis pigmentovascularis; Macrocephaly-CMTC syndrome

Genetics/Basic Defects

1. Pathogenesis
    1. Unknown
    2. Most cases are sporadic
2. Hypothesis
    1. Environmental factors
    2. Multifactorial cause
    3. A nerve conduction defect (Bormann et al. 2001)
    4. A lethal gene surviving by mosaicism suggested by segmental distribution often with a sharp midline separation (Rogers and Poyzer 1982)
    5. Autosomal dominant inheritance with low or variable penetrance
        1. An affected parent showing more limited involvement than his offspring (Kurczynski 1982)
        2. Two siblings with one having CMTC alone and the other showing associated anomalies (hypertension and acrocyanosis) (Andreev and Pramatarov 1979)

Clinical Features

1. Onset (Garzon and Schweiger 2004):
    1. Congenital: common
    2. Later onset (Way et al. 1974)
2. Reticulated vascular pattern
    1. Finely reticular or coarse pattern: will not resolve completely with warming of the skin
    2. Broad streaks of discolored skin in a "train-track-like" pattern
    3. Relatively fixed and discernable at rest
    4. Pallor of the skin between the vascular network pattern: often reported (Ben-Amitai et al. 2000)

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5. Often accompanied by:
    1. Phlebectasia (prominent veins)
    2. Telangiectasias
    3. Cutaneous and subcutaneous tissue atrophy: may manifest as hypoplasia of the affected limb (an inconsistent feature) (South and Jacobs 1978)
    4. Ulceration of the affected skin, particularly involving the skin overlying the elbows and knees (Picascia and Esterly 1989)
    5. Hyperkeratosis
6. The presence of atrophy and ulceration helps to differentiate CMTC from physiologic cutis marmorata
7. Localized lesions
    1. Most commonly affecting the trunk and extremities
    2. Sharp segmental pattern: easy to differentiate from physiologic cutis marmorata
8. Generalized lesions
    1. Often unilateral
    2. May involve face but mucosal involvement uncommon (Ben-Amitai et al. 2000)
    3. Do not occur on the entire body surface (Devillers et al. 1999)

3. Associated anomalies (27–80%) (Picascia and Esterly 1989; Devillers et al. 1999; Gerritsen et al. 2000)
    1. Relatively high associated defects
        1. May represent true associations or coincidental
        2. May represent a bias toward reporting cases with more severe anomalies
        3. Inconsistency among authors regarding diagnostic criteria
    2. Asymmetry
        1. Limb asymmetry (hyperplasia or hypoplasia of a limb)
            1. The most common associated anomaly
            2. Cutaneous atrophy may be noted concomitantly with asymmetry
        2. Facial asymmetry may occur
    3. Skeletal defects
        1. Syndactyly
        2. Tendonitis stenosans
        3. Hip dysplasia
        4. Clubfoot
        5. Scoliosis
        6. Macrocephaly
        7. Skull asymmetry
        8. Scaphoid scapula
        9. Micrognathia
        10. Generalized osteoporosis
        11. Consider Adams-Oliver syndrome and macrocephaly-CMTC if limb defects are present
4. Other vascular anomalies:
    1. May occur distant to the area of CMTC or within the same affected area (Picascia and Esterly 1989)
    2. Capillary malformations (port-wine stains): the most commonly associated vascular birthmark occurring in 20% of patient (Ben-Amitai et al. 2000)
    3. Sturge-Weber syndrome (Petrozzi et al. 1970)
    4. Hemangiomas of infancy
    5. Multiple angiokeratomas
5. Ocular anomalies:
    1. Glaucoma
    2. Infrequent anomalies:
        1. Persistent arterial hyaloidia (an embryonic vessel that typically regresses)
        2. Granular retinal pigmentation
        3. Small optic disks
        4. Optic nerve atrophy
6. Macrocephaly-CMTC syndrome (Moore et al. 1997; Robertson et al. 2000; Lapunzina et al. 2004; Katugampola et al. 2008):
    1. Macrocephaly and cutis marmorata: diagnostic features
    2. Hypotonia
    3. Psychomotor retardation
    4. Seizures
    5. Hydrocephaly
    6. Cerebral atrophy
    7. Agenesis of the corpus callosum
    8. Dilated ventricles
    9. Hemangioma of the lip and philtrum
    10. Syndactyly of the second and third toes

