Nouvelles stratégies thérapeutiques quand les collyres ne suffisent plus!

Quoi faire avant la chirurgie ?

- Selective trabeculoplasty: SLT
- Pneumotrabéculoplastie : PNT
- autres ??

Selective Trabeculoplasty

3.5.2 - TRABECULOPLASTIE AU LASER[77-85]

Indications :
GPAO, glaucome pigmentaire et exfoliatif quand la pression intra-oculaire ne peut pas être contrôlée médicalement ou lorsque celui est contre indiqué ou si la compliance est difficile comme chez les sujet âgé.

Quand la pression intra-oculaire ne peut pas être contrôlée médicalement une TLA peut être envisagée si le trabéculum est pigmenté notamment si le traitement médical semble difficile (sujet âgé) ou si l'espérance de vie est courte

Préparation pré-opératoire
- prévention des pics d'hypertonie oculaire : acetazolamide per os et/ou apraclonidine 1% par voie topique 1 heure avant le laser et immédiatement après. On éliminera une intolérance médicamenteuse et/ou une contre-indication à l'utilisation de ces traitements.
- anesthésie topique

Procédure :
Laser Argon (vert ou bleu-vert)
Laser Diode

Lentilles :
verre de gonioscopie du verre de Goldmann
verre de trabéculoplastie de Ritch
verre CGA LASAG CH

- Identifier les structures angulaires sur 360°
- Localisation des impacts : entre le trabéculum pigmenté et le trabéculum non pigmenté c'est-à-dire entre le 1/3 antérieur et la moitié du trabéculum sur 180 ou 360 d°

La TLA peut être réalisée en deux séances de 180 d° à 2 semaines d'intervalle.
On prendra soin dans ce cas de ne pas retraiter deux fois le même quadrant.

Paramètres du laser

Diamètre :	50 µm
Temps d'exposition :	0.1 sec
Puissance :	500-1 200 mW en fonction de la réaction trabéculaire

Réaction trabéculaire souhaitée : blanchiment ou formation d'une petite bulle

3.5.2 - LASER TRABECULOPLASTY[145-164]

Indications: [I,D]
a - Consider it as initial treatment for POAG, exfoliative and pigmentary glaucoma
b - POAG, exfoliative and pigmentary glaucoma when IOP is not satisfactorily controlled with a single medication
c - Overall, in POAG, exfoliative and pigmentary glaucoma when IOP is not satisfactorily controlled with medications, when the latter are contraindicated, or where compliance is a problem, such as in the elderly.

Preoperative preparation: [I,D]
- prevention of IOP spikes: topical apraclonidine 1% (or brimonidine) and/or oral acetazolamide one hour prior to the procedure and immediately afterwards
- topical anaesthesia

Procedure: [II,D]

Argon laser (Green or Blue/Green)
Diode laser
Selective laser (SLT): large spot size, high power, low energy Q-switched, frequency doubled neodymium:YAG (532 nm) system

Lens:
- Goldmann type gonioscopy lens
- Ritch trabeculoplasty lens©
- CGA © Meridian
- Latina (SLT)
- Magnaview goniolens

- Identify angle landmarks
- Laser burns placed between the anterior pigmented trabecular meshwork and the non-pigmented trabecular meshwork ie mid to anterior third of the trabecular meshwork over 180 or 360 degrees. [I,D]

If necessary, repeat 2 weeks later over the other 180 degrees if only half circumference was initially treated. [II,D]
When electing to perform two sessions of 180 degrees, make sure not to repeat the treatment in the same quadrant. [I,D]

Laser parameters: [I,D]

Argon

Diameter:		50 µm
	Exposure time	0.1 seconds
	Power	500-1200 mW according to the reaction on the trabecular meshwork
	Optimal reaction	transient blanching or small gas bubble formation

SLT

Diameter		400 µm (fixed)
	Exposure time	3 ns (fixed)
	Power	0,4 to 1, 2 mJ
	Optimal reaction	blanching or cavitation bubble are not desirable= start at 0,8 mJ and decrease the energy by increments of 0,1 mJ until there are no visible bubbles

Complications:

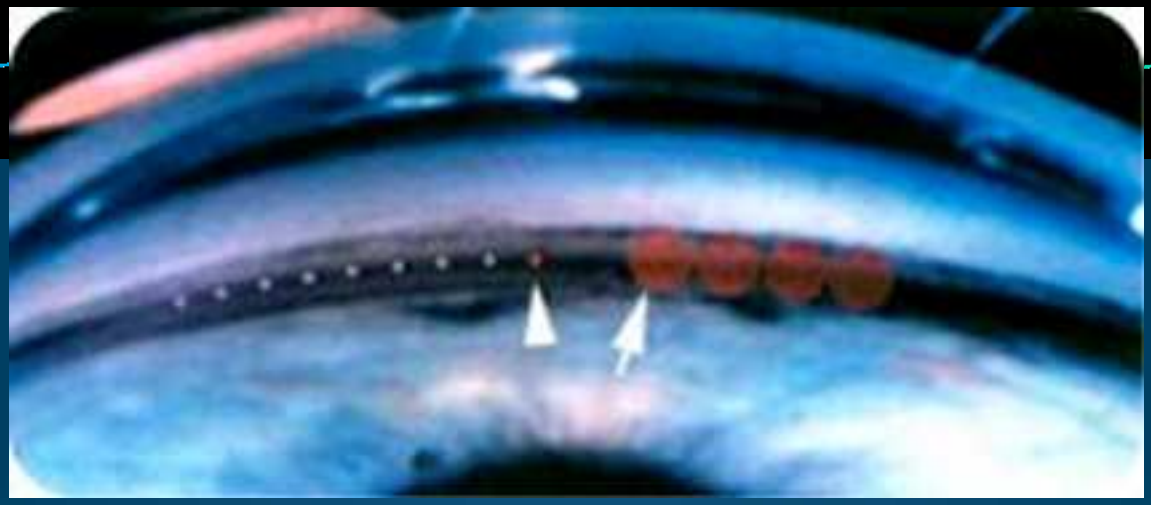
Transient decrease in visual acuity due to gonioscopy contact fluid, inflammation, significant IOP elevation
Transient iritis
Early and transient IOP elevations
hemorrhage
Visual field loss as a consequence of IOP spikes
Peripheral anterior synechiae, especially after posteriorly placed burns, or a narrow drainage angle
Late IOP rise due to loss of effect (not infrequent after longer follow-up)[34]

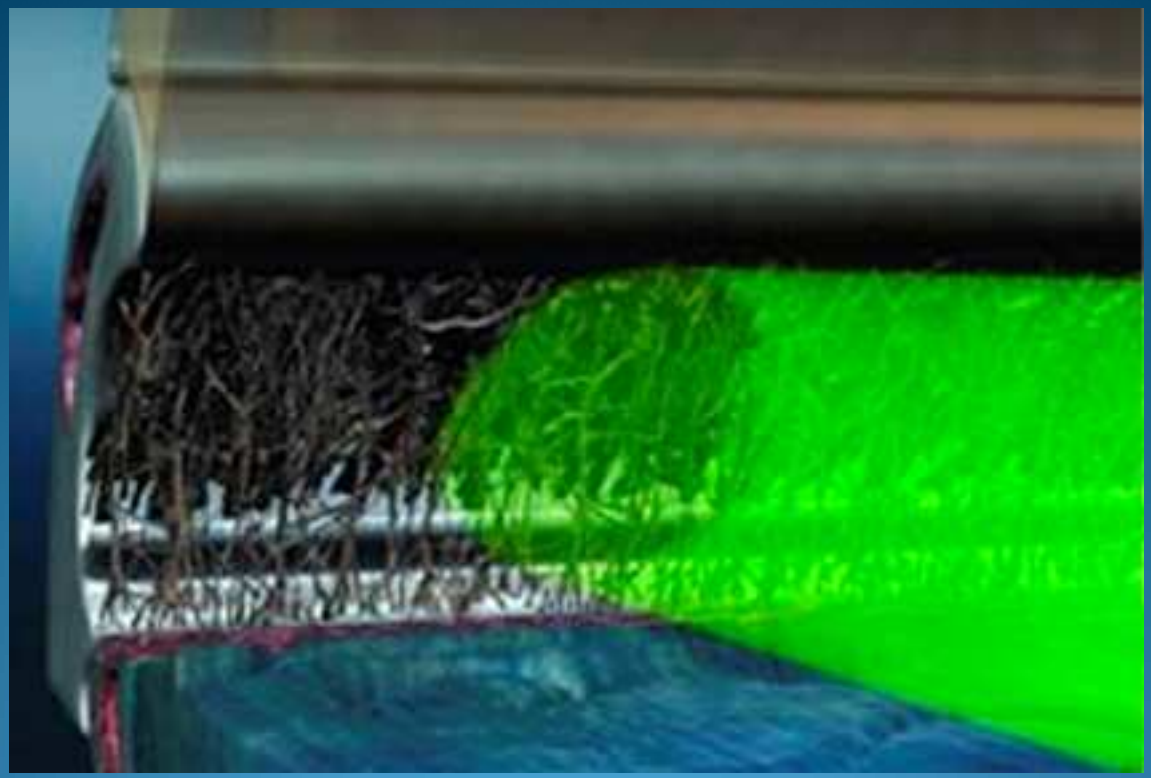
Post-operative management: [II,D]

