Behandlungsstrategien beim Offenwinkelglaukom

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What is strategy?
what is our goal?

where are we?

how can we achieve our goal?
Mission Statement

The goal of glaucoma management is to maintain the patient’s visual function and related quality of life, at a sustainable cost....
the case

- male patient, 77 years of age (2017)
- **second referral** because of massive irritation caused by filtering bleb and reduced visual acuity. - > VERY UNHAPPY
- had Phako-Trab and two revisions because of leakage and large filtering bleb and low IOP
- original diagnosis of a normal tension glaucoma was based on cupped discs.
What is our goal?

Where are we?

How can we achieve our goal?
the case

• female patient 57 y
• air-tonometry 25 and 29mmHg
• at a first glance, optic discs seem to be o.k.
first step...

A  OHT -> no treatment
B  examination of eye, re-evaluation IOP
C  for safety reasons...start treatment
D  determine target IOP and interval for check up
E  baseline for structure (OCT) and function (VF)
where are we?

- careful examination (IOP, Gonio, CCT, optic disc...)
- **NAMING**
  - POAG
  - secondary open angle glaucoma
  - PAC
  - ...
- **STAGING**
  - structure (OCT)
  - function (VF)
- identification of risk factors
- rate of progression?
Glaucom is not Glaucoma
Results:

Associated with higher rate of progression:
- advanced age
- PEX
- low CCT
- disc haemorrhages
- advanced glaucomatous damage at diagnosis
- Low initial IOP and frequent change of medication

Main prognostic factor for rapid progression:
- Cardiovascular disease and hypotension
Was wir wissen
What is our goal?
Where are we?
How can we achieve our goal?
- which factors can be influenced?
- how can these factors be influenced?
- how can I control the effectiveness of the treatment?
Planning of treatment

IOP

- most accepted risk factor
- define range of target IOP
- important for prognosis
- direct indicator for effectiveness of treatment
Planning of treatment:

THERAPY risk vs value

- decision upon treatment
  - no treatment at all
  - topical therapy
  - laser interventions (SLT / ALT)
  - surgery
- compliance, can patient manage to put in drops?
- optimising treatment
Planning of treatment: FOLLOW UP

- adequate tool for follow up?
- how often?
- acceptable rate of progression?
strategic control

- right on track
- ...
- line closed -> by-pass
- change trains
- go around in circles
- overshoot the target
First choice monotherapy

- effective on IOP
  - Well tolerated
    - target IOP reached
      - continue
        - target IOP maintained
          - periodically verify endpoints
            - QoL
            - VF
            - Optic disc
      - target IOP not reached
        - add second Drug
        - Target IOP reached
          - substitute 2nd drug and verify efficacy
        - Target IOP NOT reached
          - other therapeutic options
  
- NOT effective on IOP
  - NOT well tolerated
    - Change monotherapy
      - effective on IOP
      - non-effective on IOP
Adequate tool for monitoring Glaucoma?

A  I go for the IOP
B  structure (OCT)
C  clinical evaluation of ONH
D  function (VF)
E  OCT and VF depending on situation
The Relative Odds of Progressing by Structural and Functional Tests in Glaucoma
Abe YA et al. IOVS 2016;57:421-428

- 462 glaucoma patients (under treatment) 62 healthy controls
- Follow up over 3.6 years, 8 follow up examinations
- Each follow up examination: Progression YES or NO
Results

• Cut-off-IOP defining progression
  • RNFL 1.48 μm / year
  • SAP 0.35dB / year

• Analysis of 1910 progression curves / Visits
  • Progression in OCT: 363
  • Progression in GF: 183
  • Progression OCT and VF: 80
OCT vs VF

Perimetrie
- Screening ✗
- Diagnostik ✓
- Progression ✓

OCT
- Screening ✓
- Diagnostik ✓
- Progression ✗

Severity of disease vs time

Screening and diagnosis are evaluated over time, with OCT showing progression in disease severity.
OCT vs VF

Severity of disease

OCT
- Screening ✔
- Diagnostik ✔
- Progression ✔

Perimetry
- Screening ✗
- Diagnostik ✔
- Progression ✗

Time
- male patient, 65y
- PEX-Glaucoma
- maximal tolerated treatment
- IOP OD around 25mmHg
- VF stable
- everything fine ???
Global RNFL Thickness (12° Circle) over time

Reference database: European Descent (2009)
Monitoring ocular hypertension, how much and how often? A cost-effectiveness perspective.
Azuara-Blanco A, Br J Ophthalmol. 2016; 100(9): 1236-8

Conclusion:
For confirmed OHT, glaucoma monitoring more frequently than every two years is unlikely to be efficient.
How many visual field tests do we need to detect progression?

Bsp:
High rate of progression of 2dB/year, low variability in the field tests

- 1 examination per year: 5 years
- 2 examination per year: 2.5 years
- 3 examination per year: 1.7 years

Chauhan BC et al. Practical recommendations for measuring rates of visual field change in glaucoma. BJO 2008;92:569-573
Is there an acceptable rate of progression?

A  NO, progression is the result of inadequate treatment!
B  < 1.0 dB (MD) / year in perimetry
C  < 0.5 dB (MD) / year in perimetry
D  < 0.5 μm/ year in OCT
E  Depending on age of patient and severity of disease
Importance of Normal Aging in Estimating the Rate of Glaucomatous Neuroretina Rim and Retinal Nerve Fiber Layer Loss
Vianna JR et al. Ophthalmology 2015;122:2392-2398

• 192 Glaucoma patients (under treatment) and control group of 37 healthy individuals
• Follow up for 4 years
• Measured parameters
  • RNFL
  • BMO-MRW
  • BMO-Fläche
# Results

detectable change (statistically not significant)

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<thead>
<tr>
<th></th>
<th>controls</th>
<th>Glaucoma patients</th>
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</thead>
<tbody>
<tr>
<td>RNFL</td>
<td>31%</td>
<td>32%</td>
</tr>
<tr>
<td>BMO-MRW</td>
<td>35%</td>
<td>42%</td>
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</table>

annual loss of RNFL thickness (average)
(STATISTICALLY NOT SIGNIFICANT)

<table>
<thead>
<tr>
<th></th>
<th>controls</th>
<th>Glaucoma patients</th>
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<tbody>
<tr>
<td>RNFL</td>
<td>0.44 μm/year</td>
<td>0.84 μm/year</td>
</tr>
<tr>
<td>BMO-MRW</td>
<td>1.92 μm/year</td>
<td>3.18 μm/year</td>
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the case

- female patient 68 years of age
- POAG both eyes
- highest IOP 24-25mmHg
- under treatment since 11 years
- no symptoms, treatment well tolerated
- IOP around 12mmHg
Take home message

- Careful assessment before initiation of treatment
- Treatment and follow up needs to be customised
- Monitoring IOP, treatment and rate of progression
- There might be progression despite adequate treatment