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VITRECTOMY FOR RETINOPATHY

EXPANDING DISEASE SPECTRUM



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SHRINKING GLOBE, EXPANDING VITREORETINA DISEASE SPECTRUM

It's a geographical coincidence that India and the United States of America occupy virtually opposite sides of the globe. So while the world's most populous democracy prepares for bed, another day breaks over the American continent. The era of globalization does not merely mean the presence of McDonalds and IBM in India, and Indian software companies and professionals in the U.S. It means a flow of population empowered by air travel across time zones. I may be required to diagnose a case of retinal histoplasmosis, in a patient from the Midwest, who represents his tractor company in India; while a young Indian software engineer may walk into a retina practice in Los Angeles with Eales' disease. The international character of the ASRS underlines the need for scientific intercourse amongst VR specialists, in these changing times.

In India, posterior segment disease accounts for about 11% of the blind population (APEDS-Andhra Pradesh eye disease study, 1996-2000). India was one of the first in the developing world to recognize the need to have a national program for the control of blindness. Significant and noteworthy work is done in the area of cataract blindness, with a creditable outreach of NGOs (non-government organizations) and government agencies. This helps the poorest sections of society. However, retinal conditions are

facing an epidemic of type 2 diabetes. This is probably fuelled by lifestyle changes, especially in the urban centers. At present, India has the largest diabetic population, it is believed it will increase to 221 million by 2010. The National Urban Survey of Diabetes was an eye opener about the magnitude of the problem. This population-based study conducted in 2001 across 6 urban centers in India, with a sample size of 12,500, found the prevalence to be 16%. Multiple studies show that the presence of diabetic retinopathy is approximately 49% amongst diabetics. Needless to emphasize, we are seeing a large number of patients with diabetic retinopathy. We expect an explosive growth in numbers with every passing year. The major challenge will be to reach a large population spread over a subcontinent: first for diagnosis and then for treatment.

Telemedicine could provide an answer to this problem. Digital (preferably non-mydratics) fundus cameras mounted on a mobile platform like a bus can be used to reach the periphery. The bus, apart from providing mobility, provides an independent power source, where electricity is a problem. The image acquisition can be performed by a technician. At the end of the day these could be transferred by wireless technology to a master control facility for reporting. Treatment could be provided by a monthly visit of

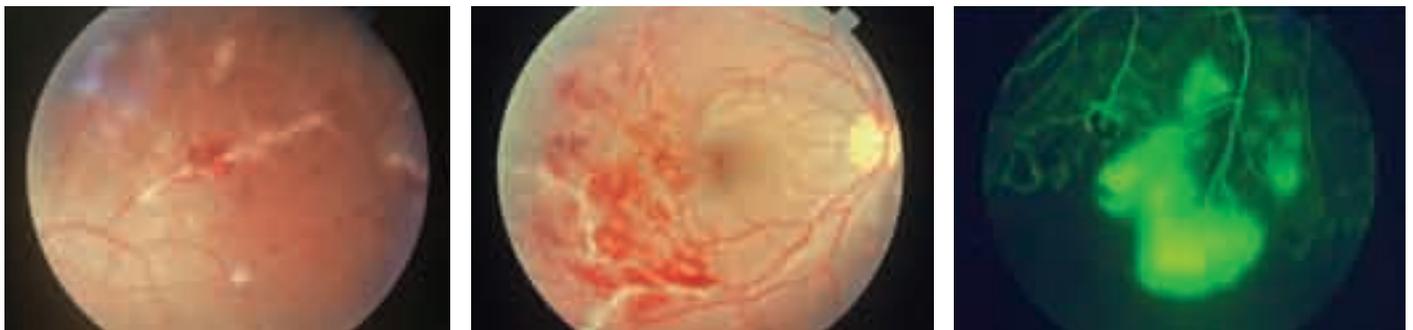


Figure 1. Peripheral retinal vasculitis manifesting as sheathing. Figure 2. Branch retinal vein occlusion secondary to Eales' disease. Note the sheathing of the involved branch and that the hemorrhages cross the horizontal midline raphe. Figure 3. Typical peripheral sea fan neovascularization at the boundary of non-ischemic and ischemic retina.

more difficult to treat, especially in rural areas, for a variety of reasons. The complex disease pathology, requirement of high tech instruments, and the frequent follow up, create a special challenge. The management of the medical conditions also has a bearing on the long-term prognosis of some of these conditions—like diabetic retinopathy.

