Use of Biodegradable Collagen Matrix Implant as Adjunct in Valve Implantation for Uveitic Glaucoma

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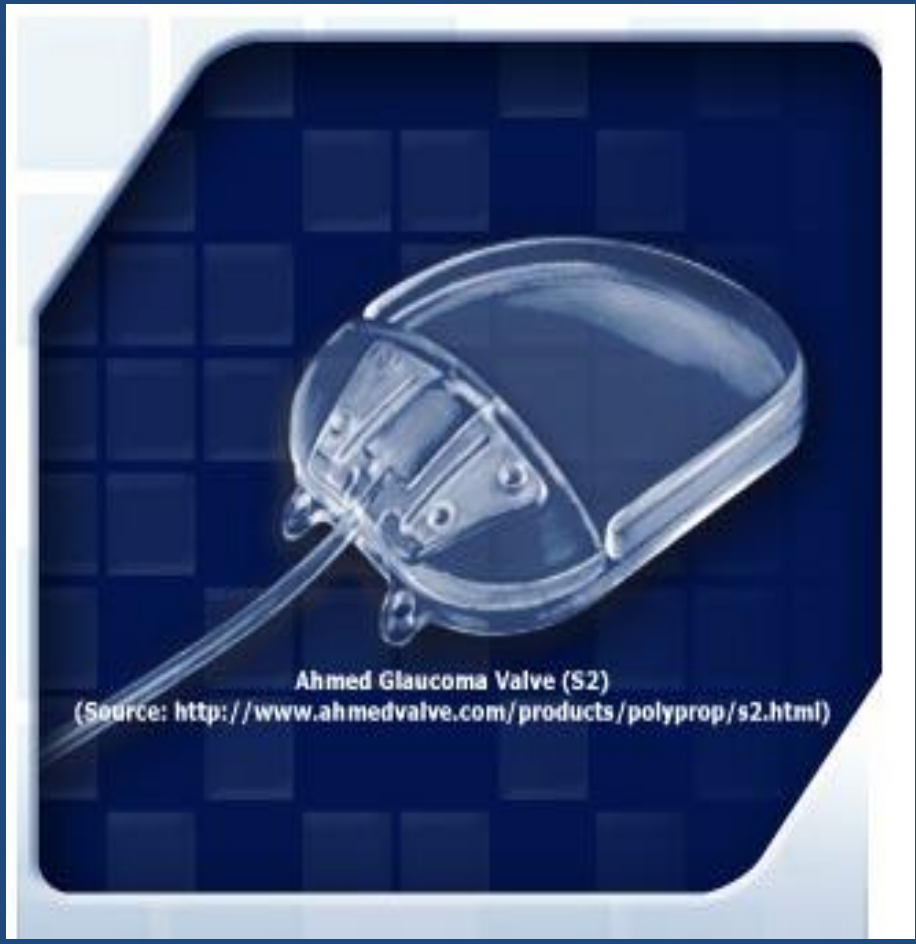
Management of Uveitic Glaucoma

- Management can be very challenging
- First line agents: topical beta-adrenergic antagonists, alpha$_2$ agonists, & carbonic anhydrase inhibitors,
- Surgical treatment indicated for uncontrolled IOP
  - Trabeculectomy – high early success rate but long term failure due to fibrosis & inflammation of filtration bleb
  - Potential risk of hypotony with trabeculectomy in uveitic glaucoma patients
  - Complications with anti-metabolites include prolonged wound healing, epithelial defects, conjunctival wound defects, late bleb rupture, & postoperative endophthalmitis
- Glaucoma drainage devices (GDD) – promising treatment for uveitic glaucoma to overcome complications of surgery with antimetabolite use

Ahmed Glaucoma Valve Implant

- Indicated as primary procedure in cases where trab + antimetabolites thought to have low chance of success (e.g. uveitic glaucoma)
- Consists of silicone tube attached to polyproylene body & plate
- Valve mechanism with 2 silicone elastomer membranes → create Venturi-shaped chamber
- Membranes – pretensioned to open & close with changes in IOP



Success of Ahmed Valve Implantation

- Comparable success rates to filtering surgery, but higher efficacy reported long-term
- Gil-Carrasco, et al. (1998)[1]: 14 PTs, 57% success rate, 1-2 year F/U
- Wu, et al. (2003)[2]: 19 PTs, 58% success rate, 6 month F/U
- Papadaki, et al. (2007)[3]: 60 PTs, 77% & 50% success rate, 1 & 4 year F/U, respectively

Complications of Ahmed Valve

- Complications include postoperative hypotony, elevation in IOP, corneal decompensation, & conjunctival melting
- Hypertensive phase after valve implantation may result in bleb fibrosis & inadequate control of IOP
  - Rigid consistency of polypropylene may attract white cells & collagen to grow on surface of valve → fibrosis & scarring
  - Graft failure from fibrosis – most common long-term complication
  - Attempts to prevent fibrosis with use of anti-metabolites, but this can lead to other complications (e.g. conjunctival thinning & scarring)

Ologen: Biodegradable Collagen Implant

- Porous collagen-glycosaminoglycan matrix
- Acts as a wound-healing scaffold for structurally more normal tissue instead of scar tissue
- Avoids direct contact with conjunctiva & silicone tube
- Reduces fibrosis in the filtering bleb area
- Limits use of anti-metabolite for wound healing

