

Tuberous sclerosis

Case history

SE. II. sz. Gyermekklinika

Case history 1.

- GD.
- DOB: 05-03-1989
- Pre and perinatal history: normal
- His development was normal till 2month
- **At 2 month** hypomelanotic macules and developmental arrest
apathetic behavior
- **3 month** episodes of infantile spasm
hypsarrhythmic pattern on EEG (West's syndrome)



hypomelanotic macules
„ash-leaf” spot

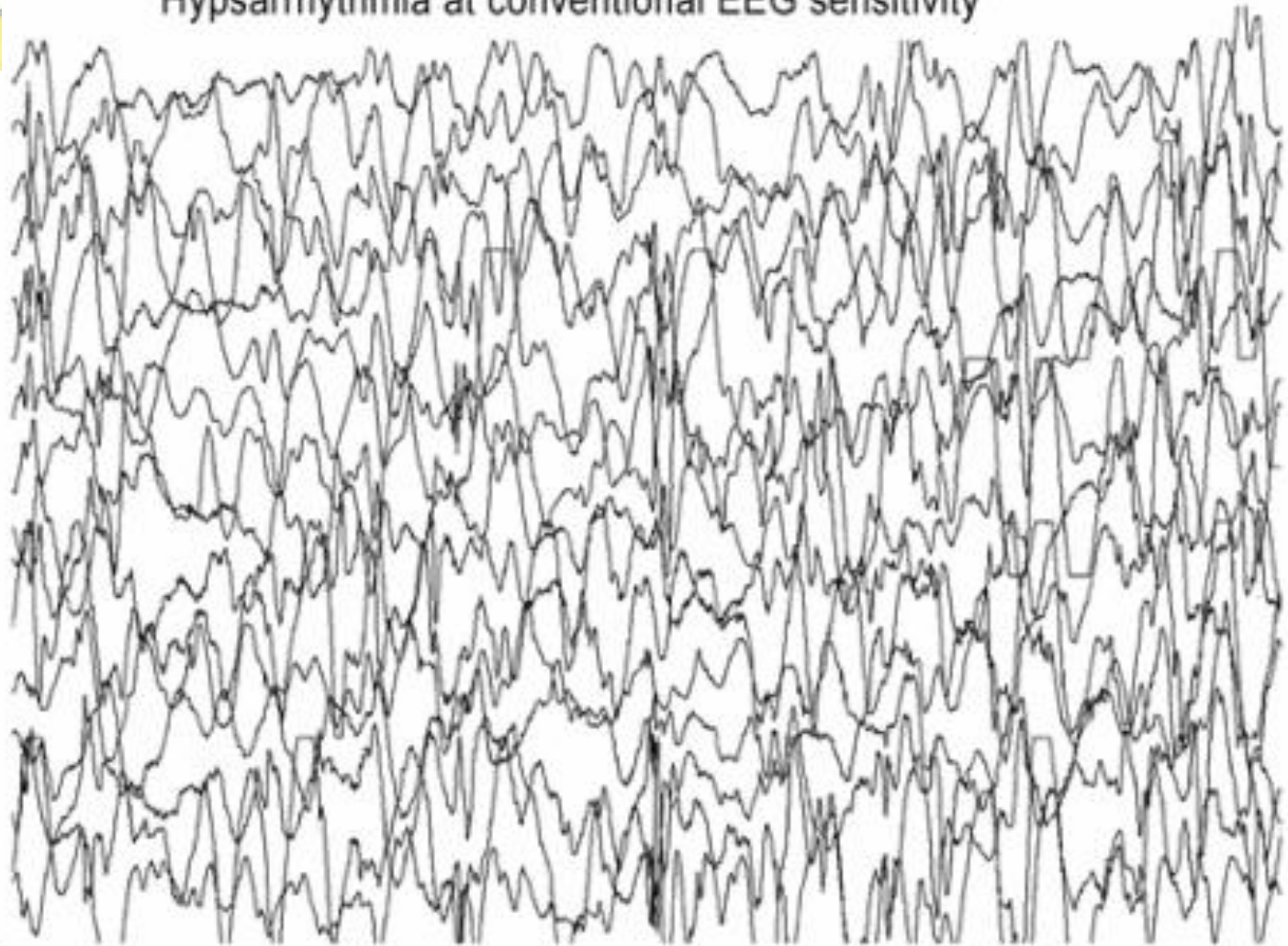
EEG- examination



Hypsarrhythmia at conventional EEG sensitivity

Fp2 - F4
F4 - C4
C4 - P4
P4 - O2
Fp1 - F3
F3 - C3
C3 - P3
P3 - O1
Fp2 - F8
F8 - T4
T4 - T6
T6 - O2
Fp1 - F7
F7 - T3
T3 - T5
T5 - O1

