

Contents

Foreword *vii*

Preface *ix*

CHAPTERS

1. An Approach to Visual Field Interpretation	1
2. An Approach to Optic Nerve Disease	41
3. Unexplained Visual Loss	61
4. An Approach to Disc Edema	85
5. Ocular Motility: Some Basic Concepts	107
6. Neurologic Motility Patterns: An Overall Survey	131
7. Neurological Motility Patterns: A Cranial Nerve Focus	167
8. Performing the Motility Exam	191
9. A Brief Summary: Case Studies in Neuromotility Disorders	215
10. Nystagmus	227
11. Pupil Problems	257

APPENDIXES

A. Optic Nerve Diseases	295
B. Covert Retinal Disease	313
C. Optic Disc Anomalies	317
D. Gaze Paresis Overview	327
E. Saccadic Intrusions and Bobbing	337
F. Horner's Pupil	343
G. Episodic Pupillary Mydriasis	349
H. The Pupil in Coma	353

Bibliography 357

Index 365

CHAPTER 4

An Approach to Disc Edema

KEY CONCEPTS

- In separating true from pseudo disc edema, findings lending strong support for true disc edema are peridisc hemorrhages and exudates and documented increased blurring of the disc borders.
- True disc edema can be assigned to one of three groupings
 - A medical problem
 - Papilledema, (ie, disc edema secondary to increased intracranial pressure)
 - An anterior optic neuropathy
- Disc edema with peripheral hemorrhages defines the medical problem group
- Papilledema can present in three different patterns based on its effect on vision and disc appearance
 - Edema limited to the area around the disc without any associated visual loss
 - Disc edema extending into the macula producing a centrocecal defect

- An edematous disc that is pale (chronic ischemia) producing a peripheral constriction, especially nasally
- If neither peripheral hemorrhages or a pattern consistent with papilledema is found, the patient has an anterior optic neuropathy
- In addition to the three main categories for disc edema listed above, there are three usually less frequent characteristic eye syndromes that can be associated with a disc edema.
 - Low intraocular pressure (hypotony)
 - Inflammation in the posterior part of the eye (posterior uveitis)
 - Vitreous traction syndrome

DEVELOPING AN APPROACH

1. Pseudoedema Versus True Edema



The Pseudoedema Problem (Slide Show 1)

When considering the edematous disc problem, you must be sure that you are dealing with true disc edema and not one of the various simulating disc anomalies. An elevated disc with blurred borders may not be an edematous disc. With a little experience, disc anomalies such as myelinated I nerve fibers, temporal myopic crescents, peripapillary atrophy, and glial membranes should not present any real problem (Glossary Notes 1-5). Buried drusen, however, can present a very significant problem. In addition to the features of disc drusen listed below, a quick trip to the ultrasound B scan looking for highly reflective signals on the disc can be very helpful in supporting a diagnosis. It is important to reemphasize that some very significantly raised disc borders can be normal variations (Figs 4-1 and 4-2).

Optic disc drusen: Ultrasound findings

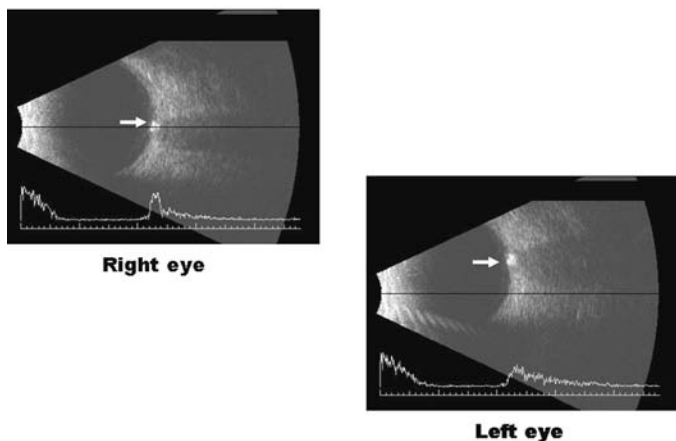


Fig 4–1. Optic disc drusen, ultrasound findings. The bright globular signals in front of the disc are characteristic of disc drusen.

