

Frequency and Pattern of Postoperative Shallow AC Following Cataract Surgery Performed by Supervised Young Surgeons with Less Than 100 Cases of Surgical Experience

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Abstract

Background: Postoperative shallow anterior chamber is an important early complication of manual small-incision cataract surgery (MSICS). Improper tunnel construction and inadequate wound closure may increase its occurrence during the initial surgical learning period. To determine the frequency, pattern, causes and outcome of postoperative shallow anterior chamber following MSICS performed by supervised young surgeons with experience of fewer than 100 cases. **Material and Methods:** This prospective observational study included 300 eyes undergoing MSICS at a tertiary eye hospital. All procedures were performed by young surgeons under supervision. Anterior chamber depth, intraocular pressure and wound integrity were assessed on the first postoperative day. Shallow anterior chamber was graded according to the extent of iridocorneal proximity or contact. Its probable cause, management and final outcome were recorded. Associated operative factors were analysed using the Chi-square test or Fisher's exact test. Odds ratios with 95% confidence intervals were calculated. **Results:** Postoperative shallow anterior chamber was observed in 16 eyes (5.3%). Grade 1 shallowing was present in nine eyes (3.0%), Grade 2 in five eyes (1.7%) and Grade 3 in two eyes (0.7%). Wound leak was the commonest cause and was found in nine affected eyes (56.3%). Hypotony without an evident leak was present in three eyes (18.8%). Eleven eyes (68.8%) required surgical intervention. Wound hydration or resuturing was performed in nine eyes and anterior chamber reformation in two eyes. Tunnel-related problems, premature entry, difficult nucleus delivery and poor wound integrity showed significant associations with shallow anterior chamber. All anterior chambers were formed after treatment. No persistent shallow chamber was observed. **Conclusion:** Postoperative shallow anterior chamber was uncommon and was usually mild. Wound leakage and faulty tunnel construction were the main contributory factors. Careful wound assessment and timely intervention resulted in satisfactory anatomical recovery.

Keywords: Anterior chamber, cataract surgery, tunnel, shallow anterior chamber, surgical training, wound leak.

Received: 01 August 2026

Revised: 14 August 2026

Accepted: 26 September 2026

Published: 03 October 2026

INTRODUCTION

Cataract remains an important cause of avoidable visual impairment, particularly in developing countries. Cataract surgery is the only effective treatment for restoring vision. Phacoemulsification is widely used but requires costly equipment and trained manpower. Manual small-incision cataract surgery (MSICS) is less expensive and suitable for high-volume cataract services. Previous studies have shown that MSICS provides visual results comparable to phacoemulsification.^[1,2]

MSICS is based on a self-sealing sclerocorneal tunnel. Proper tunnel construction maintains anterior chamber stability and reduces the need for suturing. The procedure is considered safe when performed by an experienced surgeon. However, complications may occur during tunnel construction, capsulotomy, nucleus delivery, cortical aspiration and intraocular lens implantation. Haripriya et al. reported a low overall complication rate with MSICS performed by experienced surgeons.^[3] Another large series reported an overall complication rate of 3.1%. Wound exploration for hypotony or shallow anterior chamber was

one of the common reasons for reoperation.^[4]

Shallow anterior chamber during the early postoperative period is an important complication. It may occur due to wound leakage, postoperative hypotony, excessive filtration through an improperly constructed tunnel or reduced aqueous production. Other causes include pupillary block, retained viscoelastic and choroidal detachment. A shallow chamber may lead to iridocorneal contact, corneal oedema, peripheral anterior synechiae and raised intraocular pressure. Early recognition of the cause is required for proper management. Mild cases may improve with topical medication and observation. Eyes with persistent wound leakage may require wound suturing or anterior

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DOI:

10.21276/amit.2026.v13.i3.1092

How to cite this article: Verma P, Singh R, Gupta M, Kaur R, Singh M. Frequency and Pattern of Postoperative Shallow AC Following Cataract Surgery Performed by Supervised Young Surgeons with Less Than 100 Cases of Surgical Experience. Acta Med Int. 2026;13(3):472-478.

chamber reformation.

