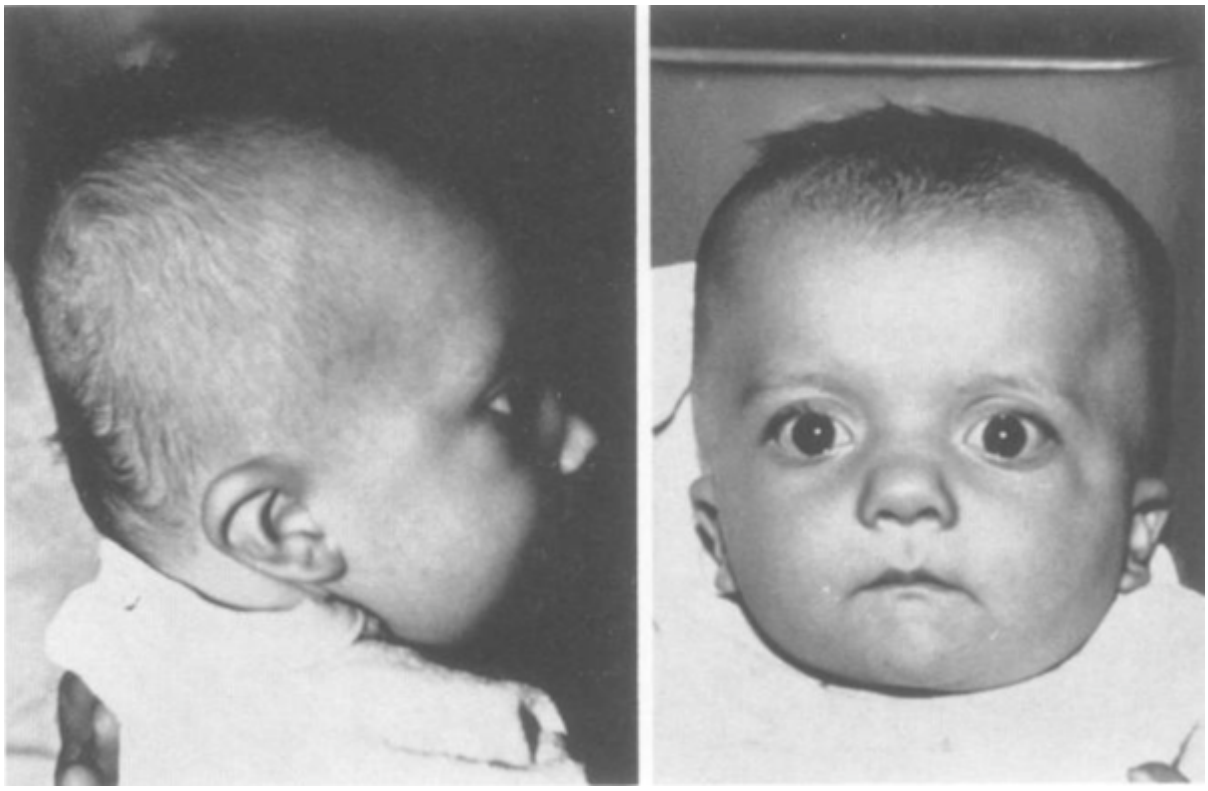
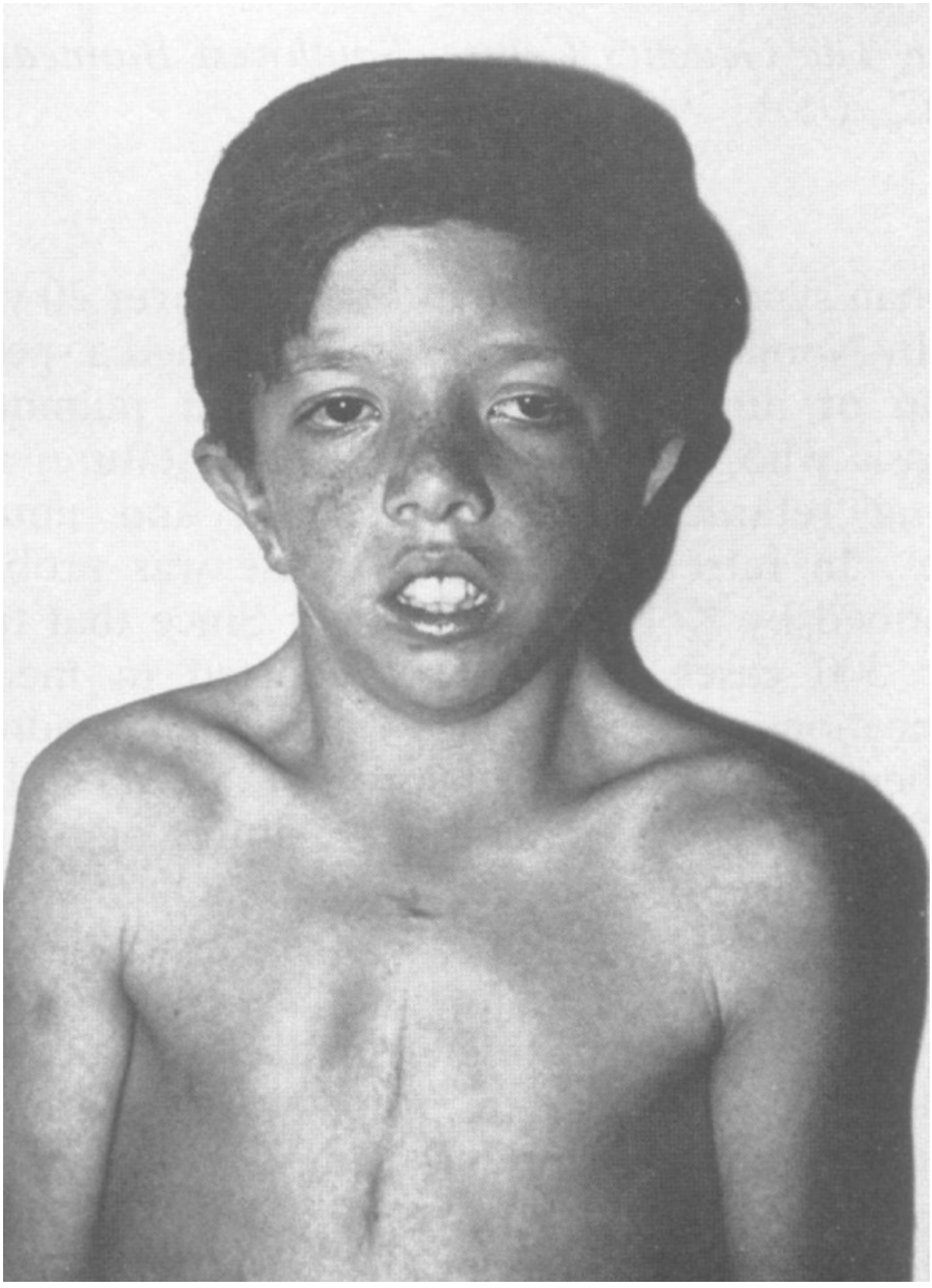
Noonan Syndrome

