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Manual Small-Incision Cataract Surgery Outcomes at Al Ihsan Specialist Hospital, Mogadishu, Somalia: A Retrospective Electronic Health Record Study

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Research Article

Keywords: cataract, manual small-incision cataract surgery, visual acuity, electronic health records, postoperative outcomes, quality of care, Somalia

Posted Date: November 6th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11155510/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

Cataract remains an important cause of avoidable vision loss in Somalia, but routine data on cataract surgical outcomes are limited. We evaluated the volume, follow-up completeness, recorded visual outcomes, and documented early postoperative events after manual small-incision cataract surgery (SICS) at Al Ihsan Specialist Hospital in Mogadishu.

Methods

We performed a retrospective, single-centre electronic health record study of manual small-incision cataract surgery (SICS) at Al Ihsan Specialist Hospital, Mogadishu, during 2025. For the visual-outcome analysis, completed unilateral SICS procedures performed from 10 August to 31 December 2025 were linked by patient and operated eye to preoperative legacy VA Examination records (1–180 days before surgery) and postoperative EyeGlass Prescription uncorrected distance visual acuity (UCVA; 8–70 days after surgery). For each eligible surgery, the latest valid preoperative VA and postoperative UCVA closest to day 32 were selected; four clinician-confirmed same-day duplicate procedure records were removed. Broad distance-VA categories were compared descriptively. Electronic same-eye diagnosis and reintervention signals arising within 1–30 days of 2025 SICS were separately screened; these were not considered clinically adjudicated complications.

Results

The full-year surgical record review identified 4,434 SICS-related records in 4,134 patients; 4,422 were recorded as completed. The revised August–December visual-outcome extraction identified 1,862 completed unilateral SICS records and 230 deduplicated paired patient-eyes in 223 patients. Among these 230 eyes, good VA increased from 20 (8.7%) preoperatively to 83 (36.1%) postoperatively, while poor VA decreased from 159 (69.1%) to 41 (17.8%). VA category improved in 141 (61.3%) eyes, was unchanged in 75 (32.6%), and worsened in 14 (6.1%). Five unique 2025 index SICS procedures had an electronic same-eye diagnosis or reintervention signal within 30 days; clinical causality could not be verified.

Conclusions

Among patients with deterministically linked, documented preoperative measurements and subsequent EyeGlass UCVA, distance-VA categories improved in a majority of eyes after SICS. These results apply to a selected documented subgroup, not to all patients undergoing surgery. Mixed routine and spectacle-

related follow-up, historical documentation gaps, and unavailable paper-based records constrain inference about hospital-wide outcomes and postoperative safety.

Background

Cataract is a leading cause of avoidable vision impairment worldwide, and the quality of cataract services depends not only on surgical volume but also on reliable measurement of visual outcomes, complications, and follow-up. Routine electronic clinical data can support cataract quality monitoring when patient, eye, procedure, and follow-up records can be linked at surgery level.

Somalia has limited published evidence describing cataract surgery volume and outcomes. A hospital-based study of adult blindness in Somalia identified cataract as a major cause of bilateral and monocular blindness. Manual small-incision cataract surgery (SICS) is particularly relevant in resource-constrained and high-volume settings because it can deliver effective visual rehabilitation without dependence on phacoemulsification infrastructure.

Large electronic record systems have demonstrated the value of surgery-level cataract data for monitoring changing indications and postoperative outcomes. At Al Ihsan Specialist Hospital (ASH), routine ophthalmology care generates electronic records across surgery, visual-acuity assessment, postoperative review, diagnoses, and subsequent procedures. We therefore constructed a retrospective surgery-level electronic health record cohort to describe 2025 SICS activity, quantify follow-up documentation, estimate recorded visual outcomes among reliably linked cases, and identify documented high-specificity postoperative event signals.

Methods

Study design and setting

This was a retrospective single-centre electronic health record cohort study at Al Ihsan Specialist Hospital, Mogadishu, Somalia. The study period was 1 January to 31 December 2025. Reporting was structured according to the STROBE recommendations for observational studies.