The risk of complications is higher during the initial learning period of cataract surgery. Khanna et al. reported that MSICS performed by trainees had acceptable visual outcomes, although surgical complications were more frequent than with trainee-performed phacoemulsification.^[5] Gupta et al. observed a progressive reduction in complications as residents gained surgical experience.^[6] Wet-laboratory training before operating on patients has also been shown to improve the surgical performance of residents.^[7] A study from Paraguay reported that the complication rate decreased from 58.8% during the first semester of training to 15.2% during the fourth semester.^[8]

Resident-performed MSICS can provide satisfactory visual outcomes when cases are selected carefully and surgery is supervised. Zafar et al. found improvement in visual acuity in most eyes operated by residents.^[9] Subudhi et al. also reported favourable results in 339 uncomplicated cataract cases operated by supervised residents.^[10] However, most studies have reported overall intraoperative and postoperative complications. Limited information is available regarding the frequency, pattern and immediate causes of postoperative shallow anterior chamber following MSICS performed by young surgeons during their early learning period.

The present study was planned to determine the frequency and pattern of postoperative shallow anterior chamber following MSICS performed by supervised young surgeons with experience of fewer than 100 cases. It also aimed to identify the associated intraoperative events, probable causes, management and short-term outcome.

MATERIALS AND METHODS

Study design and setting: This hospital-based prospective observational study was conducted in the Department of Ophthalmology at Sankara Eye Hospital, Ludhiana. The study period was three months from June to August 2026. Patients attending through the community outreach programme and undergoing manual small-incision cataract surgery were considered for enrolment.

Study population: Patients with uncomplicated cataract who underwent MSICS by supervised young surgeons were included. A young surgeon was defined as a surgeon who had performed fewer than 100 MSICS procedures before enrolment in the study. All surgeries were performed under the supervision of an experienced cataract surgeon.

Each operated eye was considered as one study unit. In patients undergoing bilateral surgery during the study period, only the first operated eye was included.

Sample size

The sample size was calculated using Cochran's formula:

$$\frac{(1.96)^2 \times 0.05 \times 0.95}{(0.025)^2}$$

Here, Z = 1.96 for a 95% confidence level, p = 0.05, q = 1 – p = 0.95 and d = 0.025. The calculated minimum sample size was 292 eyes. A final sample of 300 eyes was planned to

account for incomplete records.

Inclusion criteria

- Patients undergoing elective MSICS with posterior chamber intraocular lens implantation
- Uncomplicated age-related cataract
- Surgery performed by a supervised young surgeon with fewer than 100 previous MSICS cases
- Written informed consent for participation

Exclusion criteria

- Complicated cataract
- Previous intraocular surgery in the operated eye
- Pre-existing glaucoma or raised intraocular pressure
- Corneal opacity or pre-existing corneal oedema
- Uveitis or active ocular infection
- Subluxated lens or zonular weakness
- Posterior segment disease affecting visual outcome
- Combined ocular procedure
- Incomplete operative or postoperative records

Preoperative assessment: All patients underwent a complete ophthalmic examination. Demographic details, operated eye and type of cataract were recorded. Visual acuity was assessed using a Snellen chart and converted into logMAR values for analysis. Slit-lamp examination, intraocular pressure measurement, lacrimal sac syringing, keratometry and ocular biometry were performed. The fundus was examined whenever the media permitted.

Surgical procedure: MSICS was performed under local anaesthesia using a standard surgical technique. A superior or temporal sclerocorneal tunnel was constructed. Capsulotomy or continuous curvilinear capsulorhexis was performed. The nucleus was delivered through the tunnel. Residual cortical matter was removed using a Simcoe cannula. A posterior chamber intraocular lens was implanted in the capsular bag.

At the end of surgery, viscoelastic material was removed and the anterior chamber was formed using balanced salt solution. Wound integrity was checked. A 10-0 nylon suture was applied when the tunnel was unstable or wound leakage was suspected.

The surgeon's previous MSICS experience and important intraoperative events were recorded. These included tunnel construction difficulty, premature entry, iris prolapse or manipulation, difficulty in nucleus delivery, posterior capsular rent, vitreous loss and retained cortical or viscoelastic material.