11. Segmental overgrowth
12. Connective tissue abnormalities: features similar to Ehlers-Danlos syndrome

7. Other cutaneous anomalies (may be coincidental) (Ben-Amitai et al. 2000):
   1. Congenital melanocytic nevi
   2. Café au lait macules
   3. Mongolian spots
8. Other systemic anomalies (uncommon):
   1. Hypothyroidism
   2. Cardiac defects
   3. Genitourinary tract anomalies (Del Guidice and Nydorf 1986; Ben-Amitai et al. 2001; Sills et al. 2002; Fujita et al. 2003):
      1. Hypospadias
      2. Renal cysts
      3. Duplication of the renal collecting system
      4. Rectovaginal and ureterovaginal fistulae
      5. Absent clitoris
      6. Imperforate anus
      7. Unilateral ovarian agenesis
      8. Septate uterus
      9. Premature gonadal failure associated with de novo balance translocation affecting chromosomes 8 and 9

4. Suggested diagnostic criteria for cutis marmorata telangiectatica congenita (Kienast and Hoeger 2009): The presence of all three major criteria and two minor criteria is sufficient for diagnosis:
   1. Major criteria
      1. Congenital reticulate (marmorated) erythema (27%)
      2. The absence of venectasia (27%)
      3. Unresponsiveness to local warming (27%)
   2. Minor criteria
      1. Fading of erythema within 2 years (18%)
      2. Telangiectasia (5%)
      3. Port-wine stain outside the area affected by CMTC (2%)
      4. Ulceration (2%)
      5. Atrophy (2%)
5. Differential diagnosis
   1. Cutis marmorata (physiologic)
   2. Cutis marmorata (associated with genetic syndrome)
      1. Cornelia de Lange syndrome
      2. Down syndrome
      3. Homocystinuria
      4. Divry and Van Bogaert syndrome
         1. A rare disorder
         2. Corticomeningeal angiomatosis
         3. Visual field defects
         4. Seizures
         5. "Marble" skin
   3. Reticulated capillary malformations
      1. A diffuse, generalized form of a "livedoid" capillary malformation involving the entire skin
      2. Not associated with atrophy, ulceration, or limb hypoplasia
      3. Associated with a significant risk of associated visceral vascular anomalies (eye, brain, kidneys, and heart) and requires evaluation and follow-up (Enjolras and Garzon 2001)
   4. Bockenheimer syndrome (diffuse phlebectasia):
      1. A very rare disorder
      2. Onset in infancy
      3. Characterized by progressive venous varicosity
   5. Neonatal lupus erythematosus
   6. CMTC "syndrome"
      1. Macrocephaly-CMTC syndrome
      2. Adams-Oliver syndrome
      3. CMTC phakomatosis pigmentovascularis

Diagnostic Investigations

1. Physical evaluation (Garzon and Schweiger 2004)
   1. Reticulated vascular pattern
   2. Limb length and girth
   3. Limb defects
   4. Scalp defects
   5. Head circumference
   6. Other associated anomalies
   7. Facial lesions
2. Ophthalmologic evaluation

3. Brain MRI in macrocephaly-CMTC (Akcar et al. 2004; Giuliano et al. 2004; Garavelli et al. 2005)
    1. Megalencephaly
    2. Asymmetry of the cerebral hemispheres
    3. Abnormally increased signal of white matter
    4. Chiari type I malformation
    5. Bilateral prominent lateral ventricles
    6. Generalized cortical dysplasia
    7. Cavum septi pellucidum cyst
    8. Calvarial hemangioma.

