Aging Eyes, Aging Lives: Systemic Health, Not Glaucoma Severity, Predicts Mortality After Glaucoma Surgery in Octogenarians

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Introduction

- In the UK, the population aged 80+ is the fastest growing and is expected to double over the next 40 years[1].
- With age a key glaucoma risk factor, disease burden is set to rise—glaucoma is projected to increase by 44%, suspects by 18%, and OHT by 16% over the next two decades[2].

Objectives

This study aims to **quantify the mortality rate following glaucoma surgery in octogenarian patients with primary open-angle glaucoma** (POAG) and identify risk factors associated with mortality in this age group.

Methods

This was a **retrospective single-centre case series** of **115** patients aged ≥80 with POAG who underwent glaucoma surgery at **Birmingham Midland Eye Centre** (2015–2019).

- Mean follow-up was **5.15 years** (range: 0.02–9.47).
- The most common comorbidities were **hypertension** (n=84), **arthritis** (n=65), and **diabetes** (n=39).
- Mean **Rockwood frailty score** was **5**.

Results

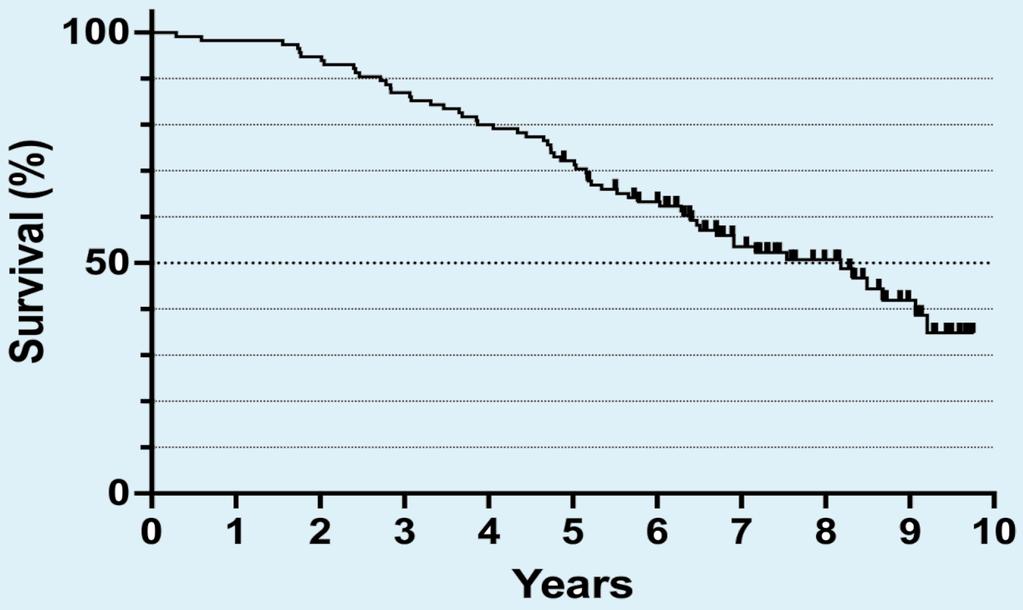
1) Overall Survival

Mortality Rate: All-cause mortality incidence was **66.9 deaths per 1000 person-years**.

Mean Survival: Average survival duration post-surgery was **6.11 years (±2.31)** (range: 0.29–9.74 years).