Optic nerve drusen: CT findings

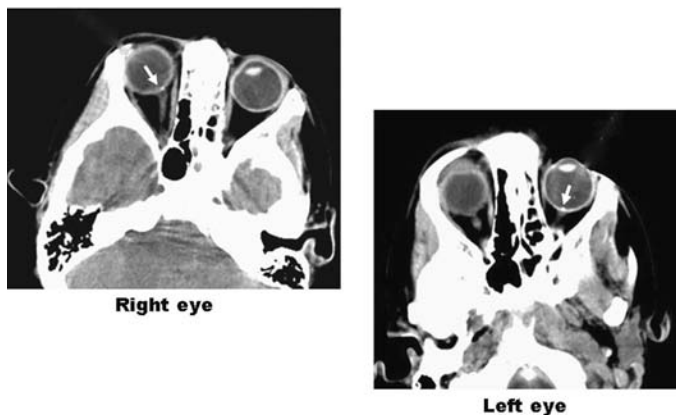


Fig 4–2. Optic disc drusen CT findings. Optic disc drusen appear as bright signals at the level of the sclera (buried drusen) or projecting into the vitreous cavity (exposed drusen) as seen in the left globe.

Features suggesting pseudoedema due to drusen (from disc periphery to its center) include:

- Nerve fiber layer about the disc is clear and sharp
- Lumpy bumpy appearance, especially if refractile bodies are seen (like a sack of marbles or rock candy)
- Vessels ride over top of disc (not buried within it)
- Increased number and branching of vessels on the disc (increased traffic): three or more vessel branching points are seen on the disc.
- Elevated center of disc



True Disc Edema (Slide Show 2)

True disc edema is associated with:

- Edema lines concentric to the temporal disc (Paton's lines)
- Hemorrhages and exudates about the disc
- Nerve fibers about the disc that are not sharp and are more opaque
- An increasing blur at the disc border
- Vessels pass through the substance of the disc rather than on the surface

It is very important to try to get information about any previous exams to document whether the disc appearance is stable or changing. At times it will not be possible to be sure whether a particular patient has true edema. This would dictate either close observation for any disc changes or the institution of a papilledema work up (namely, an MRI and possibly a spinal tap).

The True Disc Edema Differential

When true disc edema is present consider the possibilities that:

- There is a general medical condition effecting the retina and optic nerve

- Papilledema is present (that is, intracranial pressure is elevated)
- Any one of the numerous other causes of an optic neuropathy is present

From a practical point of view, it is helpful to consider the possibilities in that exact order.

1. A Medical Problem (Slide Show 3)



In determining that disc edema is due to a general medical condition, the key findings are hemorrhages and exudates in the retinal periphery. This is in contrast to papilledema and the other optic neuropathies where the hemorrhages and exudates are restricted to the disc and immediate posterior pole area. Therefore, the first job you have when confronted with an edematous disc is to explore the fundus periphery looking for hemorrhages. It is humbling to see how easily these findings can be missed if they are not specifically and actively looked for. If peripheral hemorrhage and exudate are found, you probably are dealing with one of the following:

- Malignant hypertension (bilateral)
- Blood dyscrasias including anemia, dysproteinemia, polycythemia (bilateral)
- Central retinal vein occlusion (unilateral or less frequently bilateral)

Of these conditions, only central retinal vein occlusion would tend to be unilateral. Severe head trauma and ruptured cerebral aneurysms could also produce disc edema associated with peripheral retinal hemorrhages (Terson's syndrome). However, the clinical setting in severe trauma and ruptured aneurysms is so striking that diagnosis is not a problem.

By far, in most cases of malignant hypertension, peripheral hemorrhages and exudates are present. However, there are instances when malignant hypertension presents with fundus

changes that are only about the posterior pole. Thus, even in the absence of peripheral fundus hemorrhages and exudates, in cases of bilateral disc edema, it is important to also consider malignant hypertension and always check blood pressure. This of course would be a rare presentation.