Electronic data sources and surgery-level cohort construction

The primary surgery cohort was constructed from the Clinical Procedure table. SICS procedures were identified when the procedure-template text contained “SICS” or the documented spelling variant “SISC”. Patient identifier, procedure date, procedure template, practitioner, procedure status, age, sex, and laterality information were used where available. Historical operated-eye laterality was derived from procedure-template labels (RE, LE, or BE); in records with a direct postoperative-to-procedure link, template-derived laterality showed complete concordance.

For the revised visual-outcome analysis, preoperative distance VA was obtained from legacy right-eye (va) and left-eye (va1) fields in VA Examination records. Postoperative uncorrected distance VA was taken from operated-eye ucva in the EyeGlass Prescription right-eye or left-eye child table. The hospital confirmed that this field records measured distance UCVA. EyeGlass assessments occurred during both routine postoperative follow-up and spectacle-related visits; this heterogeneous ascertainment may introduce selection bias. Post Operation Form VA was retained as a separate description of historical documentation completeness and was not combined with EyeGlass UCVA in the primary paired outcome analysis.

Eligibility and analytic cohorts

The full-year service-volume cohort and postoperative-form documentation summary were retained as descriptive measures. The revised visual-outcome source cohort comprised completed unilateral SICS records dated 10 August–31 December 2025. Same-patient, same-eye linkage required a valid preoperative distance-VA record dated 1–180 days before surgery and an EyeGlass operated-eye UCVA 8–70 days after surgery. The most recent valid preoperative record was selected. The postoperative record nearest day 32 was selected; ties were resolved by the earlier visit date. Conflicting VA categories recorded on the selected date were excluded. Same-day VA examinations were excluded from the primary analysis because the date alone does not establish whether measurement preceded surgery. Four same-day duplicate SICS records were excluded following institutional confirmation; the source clinical records were not altered. Results represent eligible surgery-linked patient-eyes and are not population estimates of cataract surgery outcomes. A denominator reconciliation covering 10 August–31 December 2025 identified 1,873 submitted and completed SICS records, including 1,862 unilateral RE/LE procedures and 11 bilateral (BE) records. Four further unilateral records were marked Completed but had cancelled document status (docstatus = 2) and were not eligible. Four completed records with cancelled document status were excluded from the submitted unilateral extraction.

Visual-acuity outcomes

Distance VA categories were defined using recorded Snellen equivalents: good (6/18 or better), borderline (worse than 6/18 through 6/60), and poor (worse than 6/60). Counting-fingers, hand-movements, light-perception and no-light-perception entries were classified as poor; standard notation variants with terminal + or − markers were normalized. Ambiguous values, including some entries marked P where pinhole status was uncertain, were excluded from the primary analysis. Preoperative legacy VA lacks a consistently specified correction status and is therefore described as recorded preoperative distance VA. Postoperative EyeGlass UCVA is explicitly uncorrected. Consequently the paired comparison is between recorded preoperative VA and postoperative UCVA, not a matched best-corrected VA comparison.

Documented 30-day postoperative events

Structured complication fields were unpopulated in historical records. Electronic screening linked diagnosis updates and completed procedures to the same patient and operated eye within 1–30 days after a 2025 index SICS procedure. Signals included iris prolapse, endophthalmitis, IOL dislocation, pupillary block, and IOL exchange. Repeat event rows were deduplicated by index procedure. In routine historical practice, complication narratives were often maintained on paper, whereas diagnosis changes and operations requiring intervention could be registered electronically. These paper records were unavailable for verification during the present revision. Signals were thus retained as non-adjudicated electronic case-finding observations, not as confirmed complications or a valid complication-incidence denominator.