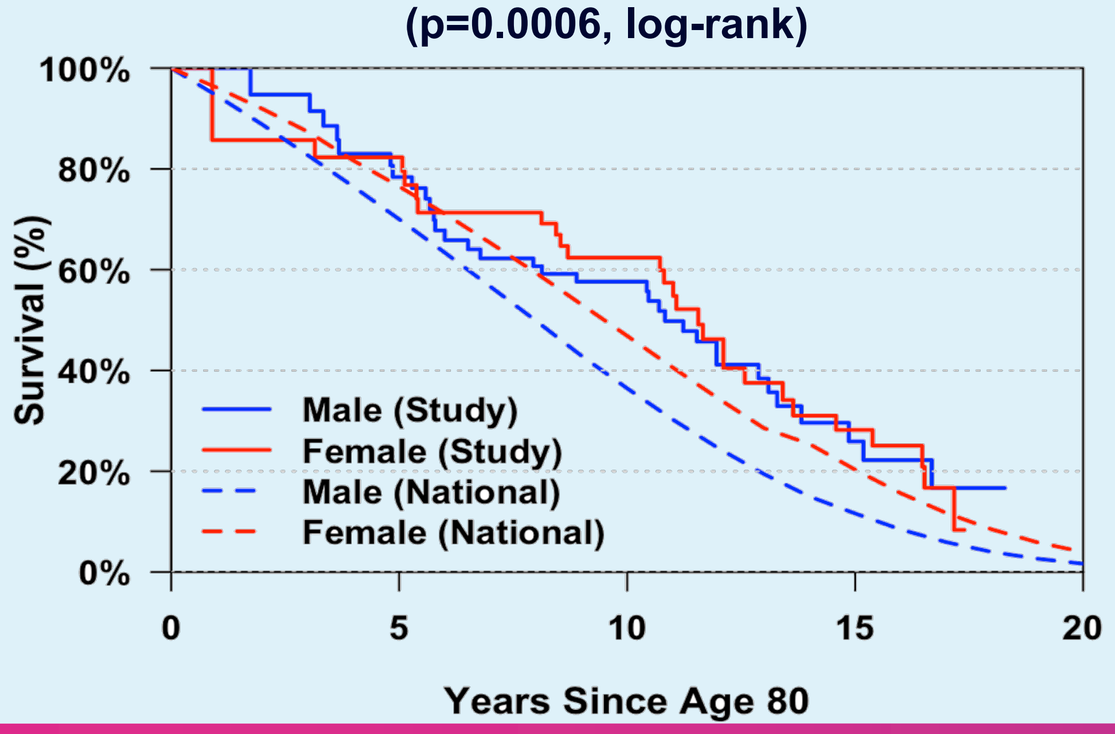
Median Survival: Median survival duration was **8.18 years**.

Kaplan Meir Survival Curve for Overall Study Cohort



Standardized Mortality Rate (SMR): 0.77 (95% CI: 0.57–0.97, $p < 0.05$), representing a **23% lower mortality** compared to the general population of similar age

Kaplan-Meier Survival Curve comparison of study cohort and national survival rates, stratified by sex (p=0.0006, log-rank)

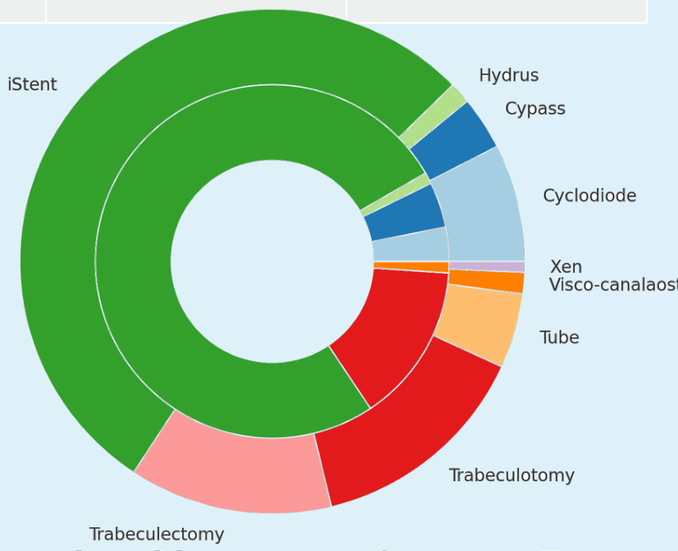


Baseline Characteristics by Survival Status at Final Follow-Up

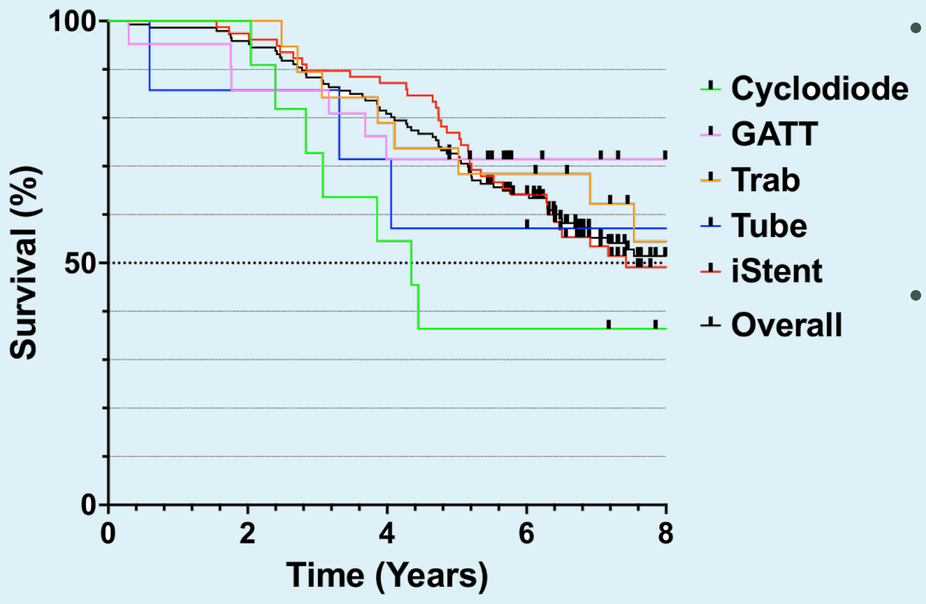
Variable	Deceased (n=59)	Survived (n=56)	p-value
Age, Mean (SD)	84.71 (3.81)	83.60 (2.82)	0.228
Female, n (%)	33 (55.93%)	32 (49.23%)	0.896
Ethnicity, p-value	—	—	0.330
Frailty Score, Mean (SD)	**6.38 (2.40)**	**4.80 (2.63)**	**0.022**

