

EPIRETINAL MEMBRANES AND DIAGNOSTIC CHALLENGES

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Abstract:

Epiretinal membranes are fibrous tissue developing on the surface of the retina mostly in the macular region. They can cause symptoms and drop of vision. They can be idiopathic or secondary. Epiretinal membranes can imposed some diagnostic difficulties. Although they are easy to detect, a large percentage of them occur in association with other retinal conditions. Therefore it would be necessary to know what is causing what to avoid treating the wrong illness.

Keywords: epiretinal membrane, age-related macular degeneration, intravitreal injections, proliferative vitreoretinopathy,

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Introduction:

Epiretinal membrane (ERM) is a proliferative membrane that grows on the surface of the retina initiating some morphological changes. This is the membrane we normally refer to when the term ERM is used. However it has to be noted that literally speaking this term is a misnomer. The prefix 'epi' normally means adjacent to. This means an ERM can be above, underneath or even beside the retina. The correct name should be preretinal membrane (PRM) or even premacular membrane (PMM). However, for the purpose of simplicity this structure will be referred to in this article as ERM.

Epidemiology:

The age distribution of epiretinal membrane is normally 70-79 years of age where prevalence is found to be as high as 7-11.8%¹. Overall incidence rate is 5% above age 50 with more prevalence in females than males. Those membrane develop more in Chinese than in Caucasian with the Japanese having one of the lowest prevalence rates².

Clinical features:

The impact of such membranes vary significantly depending on their location. Those developing in the macular area can affect the eye sight. In case those membrane develop elsewhere in the retina other morphological changes develop. However due to the functional differences of different parts of the retina those can even be unnoticeable. Epiretinal membrane tend to develop more in elderly population. However children can have those ERMs following ocular trauma. They can be seen more commonly after

age 60 in many cases they develop with no known etiology. However they can develop as a result of minor or surgical trauma. Epiretinal membrane is the most common cause of vision reduction after successful scleral buckling. Those used to be called proliferative vitreoretinopathy. Other inflammatory processes can initiate the formation of epiretinal membranes. Connective tissue growth factor is believed to play a role in the development of these membranes³. Conditions such as central and branch retinal vein occlusion, diabetic retinopathy as well as uveitis and retinal breaks with and without retinal detachment cause secondary ERMs⁴. Most of those so called idiopathic ERM are in fact secondary to posterior vitreous detachment which precipitates breaks in the ILM with migration of fibroglial tissues from within to the surface of the retina⁵.

Pathogenesis:

The process of formation of epiretinal membranes normally starts with vitreoschisis. At the time of diagnosis of ERM 60-90% would already have posterior vitreous detachment⁶. The posterior vitreous face separate leaving some remnants adherent to the internal limiting membrane. Also at the same time the process of separation creates small holes through which hyalocytes start to migrate from within the retina to its surface⁷. This initiate the formation of fibrous tissue on the surface of the retina by sticking to the internal limiting membrane. Over time the fibrous tissue start to contract changing the morphology of the retina. In peripheral parts of the retina the condition can be as advanced as the development of cysts within the retina. Those can be incidentally discovered on routine eye assessment without any noticeable effect on vision. Epiretinal membranes developing within the macular area are normally easier to see even when asymptomatic. A glistening cellophane appearance can exist in the macular area without any obvious morphological changes. However with the progression of the connective tissue element of the membrane puckering of the macula start to appear. Blood vessels can appear distorted as well. In the day and age where optical coherence tomography is readily available, epiretinal macular membranes are often diagnosed even before they cause any visual symptoms. However that does not come handy most of the times. With the appearance of the macula caused by epiretinal membranes many unnecessary referrals are made.

Discussion:

Since epiretinal membrane develop after age 50. They develop about the same time age-related macular degenerations start to show some of its features. With the appearance of corrugated retinal surface and some degenerative macular changes, even atrophy, it can be difficult to distinguish whether the spaces seen within the retina are caused by the mechanical effects of the epiretinal membrane or due to neovascular age related macular degeneration (nAMD). Although it is quite easy to distinguish the two using the good old technique of wait and see, sometimes further investigations such as Fluorescein fundus angiography (FFA) are warranted. Also the coexistence of epiretinal membrane and neovascular age related macular degeneration is not uncommon. A case where further challenge exists.

Neovascular age related macular causes the development of macular intraretinal and subretinal fluid. Advanced epiretinal membranes cause intraretinal cysts too. Sometimes it not easy to identify whether the new cysts developing in an eye which remained treatment free for some time is due to reactivity of nAMD or merely the mechanical effect of ERM. Patients can be restarted on a new course of injections before even consulting the retinal surgeons, one of the drawbacks of separating retinal specialty into medical and surgical.

Based on the proposed pathogenesis of epiretinal membrane, with the theory proposing posterior vitreous traction initiating the development of ERM, it is postulated that more injection can make epiretinal membrane progress faster. The mechanical effect of the needle going through the vitreous cortex increase the traction the posterior vitreous cortex exerts on the ILM and creating more holes around retinal blood vessels allowing more subretinal cells to proliferate on the surface of ILM. Therefore when 'reactivity' of a dormant nAMD is suspected in the presence of ERM, perhaps the first line of treatment is not adding more injections.

Conclusion:

Epiretinal membranes are proliferative connective tissue growth on the surface of the retina that can impose some challenge to clinical diagnosis in the present of other retinal diseases such as diabetic retinopathy, retinal vein occlusion or age-related macular degeneration. Although the primary macular condition might be under control, the presence of ERM can sometime cause confusion about activity of the primary condition. The primary condition is normally under the care of the medical retina specialist.

However it may be necessary to consult the surgical colleagues to decide whether removing such ERMs would be beneficial.

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