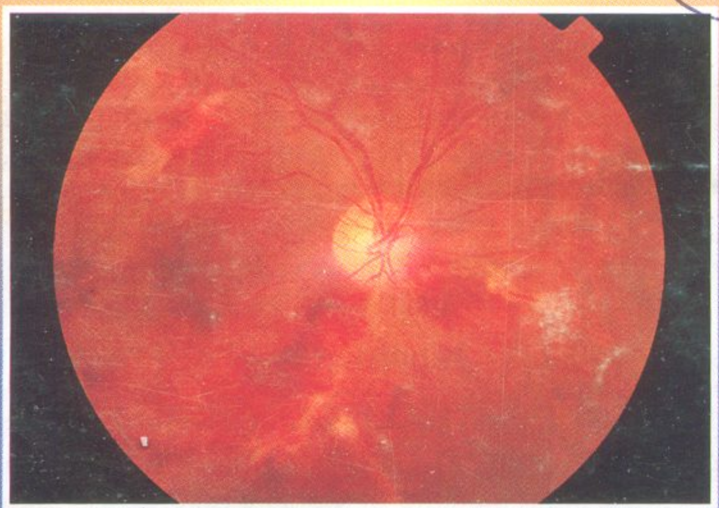
CME SERIES (No. 2)

EALES' DISEASE
(PHLEBITIS RETINAE)

1998



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By
Dr. Bijayananda Patnaik,
MD.,MS.
Dr. Rajinder Kalsi Patnaik
MS.

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Dr. Rajendra Prasad Centre for Ophthalmic Sciences,
All India Institute of Medical Sciences,
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For any suggestions, please write to :

Dr. H.K. Tewari
Hony. General Secretary

1998

Eales' Disease

(Phlebitis Retinae)

Dr. Bijayananda Patnaik MD, MS, Dr. Rajinder Kalsi Patnaik, MS

Definition

Eales' disease is a clinical entity, classically presenting with repeated vitreous haemorrhage (RVH) in young adult males. Underlyging pathology is retinal phlebitis, predominantly in the peripheral fundus. Phlebitis may or may not be associated with uveitis, arteritis or papillitis. There seems to be multiple etiologies and etiopathological processes involved.

Pathophysiology

Although exact etiology eludes us, the pathomechanism is well understood. The pathophysiology is essentially that of inflammatory branch retinal vein occlusion (Predominently Peripheral Involvement) (BRVO) or central retinal vein occlusion (CRVO). The special features of inflammatory branch retinal vein occlusion of Eales disease in contrast to sclerotic BRVO are :

1. There could be single or multiple branches involvement in any part of the retina including central retinal vein;
2. Often bilateral (about 80-90%).
3. Wide variation in acuteness and completeness of venous occlusion.
4. Younger age group, predominantly males.

Clinical Course

The clinical course is variable (see chart). It may be so mild that signs of venous insufficiency (retinal haemorrhages, odema) are hardly manifested. On the other extreme, it may be extremely acute and complete causing spontaneous, often massive vitreous haemorrhage. The inflammation may completely and permanently destroy a segment of the retinal vein. Clinically, it seems Eales' disease goes through three stages :

1. Stage of inflammation
2. Stage of Ischemia

3. Stage of Neovascularisation with/without sequalae (Vitreous Haemorrhage/TRD etc.)

Acute Course

Acute inflammation of a vein results in its abrupt closure. This results in rapid increase in capillary pressure leading to significant retinal haemorrhages which often breaks into vitreous cavity causing subhyaloid or vitreous haemorrhage. If the vein involved is of a larger caliber, the vitreous haemorrhage can be massive and may take variable time for clearance. On the other hand, when a smaller venule at the periphery is so involved, the quantum of haemorrhage could be small and clears with time. Sequential involvement of a series of peripheral venules with acute inflammation can lead to repeated vitreous haemorrhage (RVH).

