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360 Ab externo in POAG

Superior outcomes in a 2-year randomized Trial

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POAG is the leading cause of irreversible blindness globally, accounting for 74% of all glaucoma cases.

While trabeculectomy remains the gold standard, it is associated with vision-threatening complications such as ocular hypotony, choroidal detachment, & bleb-related infections

These risks have driven the shift toward bleb-independent, less invasive procedures that restore natural aqueous outflow.



CLINICAL INVESTIGATION

Two-year randomized controlled trial of circumferential versus segmental ab externo angle surgery in patients with primary open angle glaucoma

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Abstract

Purpose To compare the surgical outcomes of visco-circumferential-suture-trabeculotomy (VCST) and rigid probe segmental viscotrabeculotomy (VT) in primary open-angle glaucoma (POAG).

Study design A prospective randomized controlled study.

Patients and Methods Patients presenting with POAG and operated upon in Mansoura Ophthalmic Center in Mansoura, Egypt between February 2017 and September 2021 were enrolled. Study eyes were randomized to either VCST or VT and follow up extended for 24 months. Success was defined as an intra ocular pressure (IOP) ≤ 18 mmHg with a 40% reduction from baseline. Complications were noted.

This was a prospective, randomized controlled trial conducted at the Mansoura Ophthalmic Center between 2017–2022. We enrolled 166 eyes from 107 patients, all suffering from medically uncontrolled POAG.

The primary objective of our study was to compare the two-year surgical outcomes of:

1-Visco-circumferential-suture-trabeculotomy(VCST): Treating the entire 360-degree circumference of the angle.

2-Rigid probe segmental viscotrabeculotomy(VT): A partial treatment of the angle circumference.

Methodology

Study Design: Prospective RCT

Inclusion Criteria

- Uncontrolled IOP > 21 mmHg despite maximal AGMs.
- Typical glaucomatous VF defects & optic disc appearance.

Complete Success: IOP 6–18 mmHg + $\geq 40\%$ IOP reduction without AGMs

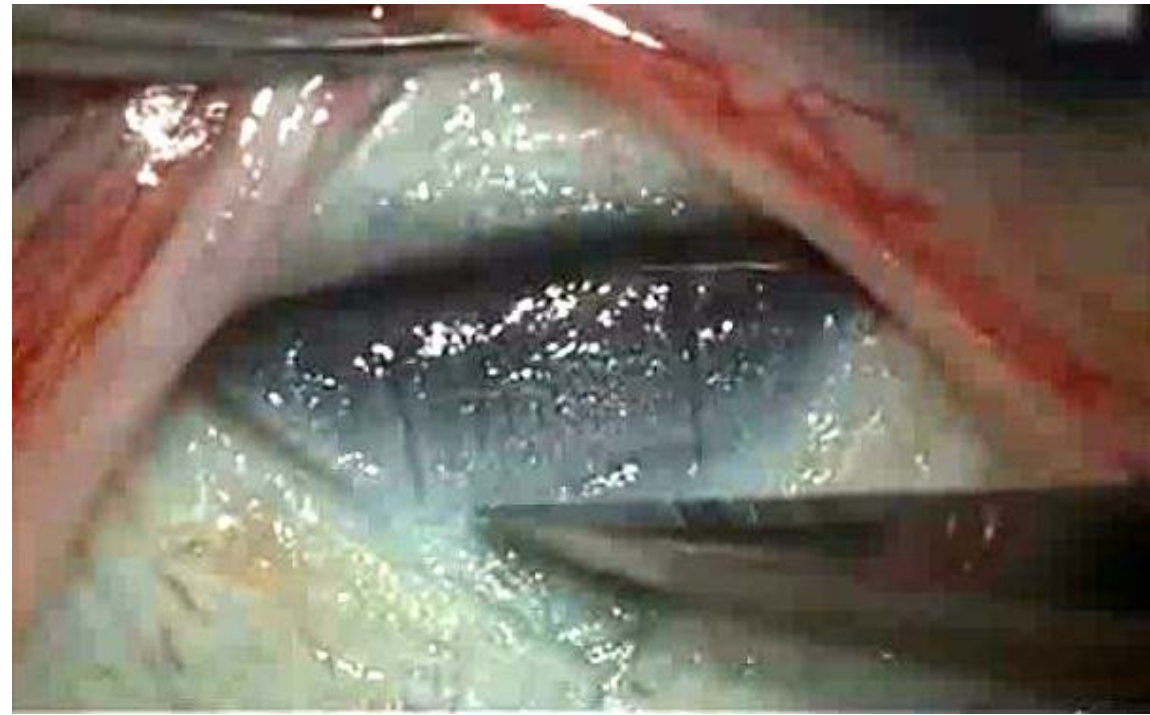
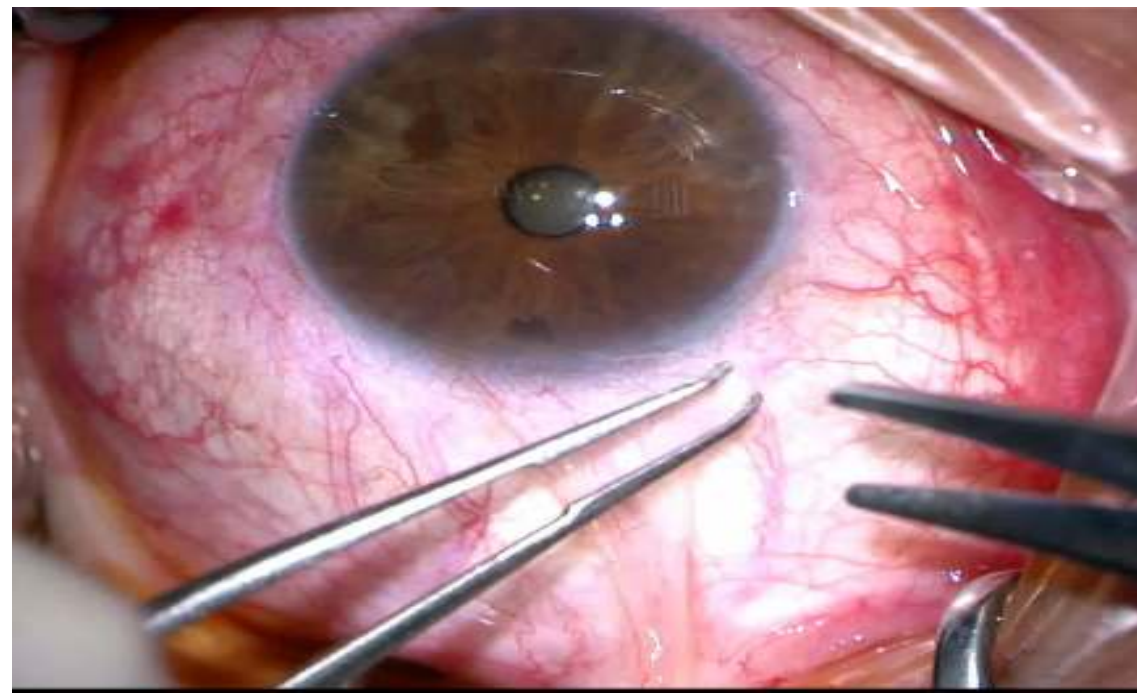
Qualified Success: Same criteria but with the aid of AGMs