100 μ V
1 sec

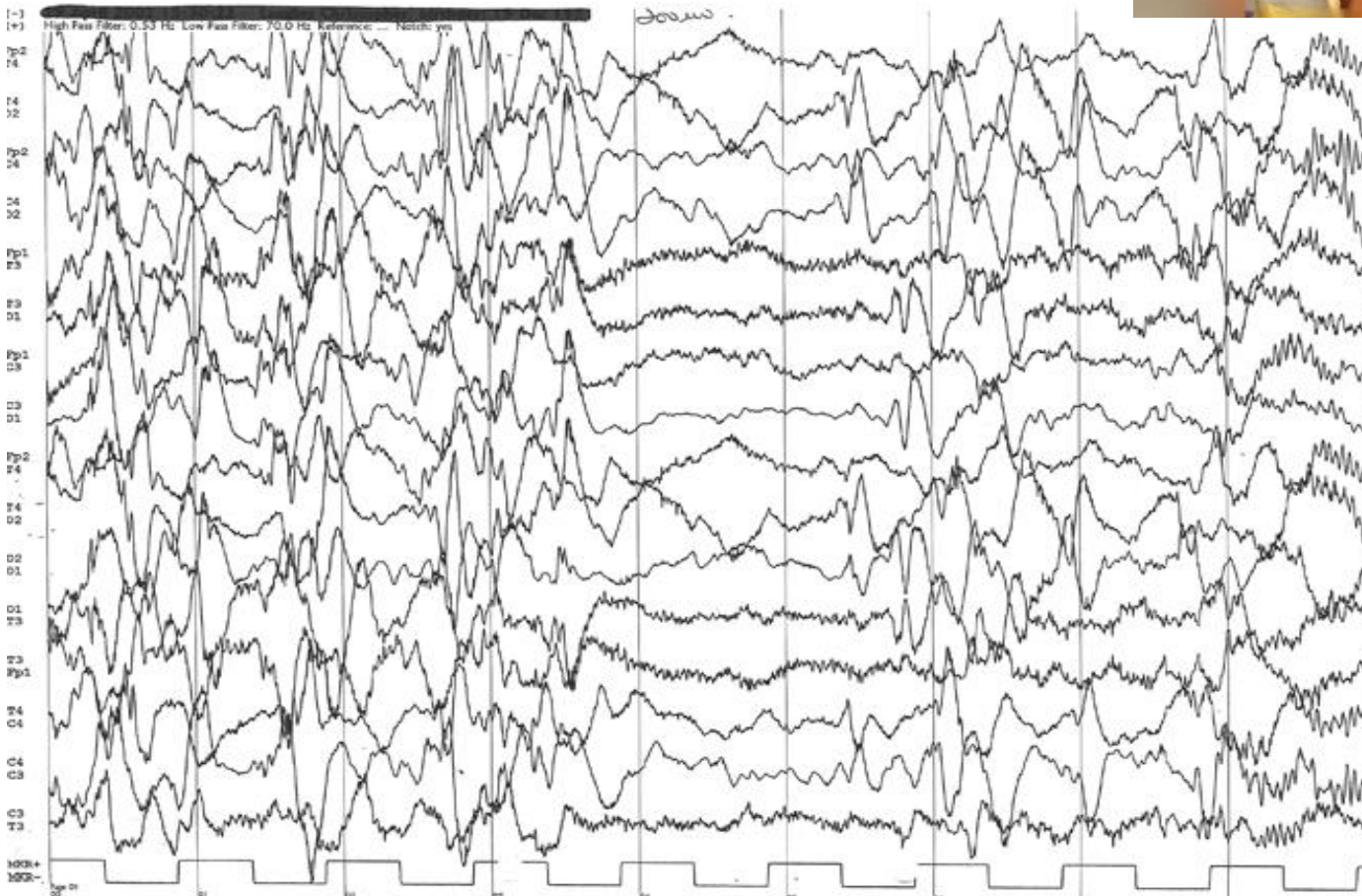


high amplitude and irregular waves and spikes in a background of chaotic and disorganized activity seen

Case history 2.

- JKB.
- DOB:22-03-2015
- Pre and perinatal history: normal
- Her development was normal
- **Symptoms:** at 9 month
 - with abnormal eye movements after waking up
 - repeated during the day several times
 - some hypomelanotic macules on the skin (from birth)

EEG- examination



hypsarrhythmia and suppression burst activity during sleep

Tuberous sclerosis



Désiré-Magloire Bourneville

