Vitreoretinal Surgery on Video

Tape 7

Macular surgery

Technique for macular hemorrhages
Technique for submacular membranes
Technique for epiretinal membranes
Technique for macular holes

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Text:
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“Vitreoretinal Surgery on Video” shows a selection of operations performed in the last eight to ten years. The series is meant for vitreoretinal surgeons who have mastered the initial difficulties of this area and now encounter more and more difficult cases in their daily work. Nonetheless, even the experienced vitreoretinal surgeon, who does not exclude any patients from his practice but treats even the most complicated cases himself, will find difficult cases here in all the regular indication groups.

The cases on the videos are divided into the usual indication groups.

From the point of view of philosophy and surgical concepts, vitreoretinal surgery has not changed much in the last ten years. The surgery undertaken in this series is based on the philosophy and surgical concepts described in my book *Silicone Oil in Vitreoretinal Surgery*, which are still valid. The field has, however, undergone significant modifications in its techniques. The development of new instruments, the introduction of the perfluorocarbon liquid (PFCL) and of the wide angle system are the most important recent innovations. This development can be followed on the videos in the selection of cases, but none of the cases presented can be seen as an isolated technique. On the contrary, surgeons who are not in the situation to apply the most recent techniques in their daily work will be able to see how it is possible to operate successfully with less sophisticated means. Surgeons who are in a position to apply all the modern techniques available will also find sufficiently many cases of interest.

The videos are divided into several texts and films. Each text gives relevant facts on the patient, a description of the course of the operation, with the emphasis on specific moments in the surgery, and the instruments which were used. The videos on proliferative diabetic retinopathy and on macular surgery do not always follow
the described pattern, for obvious reasons. In a number of cases we have added a short comment.

In most cases, the surgery was performed by myself, in some, particularly in the macular surgery and miscellaneous videos, the surgeon was Dr. Carel Claes. The name of the surgeon is given after each case. The text and comment of the course of the operations was written by Dr. Taraprasad Das in cooperation with myself. Most instruments presented and used in the surgery were manufactured by the Dutch Ophthalmic Research Center International.

R. Živojinović, M.D.

PART I

Patient data

Sixty-year old male patient; operation on the right eye. The left eye lost due to long-lasting submacular hemorrhage and unoperated secondary retinal detachment. He suffered gross reduction in visual acuity.

Surgery

1. Inspection of the retina showed a large submacular hemorrhage. Application of diathermy at the peripheral part of the hemorrhage.
2. Injection of perfluorocarbon liquid (PFCL) in an attempt to express the blood through the retinotomy site. The attempt was not successful.
3. Injection of tPA (15 Ág) in the subretinal space.
4. There was little effect of tPA even 45 minutes after the injection. Finally the blood clot was removed with the subretinal forceps.
5. Additional injection of PFCL to evacuate remaining subretinal blood.
6. Endophotocoagulation of the retinotomy site and fluid-air exchange.

Instrumentation

Intra-ocular diathermy; PFCL & tPA; subretinal forceps; back-flush needle.

Surgeon: R. Živojinović
PART II

Patient data

Sixty-five year old male patient; operation on the right eye. He suffered a gross reduction in visual acuity in a period of five days. On examination, he was found to have subretinal and partly preretinal hemorrhage. He was later diagnosed as having macro-aneurysm in the macular area.

Surgery

1. Pars plana vitrectomy and attempt to create posterior vitreous detachment with the retinal scratcher and the silicone-tipped cannula. The posterior vitreous was firmly adherent.
2. Partial removal of the epiretinal blood.
3. Posterior vitreous detachment (PVD) created using the vitreous scratcher and further vitrectomy.
4. Creation of a small retinotomy and removal of the clot with the help of the subretinal forceps.
5. Injection of PFCL to evacuate additional subretinal blood.
6. Endophotocoagulation of the retinotomy site.

Instrumentation

Retinal scratcher; silicone-tipped back-flush needle; sub-retinal forceps.

Surgeon: R. Živojnović

PART III

Patient data

Seventy-year old male patient; operation on the left eye. He had a history of acute loss of vision in one eye, the other eye was lost due to complications following from untreated age-related macular degeneration. On examination, he was found to have both subretinal and vitreous hemorrhage.