2. Papilledema

The Patterns of Papilledema

If there are no hemorrhages and exudates in the periphery of the fundus and the pathology is limited to the peridisc area, the differential becomes, from a practical point of view, papilledema versus all the other causes of optic neuropathy. Because of the life-threatening and therapeutic implications of a diagnosis of papilledema, it is important that this be the next diagnosis to be ruled in or out. If papilledema is not present, then one of the other optic neuropathies (discussed in Chapter 2) needs to be considered. It is essential to determine whether the case under question fits into any of the three patterns of papilledema:

1. Papilledema without any visual loss
2. Papilledema with central visual loss secondary to disc hemorrhage and or edema extending into the macula
3. Papilledema with peripheral visual loss secondary to chronic disc ischemia.



Papilledema Without Visual Loss (Slide Show 4)

The classic description of papilledema (especially from medical school days) is that of bilateral disc edema with normal acuity, normal fields, and normal pupillary reactions. This setting certainly does occur. However, as is well illustrated by the problems encountered in pseudotumor cerebri, visual loss to the point of blindness, can develop solely due to papilledema. In pseudotumor cerebri, papilledema develops without a well-defined mechanism, while treatment is directed to prevent two

main clinical problems, the threat of visual loss and disabling headaches.

In summary, in cases of papilledema not associated with visual loss:

- Retina: The disc edema does not extend to the macula and the disc remains pink.
- Vision: The acuity and visual field studies are normal.
- Pupils: The pupils will show normal reactivity.

Papilledema with Central Visual Loss: Macula Edema (Slide Show 5)



With papilledema, visual loss is usually due to one or both of two mechanisms: edema of the disc extending into the macular or chronic ischemia of the disc. With edema of the disc extending into the macula, the following picture emerges:

- Retina: The edema and hemorrhage about the disc can be seen to extend into the macula.
- Vision: The acuity will fall and visual field studies will demonstrate a centrocecal defect.
- Pupils: The pupils will show normal reactivity. Even if the process is asymmetric, there will not be an afferent pupillary defect.

Papilledema with Visual Loss: Chronic Disc Ischemia (Slide Show 6)



If, however, the process has gone on to chronic papilledema with ischemia to the disc, examination will show:

- Retina: The disc edema will be less prominent but disc pallor will be seen.
- Vision: There will be constriction of the peripheral field, especially nasally just as in some of the other ischemic optic nerve diseases, glaucoma, and

ischemic optic neuropathy. Very late in the course of the disease, central vision can be snuffed out, while early on the acuity tends to be preserved, just as in glaucoma.

- Pupils: They will be sluggish and dilated and, if the process is somewhat asymmetric, an afferent pupillary defect can be present.

Note that with central visual loss (a drop in visual acuity), the loss occurs early on in the process of macula edema and develops late in the process of ischemia.

If The Patient's Clinical Picture Fits Any One of the Three Patterns of Papilledema

- Disc edema and no visual loss
- Disc edema extending into the macula with acuity loss
- Disc edema with disc pallor and peripheral field contraction (especially nasally)

A diagnosis of presumed papilledema should be made and

- An MRI obtained and if normal
- A spinal tap obtained (to rule out pseudotumor or a meningitic process)

3. The Other Acquired Anterior Optic Neuropathies

If the patient's presentation does not include peripheral hemorrhages and exudates and does not fit any of the three patterns of papilledema, then one of the other anterior optic neuropathies is present. This includes a large list of possible etiologies. You can then "plug in" the optic nerve etiology workup suggested in Chapter 2.

The disc, pupil, and field findings would be those typical for an anterior optic neuropathy:

- Discs: edema on a disc that can be pink or pale
- Pupils: APD or, bilateral dilated and sluggish
- Fields: field defects that do not respect the vertical meridian

Some of the more common optic neuropathies that can easily be confused with papilledema include neuroretinitis and anterior ischemic optic neuropathy. This is especially so when they present bilaterally or in the early stages of unilateral disease when the disc asymmetry is not marked.

Neuroretinitis presents as a disc edema that within days to weeks spreads to the macula. It is primarily due to an infectious process, but the process may also be inflammatory or infiltrative. The marked asymmetry between the involved disc and the usually normal disc of the other eye tends to rule out papilledema (Slide Show 7).

