

TONIC PUPIL

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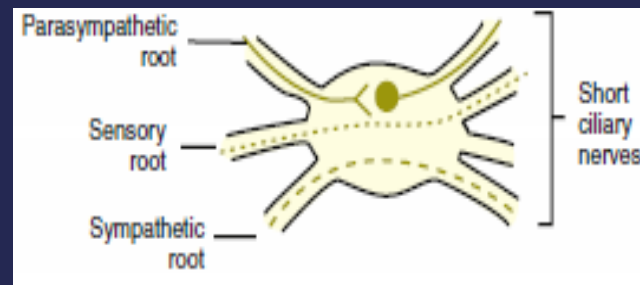
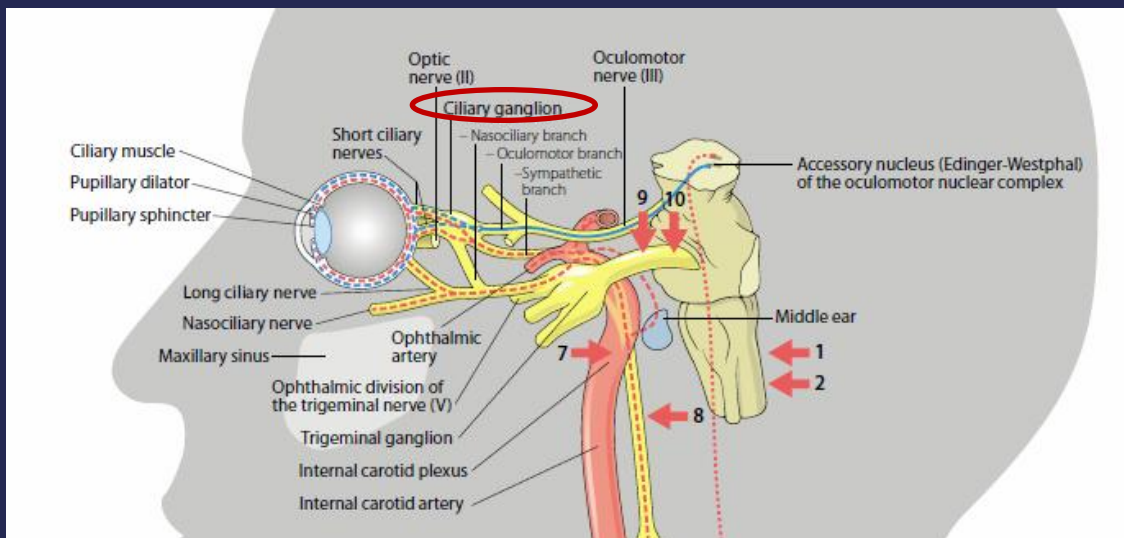
TONIC PUPIL

Damage to the ciliary ganglion and short ciliary nerves

retrobulbar part

intraocular part

suprachoroidal space





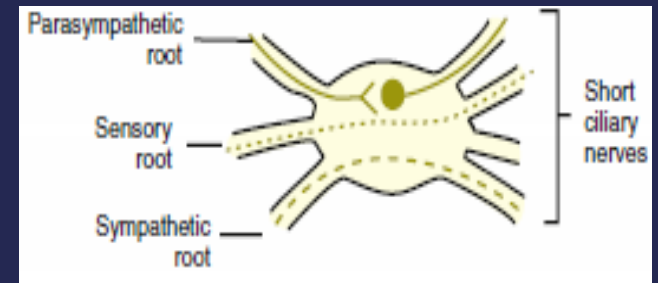
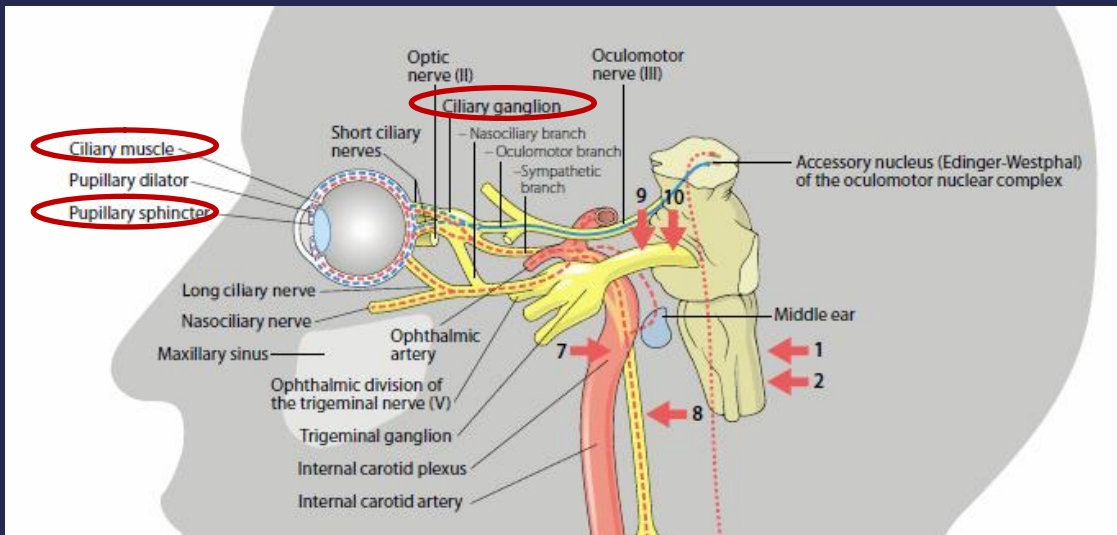
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retrobulbar part