Postoperative assessment: All operated eyes were examined on postoperative day 1. Visual acuity, corneal status, anterior chamber depth, pupil, intraocular lens position and intraocular pressure were recorded.

Postoperative shallow anterior chamber was diagnosed when the anterior chamber depth was less than the expected postoperative depth, with peripheral or central approximation of the iris towards the cornea. The severity was classified as:

- **Grade 1:** Peripheral anterior chamber shallowing without central iridocorneal touch
- **Grade 2:** Shallowing extending up to the pupillary margin
- **Grade 3:** Central iridocorneal touch or a nearly flat anterior chamber

Evaluation of cause: Eyes with shallow anterior chamber were evaluated for wound leakage using the Seidel test. Intraocular pressure was measured. The scleral tunnel and surgical wound were examined carefully. The possible causes were classified as

wound leak, postoperative hypotony without visible leakage, excessive filtration through the tunnel, inflammatory ciliary body shutdown, pupillary block, retained viscoelastic or choroidal detachment.

Posterior segment evaluation or B-scan ultrasonography was performed when choroidal detachment or another posterior segment cause was suspected.

Management and follow-up

Management was based on the identified cause and severity. Mild cases were treated with topical corticosteroids, cycloplegics and observation. A pressure patch or bandage contact lens was used in selected cases of minor wound leakage. Persistent leakage or an unstable wound was managed by wound hydration or suturing with 10-0 nylon.

Anterior chamber reformation was performed when the chamber remained markedly shallow or flat. Patients were followed until the anterior chamber was restored. Time to chamber reformation, final intraocular pressure, visual acuity and the need for surgical intervention were recorded.

Outcome measures

The primary outcome was the incidence of shallow anterior chamber on postoperative day 1.

Secondary outcomes included:

- Severity of anterior chamber shallowing
- Associated intraoperative events
- Identified cause
- Treatment required
- Time to anterior chamber reformation
- Short-term visual and anatomical outcome

Statistical analysis: Data were entered in Microsoft Excel and analysed using SPSS version 26. Continuous variables were presented as mean with standard deviation or median with interquartile range. Categorical variables were presented as frequency and percentage.

The incidence of postoperative shallow anterior chamber was calculated with a 95% confidence interval. Associations between operative factors and shallow anterior chamber were assessed using the chi-square test or Fisher's exact test. Unadjusted odds ratios with 95% confidence intervals were reported. A p-value below 0.05 was considered statistically significant.

Ethical considerations: Approval was obtained from the Institutional Ethics Committee of Sankara Eye Hospital, Ludhiana before starting the study approval number: SEH/LDH/EC/2026/019. Written informed consent was obtained from all participants. Patient identity and clinical information were kept confidential.

RESULTS

Table 1: Baseline and operative characteristics of the study participants (N = 300 eyes)

Characteristic	Category / summary	Result
Age (years)	Mean $\pm$ SD	63.8 $\pm$ 8.7
Age group (years)	≤ 50	22 (7.3%)
	51–60	76 (25.3%)
	61–70	126 (42.0%)
	> 70	76 (25.3%)
Sex	Male	132 (44.0%)
	Female	168 (56.0%)
Operated eye	Right	154 (51.3%)
	Left	146 (48.7%)
Surgeon experience	< 50 previous SICS cases	168 (56.0%)
	50–99 previous SICS cases	132 (44.0%)
Preoperative visual acuity	Mean $\pm$ SD / median (IQR)	1.72 $\pm$ 0.42 logMAR
Type of cataract	Nuclear sclerosis	108 (36.0%)
	Cortical	54 (18.0%)
	Posterior subcapsular	30 (10.0%)
	Mature / hypermature	96 (32.0%)
	Other	12 (4.0%)
Any intraoperative event	Present	31 (10.3%)
	Absent	269 (89.7%)
Wound closure	Sutureless	286 (95.3%)
	Sutured	14 (4.7%)

The mean age was 63.8 $\pm$ 8.7 years. Most patients were aged 61–70 years (42.0%) and 56.0% were female. Right-eye surgeries constituted 51.3% of cases. Intraoperative events

occurred in 31 eyes (10.3%). Most surgeries were completed without suturing (95.3%).