As expected, we see a majority of the same conditions seen by any of our colleagues elsewhere. Retinal detachment and branch retinal vein occlusion, posterior segment trauma and ARMD, macular holes and vitreous hemorrhage: it is the same story. An aging population, better survival of premature babies, longer life span of diabetics, and industrialization: the same dynamics that script the vitreoretina saga across the globe are operative here as well.

Diabetic retinopathy is one of the most common problems faced. It would not be out of place to mention that we are presently

an ophthalmologist with a portable solid-state retinal laser, in a regional center. The challenge for such a project would be mainly financial; the technological platforms for image acquisition and transfer already exist.

There are three conditions on which I would like to shed some light. The first two are not common, however are encountered time and again in India. The third is seen everywhere but its microbiological spectrum is different.

Eales' disease is an idiopathic peripheral vasculitis affecting the peripheral retina (figure 1). The diagnosis is essentially clinical. It is usually bilateral, with a marked male preponderance. It affects young, otherwise healthy individuals, often from the poorer socioeconomic strata. Approximately one in 250 patients in a general ophthalmic OPD is likely to be affected. This figure is ten times more common than in Europe or North America. The etiology of the condition is not exactly known. However a needle

of suspicion points towards Mycobacterium Tuberculosis. Two sets of theories exist. One set points to immunological mediated damage and the second set implies the actual presence of the bacilli in the vitreous/ERM, as suggested by polymerase chain reaction studies. The presentation is usually in the form of repeated vitreous hemorrhages. In the socioeconomic milieu, where it occurs, these are often ignored as spontaneous clearing is the rule, on the first few occasions. Neglect can result in non-resolving vitreous hemorrhage, traction retinal detachment and other problems associated with retinal vascular disease. Clinically, signs can be divided into signs of inflammation, ischemia and neovascularization.

These normally occur in that order, however signs from various stages may coexist. Periphlebitis or vasculitis normally affect the peripheral vasculature, however, they sometimes even affect larger vessels, resulting in a picture of a secondary branch retinal vein occlusion (figure 2). Some workers have included papillophlebitis/non-ischemic CRVO in the clinical spectrum, referring to it as central Eales. The classical neovascularization seen in Eales is the peripheral sea fan (figure 3). Treatment modalities depend on the stage of the disease. Systemic or peri-ocular steroids can be used during the inflammatory stage to limit the damage caused to the inflamed vessels. Fluorescein angiography is used to define the areas of non-perfusion followed by scatter treatment of the affected areas. Vitrectomy in non-resolving vitreous hemorrhage can be performed at a low level of difficulty. It is often visually very rewarding due to lack of macular ischemia.

Sometimes contraction of the fibrovascular tissue can cause linear retinal tears resulting in a combined retinal detachment (figure 4). Chronically neglected eyes can have severe proliferative and ischemic changes with even neovascularization of the iris, with poor visual prognosis. Given its bilateral presentation and prevalence in the economically productive age group, Eales is an important retina care issue. The presence of retinal hemorrhages and the patient profile makes CMV retinitis an important

Incidentally, the retina need not necessarily detach as a chorioretinal scar occurs all around, before the cyst breaks in. The cyst has a pathognomonic appearance which can often be seen on ophthalmoscopy. The cyst is oval in shape, 10-12 mm long and has a milk white spot along its longitudinal axis, which represents the invaginated scolex (figure 6). It also has a characteristic appearance on cross-imaging modalities. Surgical excision with pars plana vitrectomy under the cover of systemic steroids is the preferred modality of treatment of intravitreal or subretinal cysts. Cysticidal result in cyst death provoking an inflammatory response, hence are not recommended. Intraocular nematodes in a variety of locations including subretinal and intravitreal are much rarer.

