

## Preferred practice patterns in aphakia management in adults in India: A survey

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**Purpose:** To assess different approaches in the management of aphakia in adults in Indian ophthalmologists via an online survey. **Methods:** A survey-monkey based online questionnaire was fielded to Indian ophthalmologists in accordance with the CHERRIES guidelines. We recorded participants' demographics, practice settings, and preferred surgical options including the type of intraocular lens (IOL) preferred when encountering a case of aphakia in adults with and without adequate capsular support. Differences between anterior segment (AS) surgeons and vitreoretinal (VR) surgeons as well as differences between surgeons with more or less than 10 years of surgical experience were evaluated using analytic statistics. **Results:** Of the 481 surgeons who responded to the survey, 369 (77%) were AS surgeons and the remaining 112 (23%) were VR surgeons and represented all regions of India. When encountering posterior capsular rent during cataract surgery, a three-piece IOL in the ciliary sulcus was the most preferred ( $n = 275$ , 57%) when there was adequate capsular support, while a retrofitted iris-claw IOL ( $n = 91$ , 19%) was the commonest choice in eyes without adequate capsular support. With associated nucleus drop, 85% of surgeons preferred to refer the patient to a VR surgeon and left the eye aphakic. Multivariable logistic regression showed that VR surgeons were more than six times likely to prefer a scleral fixated intraocular lens (SFIOLs) [odds ratio (OR) = 6.5, 95% confidence interval (CI) = 3.4–12.5,  $P < 0.001$ ] and surgeons with >10 years of experience were also twice more likely to prefer an SFIOL (OR = 2.4, 95% CI = 1.2–4.9,  $P = 0.02$ ). **Conclusion:** The choice of IOL in absence of capsular support in adult eyes differs between AS and VR surgeons and is also influenced by the surgeon's experience.

**Key words:** Aphakia, posterior capsular rent, retrofitted iris-claw IOL, SFIOL, vitrectomy

The incidence of post-cataract surgery aphakia is <1% but causes a lot of morbidity in patients.<sup>[1]</sup> Management of aphakia has undergone paradigm shifts from anterior chamber intraocular lenses (ACIOLs) of various designs to scleral fixated intraocular lenses (SFIOLs) and more recently, retrofitted iris-claw lenses.<sup>[2–5]</sup> The SFIOL fixation has also seen major shifts from being a predominantly suture-assisted surgery to being sutureless over the past decade.<sup>[6–9]</sup> After the introduction of the sutureless SFIOL by Gabor *et al.*<sup>[6]</sup> in 2007, the glued intraocular lens (IOL) by Narang *et al.*<sup>[10]</sup> and the flange fixation by Yamane<sup>[4]</sup> have increased the popularity and adoption of the sutureless SFIOL techniques. With a few other modifications such as the XNIT surgery by Baskaran *et al.*<sup>[11]</sup> and the introduction of novel IOL designs for sutureless SFIOL fixation such as the one by Madanagopalan *et al.*<sup>[12]</sup> management of aphakia has truly come a long way in not only improving the ease of surgery but also improving patient comfort and visual outcomes.

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Given the myriad choice of IOLs in the management of aphakia, with many comparative studies showing similar visual outcomes, the choice of IOL depends upon the operating surgeon. Other factors include IOL availability, adequacy of capsular support, coexistent nucleus or cortex drop, white to white diameter, and primary (i.e., at the time of cataract surgery) vs. secondary surgery (after previous surgery).

To the best of our knowledge, surgeon preferences for the management of aphakia in India, in terms of choice of IOL and the factors determining these choices, have not been elucidated to date. In this survey of cataract surgeons across India, we sought to assess preferences in the surgical management of aphakia, especially in the absence of adequate capsular support.

## Methods

The study was approved by the Institutional Ethics Committee and the study was carried out as per the tenets of the Declaration of Helsinki. The identity of all participating surgeons was kept anonymous during data collection and analysis. A questionnaire (Annexure 1) was used during the

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survey and its administration followed the guidelines from the CHERRIES checklist.<sup>[13]</sup> The questions were pilot tested by members of the core survey team and questions and/or their options were modified by consensus over an online zoom meeting. The survey was fielded to members of the All-India Ophthalmic Society (AIOS) with valid email ID and phone numbers using emails and WhatsApp messages from March to April 2021. Single responses from participants were ensured by hosting the survey on the survey-monkey platform and tagging responses using the participant's IP address. Participation was voluntary and was not remunerated. Responses were registered as complete when all the survey questions were answered. The initial part of the questionnaire recorded the type of surgeon (anterior segment (AS) vs. posterior segment), years of surgical experience, region of practice in India (north, east, west, south, and central), type of practice (institutional, private, and combined), area of practice (urban vs. rural), the number of cataract surgeries performed per month, and the number of aphakia patients encountered in practice per month.