Failure: failure to meet criteria on 2 consecutive visits or threatening complications

Bilateral Cohort of 59 patients received different treatments in each eye for direct comparison.

Surgical Techniques

- VCST:** 360° circumferential suture trabeculotomy with viscoelastic
- VT:** Segmental rigid probe viscotrabeculotomy



Postoperative IOP Outcomes

This table shows the mean IOP values for both groups over the 24-month follow-up period. Note the significant divergence starting from the 6th month.

Time Point	Circumferential (VCST)	Segmental (VT)	P value
Preoperative	32.3 ± 2.4	31.8 ± 2.6	0.234
1st week	10.8 ± 1.1	10.6 ± 1.1	0.211
1st month	11.8 ± 0.9	11.4 ± 0.9	0.004
3rd month	12.4 ± 1.0	13.0 ± 1.0	0.001
6th month	12.5 ± 1.3	13.3 ± 1.1	< 0.001
12th month	12.8 ± 2.1	14.1 ± 1.6	< 0.001
18th month	12.5 ± 1.1	14.6 ± 2.2	< 0.001
24th month	12.4 ± 1.2	15.5 ± 0.9	< 0.001
IOP Reduction	19.9 ± 2.6 (61.5%)	16.3 ± 2.6 (51.2%)	< 0.001