Sub Acute Course

With time or with anti-inflammatory treatment, a case started with acute features may run a subacute course. There would be other cases who would run a subacute course from the inception. There would be evidence of significant venous insufficiency which include extensive retinal haemorrhages in the territory of the branch vein involved, with retinal edema. If the venous obstruction is accelerated there may be cotton wool patches, dark blot haemorrhages, indicating infarctions and retinal ischaemia.

On fluorescein angiography the capillaries as well as venules would be seen engorged and tortuous. Sometimes there could be repeated bleeding into the vitreous from this engorged capillary bed. This is the second mechanism of RVH.

The ischaemic retina, when the state of decompensation persists, would lead to neovascular growth originating just proximal to the point of obstruction. When there are multiple branch vein obstructions, in addition to peripheral neovascularisation one could expect disc neovascularisation. The new vessels would then be the source of repeated vitreous haemorrhages (RVH). The vitreous haemorrhage has a tendency to get absorbed. However haemorrhages occuring repeatedly, a second bleed occuring before the first has cleared, would lead to persistent loss of vision.

Not all cases run this course. With time or with proper treatment, a process of circulatory compensation does take place. Three processes can be identified. There is usually a tendency for opening up of the venous obstruction (Recanalisation) which is rarely complete. There are veno-venous capillary shunts. Only occasionally one records larger degeneration or atrophy. When enough of hypoxic retina atrophies, the vasoproliferative stimulus disappears. The new vessels regress with growth of glial tissue. The glial proliferation could affect vision in several ways :

1. The contracting glial tissue around the posterior pole could detach the macula with resultant gross deterioration of vision.
2. The stress folds from the glial contraction may distort the macula, reducing the visual acuity.
3. Occassionally, the glial tissue may just cover the macula obstructing vision.
4. The contracting glial tissue may produce retinal break leading to rhegmatogenous retinal detachment.

A patches of choroiditis at the site of venous inflammation is a common finding. In most cases the choroidal inflammation is secondary to the phlebitis. Occassionally the reverse may be the case.

Non Acute Course

When the inflammatory process is mild and slow in developing, one finds few signs of circulatory embarrassment. There is some engorgement of the venules distal to segments of venous inflammation. There may be few scattered retinal haemorrhages; ocasionally even these are not seen. Fluorescein angiography shows staining and narrowing of the venous segment inflamed. With time or treatment the inflamed vein may reopen completely with little evidence of old inflammation. However, often peripheral veno-venous (tortuous) capillary shunts would remain as the sole evidence of past events.

Differential Diagnosis

Vitreous haemorrhage in a young adult male can also be seen in 1. Juveniile proliferative diabetic retinopathy, 2. Sickle Cell disease 3. Traction retinal tears. A post prandial blood sugar test would exclude diabetes. Geographical distribution, absence of any evidence of present or past phlebitis in the fellow eye and hematological tests would diagnose Sickle cell retinopathy. The absence of myopia in the patient and family would tend to exclude vitreous haemorrhage due to retinal tears.

Management Strategy

Drug Therapy

Majority of cases of Eales' Disease who would need help, present themselves with symptoms related to vitreous haemorrhage. The haemorrhage occurs in three ways ;

1. Rapid occlusion of the inflamed vein during active inflammatory phase of an acute disease
2. From new vessels of proliferative retinopathy of Sub-Acute Disease.
3. From engorged capillary bed affected by the inflammatory venous obstruction, again in Sub-Acute Disease.

It is important to recognise that the initial pathology is one of phlebitis. This leads to proliferative retinopathy in some cases. By that time usually the phlebitis has subsided. The proliferative retinopathy of Eales' disease leads to gross loss of vision by way of non-resolving vitreous haemorrhage or complications related to gliosis. Appropriate steps at appropriate stages gives excellent results. Oral steroids with or without drugs for tuberculosis at the stage of acute phlebitis, selective retinal ablation by Scatter photocoagulation over the involved sector and some time supplemented by cryocoagulation for proliferative retinopathy and Vitreous surgery in cases of non-resolving vitreous haemorrhage or traction related retinal complication gives excellent results.

