

Microcatheter-assisted Trabeculotomy Vs Circumferential Trabeculotomy with the Rigid Probe Trabeculotome in Pediatric Glaucoma

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Two-year results of microcatheter-assisted trabeculotomy in paediatric glaucoma: a randomized controlled study

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ORIGINAL STUDY

Microcatheter-assisted Trabeculotomy Versus 2-site Trabeculotomy With the Rigid Probe Trabeculotome in Primary Congenital Glaucoma

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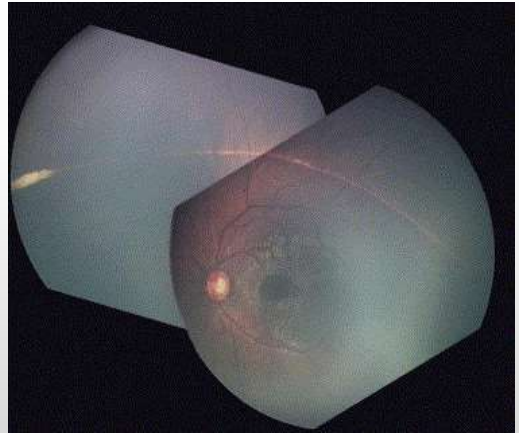
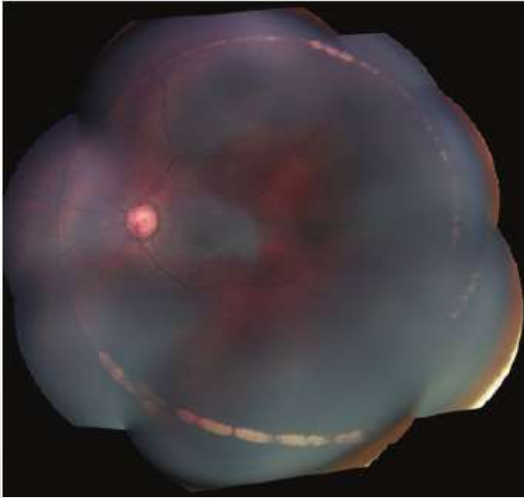
J Glaucoma. 2018 Apr;27(4):371-376

- Circumferential trabeculotomy was first introduced in 1995 by *Beck and Lynch* who used a 6/0 polypropylene suture to create a **360 degree incision** in Schlemm's canal.
- The success rate of the procedure varied from **87%** to **93%** in children with glaucoma but the main problem was the risk of false passage of the suture with some reports of subretinal and suprachoroidal suture misdirection.

Medicino ME, Lynch MG, Drack A, et al. Long-term surgical and visual outcomes in primary congenital glaucoma: 360 degree trabeculotomy versus goniotomy. *J AAPOS* 2000;4: 205-210

Verner-Cole EA, Ortiz S, Bell NP, et al. Subretinal suture misdirection during 360 degrees suture trabeculotomy. *Am J Ophthalmol* 2006; 141:391-392

Neely DE. False passage: a complication of 360 degrees suture trabeculotomy. *J AAPOS* 2005; 9:396-397



iTrack (Ellex, Adelaide, SA)



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- **Lim ME, Neely DE, Wang J, et al.** Comparison of 360-degree versus traditional trabeculotomy in pediatric glaucoma. *J AAPOS* 2015; 19:145-149
- **Shi Y, Wang H, Yin J, et al.** Microcatheter-assisted trabeculotomy versus rigid probe trabeculotomy in childhood glaucoma. *Br J Ophthalmol* 2016; 100:1257-62
- **El Sayed Y, Gawdat G.** Two-year results of microcatheter-assisted trabeculotomy in paediatric glaucoma: a randomized controlled study. *Acta Ophthalmol.* 2017 Mar 7. [Epub ahead of print]
- **Jyoti Shakrawal, Shveta Bali, Talvir Sidhu, Saurabh Verma, Ramanjit Sihota, Tanuj Dada.** Randomized Trial on Illuminated-Microcatheter Circumferential Trabeculotomy Versus Conventional Trabeculotomy in Congenital Glaucoma. *AJO.* 2017;180:158-164
- **Rebecca F. Neustein, Allen D. Beck.** Circumferential Trabeculotomy Versus Conventional Angle Surgery: Comparing Long-term Surgical Success and Clinical Outcomes in Children With Primary Congenital Glaucoma. *AJO.*2017;183:17-24.
- **Girkin CA, Rhodes L, McGwin G, et al.** Goniotomy versus circumferential trabeculotomy with an illuminated microcatheter in congenital glaucoma. *J AAPOS* 2012; 16:424-427