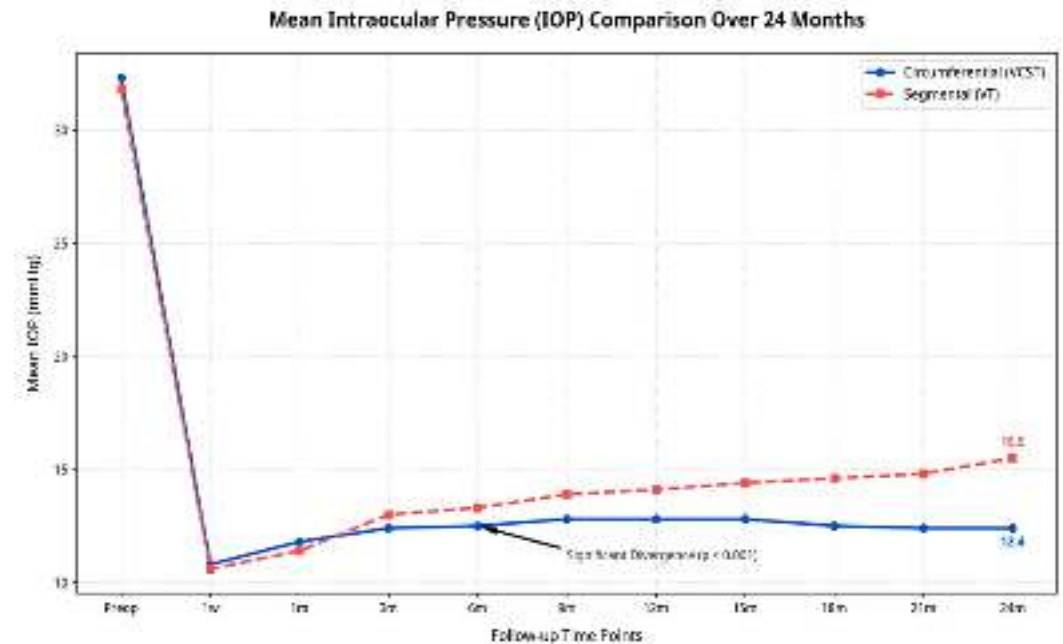
Results

IOP Reduction

Parameter	VCST Group	VT Group	p-value
Pre-op IOP	32.3 ± 2.4 mmHg	31.8 ± 2.6 mmHg	0.234
24-month IOP	12.4 ± 1.2 mmHg	15.5 ± 0.9 mmHg	<0.001
% IOP Reduction	61.5%	51.2%	<0.001

VCST showed significantly lower IOP from 6 months onward

Divergence became significant from the 6th month onwards.



Results

Success Rates

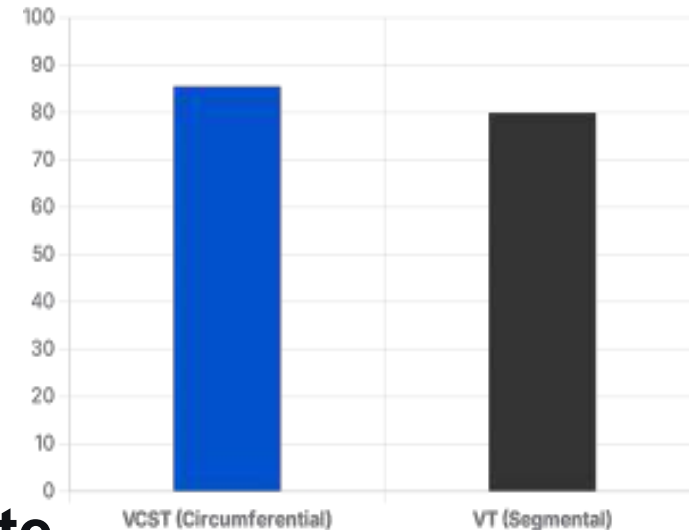
Complete success rate was higher in VCST group at the end of 24 months

- VCST: 85.4%
- VT: 79.8%

Stricter Success rate (IOP $\leq$ 14 mmHg):

VCST shows statistically significant higher success rate

- VCST: 93.9%
- VT: 23.8%



Reduced Medication Burden

Both groups show a significant reduction in AGMs. However, the VCST group required fewer medications to maintain target IOP, reducing the long-term treatment burden.

Safety Profiles

(Comparable with Minimal Complications)

1-Both procedures demonstrated an excellent safety profile.

Minimal self-limiting hyphema was a universal occurrence, typically resolving within 7 days without intervention.

2-Descemet's membrane split: More in VT group (9.5% vs. 0%, $p=0.007$)

3-Transient IOP spike: More in VT group (9.5% vs. 2.44%, $p=0.099$)

4-Additional glaucoma surgeries: VT 13.1% vs. VCST 7.3%

Bilateral Comparison (Same Patient, Different Eye)

This table analyzes patients who had one eye treated with VCST & the other with VT, providing a highly controlled comparison.

Time Point	Circumferential (N=59)	Segmental (N=59)	P value
1st week	10.9 ± 1.0	10.6 ± 1.1	0.131
6th month	12.7 ± 1.3	13.4 ± 1.1	0.009
12th month	13.1 ± 2.3	14.3 ± 1.7	0.003
18th month	12.7 ± 1.2	14.6 ± 2.2	< 0.001
24th month	12.8 ± 1.5	15.4 ± 1.1	< 0.001

Conclusion & Home Messages

1-Both segmental and circumferential procedures are effective in lowering IOP for at least 2 years in eyes with POAG.

2-Circumferential surgery (VCST) provides significantly greater IOP reduction and higher long-term success rates.

3-VCST requires fewer subsequent glaucoma procedures and offers a safe cost-effective alternative to microcatheter-assisted techniques.

Clinical recommendation: 360-degree circumferential surgery should be considered as a preferred technique for bleb-independent POAG management.



Thank you