

Comparison of Isovolumetric vs Expansile Gas use in Macular Hole Surgery

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Study Overview

Purpose:
Evaluate safety and efficacy of different gas concentrations in Macular Hole surgery.

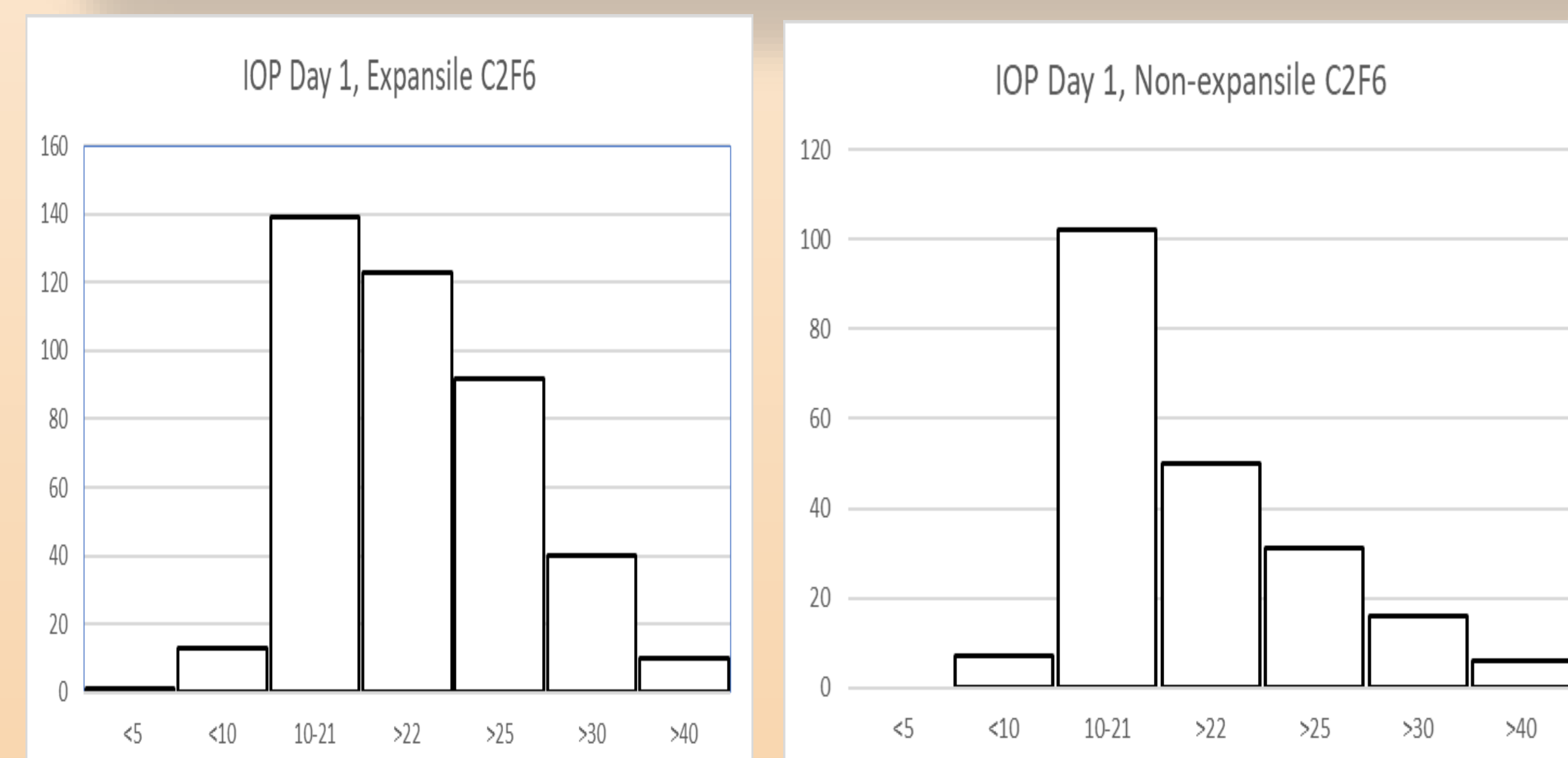
Setting:
Single ophthalmology center in the UK (2013-2022).

Methods:
Retrospective analysis of 658 patients with primary idiopathic full-thickness macular hole.