Purpose:

- To compare the results of **microcatheter-assisted trabeculotomy** to **2-site trabeculotomy using the rigid probe trabeculotome** through a combined *superonasal and inferotemporal* approach in primary congenital glaucoma

METHODS

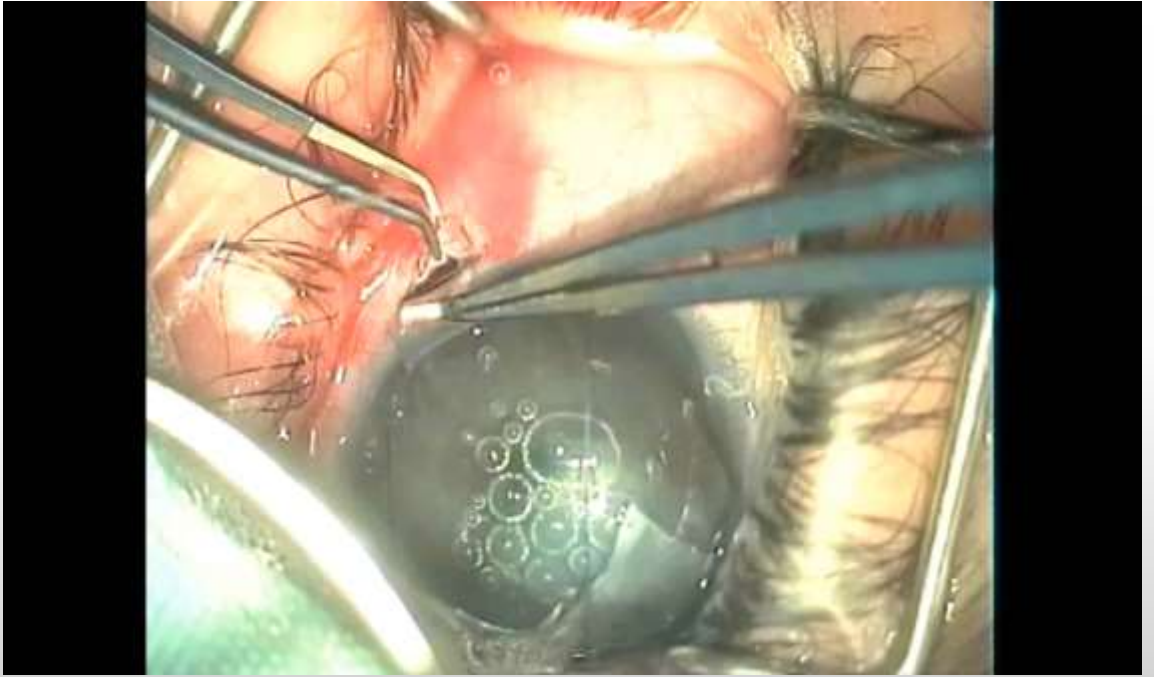
Methods

- Children aged ≤ 12 years who underwent circumferential trabeculectomy for primary congenital glaucoma (PCG) at Abureish Children's Hospital, Cairo University, from January 2013 to June 2016.
- *Retrospective*
- At least 6 months of follow up