> multi-system **genetic disease** that causes benign tumors in the brain and other organs as kidneys, heart, eyes, lungs, and skin

> tubers were first described by M.Bourneville (1880)

> the cortical manifestations are known by the eponym
Bourneville's disease

Symptoms include: skin abnormalities
developmental delay
epileptic seizures
behavioral problems
intellectual disability

/Vogt, 1908/

trouble in school and concentration problems

Tuberous sclerosis

Skin lesion

15 years later

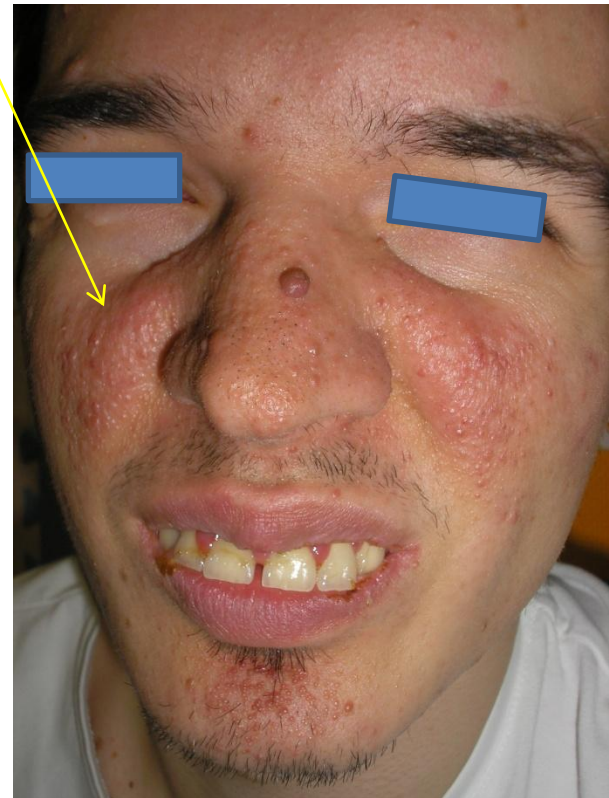
Adenoma sebaceum (facial angiofibromas)