Acute Venous Inflammation

Calls for adequate oral corticosteroids for extended periods[1]. In case, one can visualise the inflammed veins and they show massive infiltration or nodular formations or complete destruction of venous segments, in India, it is adviseable to consider using suitable drugs for tuberculosis[2] in addition to oral steroid therapy. Although empirical, this therapy does yield results in these selected cases.

However it is not often that one can study the inflamed veins in the presence of vitreous haemorrhage. The following clinical features would help in suspecting the presence of active phlebitis.

1. When the haemorrhage is the first such event and of recent origin.
2. When the fellow eye shows active phlebitis.
3. On putting the patient on bedrest if one detects inflamed venules in the upper periphery.
4. When fundus is not visible, yet one finds such signs of anterior uveitis as fresh Keratic precipitates (KPs.) and/or aqueous flare.

Sometimes it may be advisable to put the patient with a first time vitreous haemorrhage on oral steroids for 3-4 weeks even though none of the above clinical features of inflammation are detecteble because of poor visibility.

Situation becomes complicated when new vessels develop in an eye with plenty of active phlebitis. No treatment for proliferative retinopathy (Photocoagulation, Cryopexy or Vitrectomy) is safe in the presence of active uncontrolled phlebitis.

Proliferative Retinopathy

The treatment for proliferative retinopathy in Eales' Disease is essentially similar to that in other conditions-such as Diabetic Retinopathy. The new vessels are made to regress by selective retinal ablation of the affected ischaemic retina. The method of choice is scatter photocoagulation. However peripheral retinal cryopexy can be used as a supplement to photocoagulation and under certain circumstances as a partial alternative to vitreous surgery (to be described).

In the presence of significant phlebitis with proliferative retinopathy, the inflammation is brought under control with oral steroids before commencing retinal ablation. This strategy minimises

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1. In a typical case we use oral Prednisolone, 20mg TDS for 3-4 weeks. Once signs of phlebitis is seen to be subsiding, the drug is tapered off. High body weight or very severe inflammation calls for higher dosage.
2 We use 2 of the following 3 drugs : Rifampicin, Isoniazide, Pyrazinamide. Sometimes all three are used for at least 6 months.

pre-retinal gliosis associated with laser photocoagulation in the presence of active phlebitis. The cases of non-absorbing vitreous haemorrhage would call for vitreous surgery.

Photocoagulation in Eales' Disease
(The Principle of Anchoring Photocoagulation)

Once the venous inflammation subsides or is brought under control by oral steroids, the proliferative retinopathy can be managed very satisfactorily by photocoagulation. The principle is very similar to the mangement of Branch Retinal Vein Obstruction (BRVO). The special situations in Eales Disease are :

1. Usually one finds multiple BRVOs.
2. The disc neovascularisation (NVD) as a consequence is more common.
3. The development of new vessels is often accelerated, calling for prompt and intensive treatment at an early stage.

As a rule, it is better to prevent a significant neovascular growth, than to regress it. Fluorescein angiography is invaluable in early detection and even anticipating neovascular growth.

Eales' Disease is often associated with massive neovascular proliferation around the posterior pole which includes disc neovascularisation. A peripheral scatter photocoagulation can produce a regression of these new vessels. However, unless one follows certain principles of (what we call) Anchoring Photocoagulation, the massive gliosis which replaces the regressing new vessels, on contraction can cause several unfortunate complications : 1. The macula may get detached or distorted 2. There could be retinal breaks near the feet of the neovascular mass, usually the draining venules. These breaks can then lead to rhegmatogenous retinal detachment, which are difficult to manage because of their posterior situation 3. Contracting glial tissue around the posterior pole may crumple the retina sending retinal folds or stress lines across the macula causing distorted vision. The process may lead to cystoid macular degeneration also. All these can be minimised or eliminated if the technique of anchoring photocoagulation is used.