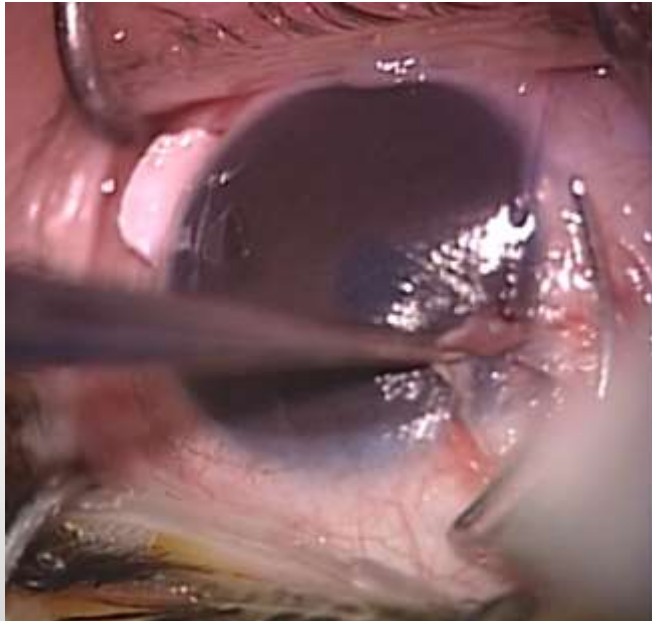
Exclusion criteria

- Eyes in which the trabeculotomy involved $< 270^\circ$ of Schlemm's canal.
- Microcatheter-assisted cases in which the microcatheter alone created $< 180^\circ$ incision were also excluded.
- Combined procedures
- Previous trabeculotomy

Microcatheter-assisted Trabeculotomy



Two-site Trabeculotomy with the Rigid Trabeculotome



Methods

IOP

Glaucoma
medications

Success
rates

Complications

Methods

■ Success Criteria:

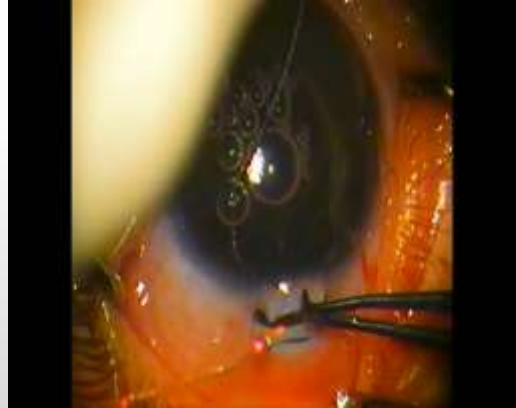
- *Complete* : IOP < 18mmHg and stable cup disc ratio without medications
- *Qualified* : IOP < 18mmHg and stable cup disc ratio on topical medications
- *Failure*: IOP \geq 18mmHg on medications
 - Need for another glaucoma procedure
 - Devastating complication (RD, endophthalmitis,...)

RESULTS

	Microcatheter-assisted trabeculotomy group	Rigid probe trabeculotomy group	P-value
Eyes	33	59	
Right (%)	18 (55%)	29 (49%)	0.67
+ve Consanguinity (%)	18 (55%)	37 (63%)	0.5
+ve Family history (%)	1 (3%)	7 (12%)	0.25
Gender			
Male (%)	22 (67%)	29 (49%)	0.13
Previous surgeries			
Goniotomy(%)	6 (18%)	10 (17%)	0.17
Age at presentation (months)			
Range	0-18	0-144	0.17
Mean \pm SD	2.7 \pm 3.8	8.1 \pm 22.1	
Age at surgery (months)			
Range	0.6 - 51.2	0.4- 90.1	0.48
Mean \pm SD	6.4 \pm 8.7	8.2 \pm 13.1	
Cloudy cornea (%)	17(51%)	29 (49%)	1
Horizontal corneal diameter			
Range	10-14.5	9.5-15	0.4
Mean \pm SD	12.7 \pm 1.7	12.9 \pm 1.5	
Cup-to disc ratio			
Range	0.2-0.9	0.2-0.9	0.2
Mean \pm SD	0.59 \pm 0.2	0.53 \pm 0.3	

