Neurocutaneous Disorders

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Definition

They are group of syndromes characterized by involvement of the brain & skin.

Because both originated from ectoderm embryologically.

Types :

- neurofibromatosis type1&2
- tuberous sclerosis
- sturge webber syndrome
- von hipple lindau disease
- incontinentia pigmenti
- ataxia telangectasia
- Maffucci's Syndrome
- Epidermal Nevus Syndrome
- Parry–Romberg Syndrome
- Neurocutaneous Melanosis

Z

- The disorders referred to as phakomatoses are notable for their :

-dysplastic nature

- tendency to formtumors in various organs,particularly the nervous system.

Neurofibromatosis NF1&NF2

- Incidence 1:3000 live birthes/prevalenc 1/50000
- A.D- 1/3 due to new mutation
- Abnormality due to chromosome 17& neurofibrin

Neurofibromatosis NF1&NF2

- peripheral form of neurofibromatosis referred to as NF1,
- the central form, the hallmark of which is bilateral vestibular schwannomas, called NF2.
- The distinction between the disorders was subsequently verified when the two genes were found to be distinct

NF 1

- **not only** the peripheral and central nervous systems,

- **but also** many other systems, including:

- skin
- bone
- endocrine
- gastrointestinal,
- vascular systems

Neurofibromatosis 1/von Recklinghausen disease

- Criteria for Diagnosis ,2 or more of:
- 6 or more café au lait macules
- FH in first degree relative
- 2 or more neurofibromas OR 1 plexiform neurofib
- optic glioma
- lisch nodules
- osseous lesion

NF1

café au lait macules





neurofibroma



plexiform neurofibromas

Cutaneous



axillary freckling

Other

- Ocular
  - optic gliomas
  - lisch nodules



- Skeletal
  - scoliosis
  - pseudoarthrosis
  - sphenoid dysplasia
- HTN, renovascular

NF 1





Complications of NF1

- seizure
- intracranial tumor
- nerve sheath, root tumor
- polyneuropathy
- vasculopathy
- macrocephaly
- learning disability
- UBOs

malignant transformation in NF 1

NF1- facts we haven't covered

- Cells have only half the normal amount of intracellular neurofibromin
- Most tumors are benign, but overall increased risk of malignancy by 5%
  - Plexiform neurofibromas occur in 25% of NF patients, and undergo malignant transformation to neurofibrosarcoma in 10-15%
  - Malignant transformation signs include rapid tumor growth and pain
- Regarding the other choices:

A. Leukemia: myeloproliferative and myelodysplastic leukemias are associated with NF1

B. Lisch nodules: hamartomas in the iris stroma; benign

C. Optic glioma: 15% patients; before age 6; benign

D. Pheochromocytoma: increased incidence, occurs in adulthood

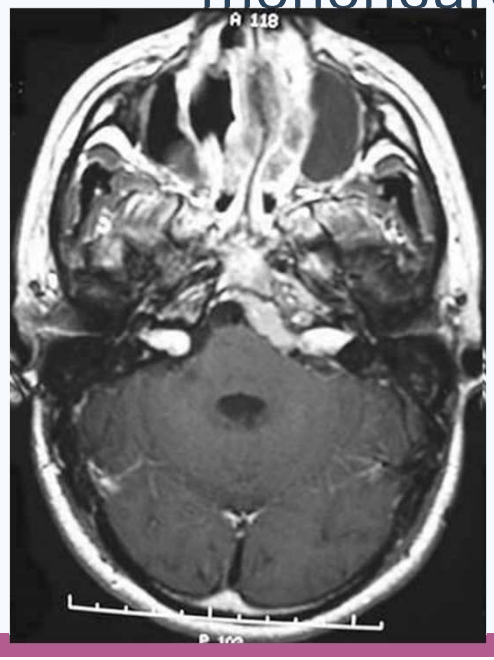
Neurofibromatosis 2,diagnostic criteria

- **Confirmed NF2**
- Bilateral vestibular schwannomas
- or
- n A first-degree relative with NF2
- and either
- Unilateral vestibular schwannoma before age 30 years
- or any two of
- Meningioma, schwannoma, ependymoma, juvenile lens opacity
- **Presumptive NF2**
- Unilateral vestibular schwannoma before age 30 years and at
- least one of: meningioma, schwannoma, ependymoma, juvenile
- lens opacity
- or
- Two or more meningiomas and unilateral vestibular schwannoma
- before age 30 years or at least one of: meningioma,
- schwannoma, ependymoma, juvenile lens opacity