The Technique :

New Vessels Around Posterior Pole

First moderate to strong photocoagulation burns of 200-300 microns are placed around the neovascular tissue facing the macula. All extensions are similarly surrounded. Some scatter photocoagulation may also be done if vitreous haemorrhage is anticipated. After about three weeks when the photocoagulation scars are well formed, (thereby anchoring the retina to the underlying choroid), peripheral retinal ablation is carried out by scatter photocoagulation with burns of mild to moderate intensity, in more than one sitting, till new vessels regress. Some times, in cases with florid new vessels or when vitreous haemorrhage does not permit adequate photocoagulation, peripheral cryo could help in regressing the process. Once the retina around the neovascular lesions is properly 'anchored' regression by peripheral retinal ablation with photocoagulation or cryo or both is safe.

Peripheral New Vessels

The first step is again surrounding the neovascular lesion with moderate to strong photocoagulation spots of 200-300 microns. Besides anchoring photocoagulation is also carried out along the draining venules. This step prevents retinal breaks around the point where the draining veins are pulled up when the shrinking vascular mass is pulled up into the vitreous. If the new vessels are found to be bleeding or are suspected to be on the verge of bleeding (too vascular) the crimping of the feeding arterioles is also carried out to reduce the chances of bleeding during the process of laser treatment. Some peripheral photocoagulation can be done at this stage. But, only after the anchoring scars are firm that peripheral retinal ablation by scatter photocoagulation or cryo is completed.

Retinal Cryopexy in the Management of Eales' Proliferative Retinopathy

Peripheral Cryopexy is a potent alternative to Laser photocoagulation as a method of ablation of ischaemic retina in the mangement of proliferative retinopathy. However, it cannot supplant photocoagulation, but can only supplement.

State of Ocular Media

In a case with clear media, cryo is usually superfluous and best avoided even as a supplementary procedure to laser.

However, in the presence of cataract or capsular thickening in ECCE, corneal opacity or partial vitreous haemorrhage, cryo is a very useful supplimentary procedure. Small pupil presents a similar situation. In these cases it may not be possible to carry out enough retinal ablation by laser to regress the new vessels. Supplementing with peripheral cryo often achieves the end point and conclude the treatment. Very often, because of vitreous haemorrhage settling in the inferior vitreous the inferior peripheral retina remains inadequately treated by laser. New vessels over inferior quadrants continue to perfuse and bleed. In such cases, the only alternative to vitreous surgery is peripheral cryo.

Limitation : However, using exclusively extensive cryopexy can be disastrous. It is possible to regress any neovascular lesion by cryo alone. But in the absence of adequate anchoring photocoagulation, this would lead to contraction of glial tissue which replaces the regressing new vessels and produce traction related retinal complications. Therefore, cryo should never be used alone. The ideal strategy would be to put in place as much of photocoagulation as possible around the posterior pole, before considering cryo.

Special Role in repeated vitreous haemorrhage

Small vitreous haemorrhages almost always clear off with time. However, when some one has repeated vitreous haemorrhage, where a second haemorrhage comes in before the first has cleared and so on, the media becomes progressively opaque. The patient remains blind. This is a classical situation where one would opt for vitrectomy and endolaser. However, in many such cases an interesting alternative method could be used. If one can guess the quadrant or quadrants involved in neovascularisation, peripheral cryo can be used to discourage bleeding for several months. In the interregnum, often the vitreous clears enough to permit photocoagulation to complete the treatment. Several strategem could be used to identify the quadrant involved. If extreme retinal upper periphery can be visualised with indirect ophthalmoscope with or without scleral depression,one may have a glimpse of a sclerosed veins, or blotches of retinal haemorrhages or even neovascular lesions. It is surprising how much more information one can get on scleral depression with Indirect Ophthalmoscopy. Absence of such findings in upper quadrants may indicate involvement of lower quadrant. In cases with dispersed but not so dense vitreous haemorrhage one could be lucky to visualise dye leakage on fluorescein angioscopy. Sometimes when no clues are available a mild to moderate peripheral cryo all round can be helpful to discourage haemorrhage from suspected disc new vessels, long enough to let the vitreous clear.Thus peripheral cryo can be considered a viable alternative to vitreous surgery in some cases, specially when vitreous surgery services are not available or are unaffordable.