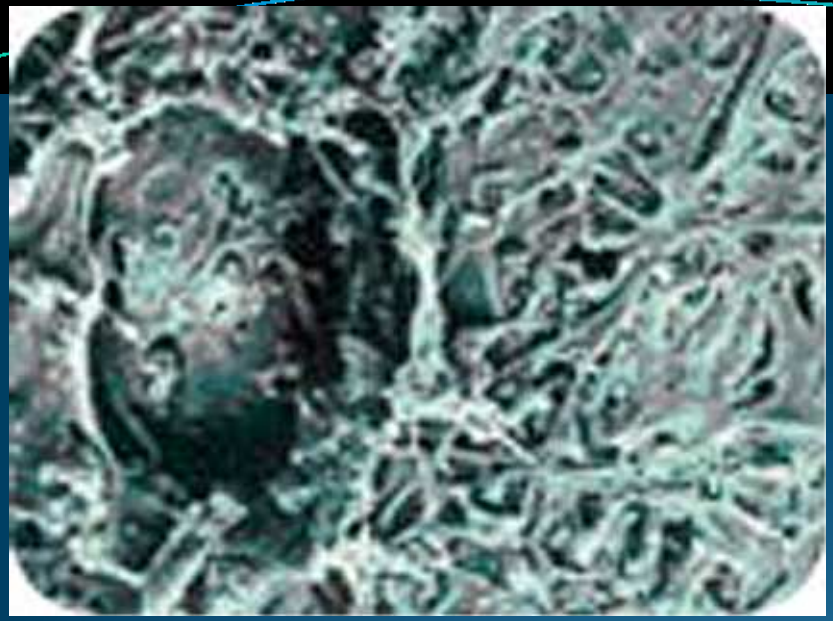
- Check the IOP during the first 1-6 hours. If this is not possible, treat with oral CAIs to prevent IOP spikes in susceptible patients.
- Topical corticosteroids or non-steroidal anti-inflammatory agent TID or QID for 4-7 days.

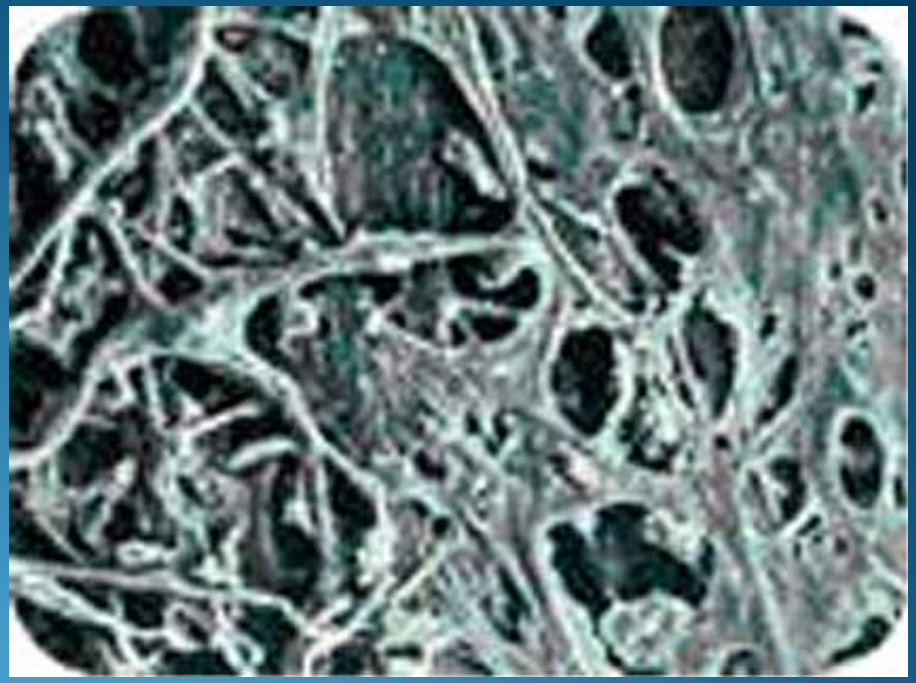
Close monitoring is suggested in the following cases: advanced glaucomatous optic nerve damage with severe field loss, one-eyed patients, high pre-laser IOP, exfoliation syndrome, previous laser trabeculoplasty[II,D]

