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Plenary Lecture 2
Speaker: Dr. Andrew Chang

Vitreomacular Interface: Structure and Function Assessment for the Surgeon

"Vitrectomy is an effective surgical option and enzymatic pharmacotherapy is promising."

Dr. Andrew Chang, Associate Clinical Professor, University of Sydney

Changes in the macromolecular structure of gel vitreous that result in liquefaction leads to posterior vitreous detachment (PVD).[1] At the same time, alterations in the extracellular matrix at the vitreoretinal interface allow the posterior vitreous cortex to detach from the internal limiting lamina of the retina.

Anomalous PVD (APVD) occurs when gel liquefaction exceeds the degree of vitreoretinal dehiscence, and the clinical manifestations vary based on where the fundus vitreoretinal adhesion is strongest.[1]

"Vitreous remodeling leads to progressive liquefaction with age, which may progress to vitreomacular adhesion (VMA)," explained Dr. Andrew Chang, Associate Clinical Professor, University of Sydney and Medical Director of Sydney Retina Clinic and Day Surgery in Australia, when he recently spoke to delegates of the 31st Malaysia-Singapore Joint Ophthalmic Congress (MSJOC) in Pullman Kuching, Sarawak, Malaysia, on vitreomacular interface structure and function.

The network of fine collagen fibrils at birth holds the vitreous humor together in a gel state. During the aging process, the vitreous undergoes aging as well and these collagen fibrils aggregate from their surfaces. The aggregation of collagen fibrils results in vitreous liquefaction which, when combined with an age-related weakening of postbasal vitreoretinal adhesion, predisposes to vitreous detachment and retinal break formation.[2]

During his lecture, Dr. Chang highlighted different vitreoretinal interface problems such as macular edema, focal vitreomacular traction (VMT), macula hole, epiretinal membrane and myopic maculopathy.

Further, Dr. Chang presented the different classifications (and sub-classification) of the structure of the macula as follows:

1) Vitreomacular Adhesion (VMA)

- Focal (≤1500 µm) or broad (>1500 µm)
- Isolated or concurrent with other diseases
- No structural abnormalities in retina

2) Vitreomacular Traction (VMT)

- Focal (≤1500 µm) or broad (>1500 µm)
- Isolated or concurrent with other diseases
- With structural abnormalities in macula

3) Full-Thickness Macular Hole (FTMH)

- Small (≤250 µm), medium (>250 µm and ≤400 µm) or large (>400 µm)
- With or without VMT
- Primary or secondary to other conditions

Surgeons use macular integrity assessment (MAIA) microperimetry to measure the function of the macula. MAIA is a high-density assessment of macular function. It combines scanning laser ophthalmoscopy (SLO) with an eye-tracker under light perception thresholds of 37 points in the central 100 of the retina. The test points are then matched to retinal topography.

Also, noninvasive high-resolution OCT imaging has transformed the surgeon's understanding of vitreomacular interface disease.[3]

"While MAIA is useful in measuring macular function, OCT has improved the evaluation of vitreomacular interface," added Dr. Chang. Careful evaluation of the vitreomacular interface using OCT has increased in importance relevant to the treatment option.[3]

The different case reports presented by Dr. Chang demonstrated how pathology of the vitreomacular interface results in a spectrum of maculopathies; the different treatment options available were also discussed.

"Vitrectomy is an effective surgical option and enzymatic pharmacotherapy is promising," he concluded.

References:

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2. Le Goff MM, Bishop PN. Adult vitreous structure and postnatal changes. Eye (Lond). 2008;22(10):1214-1222.
3. Stalmans P, Duker JS, Kaiser PK, et al. Oct-based interpretation of the vitreomacular interface and indications for pharmacologic vitreolysis. Retina. 2013;33(10):2003-2011.