Genetic Counseling

1. Recurrence risk
    1. Patient's sib
        1. Sporadic cases: a low recurrence risk
        2. A 50% risk if one of the parents is affected
    2. Patient's offspring: a 50% risk in autosomal dominant transmission, otherwise a low recurrence risk
2. Prenatal diagnosis: not reported
3. Management
    1. Careful physical examination to assess for other congenital anomalies
    2. Measurement of limb length and girth at the time of evaluation
    3. Baseline and follow-up ophthalmologic examinations should be performed when the vascular lesions affect the periocular skin
    4. Local supportive care including application of hydrocolloid dressings for ulcerations

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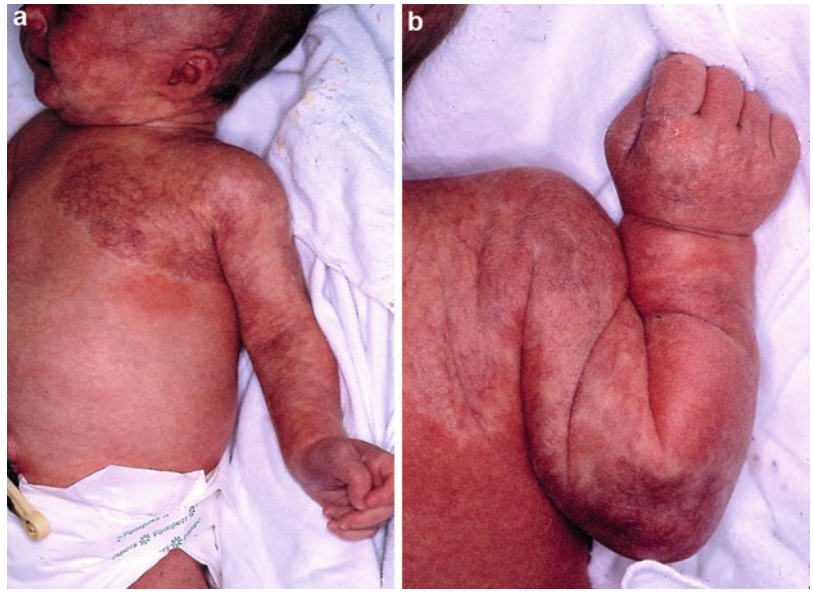

Fig. 1 (**a**, **b**) A 2-month-old infant with cutis marmorata telangiectatica congenita showing a reticular vascular pattern which was present from birth