Ischemic anterior optic neuropathy is secondary to an infarct of the optic nerve at the point it reaches the globe. It presents as a disc edema that can be pale or hyperemic, that can involve the entire disc or be sectoral, and that can be associated with spread of edema to the macula. Again, the marked asymmetry between the involved disc and the usually normal disc of the other eye tends to rule out papilledema (Slide Show 8).

Demyelinating optic neuropathies usually are unilateral. However, they do at times present bilaterally and when associated with disc edema, can also be confused with papilledema. In these cases, there is the presence of visual loss. However, there is no evidence of the usual reasons for visual loss in cases of papilledema, macula edema and or disc ischemia (Slide Show 9).

POINTERS AND PITFALLS

1. When It Is Not Papilledema

There are at least three clinical situations in which you can with reasonable assuredness say that a particular case of disc

edema is not papilledema. It's very helpful to look for the following patterns

- *When there is marked asymmetry between the discs.* A mild asymmetry is certainly compatible with papilledema. However, when the disc process is very advanced on one side (edema extending to the macula or chronic ischemia), and relatively normal on the other side, the chances that this is papilledema are significantly decreased.

A rare exception to this concept, that in papilledema there is generally not a marked asymmetry between the discs, is seen in the true Foster Kennedy syndrome. In this situation, a subfrontal mass has caused a compressive optic atrophy in one eye (and so disc edema would not be possible) and increased intracranial pressure with disc edema in the other (Slide Show 13; see Pointers and Pitfalls 10).

- *When there is visual loss regarding acuity and field,* yet there is no disc pallor and no edema or hemorrhage extending into the macula. In such a case, the mechanisms for visual failure in papilledema are not operative and the cause should be sought in one of the other optic neuropathies.

2. Bilateral Anterior Ischemic Optic Neuropathy Versus Chronic Papilledema (Slide Show 10)

When acute anterior ischemic optic neuropathy is bilateral, differentiating it from chronic papilledema can be very difficult. Most likely you will want to get an MRI and possibly a spinal tap to rule out papilledema. However, you may be able to clinically rule out papilledema if (as indicated in Pointers and Pitfalls above) vision is lost but the two common mechanisms for visual loss due to papilledema are not present. This means disc edema extending into the macula or disc pallor.

In addition if the discs are pale and normal discs were noted recently, then it is not likely that chronic papilledema is operative. It is much more likely that an acute process such as bilateral anterior ischemic optic neuropathy has taken place.

3. Rarer Causes of Visual Loss in Papilledema

The more unusual causes include a concomitant central retinal artery or vein occlusion, bleeding from peripapillary nets, and vitreous hemorrhage (see Glossary Notes 6 and 7).

4. An Optic Neuropathy and No Visual Loss

The usual definition of an optic neuropathy would call for some form of visual loss. Disc edema in the absence of visual loss brings to mind the first pattern of papilledema presentation. However, optic neuropathy can present in this fashion as well. In such cases, the failure to find evidence of vision loss probably reflects the crude nature of our usual methods for detecting visual dysfunction. It is likely that if more sensitive tests such as visual evoked potentials, contrast sensitivity, and color perimetry were performed, evidence of visual function impairment would be detected. Some of the optic neuropathies known to cause disc edema and yet show no grossly detectable visual functional changes on the standard battery of tests include:

- Ischemic optic neuropathy
- Diabetic papillopathy (probably a form of the above)
- Drug toxicity
- Syphilis
- Orbital masses
- The idiopathic big blind spot syndrome (technically not truly an optic neuropathy, but rather a disorder of the inner retinal layers as demonstrated by multifocal ERG)

5. Chronic Disc Edema

Usually disc edema clears in 4 to 8 weeks. More persistent edema has been associated with

- Papilledema
- Anterior ischemic optic neuropathy
- Disc infiltration from tumor, infection, and inflammation (eg, sarcoid)

As previously noted, this is the same differential as for pallid disc swelling and disc swelling associated with a macular star.



6. Disc Drusen (Slide Show 11)

When examining a disc with a lumpy appearance and trying to confirm a refractile drusen, shine the ophthalmoscopic light off to the side of the area in question. Drusen will often reveal their refractile nature best when viewed by indirect illumination.

