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WHAT'S NEW IN DIABETIC VITRECTOMY

Dr Prashant K Bawankule, Nagpur

Advances in Instrumentation

- **Port optimization:** Beveled-tip ports allow for closer working distances and serve multiple functions. This reduces the need for frequent instrument exchanges, improving surgical efficiency.
- **Vitreous cutter speed:** High-speed cutters enable faster surgery with reduced retinal traction. Lower speeds are preferred when working on thick or fibrotic membranes.
- **Integrated pressurized infusion and intraocular pressure (IOP) control:** NIFS (Noninvasive Flow Sensor) technology ultrasonically measures infusion flow through the cassette, offering better control with reduced IOP fluctuations, minimized bleeding, and lower risk of choroidal effusions.
- **Physiological IOP maintenance:** Operating at physiological IOP levels helps reduce corneal edema and preserves clarity throughout surgery.
- **Curved endolaser:** Enables anterior laser application without contacting the lens, enhancing safety and access.

Advances in Illumination

- **Color-dyeless chromatic vitrectomy:** Enhances tissue contrast and visualization without the need for vital dyes.
- **Wide-angle endoillumination:** Provides up to a 100° field of view, improving surgical access to peripheral retina.
- **Chandeliers:** Offer panoramic illumination, reduce phototoxicity, and enable bimanual surgical techniques.

Advances in Viewing Systems

- **Wide-angle viewing systems:** Allow continuous panoramic views of the peripheral retina without needing frequent adjustments.
- **Optical fiber-free intravitreal surgery system:** Integrates its own illumination and allows a greater working distance.
- **3D – Digitally assisted surgery:** Enhances depth perception (by 11%-42%) and expands the field of view by up to 5 times.
- **Head-mounted displays:** Display separate images to each eye, eliminating ghosting and improving ergonomic visualization.
- **Intraoperative optical coherence tomography (OCT):** Real-time visualization of tissue planes helps in precise membrane dissection, identifying subretinal structures, and preventing iatrogenic macular holes.

Advances in Pharmacology

- **Systemic disease control:** Optimizing systemic status remains critical for surgical success.
- **Preoperative antivascular endothelial growth factor (anti-VEGF) (e.g., Avastin):** Reduces intra- and postoperative bleeding and complications, and shortens surgical time.
- **Perfluorocarbon liquids:** Offer stability due to their high specific gravity and low viscosity; useful in retinal manipulation.

Advances in Technique: Physiological IOP, bimanual surgery, hydrodissection/viscodissection of membranes, inverse swiss roll, role of second membrane, interface vitrectomy, internal limiting membrane (ILM) peel, GuARD, and intraoperative hemostasis.

Advances in Vitrectomy for Diabetic Macular Edema (DME)

- **Established indications:** Vitreomacular traction and serous retinal detachment.
- **Newer indications:** Diffuse or intractable DME, DME in vitrectomized eyes without prior ILM peel, and DME associated with subretinal hard exudates.

Lens and Diabetic Retinopathy Vitrectomy

- **Combined phaco + vitrectomy:** Enhances surgical visualization, facilitates complete vitreous base excision, reduces need for future laser treatments, minimizes risk of neovascularization, and eliminates need for a second procedure.

What's on the Horizon?

- Anti-PVR therapies:
  - Nonsteroidal anti-inflammatory drugs (NSAIDs) (Lomoxicam)
  - Anti-VEGF and platelet-derived growth factor receptor inhibitors
  - Intravitreal statins, methotrexate, infliximab; 5-fluorouracil with low molecular weight heparin.
- **Silicone bubble/capsule:** Promising tool for internal tamponade.
- **Robotic eye surgery:** Enhances precision and dexterity during complex maneuvers.
- **Smart instruments:** Sensor-equipped forceps detect micro-forces. OCT-integrated picks help with delicate tissue lifting and confirming complete membrane removal.
- **Artificial intelligence:** Supports clinical image interpretation and surgical decision-making.

MANAGEMENT OF INTRAOCULAR RETINOBLASTOMA

Dr Santosh G Honavar, Hyderabad

Management of intraocular retinoblastoma has seen significant progress with a tailored approach based on disease stage, tumor size, and presence of vitreous seeds. One of the notable advancements is the use of safety-enhanced intravitreal chemotherapy (IVitC), which has shown promise in eyes with smaller tumors and active vitreous seeds.

Safety-Enhanced IVitC

- Best suited when the retinal tumor is not large.
- Safe injection site selection is critical to minimize the risk of extraocular spread.
- "Exit through Ice": The injection needle is passed through a pre-treated cryotherapy area to enhance safety.
- Post-injection cryotherapy at the site further reduces seeding risk.
- Subconjunctival bleb of topotecan confirms drug delivery.
- The treatment induces tumor cell death – often referred to as "death by water".

Treatment Approaches Based on Disease Presentation

- Viable retinal tumor + vitreous seeds: IVC (intravenous chemotherapy) or IAC (intra-arterial chemotherapy) + POC (periocular chemotherapy).
- Viable residual vitreous seeds: IVitC is considered ideal.

IAC is particularly beneficial in: Group D and E tumors; large recurrences.

Role of IVC: Induces tumor shrinkage; Tumor regresses towards its vascular source; Helps in the resolution of exudative retinal detachment.