over the bridge of the nose

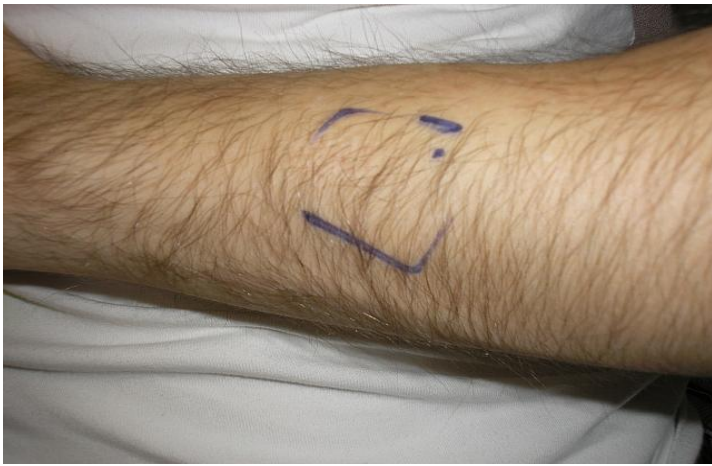


rash of reddish spots or bumps

In a butterfly distribution on the face



Skin lesion in TSC



shagreen path ,large leathery path of skin



amelanotic nevi („ash.leaf-spot”)



periungual fibromas (Koenen's tumors)
small fleshy tumors around /under the
toenails or fingernails

Skin lesion in TSC



molluscum fibrosum or skin tags,
on the back of the neck
and shoulders
café au lait spots or flat brown marks



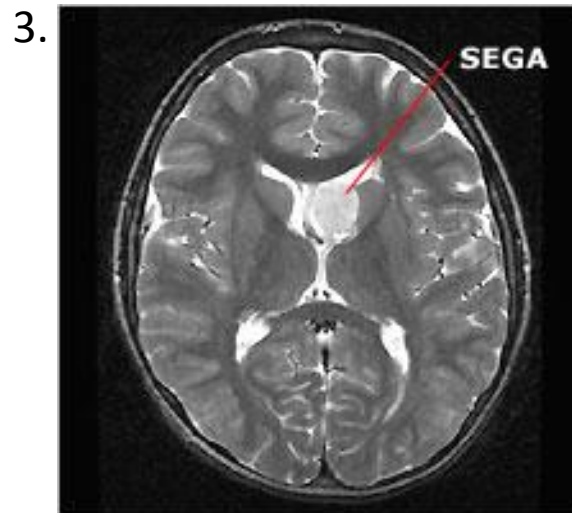
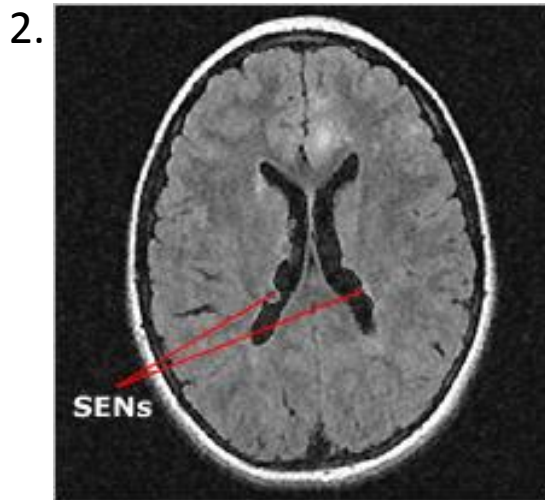
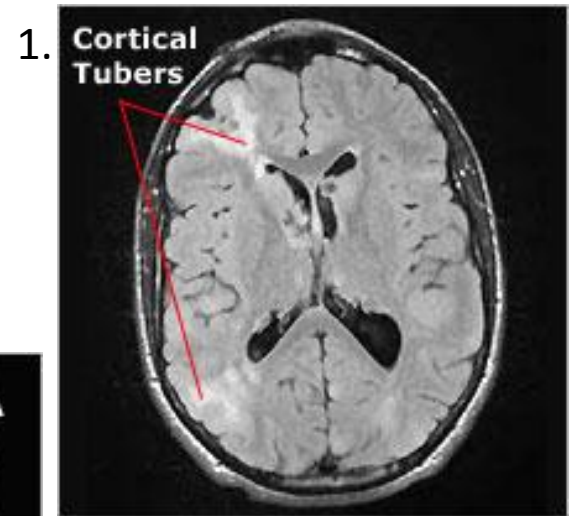
poliosis
a tuft or patch
of white hair
on the scalp or
eyelids



Central nervous system

MRI in TS

1. **cortical tubers** form in / around the cerebral cortex, the brain's outermost layer.

