

Challenging the Stronghold: Can Bleb-Creating MIGS Compete with Trabeculectomy?

By

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Note :

- The conclusions in this presentation are based exclusively on published studies that performed **direct comparisons between trabeculectomy and bleb-creating subconjunctival MIGS.**

- Evidence Base:

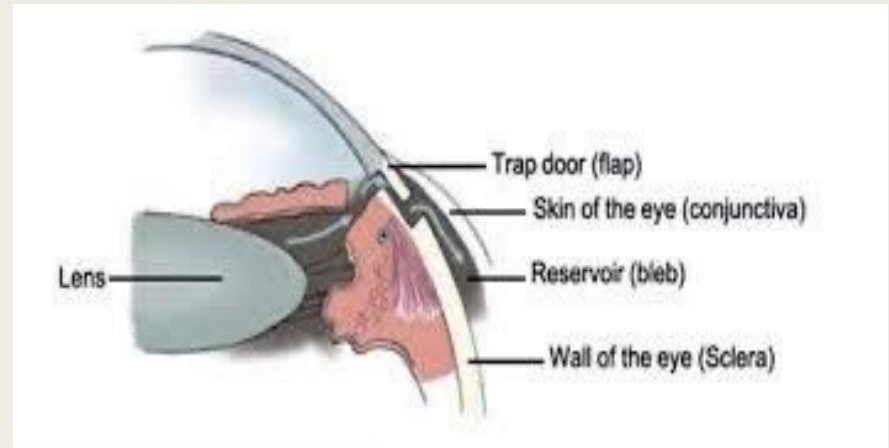
Randomized controlled trials
Multicenter and single-center cohorts
Long-term follow-up studies
Systematic reviews and meta-analyses

Clinical Questions

- Do bleb-creating MIGS provide comparable pressure control to trabeculectomy ?
- Do they represent a different value proposition ?

Background

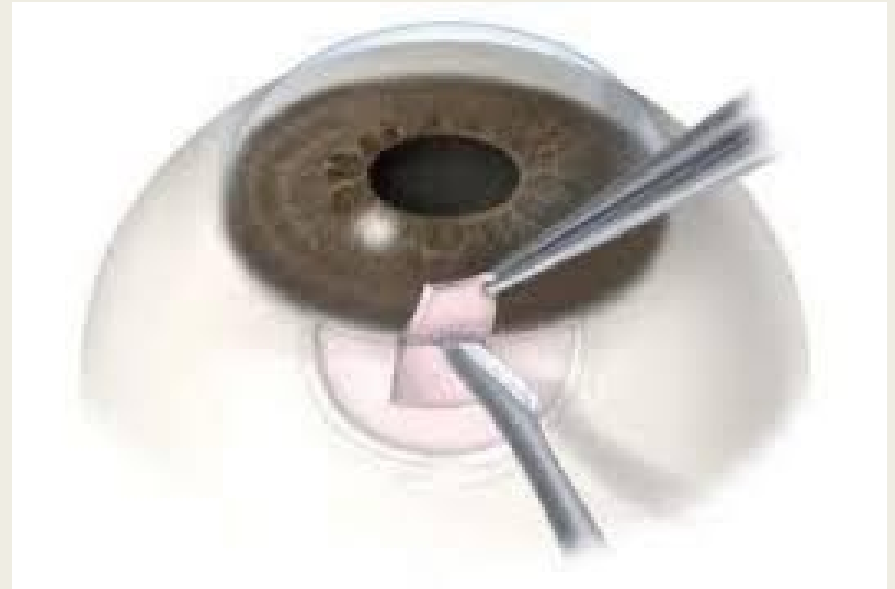
- **Trabeculectomy** remains the reference filtration surgery for glaucoma “The gold standard”



Background

Why Trabeculectomy Is the Benchmark?

- **Achieves consistent durable lowest** mean **IOP** across disease severities
- With highest rates of **complete success**



What Are Bleb-Creating MIGS?