2) By Surgery Type

Nested donut chart illustrating the distribution of glaucoma procedures in patients over 80. The inner ring represents the type of glaucoma surgery performed. The outer ring distinguishes procedures performed in combination with phacoemulsification from those performed alone.



Kaplan–Meier Survival Curves by Glaucoma Surgery Type



- Cyclodiode was linked to higher mortality (HR 2.27, p=0.030).
- No significant survival difference across other procedures (**p=0.453**).

3) Risk Factors For Mortality Following Glaucoma Surgery in Octogenarians:

Rockwood Frailty Score significantly predicts mortality (HR: 1.25, p = 0.02).

Advanced Age is a significant risk factor (HR: 1.10, p = 0.023).

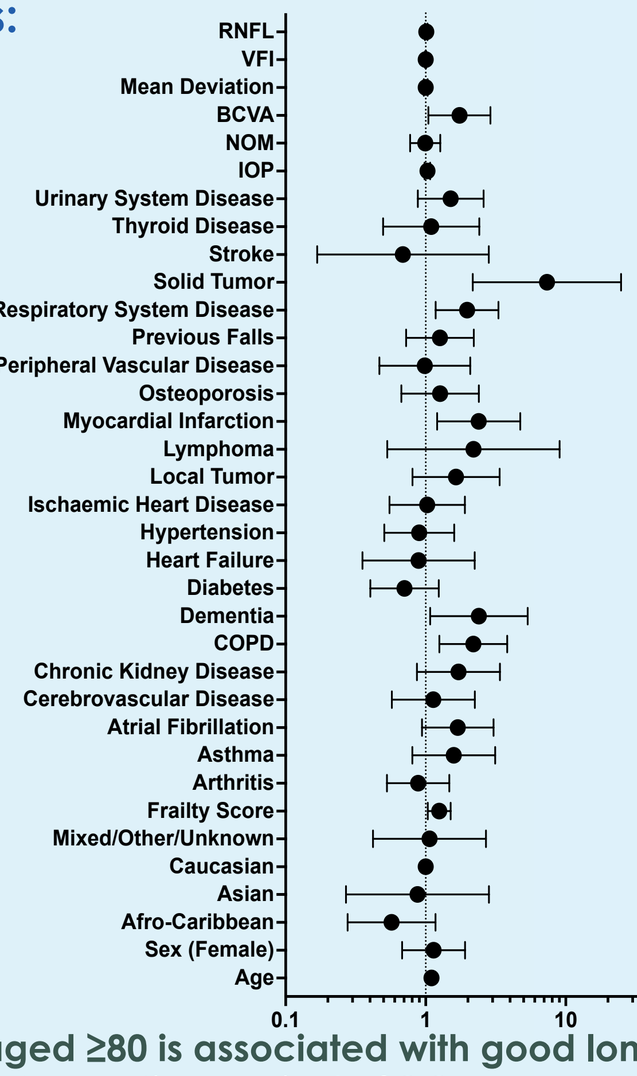
Significant Systemic Comorbidities:

- Solid tumors (HR: 7.34, p = 0.001)
- Dementia (HR: 2.40, p = 0.033)
- Myocardial infarction (HR: 2.39, p = 0.012)
- COPD (HR: 2.19, p = 0.006)
- Respiratory disease (HR: 1.97, p = 0.010)

Ophthalmic Parameters:

Only **Best-Corrected Visual Acuity (BCVA)** was significantly associated with mortality (p = 0.033).

Not significant: IOP , Medications, visual field indices (MD, VFI), and RNFL thickness.



Conclusions

Glaucoma surgery in patients aged ≥80 is associated with good long-term survival, with a median postoperative survival of **8.2 years**.

No significant difference in mortality risk between MIGS and traditional filtration surgeries.

VA was the only ophthalmic parameter significantly associated with mortality

Glaucoma severity showed **no association** with mortality.

Rockwood Frailty Score should be integrated into pre-operative assessments to guide the selection of the most suitable glaucoma procedure.

Takeaway: Advanced age alone should not be a barrier to glaucoma surgery—frailty matters more.

References