Neurofibromatosis 2

Neuro

- acoustic neuromas
- spinal tumors
- meningiomas
- mononeuropathy





Cutaneous

- café au lait macules
- intracutaneous tumors
- subcutaneous nodules
- skin plaques

Other

- Ocular:
  - posterior subcapsular lens opacities
  - retinal hamartoma
  - epiretinal membrane

Tuberous Sclerosis

- autosomal-dominant inheritance that affects multiple organ systems
- both the brain and the skin have more than one major criterion for diagnosis
- Epilepsy is the most common presenting and also is the most common medical disorder.
- Seizures develop In up to 80–90 percent of patients
- one-third develop infantile spasms

Tuberous Sclerosis

Major Features

- Facial angiofibromas or forehead plaque
- Nontraumatic ungual or periungual fibroma
- Hypopigmented macules (more than 3)
- Shagreen patch (connective tissue nevus)
- Cortical tuber
- Subependymal nodule
- Subependymal giant cell astrocytoma
- Multiple retinal nodular hamartomas
- Cardiac rhabdomyoma, single or multiple
- Lymphangiomyomatosis
- Renal angiomyolipoma

Minor Features

- Dental pits (more than 14), randomly distributed
- Hamartomatous rectal polyps
- Bone cysts
- Cerebral white matter radial migration lines
- Gingival fibromas
- Nonrenal hamartomas
- Retinal achromic patch
- “Confetti” skin lesions
- Multiple renal cysts

Diagnostic Certainty Criteria

- Definite TSC

- 2 major features or

- 1 major feature + 2 minor features

- Probable TSC

-1 major feature + 1 minor feature

- Possible TSC

- 1 major feature or

- 2 or more minor features



TS

Neuro

- cortical tubers
- subependymal nodules
- giant cell tumors
- white mater heterotopia
- Seizures (90%)
  -infantile spasms (50%)
- Mental retardation
- DD
- behavioral concerns

Other

- Ocular
  - retinal hamartomas
  - achromic patches
- Cardiac
  - atrial rhabdo
- Renal
  - angiomyolipomas
- Lung
  - lymphangioleiomyomatosis (LAM)
- skin