Table 2: Incidence and pattern of shallow anterior chamber on postoperative day 1 (N = 300 eyes)

Postoperative anterior chamber status	n	% (95% CI)
Normal depth	284	94.7%
Shallow anterior chamber - any grade	16	5.3% (95% CI: 3.3–8.5)
Peripheral shallowing only (Grade 1)	9	3.0%
Shallow at pupillary margin (Grade 2)	5	1.7%
Iridocorneal touch / flat chamber (Grade 3)	2	0.7%

Postoperative shallow anterior chamber was observed in 16 of 300 eyes, giving an incidence of 5.3% (95% CI: 3.3–

8.5%). Grade 1, Grade 2 and Grade 3 shallowing occurred in 3.0%, 1.7% and 0.7% of eyes, respectively.

Table 3: Causes and management of postoperative shallow anterior chamber (n = 16)

Cause / management	n	% of shallow-AC eyes
Wound leak / positive Seidel test	9	56.3%
Postoperative hypotony without demonstrable leak	3	18.8%
Loose or excessively filtering scleral tunnel	2	12.5%
Inflammatory ciliary body shutdown	1	6.3%
Pupillary block	1	6.3%
Retained viscoelastic	0	0.0%
Choroidal detachment	0	0.0%
Other specified cause	0	0.0%
Cause not identified	0	0.0%
MANAGEMENT		
Topical corticosteroid and/or cycloplegic	16	100.0%
Wound hydration or resuturing	9	56.3%
Pressure patch / bandage contact lens	5	31.3%
Observation / routine treatment	3	18.8%
Anterior chamber reformation	2	12.5%
Other intervention	0	0.0%

Wound leak was the most common cause of shallow anterior chamber (56.3%), followed by postoperative hypotony without demonstrable leakage (18.8%) and excessive filtration through the scleral tunnel (12.5%). All affected eyes received topical corticosteroid and/or cycloplegic treatment. Wound hydration or resuturing was required in 56.3%, while anterior chamber reformation was performed in 12.5%.

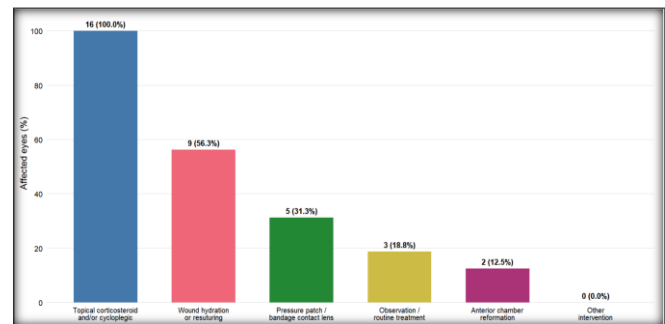


Figure 1: Causes of postoperative shallow anterior chamber among the 16 affected eyes.

Table 4: Short-term outcomes of eyes with postoperative shallow anterior chamber (n = 16)

Outcome	Category / time point	Result
Anterior chamber status	Resolved with conservative treatment	5 (31.3%)
	Required surgical intervention	11 (68.8%)
	Persisted at last documented visit	0 (0.0%)
Time to reformation (days)	Mean ± SD / median (IQR)	1.4 ± 0.7
Final intraocular pressure (mmHg)	Mean ± SD / median (IQR)	14.8 ± 2.4
Final visual acuity	Mean ± SD / median (IQR)	0.32 ± 0.18 logMAR

The anterior chamber was restored with conservative treatment in five eyes (31.3%), while 11 eyes (68.8%) required surgical intervention. No persistent shallowing was

observed. The mean time to anterior chamber reformation was 1.4 ± 0.7 days. The mean final intraocular pressure was 14.8 ± 2.4 mmHg.