- Subconjunctival microstents/microshunts that form filtering blebs
- **Bleb-creating devices** *rely on Subconjunctival aqueous outflow aim to rebalance efficacy , safety and postoperative burden.*
- Often grouped with MIGS but biologically closer to trabeculectomy

Bleb-Creating MIGS

Key_examples



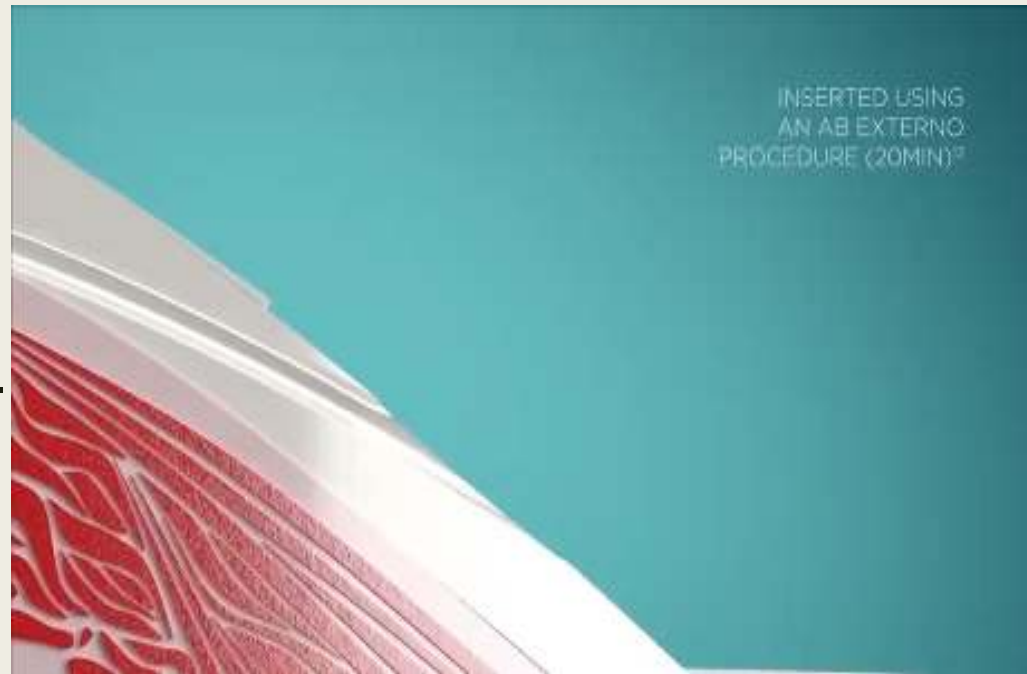
PRESERFLO MicroShunt



XEN45 Gel Stent

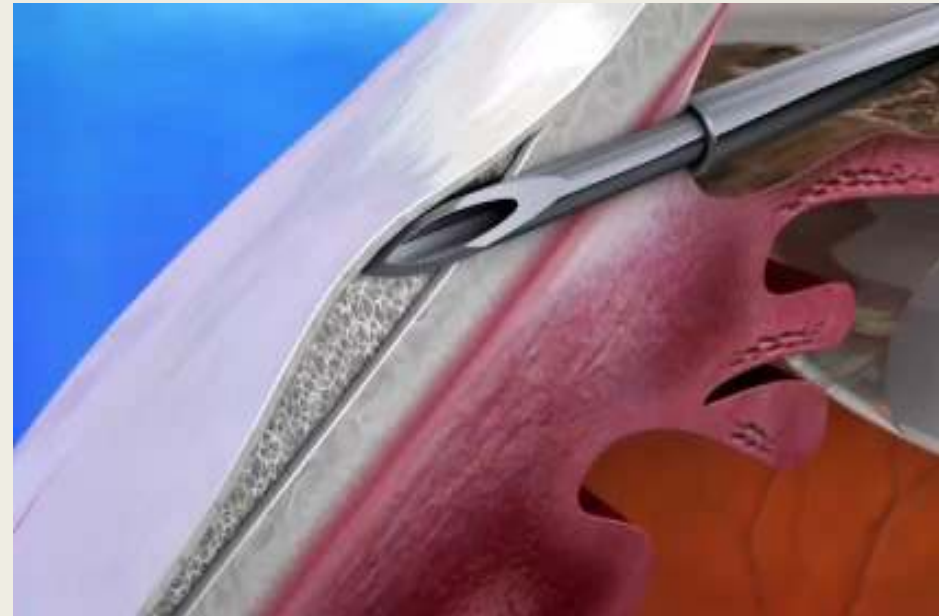
PRESERFLO MicroShunt – Mechanistic Overview