TS



periungual fibroma

Cutaneous



Shagreen patch

hypomelanotic macule



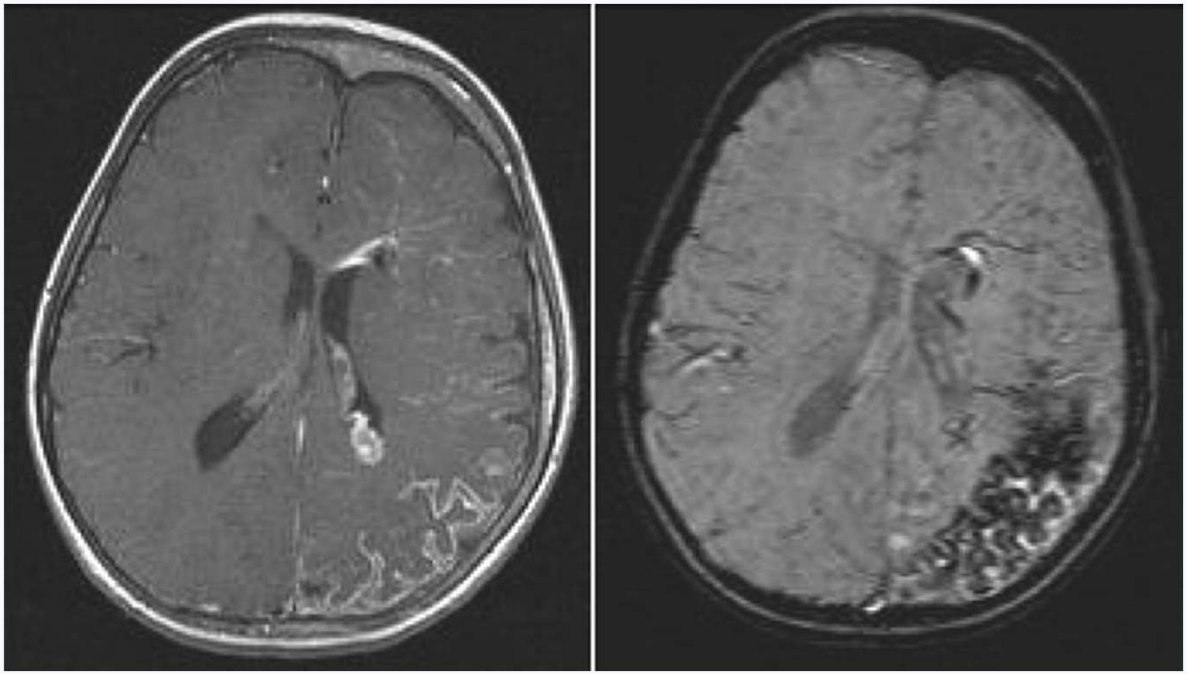


facial angiofibromas

Sturge-Weber Syndrome

Neuro

- Seizures
  - focal → generalized tonic clonic
- Leptomeningeal angioma
  - pia mater
  - IL to port wine stain
  - MC occipital and parietal areas affected
- Hypoperfusion injury
- ID, DD
- Progressive



Sturge-Weber

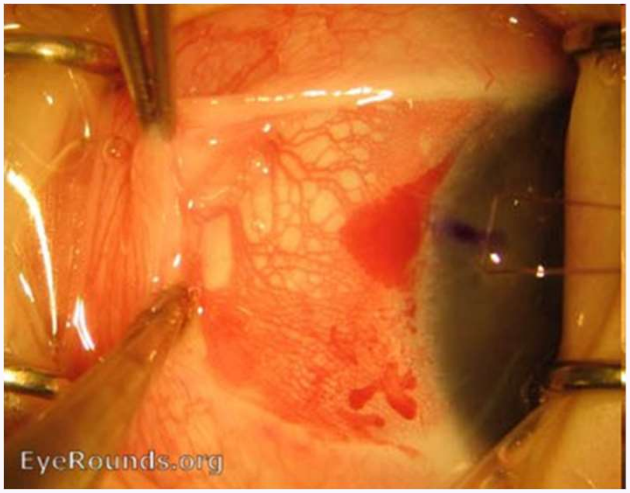
Cutaneous

- Port Wine Stain
  - 10% incidence of SWS
  - Hemifacial hemangioma
  - CN5
  - progressive

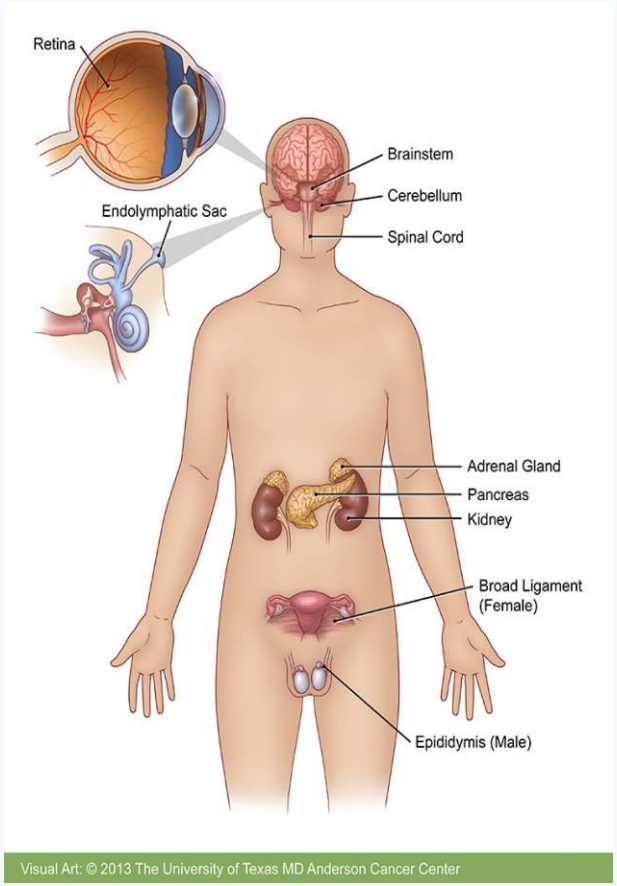


Other

- Ocular
  - visual field defects
  - glaucoma
  - other vascular anomalies
  - IL heterochromic iris
- GH deficiency
- central hypothyroidism



