

Observed variations in Hexafluoroethane (C2F6) gas endotamponade duration

Shruthi Mankal, Iacopo Macchi, Edward Bloch, Konstantina Manoli, Jared Ching

Purpose

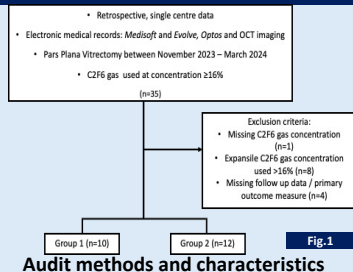
This quality improvement project was designed to compare the expected endotamponade duration of C2F6, as reported by manufacturers and in the literature, with that seen in clinical practice. The effect of different gas withdrawal protocols was also explored.

Setting: Bristol Eye Hospital, University Hospitals Bristol and Weston NHS Foundation Trust

Methods

- An audit of consecutive patients undergoing pars plana vitrectomy (for various indications) using a non-expansile concentration (16%) of C2F6 as a tamponade agent, detailed in Fig 1. C2F6 was diluted from GOT-MULTI C2F6 multiuse cannisters manufactured by ALCHIMIA.

- Two separate gas withdrawal protocols were identified, with patients classified into two groups, detailed in Fig 2.
- The primary outcome measure remained postoperative tamponade (gas fill $\geq 50\%$) at 2 weeks' follow-up.



Equipment
Gas Alchimia GOT Multi (75mL cannisters) with 24-month shelf life: <ul style="list-style-type: none">C2F6 – 16% non-expansile, manufacturer states 30-40 days tamponade¹
30G needle
0.2um filter
50mL syringe

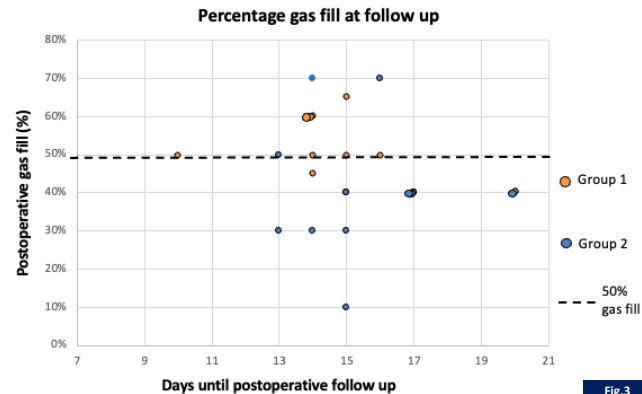
GROUP 1	GROUP 2
<ul style="list-style-type: none">Retrieve canister – ensure last use is dated on multi-use label and within expiry date written on canisterWithdraw minimum of 15mL pure gas into 50mL syringe through 0.2um filterEnsure the volume and date is recorded on canister – surgeon to checkLet surgeon adjust concentration i.e. expel 7ml unneeded pure C2F6 gas and dilute with filtered air50 mL syringe to be kept upright at all times until injected into eye	<ul style="list-style-type: none">Retrieve canister – ensure last use is dated on multi-use label and within expiry date written on canisterWithdraw 8ml pure gas into 50mL syringe through 0.2um filterEnsure the volume and date is recorded on canister – surgeon to checkDilute with filtered air50 mL syringe to be kept upright at all times until injected into eye

Gas withdrawal protocols

Fig. 2

Results

- Twenty-two consecutive patients' data were included in the analysis (10 patients in the group 1 vs 12 patients in the group 2), show in Fig 3.
- Mean (\pm SD) follow-up duration was similar between groups, 14.6 (± 2.3) vs 15.5 (± 1.9) days.
- A greater number of patients in the group 1 exhibited a gas fill $\geq 50\%$ at 2 weeks postoperative follow-up compared to group 2 (80% vs 25%, $p=0.03$).



Postoperative gas fill (%) at postoperative follow up (days) of the Group 1 (orange) versus Group 2 (blue), with those achieving $\geq 50\%$ above the dashed line.

Conclusions

- The findings indicate a significant variation around the expected endotamponade duration of C2F6 and that observed in clinical practice.
- There is a suggestion that gas concentration and, by consequence, postoperative gas fill, may be influenced by the gas withdrawal protocol.

References:

1. ALCHIMIA. TECHNICAL SHEET – GOT 008-00. Accessed April 14, 2024. <https://www.alchimiarsl.com/en/download/technical-sheet-got-008-00/>