Extent of Trabeculotomy

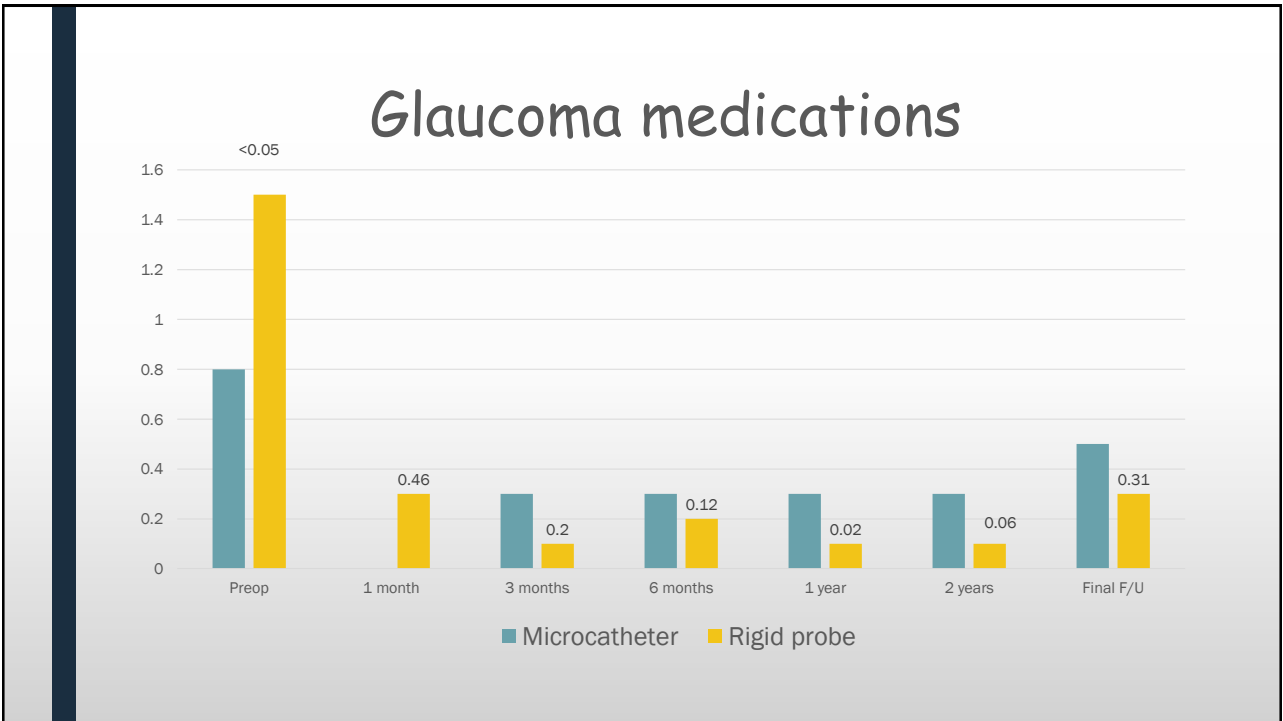
- In the *microcatheter group*, 19 eyes (58%) had a complete 360° incision compared to 33 eyes (56%) in the *rigid probe group*.
- In 18 eyes (54%) in the *microcatheter group* the microcatheter passage was interrupted and an additional scleral cut down was needed to increase the extent of the cut.