As an additional aid to its diagnosis, a look at other family members can be helpful as it is inherited in a dominant fashion.

7. Unilateral Papilledema

Although the disc edema in papilledema is almost exclusively bilateral, at times the disc edema will be mildly asymmetric. Definite, but generally early, disc edema can be present on one side while the other may be considered normal or questionable. Thus, it is possible to have papilledema and yet only one obviously abnormal disc. This is not common, but it is important to realize that it does occur. When only one disc is mildly edematous, yet the pupils are normal and the fields and acuity are normal, you have to consider papilledema as a possibility.

It is possible to see more disc asymmetry in cases of true papilledema when the nonedematous disc is atrophic (it cannot swell) or there is a presumed anomaly in the optic nerve sheath that does not allow the increased intracranial fluid pressure to be transmitted to the optic nerve head area.

8. Bilateral Versus Unilateral Disc Edema

An optic neuropathy is usually assumed when unilateral edema is present and papilledema is assumed when bilateral edema is present. However, a bilateral acute optic neuropathy associated with disc edema (an anterior optic neuropathy) occurs with enough frequency, that you cannot rely on the unilateral or bilateral nature of the disc edema to separate papilledema from the other optic neuropathies. Thus, bilaterality does not ensure a diagnosis of papilledema.

A unilateral disc edema is usually assumed to be an anterior optic neuropathy. A unilateral disc edema that is marked would rarely be due to papilledema. However, as discussed above in item 7, it is important to consider asymmetric papilledema when a unilateral disc edema is mild.

9. Disc Edema in Three Characteristic Ocular Syndromes (Slide Show 12)

In cases of posterior uveitis (see Glossary Note 8), in addition to lesions of the retina and choroid, there may be an extension of the inflammatory process onto the adjacent optic nerves. An anterior optic neuropathy with its disc edema, typical pupillary changes and visual field defects of optic nerve disease, are possible. Besides pain, ocular injection, and retinochoroidal lesions, it may also be possible to see inflammatory cells in the vitreous and posterior chambers.

A marked decrease in intraocular pressure (hypotony) can be associated with disc and macula edema. Such a hypotony



can be seen after glaucoma filtering procedures, long standing retinal detachments and marked inflammatory disease.

Vitreous traction on the optic disc is yet another ocular cause of disc edema. The vitreous gel is known to have strong attachments along the peripheral retina, the macula, and optic disc. Vitreous detachment and shrinkage is a common event accelerated by increasing age, inflammation, trauma, and ocular surgery. Portions of the detached vitreous may retain their attachment to the optic disc, a setting in which traction on the disc may produce a chronic disc edema. Ocular coherence tomography is a very effective imaging technique for visualizing this vitreous traction syndrome.

10. True and Pseudo Foster Kennedy Syndromes (Slide Show 13)



The true Foster Kennedy syndrome is due to a subfrontal lobe mass that causes compression of one optic nerve with a subsequent loss of vision and the development of optic atrophy. As the tumor grows, it causes a second problem, increased intracranial pressure and the development of papilledema. However, the optic disc of the eye that had suffered compression and usually is atrophic can no longer swell and so remains unchanged as a pale disc with sharp margins. The other disc develops the pink swelling of acute and subacute papilledema. A summary of the findings would be as follows:

The history in a case of true Foster Kennedy syndrome would reveal

- Progressive loss of vision in one eye
- Symptoms of increased intracranial pressure such as headache, obtundation, and malaise

The disc findings are:

- A sharp pale disc in the eye that had progressive visual loss

- A swollen pink disc in the other eye (rarely it could also be pale)

In the case of the pseudo Foster Kennedy syndrome, the underlying mechanism is bilateral episodes of anterior ischemic optic neuropathy separated by at least several months. The patients report a history of having had an episode of acute loss of vision in one eye, several months to years ago. They now present with an acute loss of vision in the other eye. On examination, they will have a sharp pale disc in the eye that had the first bout of anterior ischemic optic neuropathy. In the eye with the new onset ischemic optic neuropathy, the swollen disc will be either pale or pink. A summary of the findings would be as follows.