Vitreous Surgery

Vitreous surgery is highly rewarding in cases of Eales' disease with non resolving vitreous haemorrhage and the traction related complications specially macular and retinal detachment. Usually the macular circulation remains unaffected in Eales' Disease. Therefore the recovery of visual acuity is generally good. However, long-standing macular detachment or distortion, often leads to macular degeneration of varying degree, adversely affecting the visual outcome.

The neovascular lesions around the retinal periphery with intimate involvement of the base of vitreous, creates considerable technical problems in a phakic eye. Often it is advisable to settle on incomplete vitrectomy and avoid injury to the lens. An encircling band could be used to support the vitreous base. Cryo should be preferred to laser in treating the extreme periphery.

Conclusion

The understanding of the pathophysiology of Eales' Disease and availability of state-of-art technology, such as fluorescein angiography, lasers and vitreous surgery, has led to highly satisfactory management of this condition.

(Adopted from various publications and presentatins by th authors including the presentation at the Symposium on Vasculitis in the Annual meeting of the American Academy of Ophthalmology, October 1997)

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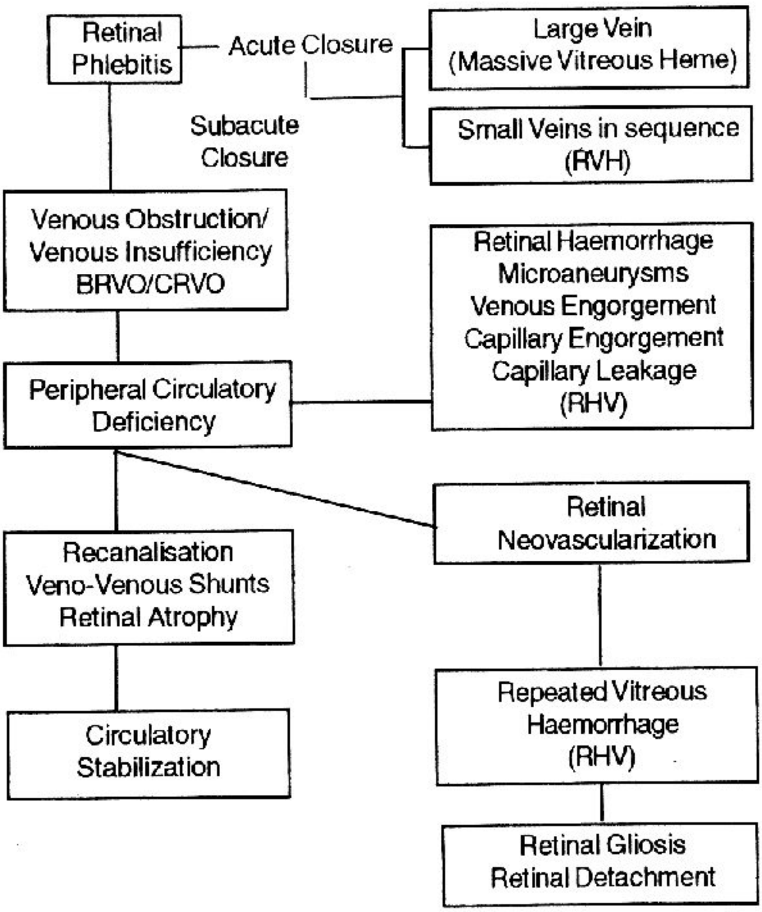

Natural course of Eales' disease (Kalsi and Patnaik) 1979

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