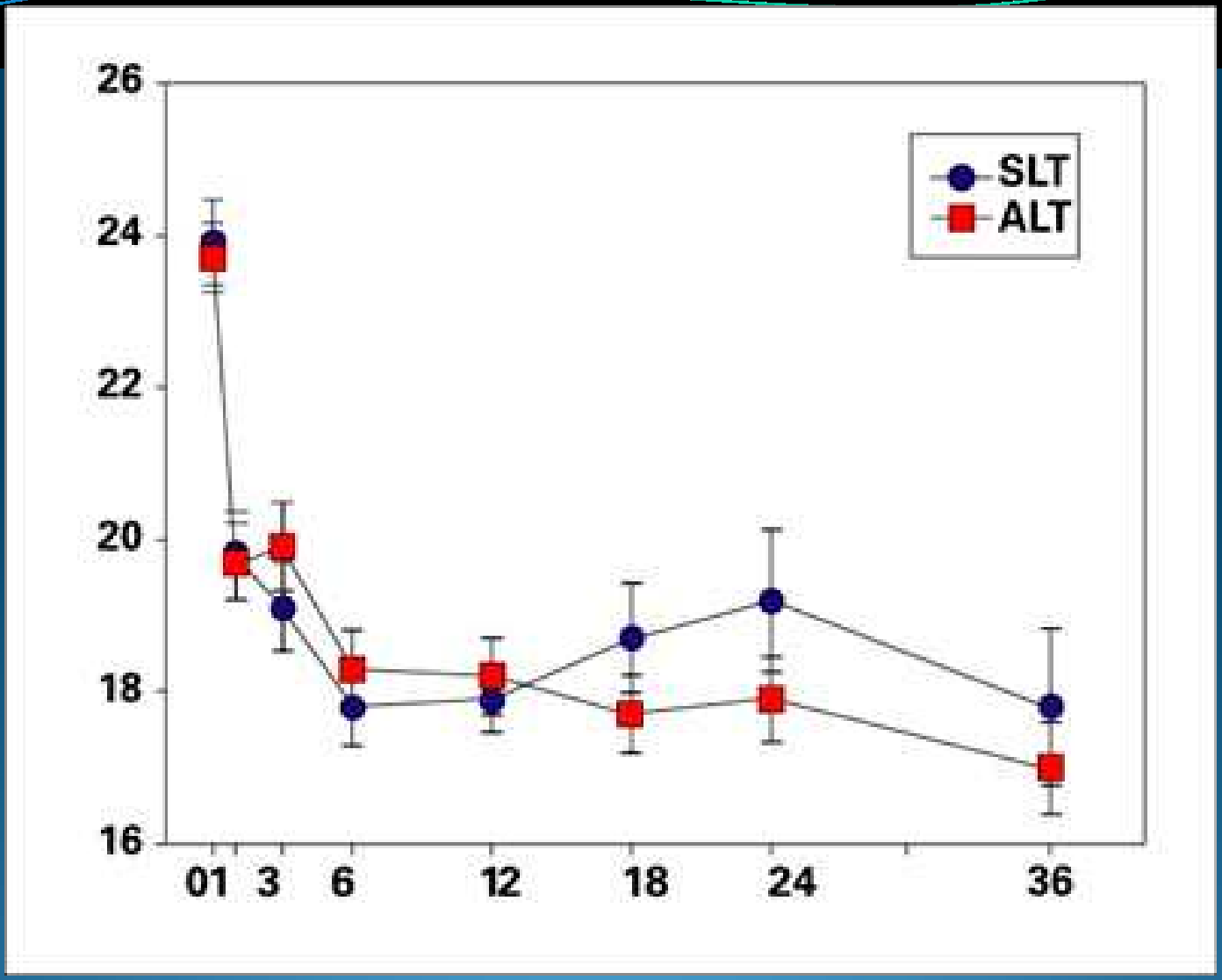
Effectiveness of laser trabeculoplasty










26
24
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20
18
16
01
3
6
12
18
24
36
SLT
ALT

1: J Glaucoma. 2008 Sep;17(6):497-502.

Selective laser trabeculoplasty: a review.

Realini T.

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realinia@wvuh.com

The introduction of selective laser trabeculoplasty (SLT) has renewed interest in laser trabeculoplasty for the reduction of intraocular pressure (IOP) in eyes with glaucoma. This review was undertaken to address frequently raised issues pertinent to SLT in clinical practice. On the basis of the peer-reviewed medical literature, SLT demonstrates equivalent efficacy and comparable safety to argon laser trabeculoplasty, and is also equally as effective as topical medical therapy. SLT's safety profile includes mild and transient inflammation, ocular pain, and a small risk of moderate IOP elevations after the procedure. The mechanism of action of SLT is not known. SLT delivers less energy to the trabecular meshwork and generates less damage to angle tissues. Whether this renders SLT more repeatable than argon laser trabeculoplasty has not been evaluated in published data. SLT seems to be a safe and effective means of IOP reduction in eyes with glaucoma, and can reasonably be applied as primary or adjunctive therapy.

PMID: 18794688 [PubMed - indexed for MEDLINE]

TABLE 1. Summary of Studies Comparing Selective and Argon Laser Trabeculoplasty

Lead Author	Study Design	No. Eyes	Previous Therapy	Mean Follow-up	Outcome Measure	Results SLT	Results ALT	*P*
Damji	Prospective RCT	36	MMT ± prior ALT	6 mo	Mean IOP reduction	4.8 mm Hg	4.7 mm Hg	0.97
Popiela	Prospective RCT	27	MMT	3 mo	Mean IOP reduction	2.85 mm Hg	2.63 mm Hg	0.84
Martinez-de-la-Casa	Prospective RCT	40	MMT	6 mo	Mean IOP	18.6 mm Hg (baseline 24 mm Hg)	19.0 mm Hg (baseline 23.6 mm Hg)	0.81
Damji	Prospective RCT	176	MMT ± prior ALT	12 mo	Mean IOP reduction	5.86 mm Hg	6.04 mm Hg	0.846
Best*	Prospective RCT	165	MMT	12 mo	Mean IOP reduction	1.8 mm Hg	2.1 mm Hg	NS
Juzych	Retrospective case series	195	MMT ± prior ALT	37.4 mo (SLT), 33.6 mo (ALT)	Percent with ≥3 mm Hg reduction without further therapy	1 y: 58% 3 y: 38% 5 y: 32%	1 y: 54% 3 y: 30% 5 y: 31%	0.20
					Percent with ≥20% IOP reduction without further therapy	1 y: 68% 3 y: 46% 5 y: 31%	1 y: 46% 3 y: 23% 5 y: 13%	0.12
Van de Veire	Retrospective case series	56	Topical medications	3 to 5 wk	Percent IOP reduction	15.5%	22.2%	0.141

*Data presented here excludes 119 eyes treated with an alternative SLT laser system.
ALT indicates argon laser trabeculoplasty; IOP, intraocular pressure; MMT, maximal medical therapy; NS, not significant; RCT, randomized controlled trial; SLT, selective laser trabeculoplasty.

Pneumotrabéculoplastie : PNT

Le matériel

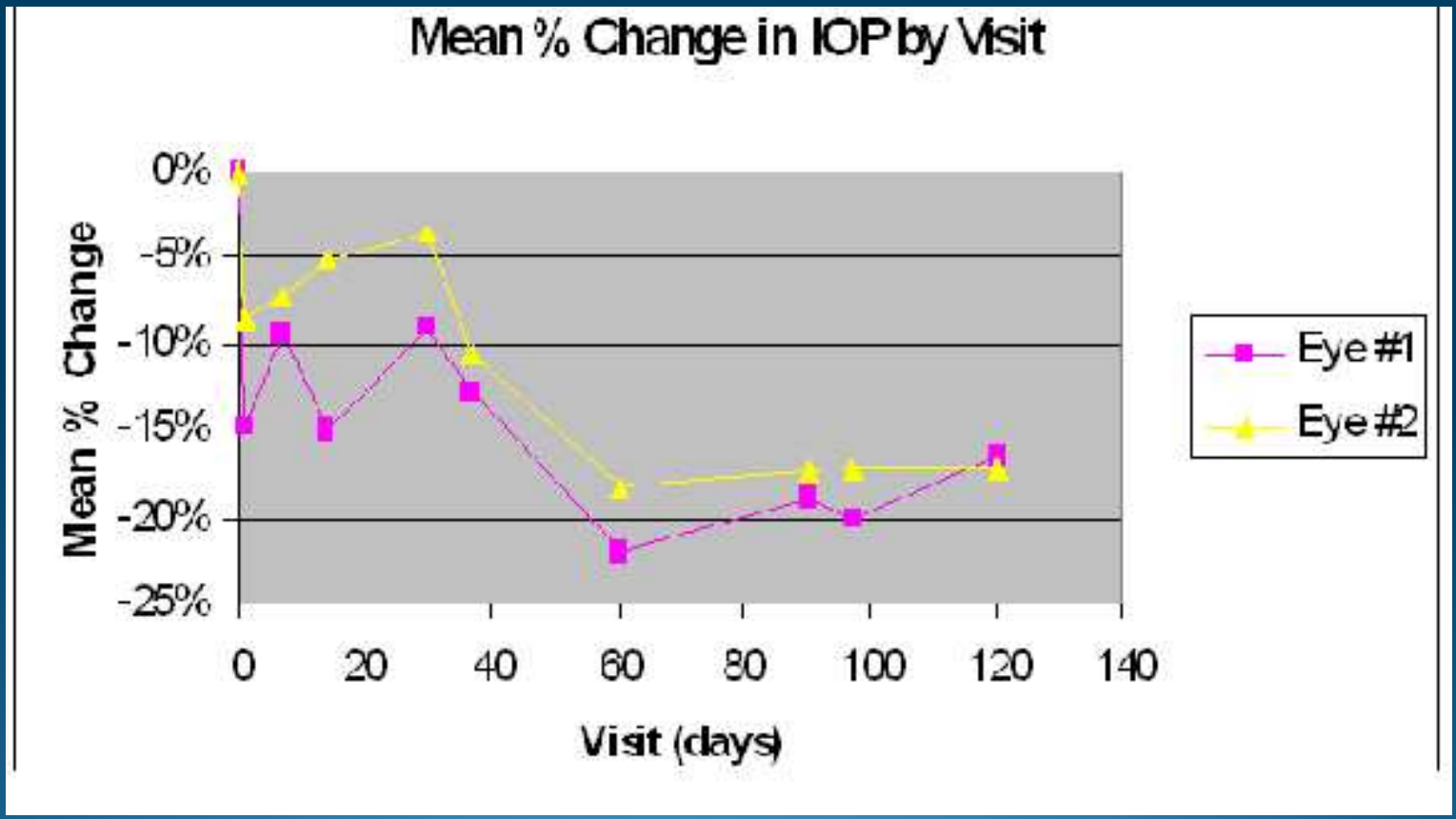
un anneau de succion spécialement conçu pour apporter une dépression homogène à la surface de l'œil, stérile et jetable

un contrôleur qui régule le temps et l'intensité de la dépression

les deux éléments sont reliés par une tubulure spécifique

En Pratique :

- anesthésie topique
- anneau aspiration relié à un contrôleur
- 1 minute d ’aspiration puis 5’ de pause et une minute d’aspiration
- deuxième procédure identique à une semaine
- puis tous les 3 - 4 mois
- chémosis – Hgies s/conj fréquentes post op!