- Ab externo microshunt placed under Tenon's capsule with controlled subconjunctival filtration.



XEN45 gel Stent – Mechanistic Overview

- Ab interno gelatin stent creating a subconjunctival bleb.
- Designed for standardized outflow resistance.



Bleb Biology

- Long-term success governed by wound healing and fibrosis
- Tenon's scarring is the dominant cause of failure
- MMC reduces fibrosis but increases hypotony and leak risk

Why This Comparison Matters

- Both approaches create filtering blebs and share wound-healing challenges
- Subconjunctival MIGS aim to preserve filtration with reduced invasiveness

Comparison items:

1. Surgical Architecture Comparison
2. Overall IOP Reduction Pattern
3. Medication Reduction
4. Safety Profiles
5. Complications Profile

1. Surgical Architecture Comparison

1. Surgical Architecture Comparison

- Trabeculectomy: adjustable flow via scleral flap and sutures
- Devices:
 - Have fixed lumen with limited intraoperative titration*
 - Designed to standardise flow through the lumen*
- Final IOP largely determined by subconjunctival resistance

1. Surgical Architecture Comparison

- Trabeculectomy blebs are often more anterior while device blebs tend to be more posterior
- Both require meticulous conjunctival handling

2.Overall IOP Reduction Pattern

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➤ **Trabeculectomy & Device-based procedures :**

All achieve durable IOP reduction.

*Differences most evident at **low target IOPs***

2.Overall IOP Reduction Pattern

- **Trabeculectomy**: greatest mean IOP reduction , higher complete success.
- **Device-based procedures**: *achieve substantial but lower reduction*

3. Medication Reduction

3. Medication Reduction

- Trabeculectomy often achieves medication-free control
- Subconjunctival devices significantly reduce medication burden
- Complete medication independence less consistent with devices

4.Safety Profiles

4. Safety Profiles

- **Trabeculectomy** associated with higher hypotony risk
- **XEN45 gel** and **PRESERFLO** show favorable safety in some datasets
- **Trabeculectomy** requires titration using laser suture lysis, whereas postoperative needling is more common with **Bleb-creating devices**

4. Safety Profiles

PRESERFLO vs Trabeculectomy

- **PRESERFLO** *shows fewer early complications in some studies*
- Lower early hypotony-related complications in some series.
- Potential reduction in postoperative visit burden.

4. Safety Profiles

XEN45 gel vs Trabeculectomy

- **XEN45 gel** offers *less invasive alternative*
- Faster visual recovery in selected datasets.
- Fewer early postoperative interventions in some trials.

5. Complications Profile

5. Complications Profile

- Trabeculectomy: higher risk, higher ceiling.
- Bleb-creating MIGS: lower risk, lower ceiling.

Overall Impression

- **Trabeculectomy** *remains dominant for maximal IOP lowering*
- **Bleb-creating MIGS** challenge but do not replace trabeculectomy
- *They reshape safety, recovery, and management considerations*

Key Take-Home Messages

- **Trabeculectomy** remains the gold standard ,unmatched for low target IOP.
- **Bleb-creating MIGS** offer alternative risk–benefit profiles, challenge the pathway , not the pressure floor.

References (1/2)

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Thank
you!