

5.10.1. Pupillary Abnormalities (I)

Pupil Irregularity

coloboma
aniridia
congenital iris malformations

focal tears in the sphincter muscle.
iridodialysis
blunt trauma

synechiae
intraocular inflammation
iris neovascularization

leading cause of a misshapen pupil in an adult ★
cataract surgery
surgical procedures

peaking of the pupil
focal spasm of the iris dilator muscle
lasts a few minutes
may occur numerous times over several days or a week
spontaneous resolution
tadpole pupil 🐸

pharmacologic testing for Horner syndrome is recommended! ❤️
small percentage harbor underlying sympathetic lesion ⚠️

eccentric or oval pupils
incomplete damage of the pupillary fibers
rostral midbrain disease 🧠
midbrain corectopia 🐛

Baseline Pupil Size

resting pupil size is influenced by
ambient light
retinal adaptation
sleepiness causes small pupils
level of arousal
pupils become smaller with age
patient age

pontine hemorrhage ✅
narcotic intoxication ✅
pilocarpine use ✅
extremely small pupils 📌

parasympathetic pharmacologic blockade ✅
stimulants ✅
high anxiety ✅
extremely large pupils 📌

dilated pupil
generalized tonic-clonic seizure ✅
elevated intraocular pressure ✅

History

patient may not be aware of pupil abnormality especially dark-colored irides
symptoms
photophobia
difficulty focusing when going from dark to light or light to dark
blurring of vision
clinician should inquire about
new medications
ocular infections
face or neck trauma
headache or facial pain
change in eyelid position

Pupillary Examination

inspection of previous photographs
shine a handheld light obliquely from below the nose
pupil size
★ patient should fixate on a distant target do not block the patient's fixation!
💡 poor vision in 1 eye is never a cause of anisocoria
pupillary light reflex
briefly shine a bright focal light onto 1 pupil and note the speed and amplitude of its constriction
pupillary near response
accommodative target with fine detail
moderate room light patient's pupils are midsize and the near object is clearly visible
requires sufficient patient effort
"practice runs" may be needed
a better response is obtained if auditory input is added to the visual stimulus
💡 a lack of near response usually indicates that the patient is not trying hard enough
slit-lamp examination
an essential part of the pupillary examination
acute corneal injury small pupil in the presence of ciliary spasm
anterior chamber inflammation small pupil in the presence of ciliary spasm
transillumination iris defects iris damage from previous trauma, infection, or inflammation
angle-closure glaucoma dilated pupil
sectoral paralysis of the iris sphincter
✅ tonic pupil
✅ aberrant regeneration of the oculomotor nerve
placing a wide beam at an angle to the iris and turning the light off and on while observing one sector of the sphincter at a time under high magnification
white pupil (leukocoria)
persistent hyperplastic primary vitreous
retinopathy of prematurity
cataract
retinoblastoma 🚩 20%
pharmacologic agents
can be used to confirm a clinical suspicion of
Horner syndrome
tonic pupil
pharmacologic mydriasis
false-positive and false-negative test results can occur