Mean % Change in IOP by Visit
Mean % Change
0%
-5%
-10%
-15%
-20%
-25%
0
20
40
60
80
100
120
140
Visit (days)
Eye #1
Eye #2

1: Graefes Arch Clin Exp Ophthalmol. 2009 Aug;247(8):1103-9. Epub 2009 Feb 27.

Pneumatic trabeculoplasty vs latanoprost as adjunctive therapy to timolol in primary open-angle glaucoma or ocular hypertension.

Uva MG, **Longo A**, **Reibaldi M**.

Institute of Ophthalmology, University of Catania, Catania, Italy.

PURPOSE: To evaluate the efficacy and safety of pneumatic trabeculoplasty (PNT) compared with latanoprost 0.005%, in primary open-angle glaucoma (POAG) and ocular hypertension (OH) not controlled by timolol 0.5%. PROCEDURES: In a randomized clinical study, 18 patients affected with primary open-angle glaucoma (POAG) or ocular hypertension (OH) with intraocular pressure (IOP) >20 mmHg after timolol 0.5% in one eye were treated with PNT; 18 control eyes received adjunctive therapy with latanoprost 0.005%. Visual acuity, IOP, visual field, biomicroscopy findings and fundus appearance were evaluated at each month. Patients with IOP >20 mmHg were excluded from the study. The study was continued until in one group no patients were left. RESULTS: At 1 month, IOP had decreased significantly in both groups. In PNT-treated eyes the mean IOP decrease was 4.5 +/- 1.8 mmHg (19.1 +/- 7.8%) and in latanoprost-treated eyes was 6.6 +/- 1.3 mmHg (28.2 +/- 5.7%) (between two groups, P < 0.001). Eleven PNT-treated eyes (61%) and 17 latanoprost-treated eyes (94%) had an IOP reduction of more than 20% of baseline value (P = 0.049); two PNT-treated patients received additional therapy. At the following months, in the latanoprost group, IOP was stable: an IOP reduction of 20% or more was seen in 89% of the eyes. In some PNT-treated eyes IOP increased: at 2 months, an IOP reduction> or =20% was seen in 50%, at 3 months in 33%, and at 4 months in 17% of the eyes. (between the two groups, respectively, P = 0.03, P = 0.002, P < 0.001). The number of eyes that required therapy increased progressively in the PNT group, and at 8 months all eyes had required therapy, whereas one latanoprost-treated eye had had additional therapy. After PNT, no patients had visual acuity reduction or intraocular inflammation; three eyes had subconjunctival hemorrhage and five eyes a hyperemia that regressed within 1 week. No posterior segment changes or visual field progression were detected in either groups. CONCLUSIONS: In eyes with glaucomatous damage that is not advanced, PNT can reduce the IOP in 60% of the eyes at 1 month, and in 33% of the eyes at 3 months, without significant side-effects. The indications, efficacy and safety of PNT retreatments remain to be investigated. IOP reduction is less and of shorter duration than that obtained by latanoprost adjunctive therapy.

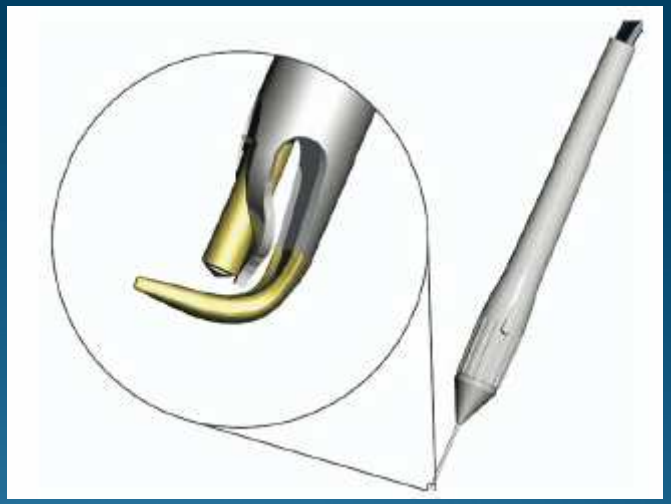
PMID: 19247684 [PubMed - in process]

Trabectome

Clinical Results with the Trabectome for Treatment of Open-Angle Glaucoma

Don S. Minckler, MD,[1] George Baerveldt, MD,[2] Marina Ramirez Alfaro, MD,[3] Brian A. Francis, MD[1]

Trabectome



Trabectome

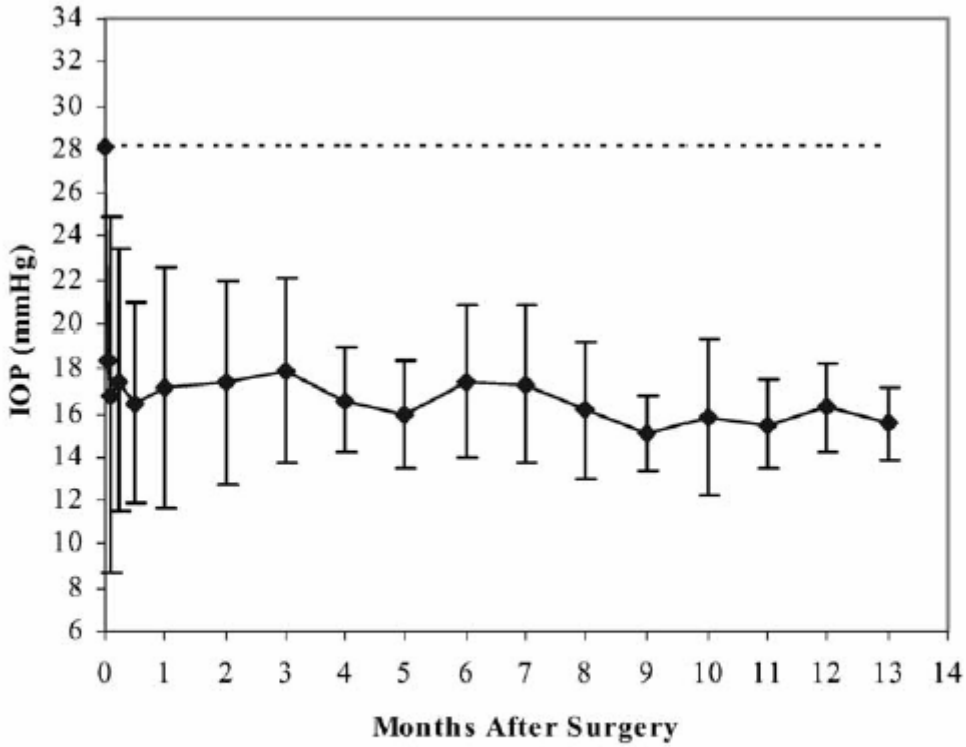


Figure 3. Summary graph illustrating the time course of postoperative intraocular pressure (IOP) results (with standard deviation bars) below baseline mean IOP.