Main Features

- Highly variable but most have short stature, mild intellectual disability or developmental delay and
- Characteristic faces
    - High forehead
    - depressed nasal bridge
    - low-set posteriorly rotated ears with fleshy helices





Photos from J Med Genet. 1987;24(1):9-13.

Eye Findings

- Refractive Errors: Myopia, hyperopia and astigmatism
- Ptosis

- Hypertelorism
- Downslanting palpebral fissures
- Epicanthal folds
- Keratoconus
- vivid blue or blue-green iris
- Posterior embryotoxin
- Cataract
- Strabismus
- Nystagmus
- Optic nerve hypoplasia
- Optic nerve coloboma

Other Findings

- Webbed or broad neck
- Chiari Malformation
- Hydrocephalus
- Macrocephaly
- Craniosynostosis
- Sensorineural deafness
- Conductive hearing loss
- Giant cell tumors of the jaw
- Sternal deformities
    - pectus carinatum of the superior sternum
    - pectus excavated of the inferior sternum
- Cardiovascular defects
    - Pulmonic stenosis
    - hypertrophic cardiomyopathy
    - ASD
    - VSD
    - lymphatic dysplasia
- Chyptorchidism
- Infertility
- Hematologic abnormalities
    - elevation in PT/PTT
    - abnormal platelets, count and function

Etiology

- Genetic disorder of the genes in the RAS-MAPK pathway
    - PTPN11 (50%)
    - SOS1 (13%)
    - RAF1 (5%)
    - RIT1 (5%)
    - others

        - KRAS, BRAF, LZTR1, NRAS
- This pathway is important in cellular differentiation and proliferation
- Autosomal dominant inheritance most commonly with 2/3 denovo
- Associated with advanced paternal age

Resources

- van Trier, et al. Ocular findings in NS: a retrospective cohort study of 105 patients. European Journal of Pediatrics. 2018;177(8):1293–1298
- van Trier et al. Ocular Manifestations of Noonan Syndrome: A Prospective Clinical and Genetic Study of 25 Patients. Ophthalmology.2016;123(10):2134-2146
- Allanson, JE. Noonan Syndrome. J Med Genet. 1987;24(1):9-13.
- eyeWiki

syndrome