The next parts of the questionnaire were designed to assess surgeon preferences and choice of IOL for managing aphakia in adults under the following headings:<sup>[1]</sup> planning when the patient is seen in the outpatient setting,<sup>[2]</sup> aphakia management during primary surgery without nucleus or cortex drop,<sup>[3]</sup> aphakia management during primary surgery with nucleus or cortex drop, and<sup>[4]</sup> IOL placement preferences during secondary surgery without adequate capsular support. For management during primary surgery, surgeons were asked about whether they manage the surgery themselves or refer, if managing themselves then do they place an IOL in the same or secondary sitting, how long they prefer to wait for IOL placement of choosing a secondary sitting and the type of IOL they prefer in cases with and without capsular support. Options for IOL types provided were single-piece IOL in sulcus and three-piece IOL in sulcus for eyes with capsular support, and SFIOL, anterior fixated iris-claw, retrofixated iris-claw, iris sutured IOL, and ACIOL for eyes without capsular support. Surgeons were also asked whether performed a peripheral iridectomy while placing a retrofixated iris-claw IOL. If preferring an SFIOL, surgeons were asked if they preferred a sutured or sutureless technique of fixation. If preferring a sutureless technique, the choices provided were glued SFIOL, Gabor Schiott's technique (or its modification), or the Yamane technique (or its modification). If preferring a sutured technique, surgeons were asked about the type of suture (9-0 prolene, 10-0 prolene, or Gortex) and the type of SFIOL preferred (SFIOL with eyelets, routine three-piece IOL anchored with haptics, or foldable acrylic IOL with plate haptics (Akreos IOL, Bausch and Lomb, USA). Lastly, surgeons were asked about their preference for managing cases with bilateral aphakia.

### Statistical analysis

All categorical variables were expressed as proportions (*n*, %) and denominators for each question were based on the total responses received for that particular question. Chi-square tests were used to analyze differences between groups. Logistic regression analysis was used to predict the choice of SFIOL in eyes without nucleus drop and no capsular support and covariates included were surgeon type (anterior vs. posterior segment surgeon), surgeon experience, and type of practice (institutional vs. private vs. both).

All data were exported from the survey server into Microsoft Excel and analyzed using STATA 12.1 I/c (Stata Corp, Fort

Worth, Texas, USA). All *P* values < 0.05 were considered statistically significant.

## Results

### Surgeon characteristics

The survey questionnaires were sent to 10,000 ophthalmologists. A total of 481 (4.8%) surgeons responded to our survey of which 369 (77%) were AS surgeons, whereas the remaining 112 (23%) were vitreoretinal (VR) surgeons. About two-thirds of the participating surgeons had surgical experience of more than 10 years (*n* = 319, 66%), majority were based in urban areas (*n* = 413, 86%), and there was good representation from north (*n* = 78, 16%), south (*n* = 114, 24%), east (*n* = 99, 21%), central (*n* = 42, 9%), and western (*n* = 142, 29%) Indian regions. Participants were almost equally distributed in terms of institutional (*n* = 194, 40%) and private practice (*n* = 184, 38%) while the remaining 103 practitioners were engaged in both institutional and private practice. In terms of surgical cataract volumes, 113 (24%) operated on fewer than 25 cases per month, 138 (28%) did between 25 and 50 surgeries, 107 (22%) did 50 and 100 surgeries, and 74 (15%) did more than 100 surgeries per month while 49 (10%) reported not doing regular cataract surgery.

The majority (*n* = 375, 78%) preferred phacoemulsification as the primary mode of cataract surgery.

### Aphakia planning when seen in outpatient clinics

Most participants saw fewer than 10 aphakia patients per month (*n* = 430, 89%) and postoperative aphakia was the commonest etiology encountered by participants (*n* = 351, 73%). Traumatic aphakia (*n* = 86, 18%) was the second commonest cause reported followed by spontaneous dislocation of IOL (*n* = 20, 4%). Nearly two-thirds of participants reported managing aphakia themselves when seeing cases in the clinic setting while the rest opted to refer patients to VR surgeons. Placing a three-piece IOL in the ciliary sulcus when available was the commonest choice for surgeons when planning for surgery in the operation department (OPD) [Table 1], whereas an SFIOL was the commonest choice followed by retrofixated iris-claw IOL in the eyes with inadequate capsular support [Table 1].