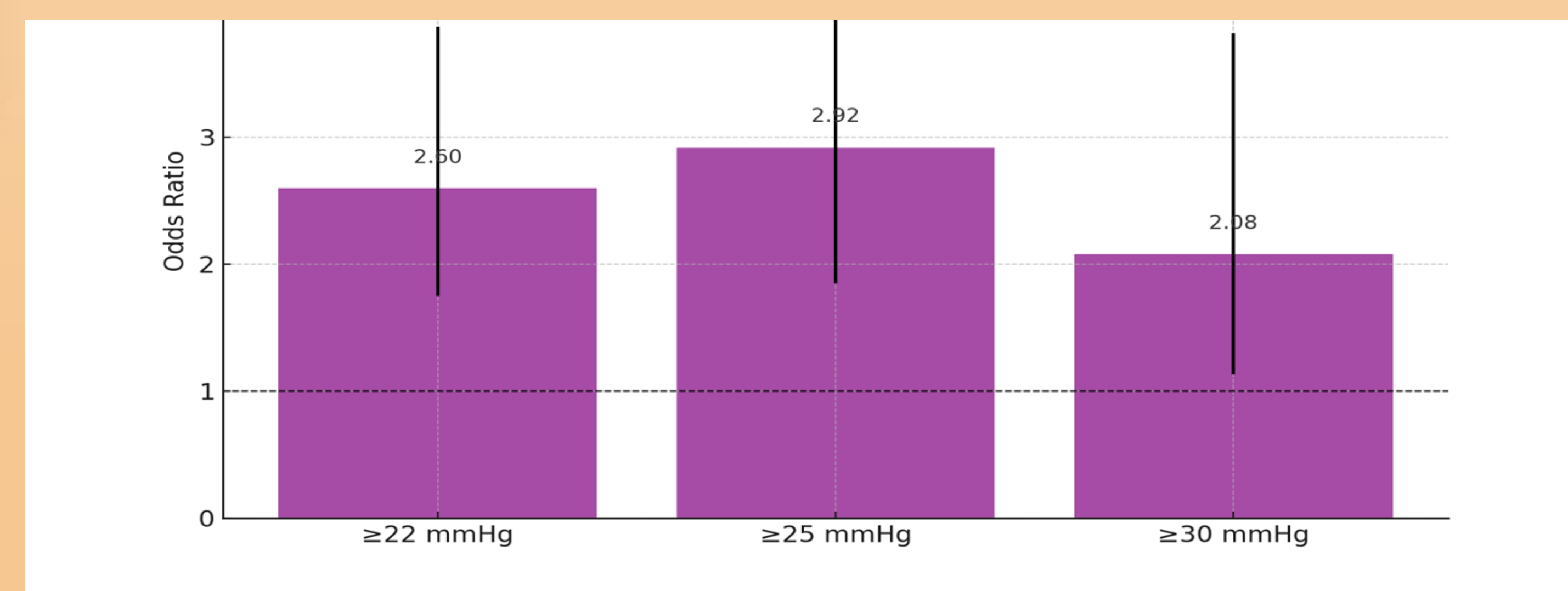
Baseline Patient Demographics

Total Patient :658
Isovolumetric groups n= 248
Expansile Group n = 410
Age: No significant difference (p=0.1938)
Gender 2 Females:1 Male
Lens Status :59.4% phakic
Macular hole Size: No significant Difference (p=0.4244)

•Primary success rates for macular hole closure was comparable between groups (p=0.79).



Higher IOP was observed with expansile gas concentrations, particularly for C2F6 (p<0.0001). SF6 showed no significant difference



Odds ratios for high IOP categories highlight the increased risk with expansile C2F6 gas:
• ≥22 mmHg: OR 2.60 (p<0.01)
• ≥25 mmHg: OR 2.92 (p<0.01)
• ≥30 mmHg: OR 2.08 (p=0.009)

Statistical Analysis Highlights

Paired t-tests:

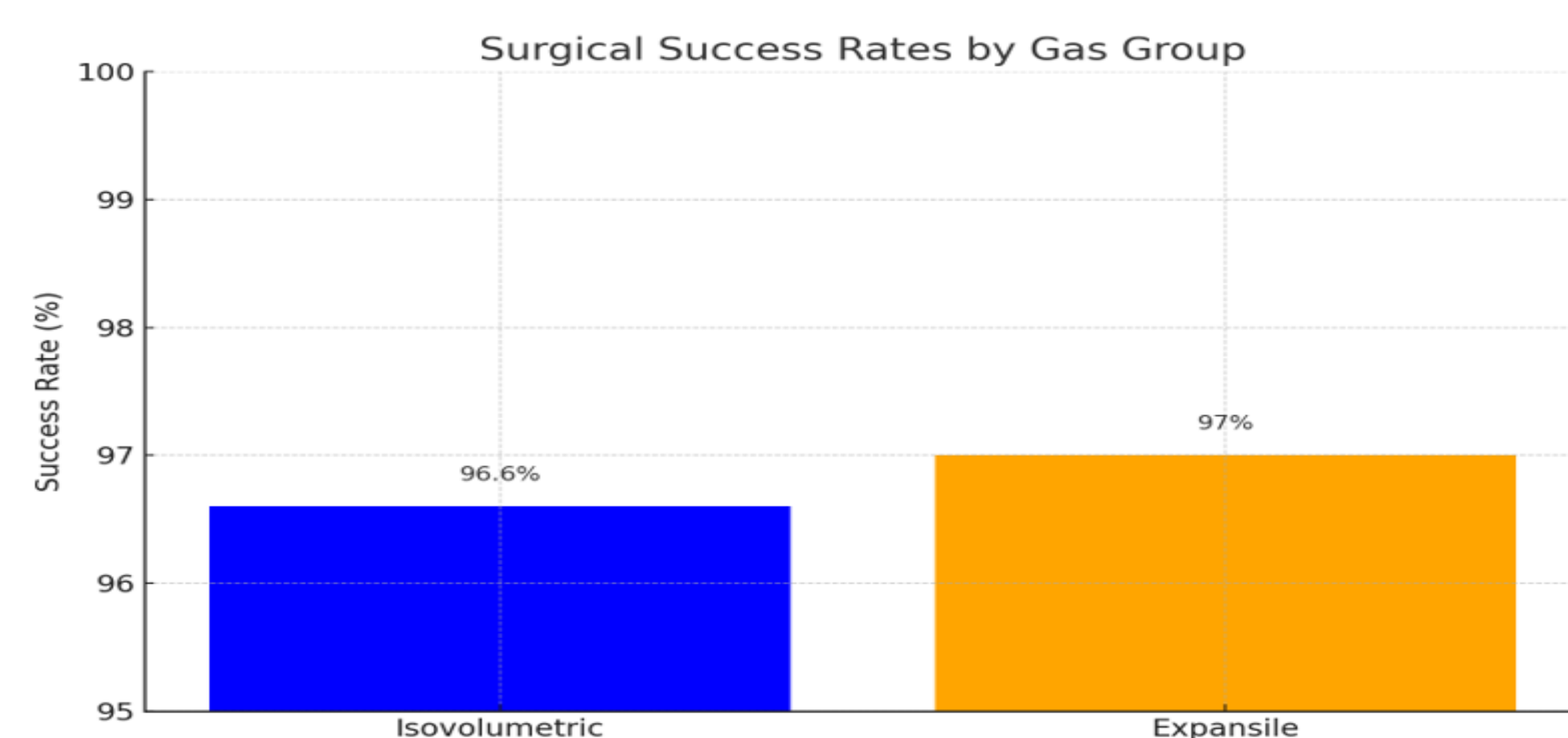
- Day 1 IOP significantly higher with expansile vs. isovolumetric gases (p=0.0013).
- No significant difference at last follow-up.

Glaucoma Risk

C2F6 expansile vs. isovolumetric:

- Glaucoma diagnosis higher in expansile group (3.99% vs. 0.94%). OR 2.33, p=0.15 (not significant).
- All gases combined:
•Glaucoma diagnosis higher in expansile group (3.41% vs. 0.81%). OR 4.35, p=0.03 (significant).

Results



Conclusion

1. Surgical success rate is similar when comparing expansile and isovolumetric concentration of the same gas type.
2. Higher expansile gas concentrations are associated with a significant increase in IOP at day 1 post-op (but not at last follow-up), with 4.35 increased risk of glaucoma.
3. This study concludes that isovolumetric gas concentrations are as effective as expansile concentrations but have a higher safety profile.