Statistical analysis

Categorical results are expressed as counts and percentages. Postoperative VA-category confidence intervals were calculated using the Wilson score method. Category change was classified as improved, unchanged, or worsened. The revised paired cohort was deduplicated by clinically confirmed same-day patient-eye procedure entries. Descriptive electronic event-linkage yields were reported without presenting them as complication rates. Analyses were restricted to read-only queries of routinely collected records.

Ethics approval

The study was reviewed and approved by the Al Ihsan Specialist Hospital Ethics Committee, Mogadishu, Somalia (Reference: ASH2026SICS01; September 2026). Because the study was retrospective, involved analysis of existing routinely collected clinical records, did not involve direct participant contact or intervention, and reported de-identified or aggregated data, the requirement for individual informed consent was waived by the Ethics Committee. Patient confidentiality and institutional data-protection requirements were maintained throughout the study.

Results

SICS activity and cohort profile

A total of 4,434 SICS-related Clinical Procedure records were identified in 4,134 unique patients during 2025. Of these, 4,422 procedures were completed. Laterality could be resolved as unilateral RE or LE in 4,403 procedures, of which 4,391 were completed. Monthly procedure volume ranged from 83 in March to 556 in April; September and November each recorded 534 procedures (Figure 1).

Table 1. Surgery-level cohort and visual-outcome documentation

Measure	n	Definition / note
All SICS-related Clinical Procedure records	4,434	Full 2025 surgery cohort
Unique patients	4,134	Patient-level denominator
Completed SICS procedures	4,422	Procedure status = Completed
Unilateral eye-resolved SICS procedures	4,403	RE or LE procedure-template laterality
Completed unilateral eye-resolved SICS	4,391	Primary denominator for 30-day event screen
Unilateral SICS postoperative forms	3,201	Post Operation Form, 2025
Operated-eye postoperative VA present	554	Historical laterality derived from postoperative procedure template
Interpretable postoperative VA	550	Four clearly non-interpretable entries excluded
Strict paired visual-outcome cohort	230 eyes / 223 patients	Revised EyeGlass-UCVA paired cohort, Aug–Dec; 4 same-day duplicate records excluded
Aug–Dec 2025 submitted completed SICS records	1,873	Includes 1,862 unilateral and 11 bilateral (BE) records
Aug–Dec 2025 submitted completed unilateral SICS	1,862	Eye-resolved source records, prior to same-day duplicate control
Aug–Dec 2025 submitted completed bilateral SICS	11	Not assignable to one operated eye
Aug–Dec completed but cancelled unilateral records	4	docstatus = 2; excluded from eligibility

Postoperative visual-acuity documentation

Among 3,201 unilateral SICS Post Operation Forms dated in 2025, 554 contained an operated-eye VA entry, of which 550 were potentially interpretable under the historical form-based extraction. These figures describe postoperative-form documentation, not the denominator or source of the revised paired EyeGlass-UCVA analysis. In the August–December surgical extraction, 1,092 of 1,862 procedure records had a nonblank operated-eye EyeGlass UCVA within 8–70 days. Of 249 initially nonblank preoperative/postoperative pairs, 234 contained interpretable VA categories; four same-day duplicate procedure entries were removed, leaving 230 paired patient-eyes in 223 patients. The full-year and August–December denominators describe distinct populations and should not be conflated. These 1,862 procedure records concern the restricted Aug–Dec electronic data extraction, before analytic same-day duplicate handling; they must not be interpreted as 1,862 distinct operated eyes.

Paired visual outcomes

The revised paired visual-outcome cohort comprised 230 operated patient-eyes in 223 patients after removal of four clinician-confirmed same-day duplicate surgical entries. Preoperative VA was selected from measurements obtained 1–180 days before surgery; postoperative EyeGlass UCVA was selected from 8–70 days after surgery, nearest day 32. Of the 234 eligible surgery records before duplicate removal, 141 had a selected postoperative assessment at 28–42 days; the deduplicated 28–42-day count and median follow-up require a final source-level calculation. Age, sex and laterality distributions from the earlier 146-eye cohort have not been carried over to this expanded cohort.