Summary of Recommended Management Strategies

- Group A: Focal therapy.
- Group B: Visually critical location - chemotherapy is the ideal initial treatment.
- Group C, D, and Good E: Chemotherapy + Local and Focal therapy.
- Bad E: Enucleation and HP-guided adjuvant therapy.
- Stage II - Adjuvant EBRT + chemotherapy.
- Stage III - Multimodal therapy.
- Stage IV - Multimodal therapy/Palliative care.

PHACO AFTER RADIAL CCC TEAR

Dr Rohit Om Parkash, Amritsar

A radial continuous curvilinear capsulorhexis (CCC) tear can be challenging, but a structured approach ensures better outcomes. The first step is to assess the extent of the tear (intermittent or continuous) and check for the flap motility sign. This evaluation helps determine the appropriate surgical technique: Femtosecond laser-assisted cataract surgery (FLACS), manual phacoemulsification, or posterior approach.

Key surgical considerations include:

- Treat the patient as having a posterior polar cataract with a pre-existing defect.
- FLACS approach: Perform a 4.5 mm rhexis with femtodelineation for precise control.
- Phacoemulsification technique:
  - Maintain low IOP and slow-motion phaco to reduce the risk of anterior hyaloid phase rupture and minimize turbulence.
  - Avoid nucleus rotation to prevent further tear extension and ensure stable chamber settings for controlled fluid dynamics.
- Epinucleus management: Handle carefully in the presence of a posteriorly open capsule.
- Use physiological settings to maintain stability.

- Utilize separate planes for irrigation and aspiration (bimanual or retracting the coaxial sleeve).
- Use triamcinolone to detect vitreous involvement.
- Perform dry aspiration.
- Proceed with intraocular lens (IOL) implantation.

SECONDARY *AB-INTERNO* STENTING TO MANAGE EARLY TUBE-RELATED HYPOTONY

Dr Anahita Shroff, Chennai

Ab-interno tube occlusion is a minimally invasive approach for managing hypotony following Aurolab aqueous drainage device implantation, offering an alternative to tube re-ligation or shunt removal.

Additionally, prophylactic intraoperative stenting using the Rip Cord technique can be employed in all cases to prevent postoperative hypotony, ensuring better IOP stability and reducing the need for further interventions.

FIRST-LINE THERAPY FOR MYOPIC TRACTION MACULOPATHY: MACULAR BUCKLE

Dr Simon Szeto, Hong Kong

Macular buckle (MB) is increasingly being recognized as a valuable first-line therapy for myopic traction maculopathy (MTM). While pars plana vitrectomy with ILM peeling or ILM flap remains a common approach, it carries inherent risks and limitations. MB, on the other hand, could address the other pathological vectors in MTM that could not be mitigated by an internal approach. Meta-analyses have shown favorable outcomes with MB, supporting its efficacy and safety profile. Therefore, it is essential for retinal surgeons to be well-versed in MB techniques to expand their treatment arsenal and offer the most appropriate intervention tailored to the pathology.

MY APPROACH TO SUBFOVEAL CNVM

Dr Dinesh Talwar, New Delhi

Exudative subfoveal choroidal neovascular membranes (CNVMs) encompass a spectrum of conditions rather than a single disease entity. When secondary to age-related macular degeneration (AMD), CNVMs are classified into predominantly classic, minimally classic, and occult types. The occult form often arises due to late leakage from an unidentified source, fibrovascular retinal pigment epithelium (RPE) detachments or serous RPE detachments.

A widely adopted treatment approach for exudative AMD is "treat, wait, and extend", recognized for its safety and effectiveness. This strategy involves regular monitoring every 4 weeks, even if the treatment interval extends beyond that period. It is particularly beneficial for monocular patients and those who are stable but not fully dry. The wait-and-extend method allows for initial 4-weekly follow-ups with progressively increasing intervals in cases of inactive disease lasting over 6 months.

Studies support aflibercept as the first-line treatment for neovascular AMD, initiated with three loading doses followed by a treat-and-extend strategy. If patients fail to maintain an >8-week interval, faricimab may be considered, while brolucizumab is reserved for select binocular cases.

Indicators for retreatment: Loss of >5 ETDRS (Early Treatment Diabetic Retinopathy Study) letters in best-corrected visual acuity. OCT evidence of new or persistent macular fluid. New macular hemorrhage. Subjective signs of worsening vision.

FIRST-LINE TREATMENT FOR CENTRAL SEROUS CHORIORETINOPATHY: PDT

Dr Jose A Roca, Peru

First-line treatment options for central serous chorioretinopathy (CSCR) include observation, photodynamic therapy (PDT), and subthreshold micropulse laser (SML) therapy. Since many cases resolve spontaneously, observation is often the preferred initial approach.

PDT works by activating verteporfin in abnormal choroidal blood vessels, releasing free radicals that help eliminate these vessels. SML, on the other hand, reduces central retinal thickness and improves visual acuity without causing retinal damage.

The choice between PDT and SML for chronic CSCR has been widely studied. Current evidence-based on the PLACE trial and subanalysis suggests that half-dose PDT is generally more effective than SML in achieving better anatomical resolution and functional improvement in patients with chronic CSCR.

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