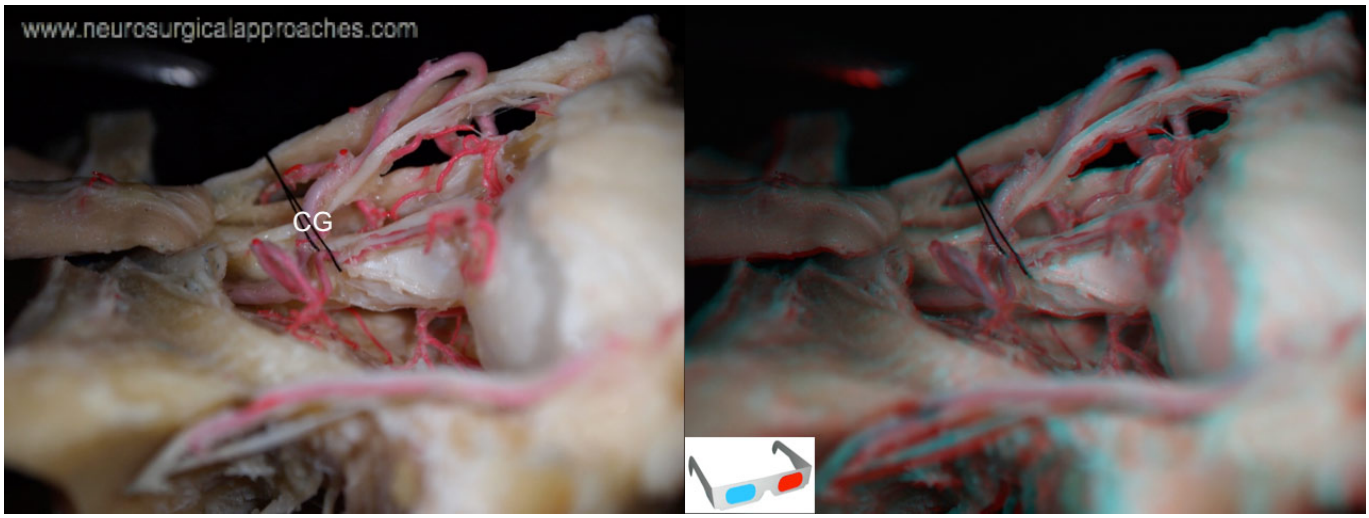
Ciliary ganglion

The ciliary ganglion (CG) is situated on the inferolateral aspect of the optic nerve and on the medial side of the lateral rectus muscle (removed in this picture). It receives three branches: the motor (parasympathetic) root from the inferior division of the oculomotor nerve, the sensory root from the nasociliary nerve, and sympathetic fibers from the plexus around the internal carotid artery.The short ciliary nerves pass from the ganglion to the globe.



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Aydin et al., aimed to investigate whether there was any relationship between the mydriasis induced by the degeneration of the ciliary ganglion (CG) and photophobia in instances of SAH.

Five of a total of 25 rabbits were used as the intact control group; five were used in the sham-operated control group; and the remaining 15 were used as the SAH group, which was created by injecting autologous blood into their cisterna magna. All animals were examined daily for 20days to evaluate their level of photophobia, after which their brains, CGs and superior cervical ganglia (SCGs) were extracted bilaterally. The densities of normal and degenerated neurons in these ganglia were examined by stereological methods.

In SAH animals with a high photophobia score, the mean pupil diameter and density of degenerated neurons density in the CG were greater than in cases with a low photophobia score ($p<0.05$). Further analysis revealed that the increase in the density of degenerated neurons in the CG following SAH resulted in the paralysis of the parasympathetic pathway of the pupillary muscles and mydriasis, which facilitates the excessive transfer of light to the brain and photophobia.

The findings indicate that SAH results in a high density of degenerated neurons in the CG, which induces mydriasis and is an important factor in the onset of photophobia. This phenomenon is likely due to more light energy being transferred through mydriatic pupils to the brain, resulting in vasospasm of the supplying arteries [1].

1)
Aydin N, Kotan D, Keles S, Ondas O, Aydin MD, Baykal O, Gundogdu B. An experimental study of the neurophysical mechanisms of photophobia induced by subarachnoid hemorrhage. Neurosci Lett. 2016 Sep 6;630:93-100. doi: 10.1016/j.neulet.2016.07.013. Epub 2016 Jul 18. PubMed PMID: 27436478.