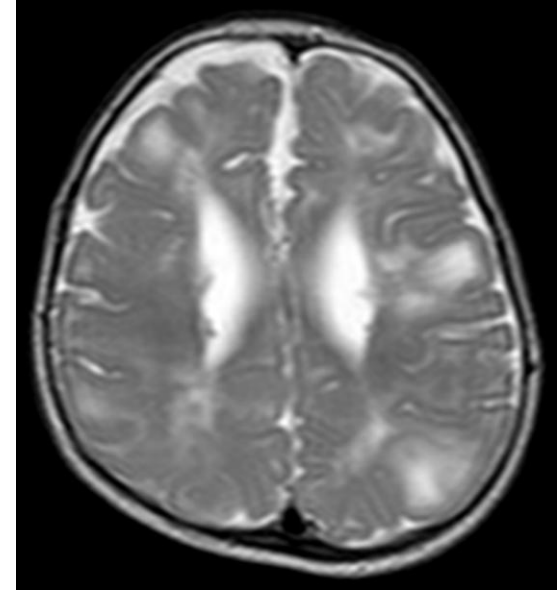


subependymal nodules (SENs), and subependymal giant cell astrocytomas (SEGAs).

Subependymal nodules (2.) (SENs) and **Subependymal giant cell astrocytomas** (3.) (SEGAs) form deeper within the brain, typically along the ependymal lining (walls) of the ventricles, the cavities containing cerebrospinal fluid.

Brain involvement and mental status

- ~ **50%** have **learning difficulties** (mild to severe)
- 25%** and 61% of patients have **autism** or a broader **pervasive developmental disorder**
- 10 %** of people with TSC **self-injurious behavior**
- Other behaviors and disabilities**, such as **ADHD**, **aggression**, **behavioral outbursts** and **OCD** also occur
- Lower IQ** is associated with more brain involvement on MRI



Tuberous sclerosis in MRI

Other organs

Kidneys 60 and 80% of TSC patients have benign
→ tumors- **angiomyolipomas (AML)**
frequently causing hematuria

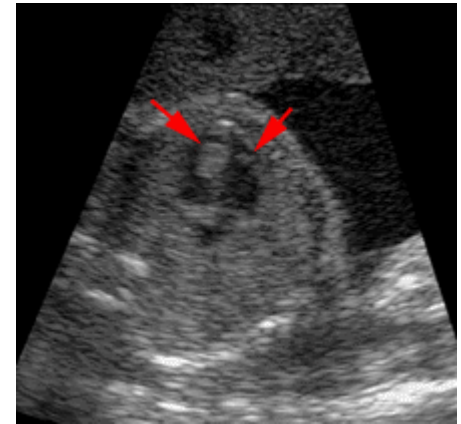


Lungs with TSC can develop **multiple cysts** of
the lung parenchyma .(identical another
disease- **lymphangiomyomatosis**

Heart **Rhabdomyomas** (benign tumors of striated
muscle)

~ 50% of people with TSC

rhabdomyomas cause obstruction
arrhythmia
murmur



Multiple cardiac rhabdomyomas
on ventricular septum and wall

Eyes → **Retinal lesions:** astrocytic hamartomas
or "phakomas"

