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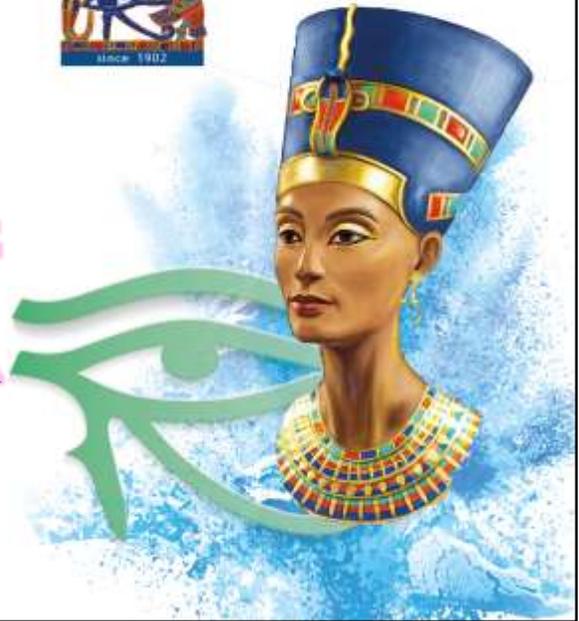
EGYPTIAN OPHTHALMOLOGICAL SOCIETY

**EOS 2023**



# GONIECTOMY, A GAME CHANGER IN THE MANAGEMENT OF CONGENITAL GLAUCOMA IN THE NILE DELTA REGION

By  
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- **CONGENITAL GLAUCOMA** is primarily a **surgical** disease, and medical treatment is of limited use. <sup>1</sup>
- The IOP-lowering effect of all glaucoma surgeries **decreases** over time. <sup>1</sup>
- **Multiple** surgeries are often required over a child's lifetime. <sup>2</sup>

## Congenital Glaucoma Surgery Approaches

### Ab-externo (Conjunctiva violating)

- Trabeculotomy
- Trabeculectomy
- Combined trab/trab
- Glaucoma drainage devices

### Ab-Interno (Non-Conjunctiva violating)

- Goniotomy
- Goniectomy
- GATT
- iStent



1) Kaur K, Gurnani B. Primary Congenital Glaucoma. [Updated 2022 Dec 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022

2) Mohammedsaleh, A., Raffa, L. H., Almarzouki, N., Jubran, R. M., Al-Harbi, A., Alluqmani, A. H., & Mousa, A. (2020). Surgical Outcomes in Children With Primary Congenital Glaucoma: An Eight-Year Experience. *Cureus*, 12(8). <https://doi.org/10.7759/cureus.9602>

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## Ab-externo (Conjunctiva violating)

- Conjunctival violating surgeries are **effective** but their effect **decreases** with time
- There is increase liability for bleb related **complications**(eg, bleb leak, hypotony) or complications related to glaucoma drainage devices
- Once you **violate conjunctiva** in some area ,this will induce fibrosis in this area



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## Ab-Interno (Non-Conjunctiva violating)

### Goniotomy

**An incision** is made across the trabecular meshwork under direct gonioscopic visualization using a goniotomy knife or MVR

### Goniectomy

**Excision** of TM and **deroofing of inner wall** of the schlemms canal  
This can be done either by

- the disposable Kahook Dual blade
- **25-gauge needle bent at the tip (BANG)**

### LIMITATIONS Corneal clarity

Only nasal angle can be treated (inferior angle ??)



Intraoperative view of eye's drainage system as a goniotomy is being performed.