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TONIC PUPIL



Damage to the ciliary ganglion and short ciliary nerves

Symptoms

Iris sphincter dysfunction

Ciliary muscle dysfunction

Photophobia

Difficulty with dark adaptation

Blurred near vision

Brow ache/Headache with near work

TONIC PUPIL



Damage to the ciliary ganglion and short ciliary nerves



Clinical signs

Internal
ophthalmoplegia,
anisocoria

Segmental
atrophy of iris
sphincter

Vermiform
movement of
pupillary
margin

Accommodative
paresis

Decrease
corneal
sensation

Light near
dissociation

Cholinergic
denervation
supersensitivity

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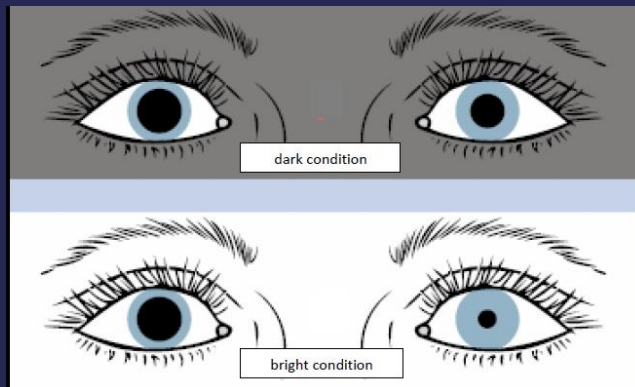
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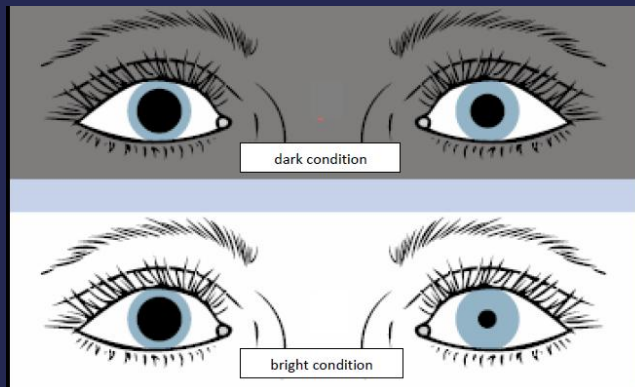
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Differential diagnosis

- ❖ Tonic pupil
- ❖ CN3 palsy
- ❖ Iris damage
- ❖ Pharmacologic mydriasis



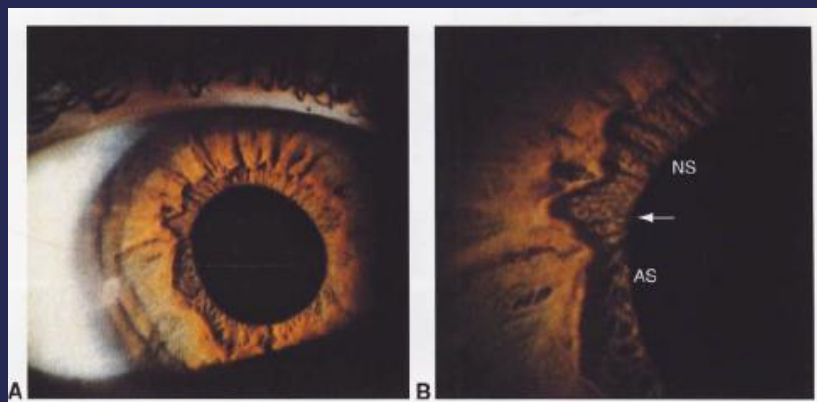
TONIC PUPIL

Damage to the ciliary ganglion and short ciliary nerves



Clinical signs

Internal ophthalmoplegia, anisocoria	Segmental atrophy of iris sphincter	Vermiform movement of pupillary margin	Accommodative paresis	Decrease corneal sensation	Light near dissociation	Cholinergic denervation supersensitivity
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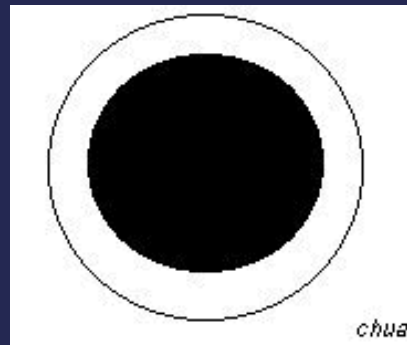


Damage to the ciliary ganglion and short ciliary nerves



Clinical signs

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- ❖ Acute: moderate to severe
- ❖ Gradually improves over several months: regeneration and reinnervation
- ❖ Recovery: the first 2 years after the acute injury

