Journal Club:
Update Vitreoretinal Surgery

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http://www.triemli-augenklinik.ch
What are the most relevant publications in Vitreoretinal Surgery of the past 12 months?

1. *Retinal Detachment Study Reports* European Vitreo-Retinal Society (EVRS)
2. *Autologous ILM-Transplantation* for unclosed macular holes
3. *Intraoperative OCT*
RETINAL DETACHMENT STUDY REPORT (EVRS)
Rhegmatogenous retinal detachment (RRD) Management

• Optimal treatment of RRD debated for decades
• Retrospective studies do not provide a consensus regarding the best procedure
• Scleral Buckling versus Primary Vitrectomy in Rhegmatogenous Retinal Detachment (SPR, randomised, prospective) study identified risk factors
• Failure rate generally is low
• To obtain a statistical difference between 2 techniques representing 1% and 2% failure rates, a minimum of 2400 cases is needed
European Vitreo-Retinal Society (EVRS) Study

Design

• Non-randomized, multicenter, retrospective
• Self-reporting
• EVRS-members record the individual treatment successes and failures of the primary procedure for RRDs with PVR ranging from grade 0 (no PVR) to grade C-1 PVR
• 176 surgeons (SPR: 45), 48 countries (5), 7678 RRDs (681), at least 3 months follow-up (1 year), April-10 to April-11 (5 years)
• PEP: anatomic outcome (not V/A!)
• Analyzed preoperative clinical findings, risk factors, varying association with failure of anatomic reattachment
• Largest report treatment of retinal detachment in the literature
References


PEP-definition: Failure Rate

- **Level 3**: % of eyes declared as a success but had recurrence of detachment or complication after initial procedure, required additional surgery.
- **Level 2**: % of eyes not been declared as a level 1 failure, *silicone oil was remaining in the eye*; success or failure?
- **Level 1**: „*True failure rate*“ declared by the surgeon and represented eyes with *detached retina judged to be inoperable* by the conclusion of the study.
Treatment of Uncomplicated RRD (Nr. 1)

- **Phakic**: final failure rate was lower in *scleral buckle* group
- **Pseudophakic**: failure rate of the initial procedure lower in *vitrectomy* group
- Vitrectomy with supplemental scleral buckle had an increased failure rate
- Vitrectomy: higher single-surgery reattachment rate than those treated with scleral buckle alone
Treatment of Complex RRD (PVR, Nr. 2)

- Additional buckle or buckle alone not lower failure rate than PPV in PVR
- Vitrectomy procedure of choice when choroidal detachment, hypotony, a large tear, or a giant tear is present
- PVR: gas or silicone oil similar results
**Risc factors** associated with failure of anatomic reattachment in primary RRD-repair (Nr. 4)

- **Independent variables of failure (negative predictive factor):**
  - Choroidal detachment or significant hypotony (<6 mmHg)
  - Amount of PVR
  - Number of detached quadrants
  - Size of retinal breaks

- **Not associated with failure:**
  - Lens status
  - Vitreous hemorrhage
  - Number of retinal breaks
Personal Critique

- Short follow-up
- Assumes that all surgeons and EVRS members have the same surgical experience
- Bias of self reporting
- Selection bias
- Subjective assessment of PVR or retinal breaks
- Macula on/off-status & time to surgery?
- Functional outcome unknown (interpretation of non-standardized acuities?)
- Using failure as a primary outcome measure is not optimal
Conclusion

- Largest cohort in the literature for RRD repair
- Risk assessment of primary RRD repair concerning anatomic outcome
AUTOLOGOUS ILM-TRANSPLANTATION FOR UNCLOSED MACULAR HOLES

Failure of hole closure after vitrectomy

- Surgical closure is challenging in cases of long-lasting large macular holes or highly myopic eyes
- *Inverted ILM flap technique* higher closure rate for large macular holes (Michalewska et al. Ophthalmology 2010)
- Might stimulate the proliferation of glial cells that fill macular holes
- Packing the macular hole with a folded ILM resulted in multilayered membrane
Autologous Transplantation of the Internal Limiting Membrane for Refractory Macular Holes

YUKI MORIZANE, FUMIO SHIRAGA, SHUHEI KIMURA, MIO HOSOKAWA, YUSUKE SHIODE, TETSUHIRO KAWATA, MIKA HOSOGI, YUKARI SHIRAKATA, AND TOSHIO OKANOUCHI

FOVEAL MICROSTRUCTURE IN MACULAR HOLES SURGICALLY CLOSED BY INVERTED INTERNAL LIMITING MEMBRANE FLAP TECHNIQUE

HISAKO HAYASHI, MD, SHOJI KURIYAMA, MD

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- 6-month postoperative SD-OCT
- restoration of IS/OS junction in
  - 43% idiopathic large MH eyes
  - 29% highly myopic MH without RD
  - 17% highly myopic MH with RD
- restoration of external limiting membrane in
  - 57% idiopathic large MH
  - 43% highly myopic MH eyes without RD
  - 17% highly myopic MH eyes with RD
INTRAOPERATIVE OCT (IOCT)
Prof. Dr. Matthias Becker  
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The Prospective Intraoperative and Perioperative Ophthalmic Imagining with Optical Coherence Tomography (PIONEER) Study: 2-year Results.  

- Evaluate the feasibility, safety, and utility of iOCT for use during ophthalmic surgery
- Prospective, consecutive case series
- Single-site, multi-surgeon
- Microscope mounted spectral domain OCT system
- Anterior and posterior segment applications
- 531 eyes (256 posterior segment surgical cases)
- ERM 35%, FTMH 23%, RD 17%, PDR 13%, VH 3%
- Re-enrolled, bilateral procedures allowed
Results: PIONEER Study

- iOCT informed surgical decision-making and altered surgeon understanding of underlying tissue configurations in 63/146 (43%) membrane peeling procedures
- Definitively reversed surgical decision-making in 13% cases
- Median time surgery paused to perform iOCT: 4.9 min per scan session
Results: PIONEER Study

• Visualize areas of successful membrane peeling
• Reveal any residual membranes
• Alterations in the outer retinal architecture
• Changes in hole architecture
• Identification of residual ILM
• Identified variable amounts of residual subretinal fluid
Largest prospective study to date to assess the feasibility, safety and utility of iOCT

Most common reported impact related to completeness of membrane peel

Interesting new technology that might provide more safety and better outcomes of posterior segment surgery in the future

Still cumbersome handling during procedure