Table 2. Recorded preoperative distance VA and postoperative EyeGlass uncorrected distance VA in the revised paired cohort (n=230 patient-eyes; descriptive reconstruction)

Recorded VA category	Preoperative n (%)	Postoperative n (%)	Postoperative 95% CI
Good (≥6/18)	20 (8.7%)	83 (36.1%)	30.2%–42.5%
Borderline (<6/18 to 6/60)	51 (22.2%)	106 (46.1%)	39.8%–52.5%
Poor (<6/60)	159 (69.1%)	41 (17.8%)	13.4%–23.3%

Visual acuity category improved in 141/230 eyes (61.3%), remained unchanged in 75/230 (32.6%), and worsened in 14/230 (6.1%). Because preoperative correction status was not consistently documented and follow-up could be routine or spectacle-related, these changes should be interpreted as selected-patient recorded-VA outcomes rather than a hospital-wide efficacy estimate.

Documented 30-day postoperative event signals

Five distinct completed unilateral index SICS procedures in five patients had an electronically documented same-eye diagnosis or completed reintervention 1–30 days after surgery in the 2025 cohort. The signals comprised one record-linked case each of iris prolapse, endophthalmitis, IOL dislocation, pupillary block, and IOL exchange. Two IOL-exchange event rows referred to one index procedure. No same-eye anterior-chamber wash event fulfilled the specified linkage rule. The electronic screening yield was 5/4,391 (0.11%) using the previously documented completed unilateral 2025 surgery-record denominator; this must not be interpreted as postoperative complication incidence. Clinical attribution and severity could not be verified because paper-based narratives were unavailable.

Table 3. Electronically linked same-eye postoperative diagnosis or reintervention signals within 30 days (not clinically adjudicated)

Documented signal	Index SICS cases	Interpretation
Iris prolapse	1	Same-eye diagnosis signal
Endophthalmitis	1	Same-eye diagnosis signal
IOL dislocation	1	Same-eye diagnosis signal
Pupillary block	1	Same-eye diagnosis signal
IOL exchange	1	Same-eye procedure; two event rows deduplicated
Anterior-chamber wash	0	No qualifying same-eye SICS linkage
Any high-specificity signal	5	Distinct index procedures; not adjudicated complications

Discussion

This retrospective study demonstrates the potential of routinely recorded ophthalmology data to quantify surgical throughput and reconstruct selected functional outcomes after manual SICS in Mogadishu. In the revised, deduplicated 230-eye sample, recorded VA shifted away from the poor category and 61.3% of eyes improved by at least one broad category. The key interpretation is not that this percentage represents the entire cataract programme, but that clinically interpretable follow-up data can be recovered when visual-acuity and surgical records are linked at patient-eye level.

The expanded postoperative source differs materially from the earlier form-based analysis. EyeGlass Prescription provides measured postoperative uncorrected distance VA, whereas the preoperative legacy examination fields do not consistently indicate correction status. This asymmetry, together with the combination of routine reviews and refraction-driven attendance, precludes direct comparison with studies using standardized presenting VA or best-corrected visual acuity at a fixed follow-up interval. The results are appropriately interpreted as a pragmatic EHR-based description of recorded visual function.

The surgery-level electronic record approach is conceptually similar to large cataract quality databases used by high-volume eye systems. For example, Aravind Eye Hospitals have used cataract quality and electronic medical record data to analyse surgical technique, preoperative vision, postoperative outcomes, and longitudinal service trends. The ASH dataset is smaller and has less complete historical follow-up, but it demonstrates that clinically useful outcome surveillance can be reconstructed from routine electronic records in a resource-constrained setting.

The five electronic postoperative diagnosis/reintervention signals offer a limited safety perspective but cannot be interpreted as a complication rate. Clinical narratives for many postoperative problems were historically recorded on paper, and such files were unavailable for retrospective adjudication. Moreover, some clinical events may have been managed without a corresponding electronic diagnosis update or

completed procedure record. The observed signal yield is therefore a minimum record-linkage observation subject to substantial under-ascertainment and uncertainty about surgical causality.