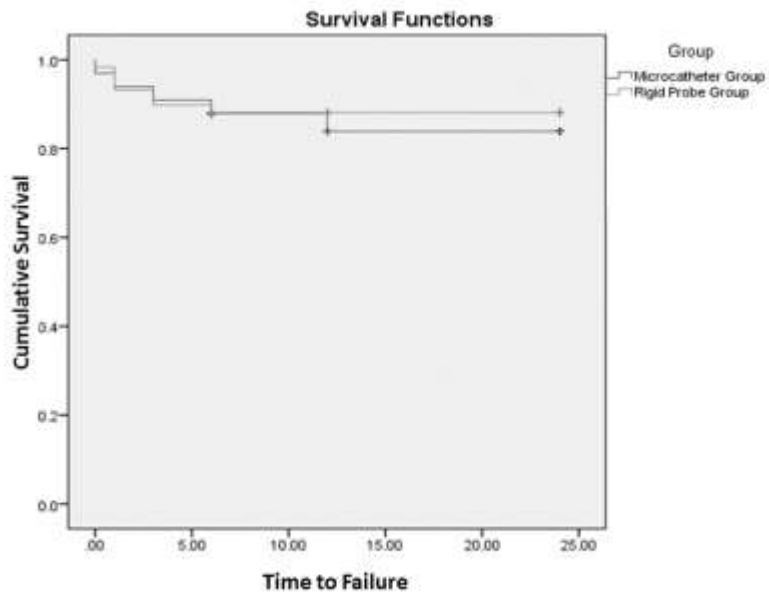
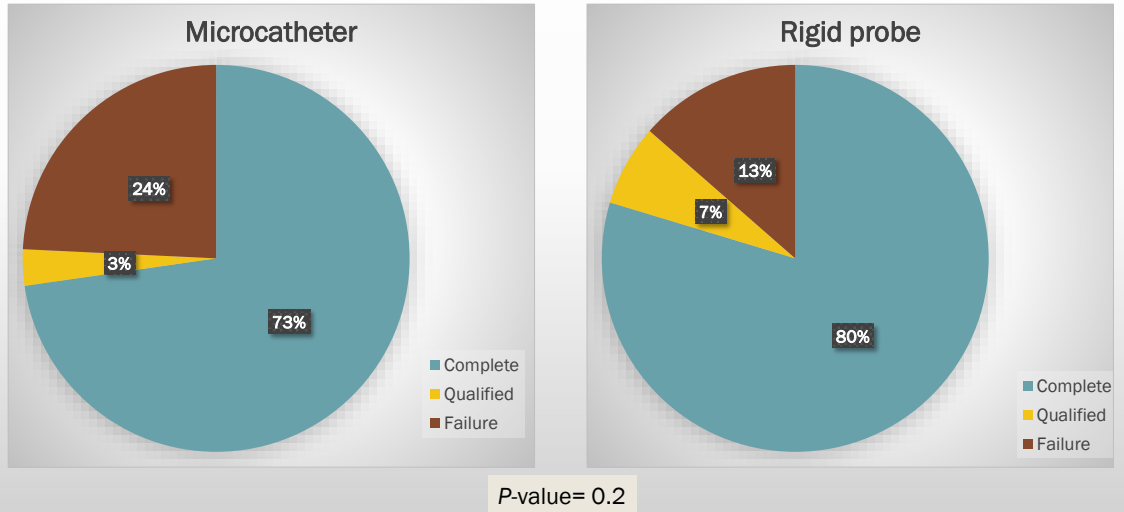
Follow up

- 19.7 ± 10.1 months for the *microcatheter group* (Range: 4-36 months)
- 22 ± 8.2 months for the *rigid probe group* (Range: 2.2-34 months)

(P-value: 0.2)



Success rates



Complications

	Microcatheter Trabeculotomy	Rigid Probe Trabeculotomy
Persistent hyphema > 1 week	--	--
Anterior chamber shallowing	3 (9%)	7 (11%)
Cataract	3 (9%)	5 (8%)
Subluxation	--	2 (3%)
Endophthalmitis	1 (3%)	--

CONCLUSION

- Circumferential trabeculotomy, whether using the illuminated microcatheter or Harms trabeculotomes yields a high success rate in eyes with primary congenital glaucoma, with **77%** of eyes having an IOP < 18 mmHg on no medications after an average follow up period of *21.2 months*
- There was no significant difference in success rates between both groups (*P*-value= 0.2).
- The IOP and number of glaucoma medications were also comparable in both groups

- 54% (18 eyes) in the *microcatheter group* required an **additional scleral cut** down when the microcatheter reached an obstruction or was misdirected into a collector channel or posteriorly.
- These scleral incisions often had to be performed in sites which we preferred to avoid or which were not easily accessible.

	Microcatheter trabeculotomy	Rigid probe trabeculotomy
Incision	One May need more	Two
Timing	Shorter May take longer	Longer
Extent	360°	<360°
Cost	+++++++	+

Both techniques may be recommended as a first line procedure in pediatric eyes requiring trabeculotomy, however the **added cost** of the microcatheter could be an unnecessary financial burden in many places where pediatric glaucoma is common.

Study Limitations

- Retrospective
- Surgical timing
- Smaller number of eyes in the microcatheter group (33 vs 59)

THANK YOU FOR YOUR
ATTENTION