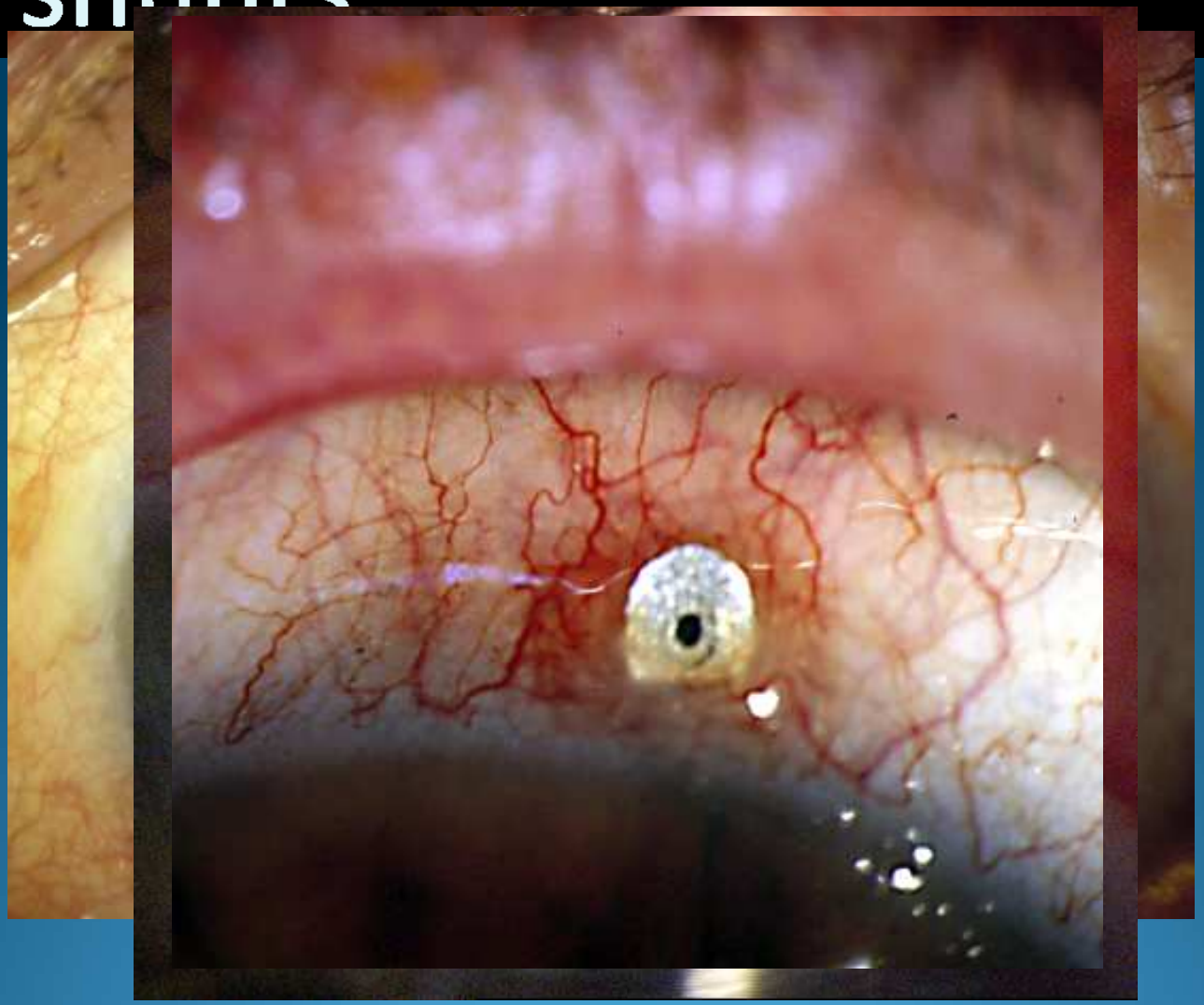
Les shunts

Long term effect on IOP of a stainless steel glaucoma drainage implant (Ex-PRESS) in combined surgery with phacoemulsification

C E Traverso, F De Feo, A Messas-Kaplan, P Denis, S Levartovsky, E Sellem, F Badalà, Z Zagorski, A Bron, M Belkin