The most important improvement opportunity is a standardized cataract outcome registry embedded in routine workflow. At minimum, it should capture operated eye, preoperative presenting VA and pinhole/best-corrected VA when clinically available, ocular comorbidity, surgery date and technique, surgeon, intraoperative complication status, early postoperative findings, 4–6-week VA, refraction, and reintervention. The structured fields now available in the hospital system create an opportunity for a stronger prospective cohort in subsequent years.

Strengths and limitations

Strengths include the high-volume real-world setting, reproducible patient-eye-time linkage, separation of postoperative uncorrected VA from corrected refraction measurements, and institutional verification of same-day duplicated operative documentation. Electronic postoperative event signals were reported transparently as non-adjudicated findings, avoiding unsupported complication-incidence claims.

Limitations include the retrospective single-centre design, incomplete historical recording of VA correction status, nonuniform postoperative assessment times, potential selection bias from EyeGlass visits undertaken for either routine follow-up or spectacle prescription, and the exclusion of same-day preoperative VA measurements when sequence could not be assured from date alone. The analytic subset is not representative of all operated eyes. Four same-day duplicates were excluded on the basis of institutional workflow confirmation. The previously reported difference between 1,866 and 1,862 unilateral SICS records is consistent with four Completed records bearing cancelled document status (docstatus = 2); eligibility was restricted to submitted records (docstatus = 1). Eleven bilateral records were also excluded from eye-specific outcome linkage. Furthermore, paper-based clinical narratives were unavailable for adjudicating electronic postoperative safety signals.

Conclusions

Manual small-incision cataract surgery generated substantial ophthalmic service volume at Al Ihsan Specialist Hospital during 2025. Among a selected group of patients with electronically linked preoperative distance VA and postoperative EyeGlass UCVA, a majority improved by at least one broad VA category. These findings support systematic routine collection of operated-eye VA, correction status, standardized follow-up times, and structured complications. Stronger evidence of programme-wide effectiveness and safety will require more complete prospective documentation.

Abbreviations

ASH: Al Ihsan Specialist Hospital; EHR: electronic health record; IOL: intraocular lens; IQR: interquartile range; LE: left eye; RE: right eye; SICS: small-incision cataract surgery; VA: visual acuity.

Declarations

Acknowledgements

The authors acknowledge the Ophthalmology Department, operating-theatre team, optometry staff, medical-records and information-technology staff, and Quality Directorate of Al Ihsan Specialist Hospital for their contributions to routine clinical care and data systems.

Author contributions

LHM conceived the study, developed the methodology, led data validation and formal analysis, interpreted the quality findings, and drafted the manuscript. MAM contributed senior surgical and clinical interpretation, supervision, and critical revision of the manuscript. HAA contributed postoperative patient review, follow-up assessment, outcome validation, clinical interpretation, and critical revision of the manuscript. All authors reviewed and approved the final manuscript and accept accountability for their contributions.

Funding

No specific external funding was received for this study.

Availability of data and materials

The underlying clinical records are held by Al Ihsan Specialist Hospital and contain confidential patient information. De-identified analytic data or aggregate outputs may be available from the corresponding author subject to institutional approval, applicable privacy safeguards, and ethics requirements.

Ethics approval and consent to participate

The study was reviewed and approved by the Al Ihsan Specialist Hospital Ethics Committee, Mogadishu, Somalia (Reference: ASH2026SICS01; September 2026). Because the study was retrospective, involved analysis of existing routinely collected clinical records, did not involve direct participant contact or intervention, and reported de-identified or aggregated data, the requirement for individual informed consent was waived by the Ethics Committee. Patient confidentiality and institutional data-protection requirements were maintained throughout the study.

Consent for publication

Not applicable; no identifiable individual-level information is reported in the manuscript.

Competing interests

The authors declare that they have no competing interests.