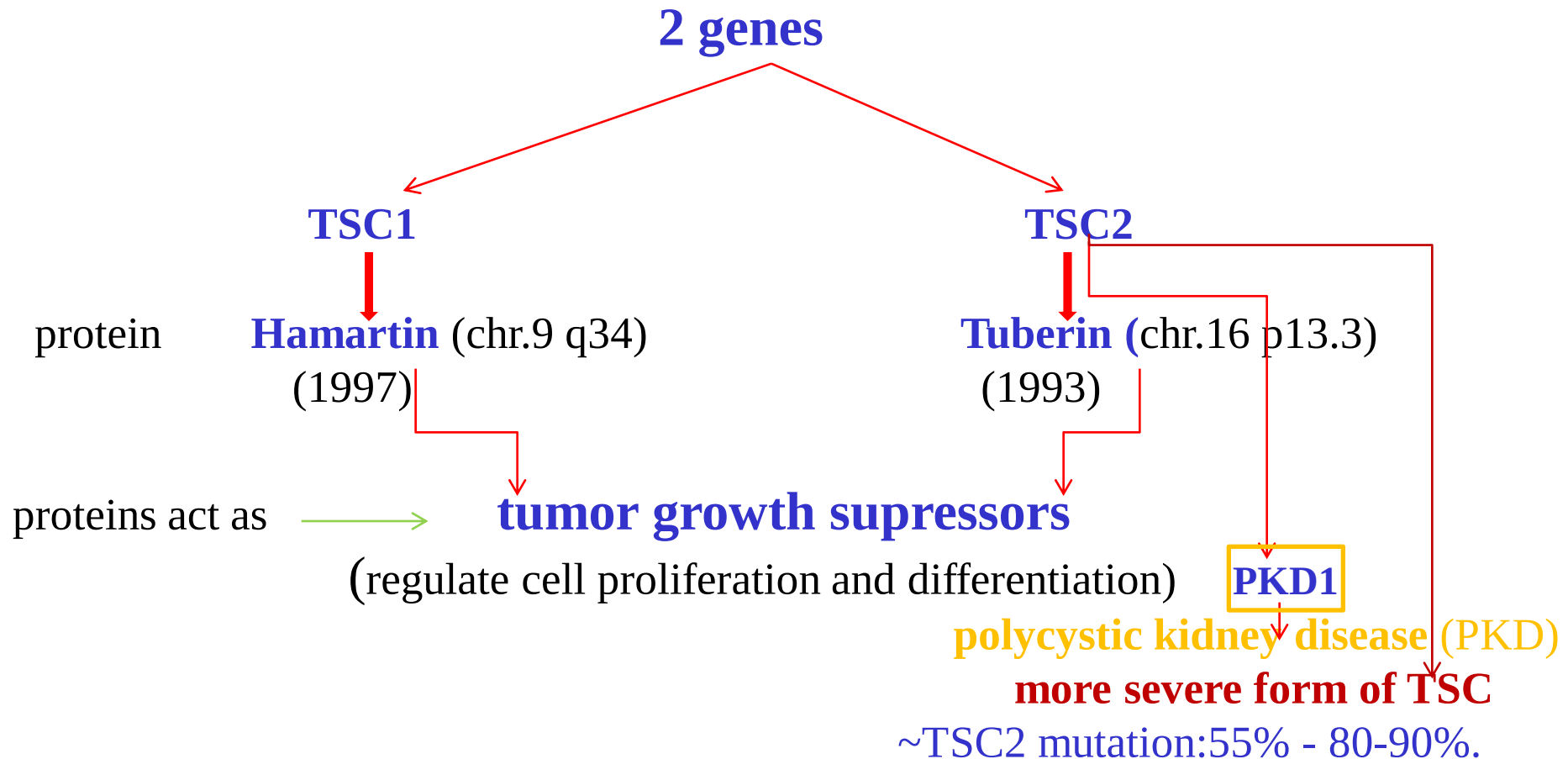
→ **Non-retinal lesions:** coloboma
angiofibromas of the eyelids
papilledema (related to hydrocephalus)



circumscribed
yellow white
retinal lesion

Genetic background of TSC

Inheritance: AD with variable expressivity and complete penetrance
2/3 of TSC cases are sporadic mutations



Management

- **rapamycin** (2008) – rescued learning and memory deficits in a mouse
- **anti-epileptic drugs** to control seizures:
Vigabatrin
ACTH
- **everolimus** (2010) for the treatment of subependymal giant cell astrocytoma
- **Treatment of angiofibromas:** socially embarrassing rash can be removed using **dermabrasion** or **laser** treatment

Thank you