Surgery

1. Inspection of the fundus that showed massive submacular hemorrhage extending anteriorly, and subretinal membrane.
2. Pars plana vitrectomy with creation of posterior vitreous detachment (PVD).
4. Removal of subretinal blood and the blood clots using various instruments such as subretinal forceps, long retinal spatula etc.
5. Injection of PFCL to evacuate additional subretinal blood.
6. Endophotocoagulation to the peripheral retinotomy site.
7. PFCL-silicone oil exchange.

Instrumentation

Endodiathermy; subretinal forceps; retinal spatula; AVI panoramic viewing system.

Surgeon: C. Claes

PART IV

Patient data

Seventy-five year old male patient; left eye involved. The fellow eye had age-related macular degeneration (ARMD), for which he had undergone krypton laser photocoagulation. He complained of a gross reduction in visual acuity of recent origin. On examination he was found
to have a large subretinal hemorrhage with macular scar, corresponding to the site of previous photocoagulation.

**Surgery**

1. Pars plana vitrectomy with creation of posterior vitreous detachment. The posterior vitreous was adherent to the coagulation scar. The surgery was done with the endo-illuminator in the infusion system (AVI system).
2. Peripheral retinotomy and bimanual removal of the blood clot.
3. Removal of the organised blood.
4. Attempt to remove the subretinal membrane firmly adherent to the retina failed; it was finally removed with paramacular retinectomy.
5. Injection of PFCL.
6. PFCL-silicone oil exchange and cleaning of blood from the retinectomy site. Laser endophotocoagulation of the retinotomy and retinectomy sites.

**Instrumentation**

Curved intra-ocular scissors; AVI illumination system with infusion; subretinal forceps, serrated end-gripping forceps.

Surgeon: C. Claes

**SUBMACULAR MEMBRANE REMOVAL**

This part of the tape shows surgical removal of submacular membrane. Almost all the membranes are caused by age-related macular degeneration (ARMD).

**Surgery**

The operations consisted of the following basic steps, with minor variations in the techniques:

1. Pars plana vitrectomy and induction of posterior vitreous detachment (PVD). The PVD was created with the vitreous cutter using high suction. On occasions, the retinal scratcher, long retinal spatula or similar instruments were used.
2. A small retinotomy with bent MVR blade. Prior application of diathermy was not done.
3. The subretinal membrane was released from either surface with the help of the subretinal spatula.
4. Finally, the membrane was removed using the subretinal forceps introduced through the small retinotomy site.
5. Injection of PFCL to clean the subretinal space.
6. Endophotocoagulation of the retinotomy site is only done when deemed necessary.
7. Fluid-air exchange.

**Comments**

The third patient had a pre-existent macular hole. The subretinal membrane was removed through this hole without creating a new one.

Surgeon: C. Claes

**PART V**

**Patient data**

Seventy-three year old female patient with a history of long-standing submacular hemorrhage due to age related macular degeneration (ARMD), which was not treated with laser. She had undergone cataract extraction and implantation of IOL one year back. On examination, the patient was found to have a large submacular fibrotic
membrane with partial vitreous hemorrhage. Operation on the left eye.

Surgery

The tape begins after initial pars plana vitrectomy and the clearing of the vitreous hemorrhage are completed.
1. Retinotomy and mobilisation of the membrane.
2. Removal of the subretinal membrane using the subretinal forceps.
3. Enlargement of the sclerotomy to accommodate the large non-elastic membrane, and removal through the pars plana sclerotomy.

The surgery was completed with photocoagulation of the retinotomy site and fluid-air exchange.

Instrumentation

Bent MVR blade; subretinal forceps.

Surgeon: C. Claes

PART VI

Patient data

Fifty-five year old female patient. She had been involved in a road accident and had sustained multiple fractures. She was an in-patient in the hospital for a prolonged time and treated with multiple intravenous drugs and blood transfusion. She had complained of defective vision in the left eye for three months but was neither examined nor treated. Finally, examination revealed that she had a thick epimacular membrane extending up to the disc with an area of traction retinal detachment at the superotemporal edge of the membrane. The vitreous was clear.