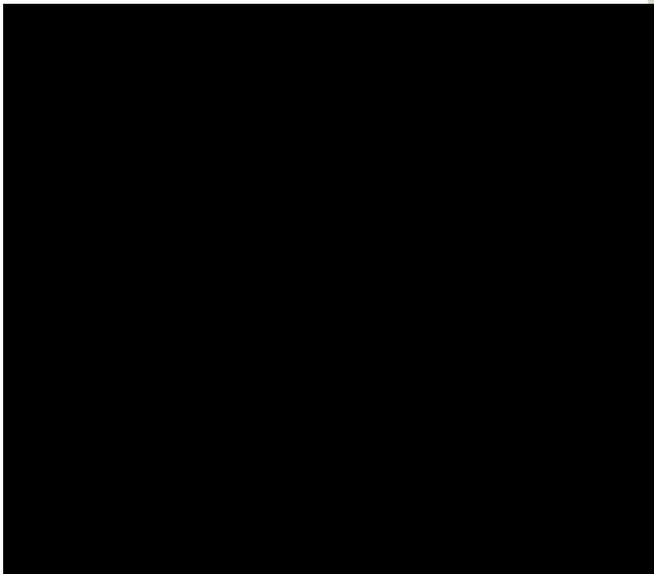
Goniotomy removal of the surface layer of the drain.

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## Why BANG ?????

- Conjunctival non violating
- Minimally invasive
- Safe
- Effective
- Low cost
- Rapid recovery
- minimally traumatic to the target tissue

Sometimes  
With only insulin syringe ,you can solve big problems



**In 2021 (44 eyes)**

- We published **THE SURGICAL OUTCOMES OF PCG IN INFANTS FROM THE NILE DELTA REGION** from 2015 to 2019. <sup>1</sup>

- **Single glaucoma surgery** was performed in **29** eyes (65.9%)
- **Two surgeries** were performed in **11** eyes (25%)
- **Four eyes** underwent **more than two surgeries** (9%).

**1st surgery**

- Trabeculotomy (11 eyes)
- Trabeculotomy-Trabeculectomy with MMC (8 eyes)
- Trabeculotomy with MMC (25 eyes)

**2nd surgery**

- Trabeculotomy-Trabeculectomy with MMC (3eyes)
- Trabeculectomy with MMC (10 eyes)
- Glaucoma Drainage Device (5 eyes)
- Diode Cyclophotocoagulation (6 eyes)

1) Farid MF, Anany M, Awwad MA. Surgical Outcomes of Primary Congenital Glaucoma in Children Under One Year from the Nile Delta. Clin Ophthalmol. 2021 Mar 16;15:1145-1151. doi: 10.2147/OPH.S299716. PMID: 33758497; PMCID: PMC7981150.

Clinical Ophthalmology  
ORIGINAL RESEARCH  
**Surgical Outcomes of Primary Congenital Glaucoma in Children Under One Year from the Nile Delta**

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**Purpose:** To present outcomes of surgical management of primary congenital glaucoma (PCG) in children less than one year of age in a population based in the Nile Delta.  
**Methods:** A retrospective review of medical records of patients with PCG less than one year of age at presentation who underwent surgical intervention in a tertiary care facility based in the Nile Delta. All patients underwent measurement of intraocular pressure (IOP), horizontal central corneal diameter (HCD), cup-to-disc ratio (CDR) before and after surgery and a minimum of 6 months follow up was required. Surgical success was defined as IOP less than 21mmHg without medication and without progression of visual disease parameters.  
**Results:** The review included 44 eyes of 28 consecutive patients who underwent surgical treatment for PCG. Average age at surgery was 1.7 months and mean follow up was 18.5 months. Preoperative IOP was 28.364 mmHg, HCD was 13.746 mm, and CDR (ratio) was 0.6341. A total of 67 surgical procedures were performed with an average of 1.56 procedures per eye. Postoperative IOP was 11.643 mmHg, HCD was 13.866 mm, and CDR was 0.3362 (P<0.0001). Surgical success was achieved in 33 eyes (72.7%) while eight developing postoperative complications were reported in 3 eyes.  
**Conclusions:** Surgical management of PCG younger than one year of age achieved good success rates in the region of the Nile Delta with low rate of visually significant postoperative complications. However, longer studies with longer follow up are needed to fully assess the overall effectiveness of PCG in the region.  
**Keywords:** primary congenital glaucoma, intraocular pressure, trabeculectomy, trabeculectomy, glaucoma drainage device, Nile Delta

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**from 2020 to 2022 (40 eyes)**

- Trainees at **BENHA GLAUCOMA UNIT** were trained on the ab-interno glaucoma surgery approach (**GONIOTOMY**).
- We used the **BENT-ANGLE NEEDLE GONIECTOMY (BANG)** for PCG patients with clear cornea that allows a good AC angle view.