The history in a case of pseudo Foster Kennedy syndrome would reveal:

- An episode of acute visual loss in the past
- The patient presents with a new onset of acute visual loss

The disc findings are:

- A sharp pale disc in the eye with the past visual loss
- A swollen pale or pink disc in the eye with the current acute visual loss

Note that the swollen disc in the case of the pseudo Foster Kennedy syndrome can be either pink or pale, whereas in the case of the true Foster Kennedy syndrome, the swollen disc is usually pink. However, if the papilledema in the case of true Foster Kennedy syndrome is allowed to persist, the edematous disc can become pale. Because the symptoms of increased intracranial pressure usually bring the patient to medical attention, this situation is not generally seen.

In summary both syndromes present with one swollen disc and another that is sharp and pale. If the swollen disc is pink, the fundus picture is similar in both the true and pseudo

Foster Kennedy syndrome. A swollen pale disc would more likely indicate a pseudo Foster Kennedy syndrome.

The usual visual loss history will reliably separate the two. Two separate acute attacks of sudden visual loss is the hallmark of the pseudo Foster Kennedy syndrome. A progressive visual loss in one eye means a true Foster Kennedy syndrome. It should be noted that the pseudo Foster Kennedy syndrome is many times more frequent than the true one.

GLOSSARY: TERMS AND TOPICS

1. Disc Drusen

Disc drusen are calcified nodules within the substance of the optic nerve head and are detected by the changes they induce in the disc tissue in front of it. With time, they may assume a more exposed position and can be detected by seeing them directly. They can cause progressive nerve fiber bundle defects (nasal steps, arcuate defects, and altitudinal defects). Central acuity, however, remains intact unless there are local hemorrhagic complications, which is a rare event.

2. Myelinated Nerve Fibers

Myelination of the optic nerve normally stops at the lamina cribrosa. However, on occasion, it will extend forward onto the retina in the area surrounding the disc. It produces patches of a silken, somewhat striated, white appearance that is bounded by a feathered edge.

3. Temporal Myopic Crescents

The myopic eye is a larger eye. In cases of high myopia, the retinal pigment epithelium and choroid may not extend to the disc margin, especially along its temporal border. This pro-

duces a crescent shaped zone of white exposed sclera, the myopic conus.

4. Peripapillary Atrophy

Benign aging changes can occur about the border of the optic disc that may be mistakenly interpreted as disc edema. The disc is surrounded by areas wherein the pigment layers may be absent and the bare white sclera and the choroidal vessels show through. In addition, there are areas where the retinal pigment is increased and jet black patches are seen.

5. Glial Membranes

Glial membranes are fibrous membranes located on the optic disc surface. They are remnants of a fetal vasculature that have not completely resorbed. It is a benign condition without any functional effects.

6. Peripapillary Nets

In response to various stimuli, a network of fine blood vessels from the choroid may proliferate in the space between the choroid and the overlying retina. This can occur about the disc border. These vascular nets can bleed and produce a significant visual loss. They are generally located in the macula or about the disc.

The rare presence of these vascular nets about the disc in some cases of papilledema and drusen of the disc is at times the cause of the rare instances when central vision is lost due to bleeding into the retina and or vitreous cavity.

7. Vitreous Hemorrhage

The vitreous cavity is the space between the retina and the back surface of the lens. Although normally filled with a clear

vitreous, it may become filled with blood as a result of a number of varied pathological processes. These would include, among others, diabetes, trauma, infection, and inflammation.

The presence of this blood can very readily be detected by examining the quality of the red reflex gotten from the direct ophthalmoscope. Stand back about an arm's length from the patient, direct the light from the direct ophthalmoscope through the pupil, and dial in approximately 5 to 10+ diopters (the green numbered lenses). The appearance of the blood would be signaled by a degradation of the red reflex from a slight haze to a completely black reflex, depending on the density of the blood.