Surgery

1. Pars plana vitrectomy with creation of posterior vitreous detachment (PVD).
2. Dissection of the edge of the scar tissue with the small spatula.
3. Shaving of the membrane with the curved scissors. To decrease the progression of retinal detachment, the retina, which was firmly adherent to the membrane, was carefully dissected out.
4. Final shaving of the membrane.

Instrumentation

Small spatula; curved intra-ocular scissors.

Comments

The membrane resulted from presumed Candida albicans endogenous endophthalmitis (healed and atrophic stage).

Surgeon: R. Živojnović

PART VII

Patient data

Eleven-year old male patient with a history of blunt trauma. Following the injury, he developed vitreous hemorrhage and reduction in visual acuity. The hemorrhage cleared partly, but an area of choroidal rupture at the upper margin of the disc was detected. Four months after the injury, his vision became defective over a period of six weeks. On examination, he was found to have a large membrane in the posterior pole involving the macular area. Operation on the left eye.
Surgery

1. Pars plana vitrectomy with creation of posterior vitreous detachment (PVD). Inspection of the membrane. The posterior vitreous was firmly adherent to the membrane.
2. The membrane was elevated from the retinal surface with the help of the spatula and peeled with the forceps.
3. The partly peeled membrane was segmented with the vitreous cutter and carefully removed with the forceps. The small fixed retinal folds in the nasal side did not require any further intervention.

Instrumentation

Small spatula; curved intra-ocular scissors.

Surgeon: R. Živojnović

PART VIII

Patient data

Thirteen-year old female patient who recently developed a loss of vision in the left eye. The right eye was normal. There was no history of ocular infection or injury to the eye. On examination, a paramacular membrane was found with evident traction on the macula.

Surgery

1. Pars plana vitrectomy with creation of posterior vitreous detachment (PVD).
2. Retinal scratcher used to dissect the edge of the membrane. It was peeled toward the disc and finally removed using the intra-ocular forceps.
3. Fluid-air exchange.

Instrumentation

Retinal scratcher; end-gripping forceps.

Surgeon: C. Claes

Instrumentation

Retinal scratcher: end-gripping forceps.

Comments

The cause of the membrane in this young girl could not be ascertained.

Surgeon: C. Claes

PART IX

Patient data

Sixty-year old male patient with metamorphopsia and a reduction in visual acuity. On examination, he was found to have a macular hole with epimacular membrane. Operation on the left eye.

Surgery

1. Pars plana vitrectomy with creation of posterior vitreous detachment (PVD).
2. Retinal scratcher used to dissect the edge of the membrane. It was peeled toward the disc and finally removed using the intra-ocular forceps.
3. Fluid-air exchange.

Instrumentation

Retinal scratcher; end-gripping forceps.

Surgeon: C. Claes
PART X

Patient data

Fifty-year old female patient with myopia. Right eye operated. She had a history of retinal detachment surgery and laser photocoagulation for peripheral horseshoe retinal break with detachment. Four months following the surgery, she developed a gross reduction in visual acuity. On examination, she was found to have recurrent retinal detachment with a macular hole.

Surgery

The tape starts after initial lensectomy, removal of the lens capsules and core vitrectomy, showing removal of the dropped lens cortex.
1. Injection of PFCL to stabilise the posterior retina.
2. The anterior flap of the peripheral retinal break excised with the vitreous cutter to relieve the traction.
3. Vitreous base vitrectomy.
4. Inferior peripheral iridectomy.
5. PFCL-silicone oil exchange and drainage of subretinal fluid through the macular hole.
6. Endophotocoagulation of the edge of the macular hole.

Instrumentation

Back-flush needle; end-gripping forceps.

Surgeon: R. Zivojnović

The video series “Vitreoretinal Surgery on Video” by R. Zivojnović consists of eight videos, which are available in PAL and NTSC, either separately or as a complete set.

Tape 1. Retinal detachment combined with proliferative vitreoretinopathy (PVR) I
Tape 2. Retinal detachment combined with proliferative vitreoretinopathy (PVR) II
Tape 3. Giant retinal tears (GRT)
Tape 4. Traumatic retinal detachment I
Tape 5. Traumatic retinal detachment II
Tape 6. Proliferative diabetic retinal detachments (PDRD)
Tape 7. Macular surgery
Tape 8. Complications incataract surgery, intraocular tumors and miscellaneous