Br J Ophthalmol 2005;**89**:425–429. doi: 10.1136/bjo.2004.058032

Les shunts

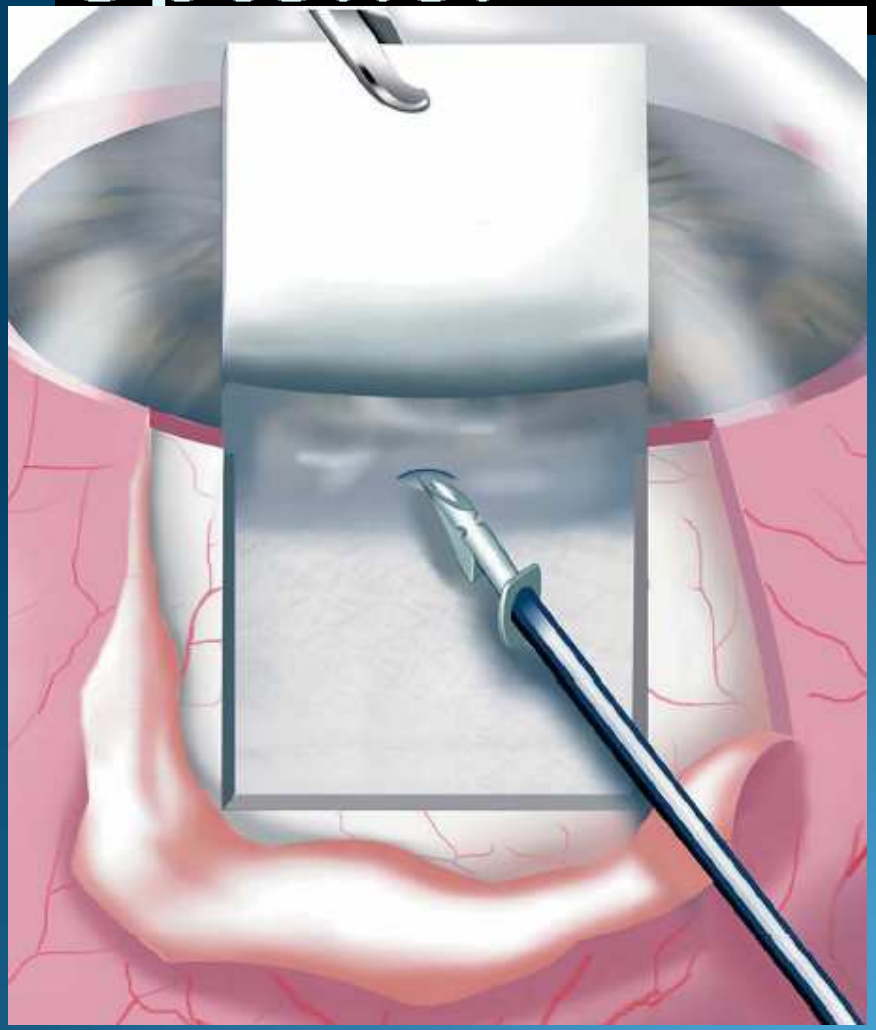


Optonol

Implantation of a Miniature Glaucoma Device Under a Scleral Flap

Elie Dahan, MD, MMed Ophth and Trevor R. Carmichael, MD, PhD

Optonol



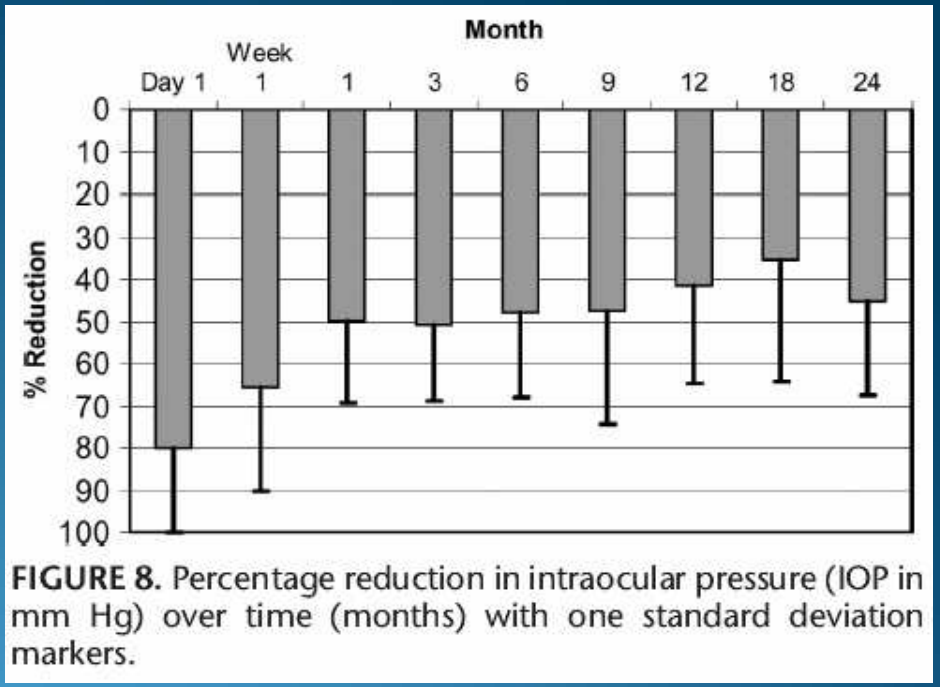


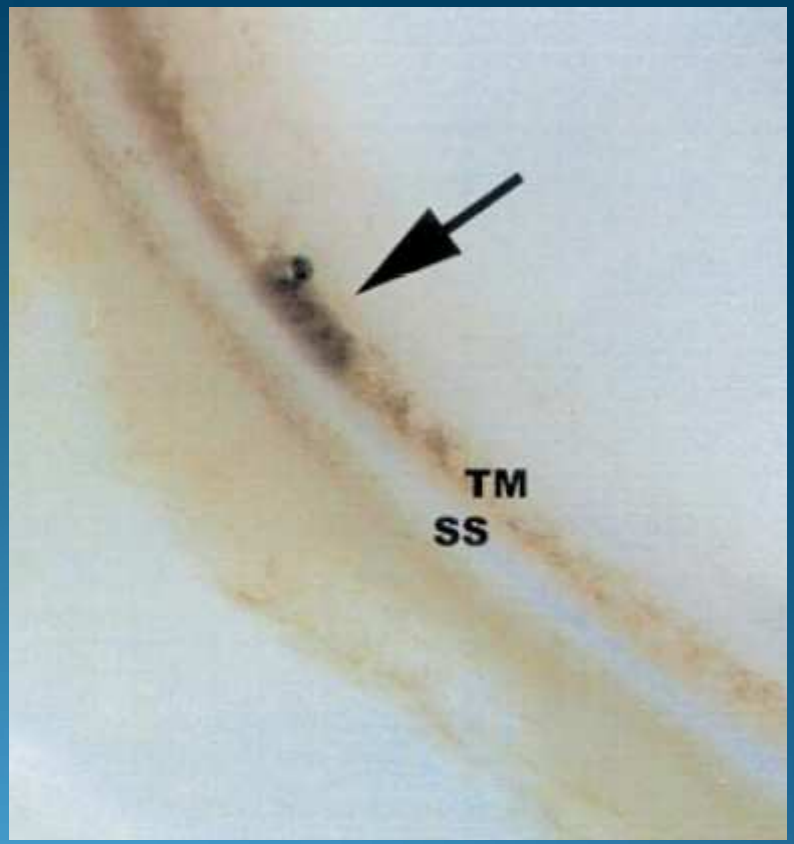
FIGURE 8. Percentage reduction in intraocular pressure (IOP in mm Hg) over time (months) with one standard deviation markers.

Istent

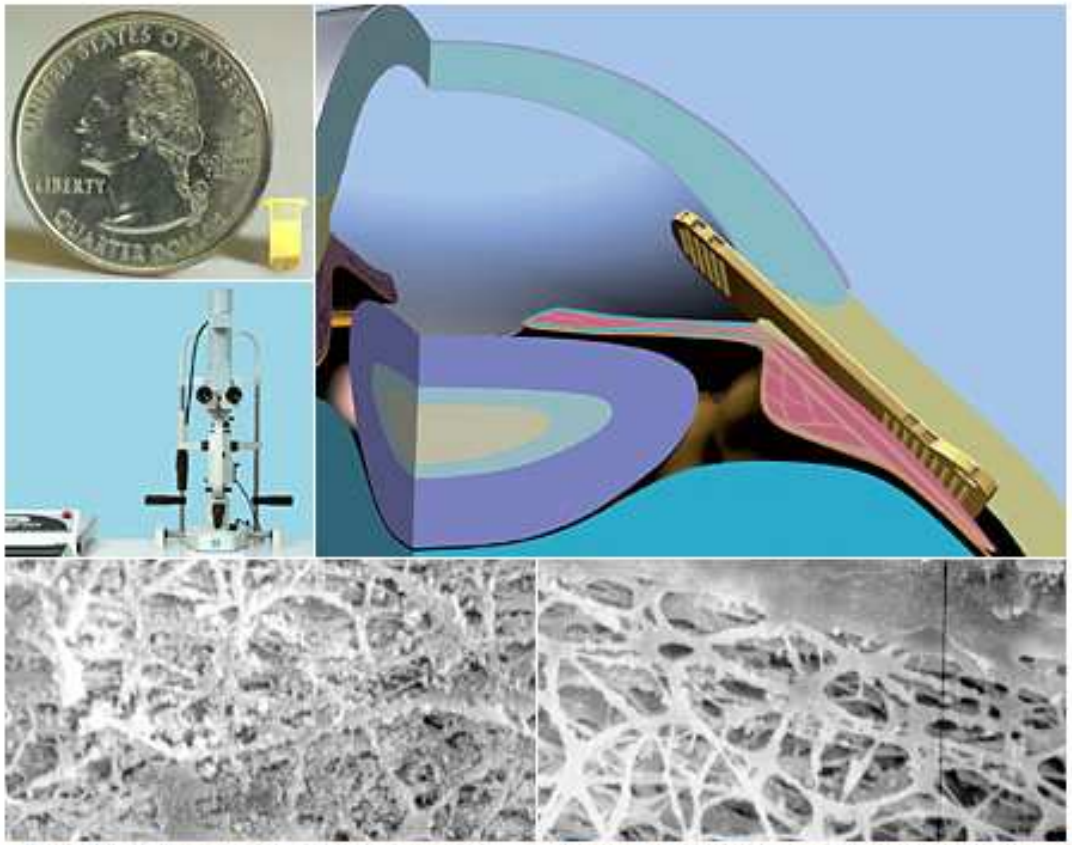
Trabecular Bypass Stents Decrease Intraocular Pressure in Cultured Human Anterior Segments