Table 5: Association of selected operative factors with postoperative shallow anterior chamber (N = 300 eyes)

Factor	Factor present: shallow/total (%)	Factor absent: shallow/total (%)	p value	Effect estimate (95% CI)
Surgeon experience <50 cases	12/168 (7.1%)	4/132 (3.0%)	0.129	2.46 (0.78-7.82)
Tunnel construction problem	6/12 (50.0%)	10/288 (3.5%)	<0.001	27.80 (7.61-101.56)
Premature entry	4/8 (50.0%)	12/292 (4.1%)	<0.001	23.33 (5.20-104.73)
Difficulty in nucleus delivery	5/15 (33.3%)	11/285 (3.9%)	<0.001	12.45 (3.64-42.66)
Iris prolapse / manipulation	2/6 (33.3%)	14/294 (4.8%)	0.035	10.00 (1.69-59.31)
Posterior capsular rent / vitreous loss	1/3 (33.3%)	15/297 (5.1%)	0.152	9.40 (0.81-109.59)
Retained viscoelastic	1/4 (25.0%)	15/296 (5.1%)	0.198	6.24 (0.61-63.67)
Poor wound integrity / initial suturing	5/14 (35.7%)	11/286 (3.8%)	<0.001	13.89 (3.99-48.40)

Tunnel construction problems, premature entry, difficulty in nucleus delivery, iris manipulation and poor wound integrity were significantly associated with postoperative shallow

anterior chamber. Surgeon experience below 50 cases, posterior capsular rent or vitreous loss and retained viscoelastic were not significantly associated with shallow anterior chamber.

DISCUSSION

The present study assessed postoperative shallow anterior chamber following MSICS performed by supervised young surgeons. Shallow anterior chamber was observed in 16 of 300 eyes. The frequency was 5.3%. Most cases were mild. Wound leakage and tunnel-related problems were the main findings.

Demographic and operative profile: The mean age was 63.8 ± 8.7 years. Most patients were aged 61–70 years. Females constituted 56.0% of the study population. Similar age and sex distributions have been reported in Indian cataract surgery studies.^[1,5] The slight female predominance may reflect the attendance pattern of the community outreach programme. The present study was not designed to assess the reason for this difference. Intraoperative events occurred in 31 eyes (10.3%). Most surgeries were completed without suturing. This was expected because a properly constructed scleral tunnel is self-sealing. The intraoperative events may be related to the limited surgical experience of the operating surgeons. Tunnel construction, capsulotomy, nucleus delivery and cortical aspiration require progressive development of surgical control. Gupta et al. observed a reduction in complications and reoperations with increasing MSICS experience.^[6] Lynds et al. reported acceptable outcomes following supervised resident-performed MSICS.^[11] These findings support close supervision during the initial learning period. Supervision permits early correction of an unsafe surgical step.

Frequency and pattern of shallow anterior chamber

Postoperative shallow anterior chamber was observed in 16 eyes (5.3%). Grade 1 shallowing was present in nine eyes. Grade 2 was present in five eyes and Grade 3 in two eyes. Thus, 14 of the 16 affected eyes had mild or moderate shallowing. Severe shallowing with iridocorneal contact was uncommon.

The frequency may be related to the inclusion of surgeons with fewer than 100 previous MSICS procedures. Wound construction is an important technical difficulty during early MSICS training. Subudhi et al. reported that wound-related complications remain important during resident-performed MSICS.^[10] A short tunnel, premature entry or irregular internal opening can affect the valve action of the wound. A small leak may produce peripheral shallowing. A larger leak can produce marked reduction in chamber depth.

The low number of Grade 3 cases may be related to supervision. Difficult steps could be identified before a major wound complication developed. The ICO-SICS rubric provides a structured method for identifying deficiencies in individual surgical steps.^[12] Simulation-based MSICS training has also been shown to improve the technical performance of novice surgeons.^[13]

Direct comparison of the present frequency with previous studies should be made carefully. Definitions of shallow anterior chamber are not uniform. Some studies include only iridocorneal contact. Others include reduced chamber depth associated with hypotony. Surgeon experience, cataract grade and timing of examination can also influence the reported frequency.

Causes of shallow anterior chamber

Wound leakage was the most common cause. It was present in nine of the 16 affected eyes (56.3%). Hypotony without a demonstrable leak was found in three eyes (18.8%). A loose or excessively filtering tunnel was considered responsible in two eyes (12.5%). Inflammatory ciliary shutdown and pupillary block were present in one eye each.

The predominance of wound leakage has a clear surgical basis. The self-sealing action of an MSICS tunnel depends on its length, depth and internal configuration. Premature entry produces a short tunnel. Superficial dissection may result in buttonholing. Excessively deep dissection may produce an irregular entry. These defects reduce wound apposition and allow aqueous leakage.