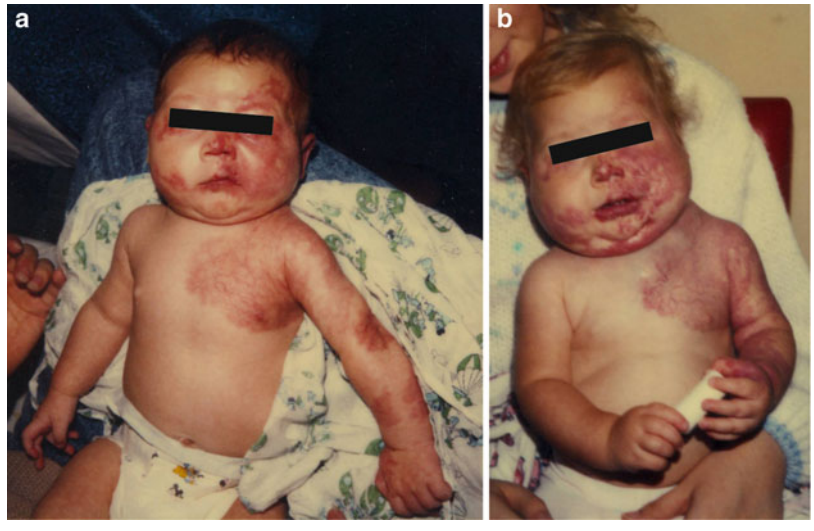

Fig. 2 (**a**, **b**) The same infant at 14 months of age

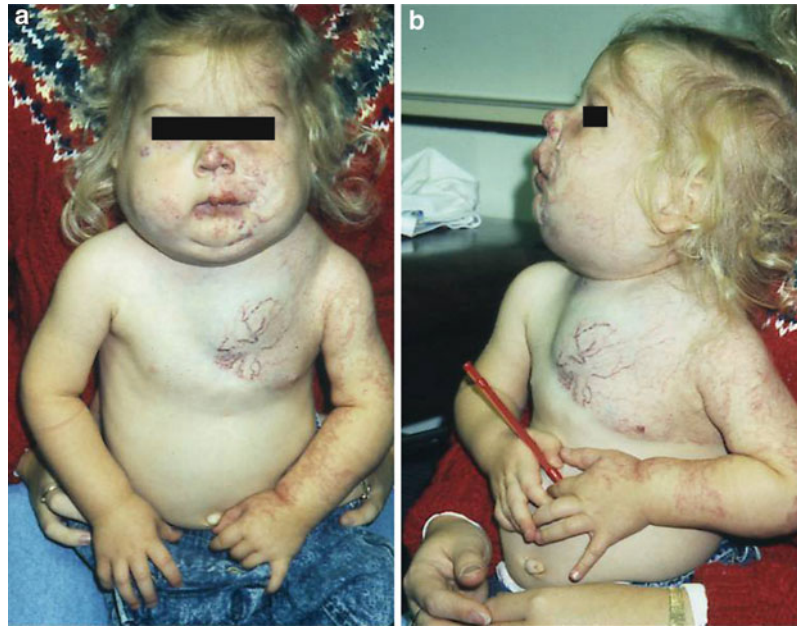

Fig. 3 (**a**, **b**) The same patient at 26 months of age showing development of a large diffuse vascular lesion extending from the whole *left* anterior chest to the *left* neck

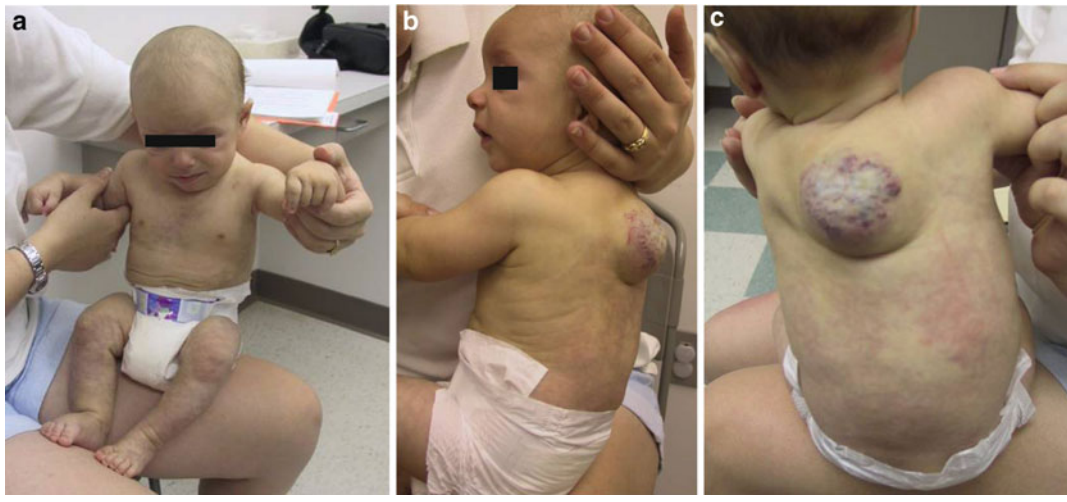

Fig. 4 (**a**–**c**) A 3-month-old infant boy with cutis marmorata telangiectatica congenita. Cutaneous vascular lesions consist of a 4 × 4 × 2 cm soft vascular lesion of the upper posterior back and diffuse *bluish* vascular lesions on the front chest, shoulders, arms, trunk, buttock, and legs. The right leg is larger than the left