- **Single glaucoma surgery** was performed in **24** eyes (60%)
- **Two surgeries** were performed in **12** eyes (30%)
- **Four eyes** underwent **more than two surgeries** (10%).

**1st surgery**

- BANG (18 eyes)
- Trabeculotomy (19 eyes)
- Trabeculectomy with MMC (1 eye)
- Combined trabeculotomy and deep sclerectomy (2 eyes)

**2nd surgery**

- Trabeculotomy (6 eyes)
- BANG (10 eyes)
- Trabeculectomy (2 eyes)
- Combined trabeculotomy and deep sclerectomy (2 eyes)



**Goniotomy, a game changer in the management of congenital glaucoma in the Nile Delta region**

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**Purpose:** To evaluate the impact of applying goniotomy in the Nile Delta Region over progressive and follow-up of primary congenital glaucoma (PCG) patients.

**Patients and methods:** In this retrospective study, we compared the surgical outcome of PCG patients who had surgery at a tertiary care facility in the Nile Delta Region in the period from 2018 to 2019 (Group A), to those who had surgery at the same unit in the period from 2020 to 2021 (Group B). All patients underwent measurement of intraocular pressure (IOP), horizontal central corneal diameter (HCD), and cup-to-disc ratio (CDR) before and after surgery and a minimum of 6 months follow-up was required. Surgical success was defined as IOP less than 22 mmHg without medication or progression of the primary disease parameters.

**Results:** No significant changes were found in the number of PCG patients and success rate in both groups. However, the percentage of patients who had trabeculectomy declined from 45.45% (Group A) to 33.33% (Group B). 6.25% of patients had a glaucoma drainage device in Group A, while no patients in Group B had that surgery. In addition, there was a dramatic reduction of medically conjunctival-venting surgeries from 100% in Group A to 34.3% in Group B.

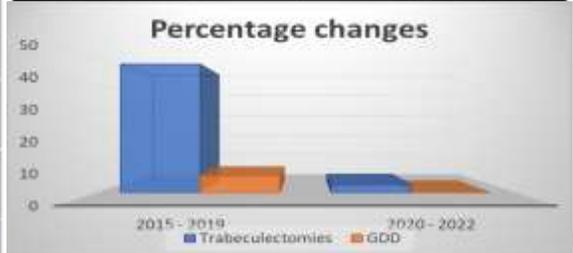
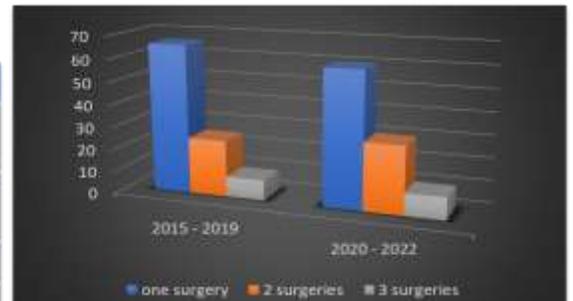
**Conclusion:** The use of goniotomy as a minimally invasive surgery for PCG patients achieved successful management of PCG and prevented the conjunctiva for possible future surgeries.

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### Audit

	2015 - 2019	2020 - 2022
Number of surgeries	69	60
Age at time of surgery	5.2 months	4.7 months
Surgical success	72.7%	74.1%
Eyes that had more than one surgery	15 (34%)	16 (40%)
Number of trabeculectomies	35	3
Number of valve surgeries	5	zero
Sight-threatening postoperative complications	3 (4.34%)	1 (1.67%)



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## Conclusion



The use of **GONIECTOMY** as a minimally invasive surgery for PCG patients achieved **successful management** of PCG and **preserved the conjunctiva** for potential future surgeries

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