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Segmental atrophy of iris sphincter

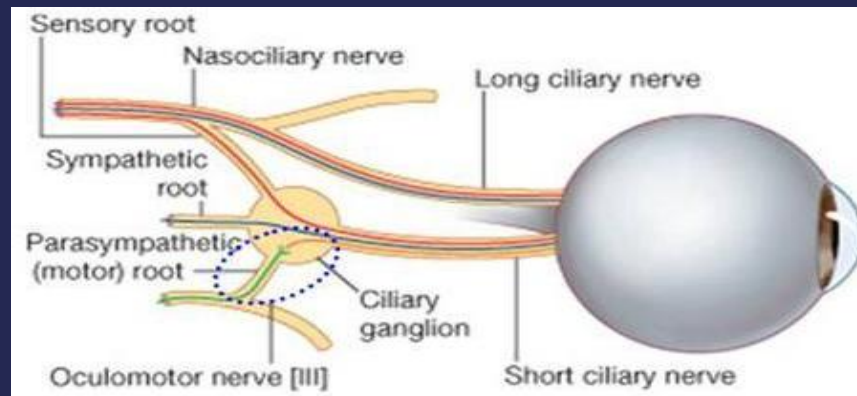
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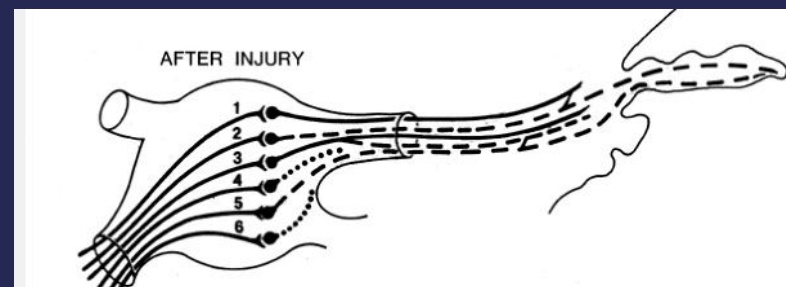
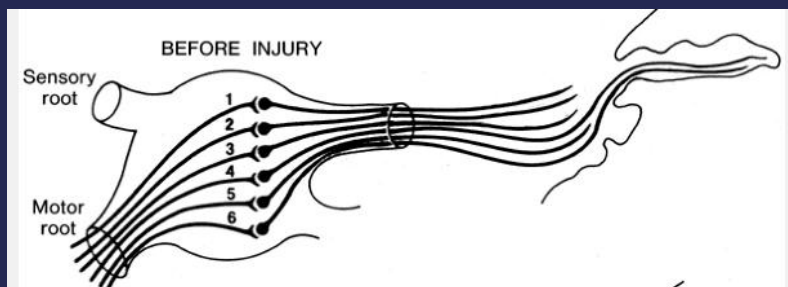
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Differential diagnosis

- ❖ Severe loss of afferent light input to both eyes
- ❖ Loss of pretectal light input to EW nucleus
- ❖ Third nerve aberrant reinnervation
- ❖ PRP, retinal cryotherapy, orbital surgery
- ❖ Peripheral neuropathy
- ❖ Adie's tonic pupil

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- ❖ Develop few days after nerve damage
- ❖ Iris constricted with weak Pilocarpine (0.0625- 0.125%) at 40-60 min, dim light
- ❖ Positive 80%

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Damage to the ciliary ganglion and short ciliary nerves



Causes

Local

Neuropathic

Idiopathic
(Adie's pupil)

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Causes

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(Adie's pupil)

Orbital or systemic, isolated involvement of ciliary GG and short ciliary nerve

Unilateral

Infection: HZV, measles, diphtheria, syphilis, Lyme disease, scarlet fever, pertussis, influenza, sinusitis, hepatitis

Infammation: VKH, RA, PAN, GCA, lymphomatoid granulomatosis, chorioiditis

Trauma & Surgery: blunt/penetrating trauma, intraocular Sx, PRP, Cryotherapy

Tumor: primary and metastatic choroidal and orbital tumors

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Damage to the ciliary ganglion and short ciliary nerves

Causes

Local

Neuropathic

Idiopathic
(Adie's pupil)

Wide spread, peripheral, and autonomic neuropathy

Bilateral

Syphilis, Chronic alcoholism, DM, SLE, Sjogren syndrome

Spinocerebellar degenerations

Amyloidosis, dysautonomias, Guillain-Barre syndrome, Miller Fisher syndrome

Paraneoplastic autonomic polyneuropathy

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Damage to the ciliary ganglion and short ciliary nerves

Causes

Local

Neuropathic

Idiopathic
(Adie's pupil)

Idiopathic, uncommon, sporadic

Unilateral 80%, F>M, 20-50 yrs

Holmes Adie syndrome: Adie's pupil + areflexia

Fellow eye: 4%/year

Long standing: smaller with time, bilateral

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Investigations

Blood tests

Neuroimaging: MRI

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Damage to the ciliary ganglion and short ciliary nerves

Treatment

Photophobia, cosmetic: weak Pilocarpine eyedrop

Accommodative paresis: bifocal glasses