8. Posterior and Anterior Uveitis

Uveal tissue is highly vascular, and as such is particularly vulnerable to immune mediated (ie, inflammatory) conditions. Inflammation of uveal tissue is referred to generically as uveitis. Uveal tissue is present in both the anterior segment of the eye (the iris) and posterior segment (the choroid). Uveitis can manifest as anterior-segment disease (eg, iritis) or posterior-segment disease (eg, choroiditis). Inflammation of both anterior and posterior segments simultaneously is called a panuveitis. Although not technically uveal tissue, inflammation of the vitreous (vitreitis) and retina (retinitis) are considered uveitides as well.

Patients with anterior segment uveitis usually complain of pain and photophobia. Slit-lamp examination reveals the presence of inflammatory cells and proteins circulating within the anterior chamber (the space between the posterior corneal surface and the anterior iris and lens). Patients with posterior segment uveitis complain of decreased vision and floaters. A posterior segment examination usually reveals clouding of the vitreous, as well as yellow-white inflammatory patches within the retina and/or choroid. Treatment of uveitis usually entails a combination of local and systemic anti-inflammatory maneuvers.

SUMMARY: BASIC TAKE-HOME MESSAGES

The Disc Appearance

Features Suggesting Pseudoedema Due to Drusen (from disc periphery to its center)

- Nerve fiber layer about the disc is clear and sharp
- Lumpy bumpy appearance, especially if refractile bodies are seen (like a sack of marbles or rock candy)
- Vessels ride over top of disc (not buried within it)
- Increased number and branching of vessels on the disc (increased traffic)—three or more vessel branching points are seen on the disc
- Elevated center of disc

Features Suggesting True Edema (from disc periphery to its center)

- Edema lines are seen concentric to the temporal disc (Paton's lines)
- Hemorrhages and exudates about disc
- The nerve fibers about the disc are not sharp and are more opaque
- An increasing blur at the disc border
- The vessels pass through the substance of the disc rather than on the surface

Diagnostic Overview of Disc Edema

When True Disc Edema Is Present Consider the Possibilities that

- There is a general medical condition affecting the retina and optic nerve (peripheral hemorrhages and or exudates are seen)

- Papilledema is present (the disc, fields, and pupil findings fits any of the three settings compatible with papilledema)
- An anterior optic neuropathy is present (the other two possibilities have been eliminated)

The Three Tests Needed to Separate the Three Possibilities

- Pupil exam
- Fundus exam
- Visual field exam and visual acuity

Diagnosing the Three Major Possibilities

1. Medical Problem

- Peripheral hemorrhages and possibly exudates are seen, consider:
 - Malignant hypertension
 - Blood dyscrasias
 - Central retinal vein occlusion (only one expected to be unilateral)

2. Papilledema

- Without visual loss
 - discs: edema without pallor or edema going to macula
 - pupils: normal
 - fields: normal
- Visual loss secondary to macular edema (visual acuity is down)
 - discs: edema going to macula
 - pupils: normal
 - fields: centrocecal defects with decreased acuity
- Visual loss secondary to chronic ischemia
 - discs: edema and pallor

- pupils: APD or bilateral, dilated, and sluggish
- fields: peripheral constriction especially nasally

3. An Optic Neuropathy

- By eliminating medical causes and papilledema
- They will show the characteristic pupil, disc, and field changes of an anterior optic neuropathy
 - discs: edema on a disc that can be pink or pale
 - pupils: APD or bilateral, dilated, and sluggish
 - fields: field defects that do not respect the vertical meridian

Miscellaneous

Three Characteristic Ocular Syndromes That Can Be Associated with a Disc Edema

- Low intraocular pressure (hypotony)
- Inflammation in the posterior part of the eye (posterior uveitis)
- Vitreous traction syndrome

When Disc Edema Is Chronic, Extends into the Macula, or Is Pale, Consider

- Papilledema
- Anterior ischemic optic neuropathy
- Disc infiltration from tumor, infection and inflammation (eg, sarcoid)

True Versus Pseudo Foster Kennedy Syndrome

- In true Foster Kennedy syndrome there is:
 - A history of progressive visual loss in one eye
 - One pale sharp disc, the other swollen and pink (rarely could be pale)

- In pseudo Foster Kennedy syndrome there is:
 - A history of acute visual loss in one eye in the past, and a current acute visual loss in the fellow eye
 - One pale sharp disc, the other swollen and pale or pink