Courtesy of optous.com

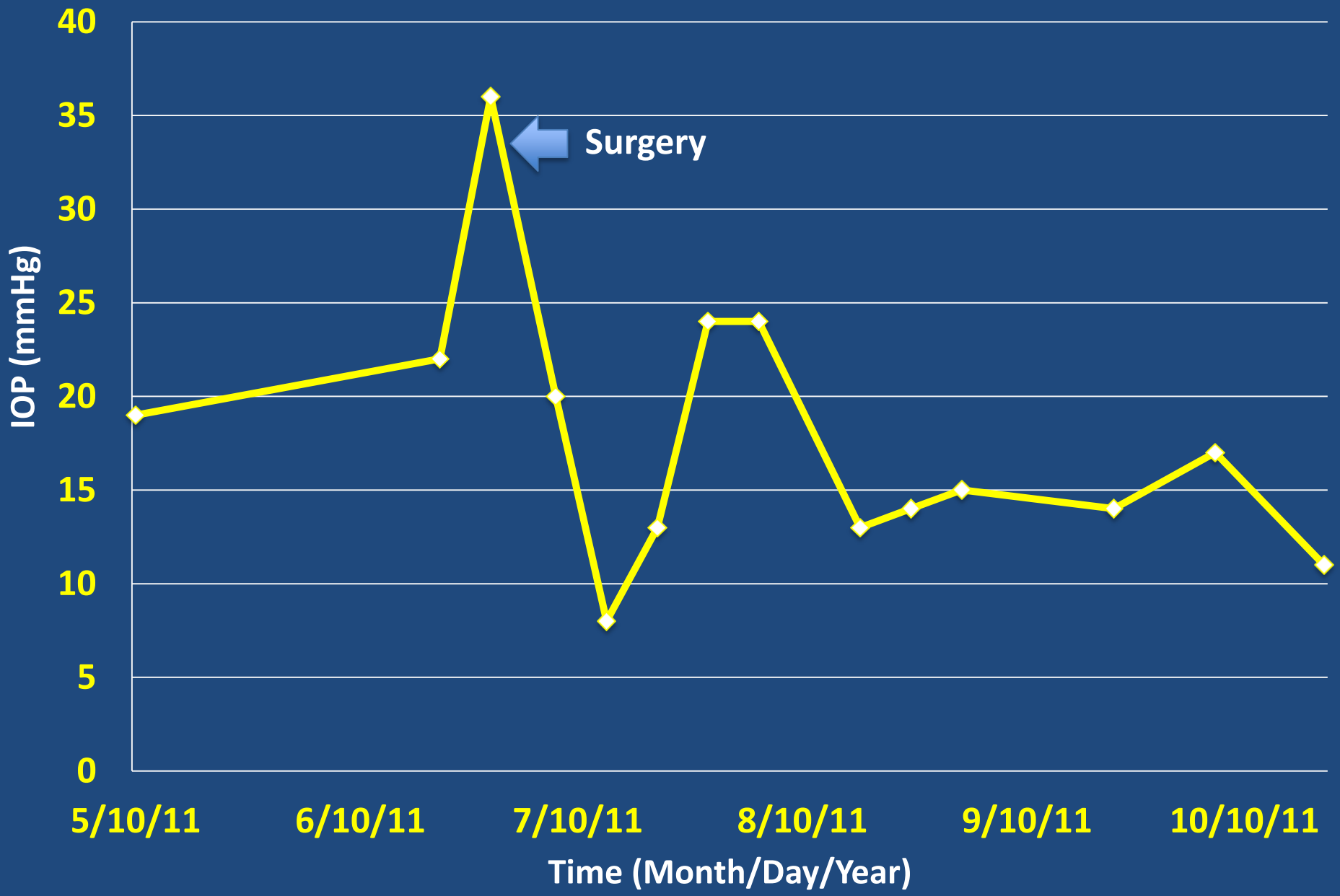
Patient N.G.

- 91 year old African American female, referred for glaucoma evaluation
- No significant medical problems
- Ocular History: chronic iritis, cataract OS, & IOL OD
- Developed advanced glaucoma in the right eye, which proved resistant to medical therapy

Surgical technique & F/U

- Subconjunctival sub-tenon pocket was dissected & Ahmed valve placed in supertemporal quadrant with two 9-0 nylon sutures
- After tube sewn to anterior chamber, Ologen implant placed over the plate and distal tube
- Rotational flap of adjacent conjunctiva used to cover Ologen implant
- Patient tolerated procedure well & no complications

OD Pressure


40
35
30
25
20
15
10
5
0
IOP (mmHg)
Surgery
5/10/11
6/10/11
7/10/11
8/10/11
9/10/11
10/10/11
Time (Month/Day/Year)

Results

- No postoperative complications or side effects noted at 3 month F/U
- Ahmed implant was successful in controlling uveitic glaucoma
- Ologen graft did not prevent hypertensive phase
- Patient ended up using 3 medications to control IOP post op
- Pre-op & Post-op visual acuity remained unchanged: 20/70

Conclusions

- GDD failure may result from fibrosis of conjunctiva & tenons capsule around implant
- The Ologen implant appeared to be a safe adjunct to Ahmed GDD implantation
- Ologen did not prevent hypertensive phase
- Further studies are needed to verify the efficacy & safety of Ologen as an adjunct in GDD implantation

References

1. Gil-Carrasco, F, Salinas-van Orman E, Recillas-Gispert C, et al. Ahmed valve implant for uncontrolled uveitic glaucoma. *Ocul Immuno Inflamm* 1998;6:27-37.
2. Wu, SC, Huang S, Lin K. Clinical experience with the Ahmed glaucoma valve implant in complicated glaucoma. *Chang Gung Med J* 2003;26:904-10.
3. Papadaki T, Zacharopoulos IP, Pasquale LR, et al. Long term results for Ahmed glaucoma valve implantation for uveitic glaucoma. *Am J Ophthalmol.* July 2007;144(1):62-69.