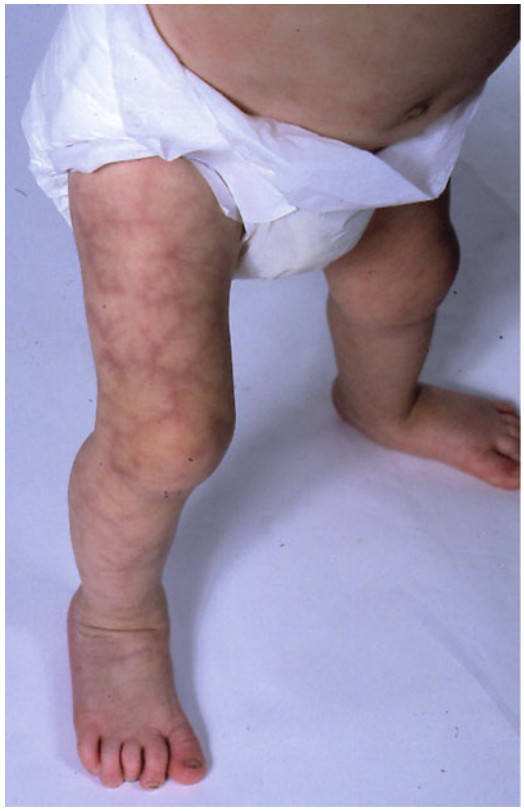

Fig. 5 Another infant with a reticular vascular pattern on the *right* leg

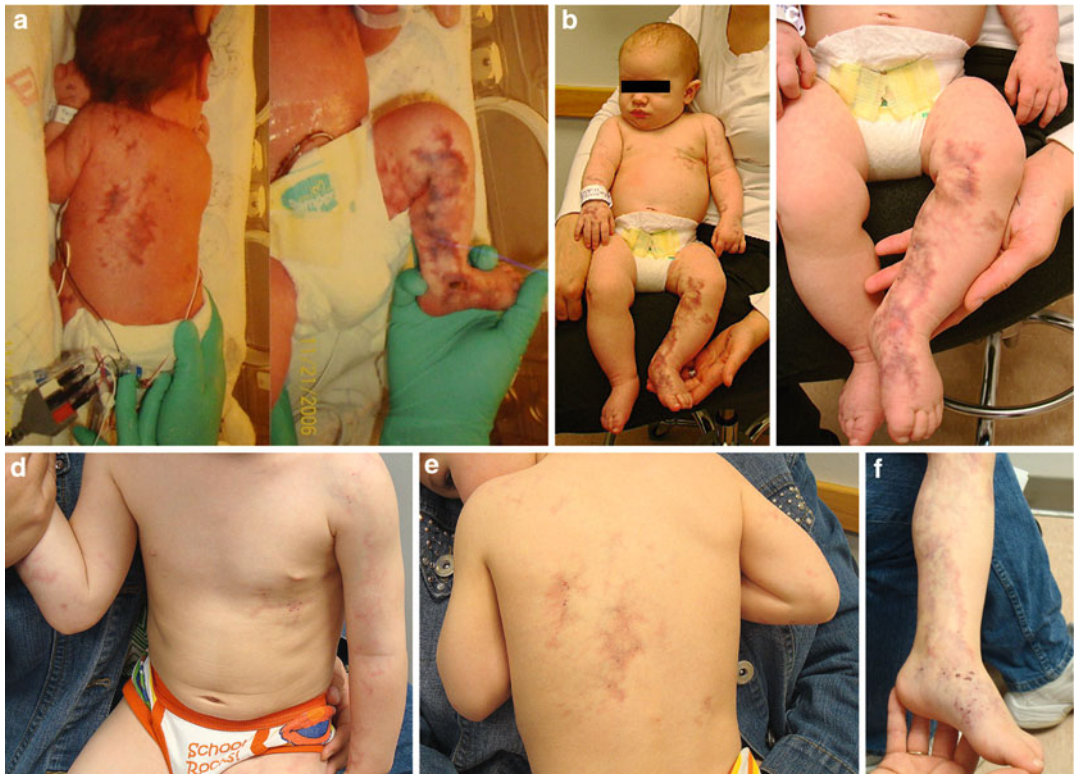

Fig. 6 (**a**–**f**) A child with cutis marmorata telangiectatica congenita at different ages (newborn, 4 months, and 4 years of age)