

Original

How to Diagnose Glaucoma based on Sinking Disc

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INTRODUCTION:

In order to diagnose glaucoma based on sinking disc we have to remember two new paradigms in glaucoma. These new paradigms will replace the currently used paradigms of *cupping and neuropathy* of the optic disc which may not be occurring in glaucoma.

New Paradigm # 1. Optic disc is continuously sinking in its entirety in glaucoma, not cupping.

New Paradigm # 2. Axons are being severed (axotomized) not atrophied in glaucoma. .

Ignore every thing about optic disc including physiological cups whether they are 0.2 or 0.8. We have to determine one thing only: *whether the optic disc is sinking or not?*

Retinal nerve fibers lie in a layered fashion. Sinking of the optic disc results in severance of axons which in turn results in depletion and thinning of the RNF layer. As a result of thinning the RNF layer becomes more transparent therefore allowing the deeper structures like scleral rim and border tissue to be seen clearly which are normally not visible due to normal thickness of the RNF layer.

We can't see the transparent axons but can follow the course of blood vessels as they cross the disc margin. If the course of blood vessels on the disc margin is straight and the optic disc appears flush with retina, there is no glaucoma. As the optic disc starts sinking the blood vessels will also start sloping in pursuit of sinking disc. It doesn't matter whether someone is born with 0.2 cup or 0.8 cup. *If the disc is flush with retina and there is no sinking evident then there is no glaucoma.* If the blood vessels on the disc appear sloping then glaucoma has occurred. This simple observation will provide you with accurate and astonishing results.

Equipment: Ophthalmoscope can provide you good information but digital camera will give you the best information. We can zoom in the disc and see the changes occurring more closely. We can compare the disc of each eye side by side and get very valuable information about the stage each glaucomatous disc is. By taking photographs on regular intervals we can know the rate the glaucoma is progressing. I personally don't care about OCT because by the time we are certain about definitive thinning of RNF layer by OCT, we can observe signs of the sinking disc like sloping of the blood vessels, prominence and visibility of the border tissue due to thinning of the RNF layer with our naked eye.

Stages of the glaucomatous discs.

Since the changes occurring in the glaucomatous discs are gradual and continuous therefore it is difficult to divide into stages. However, arbitrarily glaucomatous changes may

be divided into three stages.

Early stage: Earliest sign of glaucomatous disc will be visibility and prominence of the border tissue and scleral edge/rim due to thinning of the RNF layer. The temporal area of the disc will appear somewhat pale. As the sinking progresses and the RNF layer becomes further thin, the border tissue will become more visible and the blood vessels will also appear sloping. The temporal area will begin to appear shallow, sunken and pale due to severance of the axons and its vasculature.

Intermediate Stage: As the sinking progresses further the physiological cup will be obliterated due to confluence of cup's usual pallor and the pallor produced in the temporal part by the destruction of the axons and its vasculature. This may be taken as an enlargement of the physiological cup but it is not true enlargement but de-cupping of the physiological cup. When the physiological cup becomes obliterated, it may be called an intermediate stage.

As the sinking is advanced the sloping of the blood vessels will turn into kinking at the disc margin due to depletion of the underlying axons. Visual fields defects will appear on perimetry. Splinter hemorrhage due to severing of the blood vessels may also begin to appear at the disc margin. Area around the disc margin will appear bald due to severance of smaller vessels, a very valuable sign.

Late to End-stage: In the later stages the more of the disc area appears sunken, pale and excavated. Central vessels begin to shift nasally due to deletion of temporal axons, a very characteristic feature since no other disc disease will do it except in cases of high myopia. Due to extreme thinning or absence of the RNF layer the entire scleral opening becomes visible. Smaller vessels have disappeared after being severed whereas the larger blood vessels are left hanging on the scleral edge/rim. Histology of the end-stage glaucomatous disc reveals an empty crater. There are no axons and no lamina, probably lying at the bottom of the empty crater like a sunken ship. End-stage empty crater is unique feature of glaucoma since the axons are being severed not atrophied unlike other kinds of optic nerve disease such as due to multiple sclerosis in which the axons are being atrophied but not severed.

Kindly visit our website: >www.hasnaineye.com for power point slides of different stages of the glaucomatous discs based on sinking disc.

Just remember, **NO SINKING, NO GLAUCOMA**

(Ophthalmologists will be entering a new world of glaucoma by evaluating the disc based on sinking. Please give it a chance and see the results yourself....Editor)