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Figures

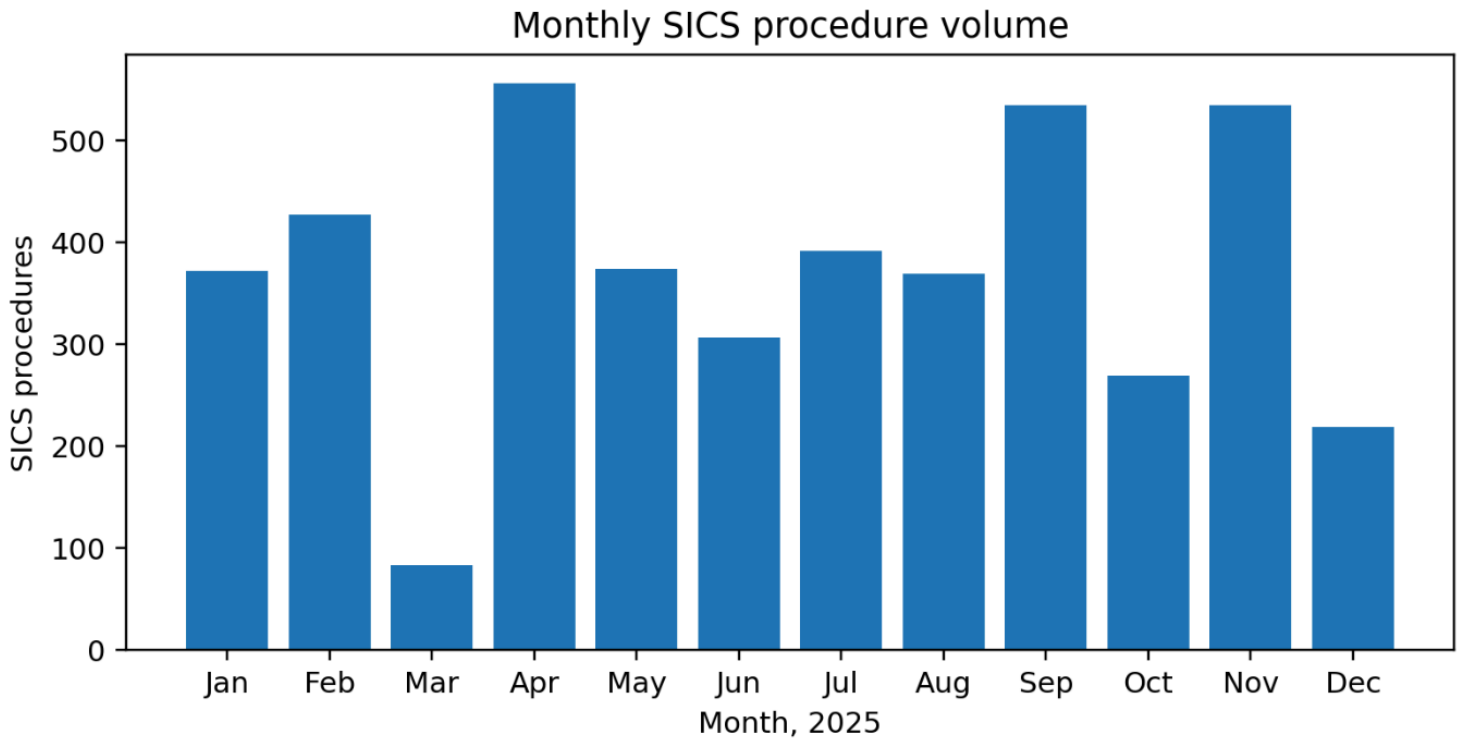


Figure 1

Monthly SICS procedure volume at Al Ihsan Specialist Hospital, 2025. Counts are surgery-level Clinical Procedure records.