CINDY K. BAHLER, BS, GREGORY T. SMEDLEY, PHD, JIANBO ZHOU, PHD, AND DOUGLAS H. JOHNSON, MD

Istent

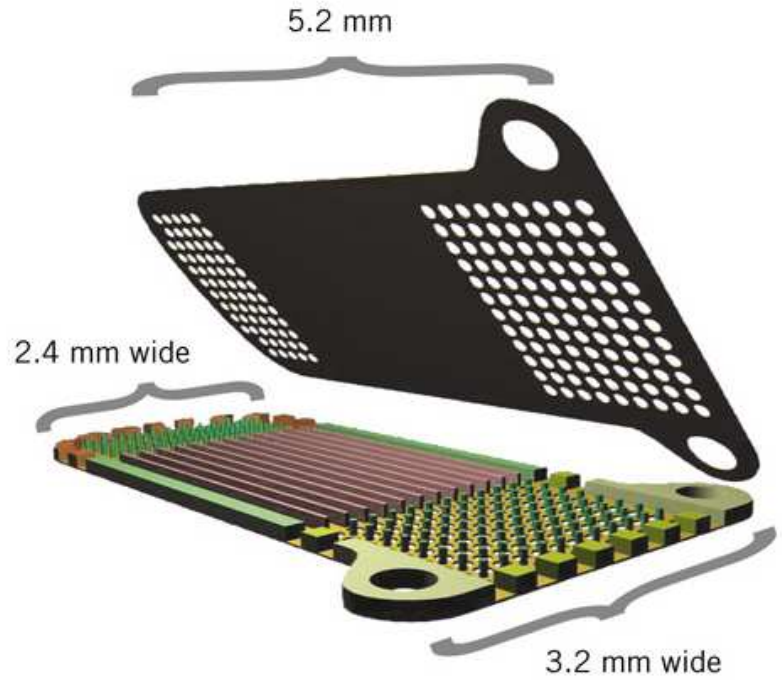


SOLX

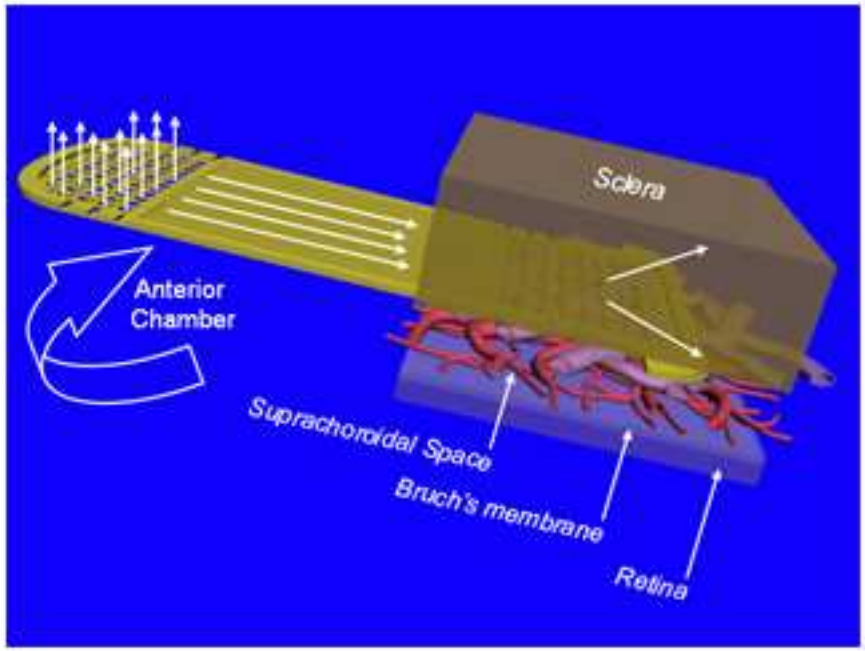


The SOLX DeepLight Glaucoma Treatment System combines a titanium sapphire laser with a gold shunt (shown at far left next to a quarter and right inserted into an eye). At lower left and right are photos of a patient trabecular meshwork before and after treatment.