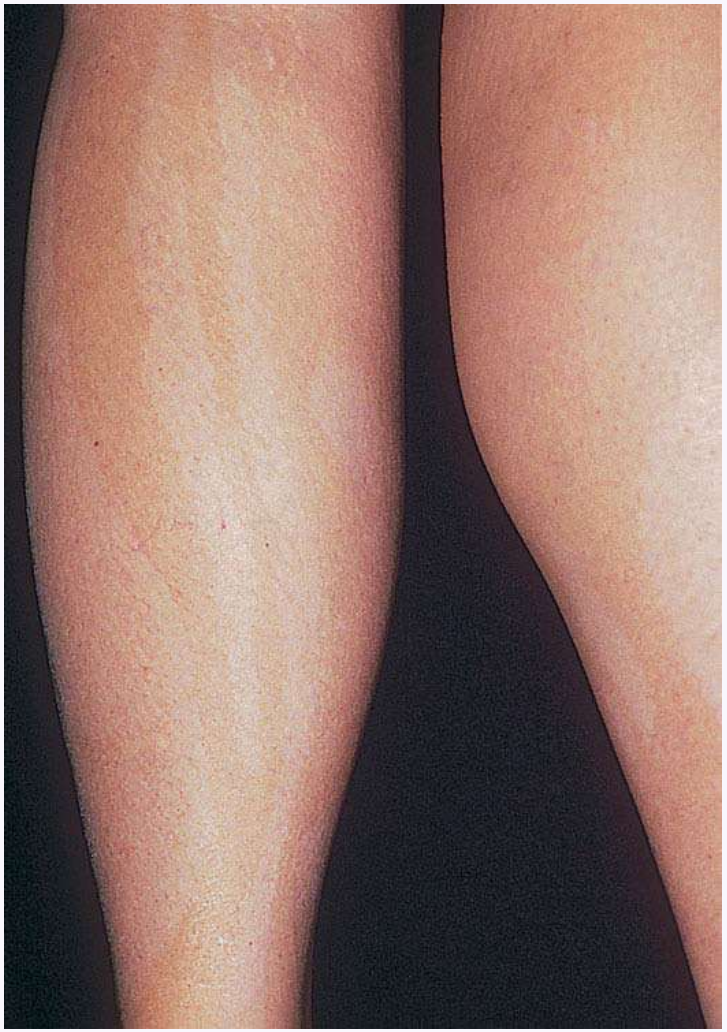
Von Hippel–Lindau Disease



Visual Art: © 2013 The University of Texas MD Anderson Cancer Center

- Autosomal dominant
- retinal, cerebellar, spinal **hemangioblastomas**,
- **cystic tumors** of the pancreas,kidney, and epididymis,
- renal cell carcinoma,
- endolymphatic sac tumors,
- pheochromocytoma

Hypomelanosisof Ito



- hypopigmented lesions on any part of the head, trunk, or limbs,either unilaterally or bilaterally
- The skin lesions are congenital.
- Multiple associated anomalies are common and can involve the central nervous system or the peripheral nervous system, eyes, and bone

Maffucci’s Syndrome

- multiple enchondromas with secondary hemangiomas,
- phlebolithiasis,
- malformations of bone
- Occasionally, patches of vitiligo, cafe´-au-lait spots, and other hyperpigmented patches and nevi, are seen
- Neurologic symptoms may result from

skull-base chondrosarcomas or from rare gliomas.



Parry–Romberg Syndrome (Facial Hemiatrophy)

- typically has onset between 5 and 15 years of age
- progressive ipsilateral loss of facial soft tissue, cartilage, and bone
- Progression of this atrophic process generallylasts between 2 and 10 years
- neurologic :recurrent headaches, trigeminal neuralgia, ipsilateral Horner's syndrome, contralateral partial seizures, and hemiparesis
- Cranial CT can be normal or document cerebral atrophy; contralateral intracerebral calcification



Klippel–Tre´naunay–Weber Syndrome

- *occurs sporadically*
- hypertrophy of the soft tissues and bone of a limb
- Limb hypertrophy usually is apparent at birth
- megalocornea, glaucoma,iridic heterochromia, syndactyly, polydactyly, macrodactyly, and clinodactyly
- Macrocephaly often is present