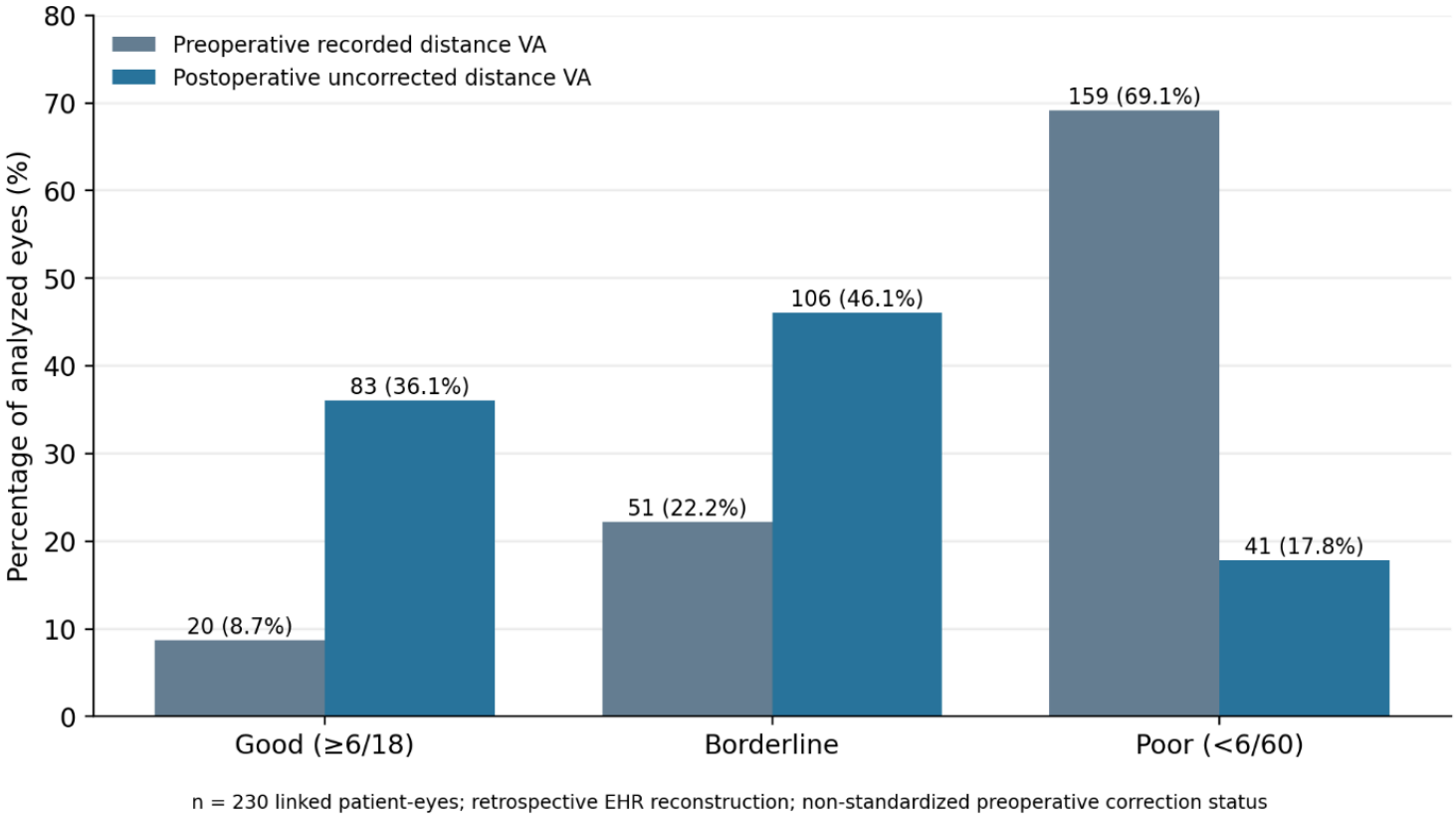


Figure 2

Recorded preoperative distance-VA and postoperative EyeGlass uncorrected distance-VA categories among 230 linked patient-eyes. Percentages are descriptive; the preoperative correction status was not standardized.