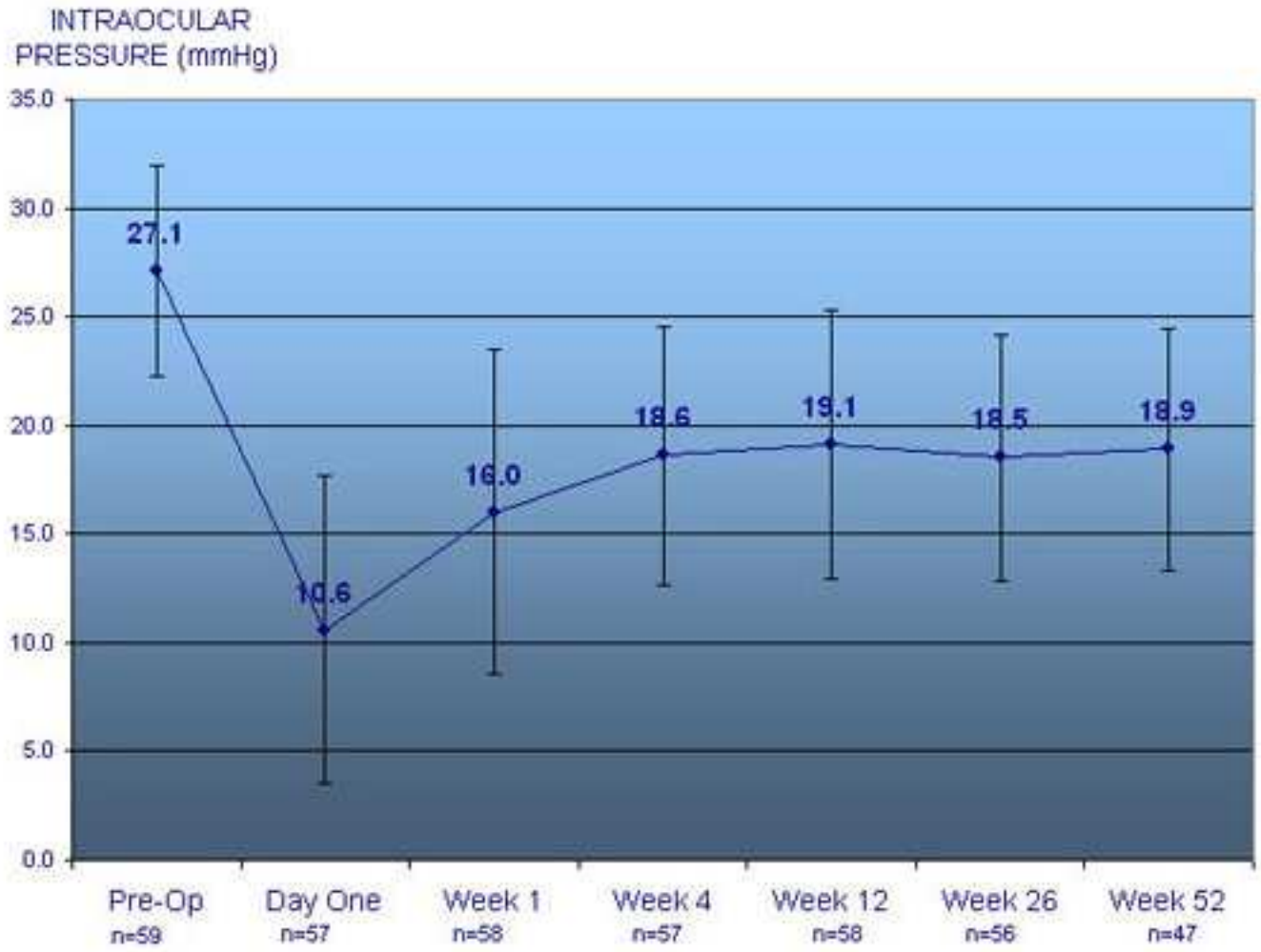
Interior View of SOLX® Gold Shunt



Function of SOLX® Gold Shunt



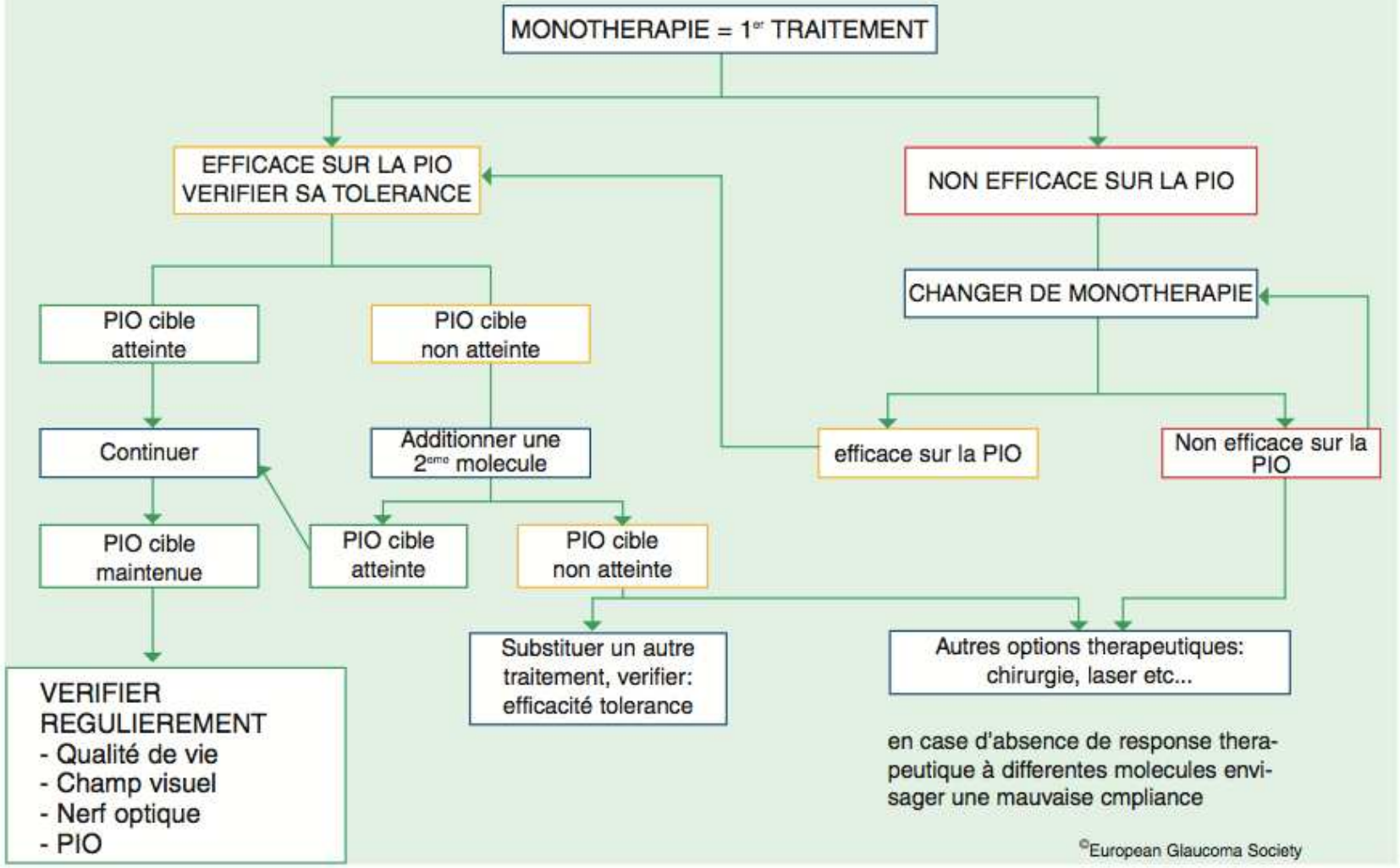
Effectiveness: SOLX® Gold Shunt Pilot Study



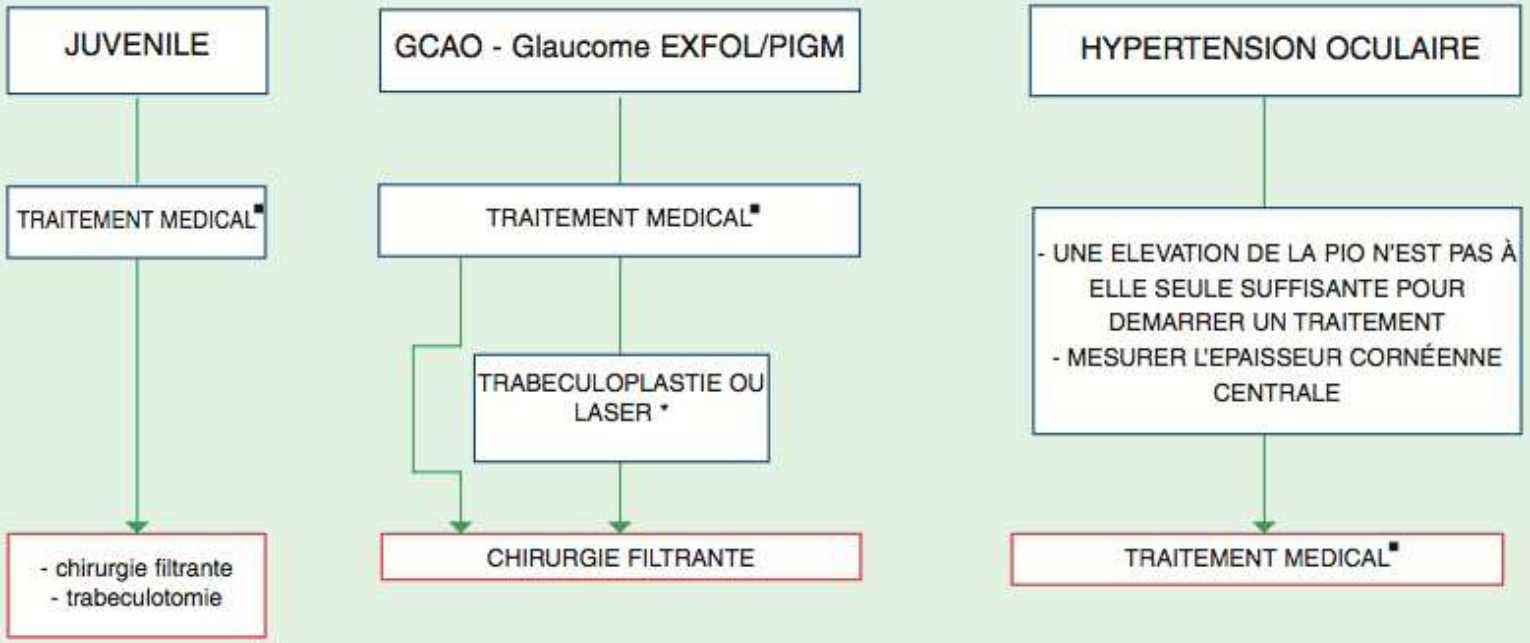
En pratique ……

Restons raisonnable !

VIII - TRAITEMENT MEDICAL DU GLAUCOME



VII - ETAPES THERAPEUTIQUES



SI LE SCHEMA THERAPEUTIQUE CI DESSUS N'EST PAS EFFICACE ENVISAGER UNE AUTRE CHIRURGIE FILTRANTE AVEC ANTI-METABOLITES OU LA MISE EN PLACE D'UN IMPLANT DE DRAINAGE OU LA REALISATION D'UN CYCLO AFFAIBLISSEMENT

* Dans certains cas, il peut être necessaire d'envisager une chirurgie filtrante sans avoir recours à une trabéculoplastie au laser

▪ Jusqu'a 2 à 3 molécules différentes. Ne pas ajouter une molecule à une précedente non efficace = envisager un changement de molécule ("switch")

XII - CHIRURGIE : QUELLE MÉTHODE ?

GONIOTOMIE → Congenital, Infantile

TRABECULOTOMIE → Congenital, Infantile

TRABECULECTOMIE
1er choix en cas de :
- GPAO
- Glaucomes secondaires

- sans antimetabolités → sujets âge avec atteinte moyenne/moderée
- ? → glaucome pigmentaire ou pseudoexfoliation
- → sujets jeunes, congenital, infantile
- avec 5-FU / MITOMYCINE →
  - antecedent de chirurgie oculaire avec incision conjonctivale
  - pathologies inflammatoires
  - PIO cible basse nécessaire
  - glaucome néovasculaire
  - uveite
  - traitement anti-glaucomateux au long cours
  - pemphygoide oculaire
  - syndrome de Stevens-Johnson

chirurgie filtrante non perforante (CFNP) en cas de GPAO si la PIO cible n'est pas trés basse

TUBES DE DRAINAGE → si la conjonctive n'est pas dissequable pour réaliser une trabeculectomie dans le quadrant superieur

CYCLODESTRUCTION → géneralement dans les cas de mauvais pronostics - les indications varient avec la technique cryoapplication ou photocoagulation

- L’expérience est le commencement de la sagesse

  Alcman de Sardes

  (Poète grec du VIIe s. av. J.C.)

- Conservons par la sagesse ce que nous avons acquis par l’enthousiasme.

  Condorcet