SURGICAL THERAPY FOR GLAUCOMA

PART 2

André Mermoud, MD
Montchoisi Glaucoma Center
Lausanne
Surgical Therapy for Glaucoma

- Trabeculectomy
- Deep sclerectomy
- Other MIGS (Minimally Invasive Glaucoma Surgery)
- Tubes
Non Penetrating Filtering Surgery

- Deep sclerectomy
- Visco-canalostomy
- Visco-canaloplasty
Deep Sclerectomy

Opening of conjunctiva
- Limbal or fornix based

Superficial scleral flap
- One third of scleral thickness (300 microns)
- 5 x 5 mm

Deep scleral incision
- Open the choroid space to know the maximal scleral thickness
Deep Sclerectomy

Deep flap
- 2 third of scleral thickness
- Opening of the Schlemm’s canal

Removal of inner wall of Schlemm’s canal
- Use a special forceps
- Increase flow through the TDM
- TDM (trabeculo-Descemet’s Membrane)

Collagen Implant or Heala-Flow
- Space feeling (to keep the intra-scleral space patent)
- Resorption after 9 months
Deep Sclerectomy

Superficial flap closure
- 2 untightened Nylon 10-0 sutures
- No resistance needed (resistance at the level of the TDM)

Conjunctival closure
- Vicryl 8-0
- Continuous suture
- 2 lateral sutures
Devices that can be used to improve the results

- Intra-operative MMC
- Space maintainer devices
- Post-operative MMC
- Gonio-puncture
Devices that can be used to improve the results

Intra-operative MMC

Space maintainer devices

Post-operative MMC

Gonio-puncture
Implants:

Collagen Implant:
(Kozlov, 1990)
Other implants used as space fillers in deep sclerectomy
Healaflow® in the scleral space
Healaflow® under the scleral flap
Healaflow® in perforated TDM
TDM 10 years after deep sclerectomy
Devices that can be used to improve the results

Intra-operative MMC

Space maintainer devices

Post-operative MMC

Gonio-puncture
Nd:YAG Goniopuncture (GPT)
Trabecolo-descemet’s Membrane after GPT
YAG goniopuncture (GPT)

- Patients: 80%
- Mean IOP before: 20 mmHg
- Mean IOP after: 11 mmHg
- Mean YAG time: 21 months
Effective Non Penetrating Deep Sclerectomy (NPDS)

- Proper depth of dissection (Mermoud et al, 1999)
- The use of intrascleral implant (Shaarawy et al, 2001)
- Nd: YAG goniopuncture (Mermoud et al, 1999)
- Use antimetabolites when needed (Kozobolis, 2002)
Where does the aqueous go?
Mechanisms of action of NPDS

• Filtration of aqueous humor through the Trabeculo-Descemet’s membrane
• Resorption of aqueous humor:
  – Scleral space, via new aqueous drainage veins
  – Sub-conjunctival bleb
  – Sub-choroidal space (uveo-scleral outflow)
  – Schlemm’s cannal
Complications of NPDS

- Rupture of the TDM
- Iris prolapse
- Encysted bleb (such as after trab.)
- Fibrosed bleb (such as after trab.)
Per-operative rupture of the TDM
Gonioscopic view of TDM rupture
Iris Incarceration through the TDM
Disadvantages of deep sclerectomy

Difficult surgery (failure if proper dissection not performed)

Need of goniopuncture in more than 50% of cases (need a good follow-up)
Conclusions

NPFS can provide good results if correctly performed (proper dissection, use of an implant, goniopuncture)

Less complications than previous filtering techniques

Allows to operate late stage glaucoma

Allows to operate earlier when medications are not efficient or when there is low patient compliance
Conclusions

- Offers new options in aqueous drainage mechanisms
- Almost flat filtering bleb
- Intrascleral bleb
- Subchoroidal filtration (uveoscleral outflow)
Surgical Therapy for Glaucoma

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- Other MIGS (Minimally Invasive Glaucoma Surgery)

- Tubes
Minimally Invasive Glaucoma Surgeries (MIGS)

- Schlemm’s canal approach
- Micro-tubes
- Cyclo-dyalise
Minimally Invasive Glaucoma Surgeries (MIGS)

Schlemm’s canal approach

Trabectome
I-stent
Visco-canaloplasty (ab-interno / ab-externo)
Minimally Invasive Glaucoma Surgeries (MIGS)

Micro-tubes
To connect the AC to the sub-conjunctival space

- Arow
- Ex-PRESS
- XEN-Tube
Minimally Invasive Glaucoma Surgeries (MIGS)

Cyclo-dyalise

Golden-shunt

C-pass
Surgical Therapy for Glaucoma

• Trabeculectomy
• Deep sclerectomy
• Other MIGS (Minimally Invasive Glaucoma Surgery)

• Tubes
Shunt surgeries

- Molteno Implant
  - tube ligature

- Baerveldt Implant
  - 250 and 350 mm plates

- Ahmed Implant
  - So called valved system
Even if the TVT study did not show great differences between Tube and trabs

**INDICATIONS FOR TUBES ARE LIMITED BY MANY SURGEONS TO:**

- Refractory glaucoma
- Uveitis glaucoma
- Neo-vascular glaucoma
- Glaucoma associated with corneal graft
- Refractory glaucoma in paediatrics
- Glaucoma after Retinal detachment

Treatment outcomes in the Tube Versus Trabeculectomy (TVT) study after five years of follow-up.
• Tubes Complications:

• Postoperative hypotony
• Blockage of internal part (bleeding, inflammation)
• Blockage of external filtration site (fibrosis or encapsulation of the filtering bleb)
• Infection, inflammation, conjunctival erosion
• Corneal endothelial loss
• Strabismus (less a problem if only eye)

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To reduce the complication rate

**Water tab**
To regulate the aqueous out flow

**Small AC tube**
1: smaller tube  
To reduce corneal decompensation

Water tab system  
To reduce the hypoony
The Eye Watch system

- Nozzle
- Tube
- Ball Bearing
- Magnetic disk
- Seton tube Connection
Connection of the Eye Watch system with the Baerveldt tube and plate
Eye Watch and Baerveldt implant:
After 5 months post-op: IOP 15 mm Hg
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THANK YOU FOR YOUR ATTENTION

André Mermoud, MD
Ancien Prof. associé à l’Hôpital Jules Gonin
Directeur médical de Genolier Swiss Visio Network (GSVN)
amermoud@gsvn.ch 24.8.2016