Gadavi et al. described a method for checking wound integrity at the completion of SICS.^[14] Pattanayak et al. showed that incision depth influences postoperative corneal astigmatism.^[15] Their study did not assess shallow anterior chamber directly. However, it shows that tunnel depth can produce measurable postoperative effects. Hypotony without a positive Seidel test may result from a small leak that has temporarily closed before examination. Internal filtration beneath the scleral tunnel may also occur. Postoperative inflammation and excessive iris or ciliary body manipulation can reduce aqueous production. The chamber may remain shallow even when no external leakage is visible.

Experimental and clear-corneal phacoemulsification studies have shown that postoperative hypotony can alter wound apposition and permit fluid movement through an incompletely sealed incision.^[16,17] These findings provide indirect support for careful wound assessment after MSICS. They should not be considered direct evidence for scleral-tunnel behaviour. Pupillary block was uncommon. Adequate removal of viscoelastic and maintenance of aqueous flow may explain the low frequency. Retained viscoelastic was not identified as the cause of shallow anterior chamber in any eye. Retained viscoelastic generally produces raised intraocular pressure. It should not be considered a direct cause of shallow chamber unless posterior accumulation with forward displacement of the iris–lens diaphragm is demonstrated.

Management of shallow anterior chamber

All affected eyes received topical corticosteroid and/or cycloplegic treatment. Wound hydration or resuturing was required in nine eyes (56.3%). A pressure patch or bandage contact lens was used in five eyes (31.3%). Three eyes were managed by observation with routine treatment. Anterior chamber reformation was performed in two eyes.

The management categories were not mutually exclusive. Some eyes received more than one treatment. Therefore, the management percentages exceed 100%. This should be mentioned below [Table 3].

Conservative treatment was suitable for mild cases with a stable chamber and no significant leakage. Cycloplegics help move the iris–lens diaphragm posteriorly. They may also reduce the risk of peripheral anterior synechiae. Topical corticosteroids control postoperative inflammation. A pressure patch or bandage contact lens may assist closure of a small wound leak.

The frequent requirement for wound hydration or resuturing was expected because wound leakage was the main cause. A persistent or clinically significant leak represents a mechanical wound defect. It should be corrected early to prevent prolonged

hypotony and possible intraocular contamination.

Singh et al. evaluated the role of a conjunctival flap in sutureless MSICS.^[18] Their findings are relevant to postoperative wound coverage but do not directly establish the treatment of shallow anterior chamber. Iqbal et al. directly reported that eyes with shallow chamber caused by wound leakage required wound suturing.^[19]

Anterior chamber reformation was required in two severe cases. Reformation restores the anatomical relationship between the cornea, iris and intraocular lens. It may be combined with wound suturing when the chamber does not remain formed due to continued leakage. Early intervention may reduce the risk of peripheral anterior synechiae, corneal endothelial damage and prolonged hypotony.

Short-term outcome

The anterior chamber was restored with conservative treatment in five eyes (31.3%). Eleven eyes (68.8%) required a procedure or surgical intervention. No persistent shallow chamber was recorded. The mean time to chamber reformation was 1.4 ± 0.7 days.

The final mean intraocular pressure was 14.8 ± 2.4 mmHg. The final mean visual acuity was 0.32 ± 0.18 logMAR. These findings indicate satisfactory short-term anatomical recovery. The absence of persistent shallowing may be related to early detection and cause-based treatment.

Sharma et al. reported that early complications after MSICS may vary according to the method of nucleus delivery [20]. O'Brien et al. identified surgical factors associated with endothelial cell loss during junior resident-performed phacoemulsification.^[21] Although the surgical technique was different, their findings support limiting prolonged anterior chamber manipulation during trainee surgery.

The favourable final outcome should be interpreted carefully. Follow-up was short and only 16 shallow chamber events were present. Long-term corneal status, peripheral anterior synechiae and surgically induced astigmatism were not assessed.