Post-operative endophthalmitis is the *bete noire* of the ophthalmologist, wherever in the world he or she may practice. In India a large number of cataract surgeries are performed under the national program for the control of blindness. This is done for free by the government or NGOs working in the field. The model of arranging to transport patients to an equipped facility, where surgery can be performed with full aseptic norms, has brought postoperative infections to acceptable standards. Studies performed in the south of the country at the LV Prasad Eye Institute, Hyderabad, have shown that a significant number of patients with culture positive post-op endophthalmitis are because of gram negative bacilli. In contrast, studies at the Post-Graduate Institute, Chandigarh, have found fungus to be the main organism. This is markedly different from studies in America which incriminate the staphylococci. This stresses the need for different world regions to have their own research programs, as local differences may exist.

In the last few years, an ophthalmic charity I am associated with has done a unique experiment using information technology to provide continuing medical education to ophthalmologists in the most remote corners of the country. An interactive CD-ROM was developed on the management of endophthalmitis. It included an instructional video on the technique of intravitreal

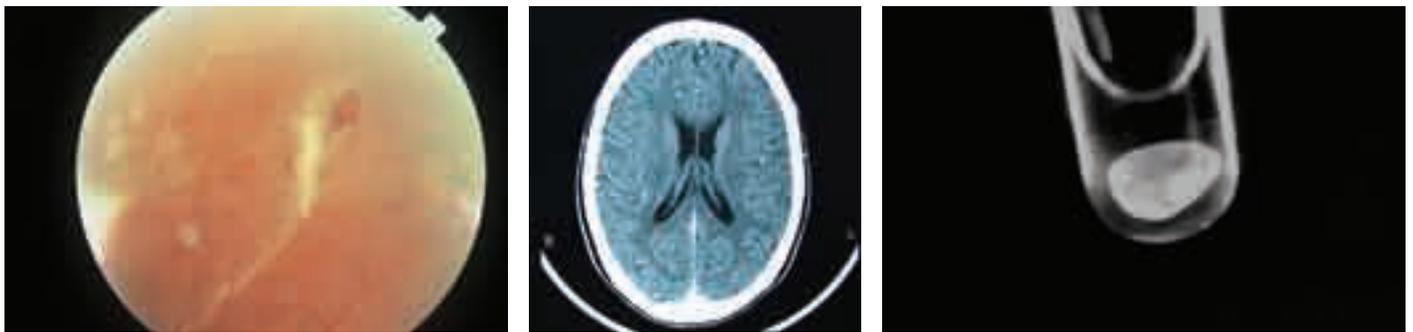


Figure 4. Contraction of fibrous tissue resulting in a linear retinal tear and a combined retinal detachment. Figure 5. CT scan of a patient with neurocysticercosis showing multiple cerebral cysts. Figure 6. An intact cyst of cysticercosis, displaying characteristic features.

differential diagnosis of Eales' disease, today.

Not as common are ocular parasitic infestations. These are usually encountered in patients from farming communities, where man and animals cohabitate in conditions of poor sanitation. *Cysticercus cellulosae* is the larval form of the pork tape. The advent of the CT scan has uncovered the true extent of neurocysticercosis in patients who are either asymptomatic or those with epilepsy in the developing world (figure 5). Notably, the transmission is not related to consumption of pork but due to orofaecal contamination. Salads are a common cause in our country, where most of the affected individuals are vegetarian. The cyst may be intravitreal, subretinal, subconjunctival, orbital or in relation to the extraocular muscles. The cysts are thought to reach the choriocapillaris hematogenously, from where they grow into the subretinal space. Sometimes the expanding cyst breaks through into the vitreous cavity to become free floating.

injections, including tables for dilutions. Needless to say, intravitreal antibiotics given at the right stage, are a stitch in time. The time delay in sending such a patient to a referral center could take days from remote places, in which time even vitrectomy will probably achieve little. The CD-ROM, which was sold on a non-profit basis, was ordered from all parts of the country.

Like every country we have our routine patients, the same diseases seen worldwide. We have some vitreoretina exotica special to our region. This short article aimed to be an introduction to some of them. In the interest of brevity it had to be concise, merely trying to kindle an interest in the reader. The change today is that the local exotica is undergoing globalization, in the process increasing the vitreoretina disease spectrum we may encounter in our practice.