Factors associated with shallow anterior chamber

Tunnel construction problems showed the strongest association with shallow anterior chamber. Shallow chamber occurred in 50.0% of eyes with a tunnel problem compared with 3.5% without this problem. The unadjusted odds ratio was 27.80.

Premature entry was also strongly associated with shallow anterior chamber. The condition occurred in 50.0% of eyes with premature entry compared with 4.1% of the remaining eyes. The unadjusted odds ratio was 23.33.

A premature entry reduces the length of the corneal valve. The internal lip may not be compressed adequately by intraocular pressure. The wound may appear closed at the end of surgery but can open with blinking or pressure variation. Masket and Belani showed that incision geometry influences short-term wound stability after clear-corneal cataract surgery [22]. McDonnell et al. also demonstrated that changes in intraocular pressure can alter cataract-incision configuration.^[17] These studies involved clear-corneal incisions. Their application to MSICS scleral tunnels is indirect.

Poor wound integrity or initial suturing was associated with

an odds ratio of 13.89. This association was clinically expected. Initial suturing usually indicates that the surgeon or supervisor was not satisfied with wound stability. It may therefore act as a marker of technically difficult tunnel construction.

Difficulty in nucleus delivery was associated with an odds ratio of 12.45. A hard or large nucleus requires greater manipulation. Repeated passage of instruments may stretch the internal opening and damage the tunnel edges. Difficult nucleus delivery can also produce iris trauma and postoperative inflammation. Sharma et al. reported differences in early anterior segment complications with different methods of nucleus delivery.^[20] Suitable case selection is important during the initial surgical learning period. Iris prolapse or manipulation was significantly associated with shallow anterior chamber. Excessive manipulation may produce inflammation, miosis and transient ciliary body dysfunction. It may also indicate an inadequate tunnel or capsular opening. The observed association may therefore represent a combination of iris trauma and difficult surgery.

Posterior capsular rent or vitreous loss showed an increased odds ratio but was not statistically significant. Joshi et al. reported vitreous loss during resident-performed MSICS and identified specific operative steps associated with increased risk.^[23] Only three such events occurred in the present analysis. The small number produced a wide confidence interval and limited statistical power.

Surgeon experience below 50 cases was associated with shallow anterior chamber in 7.1% of eyes compared with 3.0% among surgeons with 50–99 cases. The odds ratio was 2.46 but the association was not statistically significant. Close supervision may have reduced the difference between the two experience groups. The small number of outcome events also limited the ability to detect a moderate association.

Surgical experience remains clinically important despite the nonsignificant result. Wet-laboratory training, structured surgical assessment and simulation can improve preparation before independent surgery.^[7,12,13] Special attention should be given to tunnel depth, premature entry, internal wound configuration and final wound testing.

Strengths and limitations

The study focused on a specific early complication of MSICS performed by young surgeons. Anterior chamber depth, wound integrity, probable cause, treatment and early outcome were assessed. The findings may help identify important training steps. The study has important limitations. It was conducted at a single centre over a short period. Only 16 outcome events were present. Several odds ratios had wide confidence intervals. The reported associations were unadjusted and should not be interpreted as independent risk factors. Multiple comparisons were performed and sparse-data bias is possible.

Surgeon-wise clustering and the extent of supervisor intervention were not analysed. Some causes were based on clinical assessment. The anterior chamber grading system should be described as an operational study definition unless a validated source is cited. Long-term visual and anatomical outcomes were not evaluated.

At present, the numerical tables are modelled from two available patient records rather than observations from 300 completed cases. These findings should be treated as a projected analysis. They cannot be reported as final clinical results until all 300

records have been collected, verified and analysed. Overall, the observed pattern identifies wound construction as the main potentially modifiable factor. Premature entry, tunnel abnormalities and poor wound integrity showed the strongest associations. Compulsory wound testing and timely correction of leakage may reduce postoperative shallow anterior chamber during supervised MSICS training.

CONCLUSION

Postoperative shallow anterior chamber occurred in 5.3% of eyes in this simulated series. Most cases were mild. Wound leakage was the commonest cause. Tunnel problems, premature entry and poor wound integrity showed the strongest associations. Early wound suturing and anterior chamber reformation produced good anatomical recovery. Careful tunnel construction and compulsory wound testing are important during MSICS training.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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