### Aphakia management during primary surgery – without nucleus or cortex drop

When encountering posterior capsule rent (PCR) during surgery without nucleus or cortex drop, 390 (81%) participants said that they managed the surgery themselves while 21 (4%) preferred to manage aphakia in a second sitting. A separate 20 (4%) preferred to call a VS in the same sitting and another 20 (4%) referred to a VS in a second sitting and 30 did not comment. Fig. 1 shows management patterns in the case of PCR with inadequate capsular support. A three-piece IOL in the ciliary sulcus was the preferred IOL of choice when there was adequate capsular support [Table 1] while a retrofixated iris-claw IOL was the commonest choice in eyes without adequate capsular support.

### Aphakia management during primary surgery – with nucleus or cortex drop

When encountering PCR during surgery with nucleus or cortex drop, nearly half (*n* = 202, 42%) preferred to refer the patient to a VR surgeon in a secondary sitting while about a third (*n* = 132, 27%) called a VR surgeon in the same sitting. In terms of IOL placement in this scenario, a vast majority (85%) preferred to

leave the patient aphakic. The choice of IOL in the few that placed it is shown in Table 1.

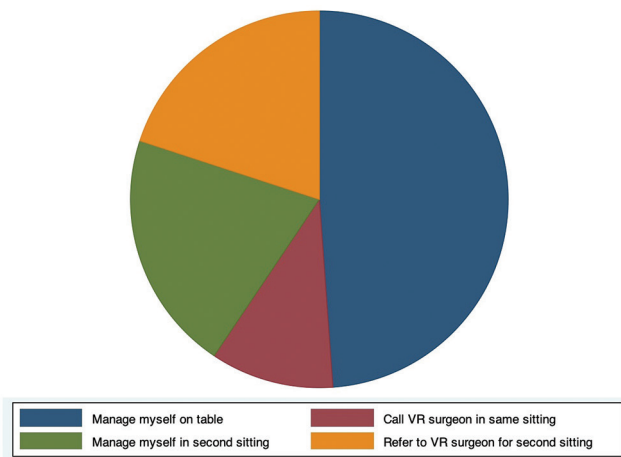
**Practices for IOL placement during secondary surgery in eyes without capsular support**

Most participants who preferred retrofixated iris-claw IOLs ( $n = 246$ ) performed a peripheral iridotomy ( $n = 183$ , 75%) at the time of its placement. The commonest response to a time interval between primary cataract surgery and a secondary IOL placement was 2–6 weeks [Fig. 2]. For those who preferred SFIOL, 125 participants (54%) preferred a sutured IOL while 108 preferred a sutureless SFIOL. In those who went with sutured SFIOL, most preferred to use the polymethyl methacrylate (PMMA) SFIOL with eyelets on the haptics ( $n = 98/120$ , 82%), 20 (17%) used a foldable three-piece and 2 (2%) opted for the Akreos plate haptic IOL. Similarly, 10-O prolene suture was used most commonly for fixation ( $n = 68$ ,

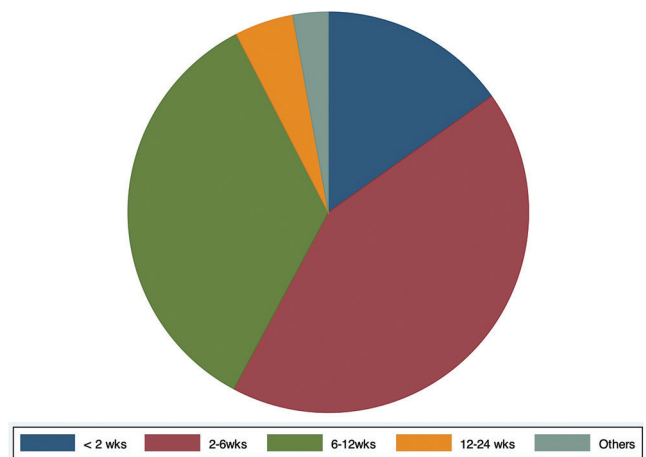
57%) followed by 9-O prolene ( $n = 44$ , 37%) and Gortex ( $n = 8$ , 7%). In those choosing sutureless SFIOL, the glued IOL was the most preferred ( $n = 42$ , 40%) followed closely by the Yamane technique ( $n = 37$ , 35%) and the Gabor technique ( $n = 26$ , 25%). In patients with bilateral aphakia already using spectacles or contact lenses, 212 (44%) participants offered a secondary IOL while 77 (16%) were advised to continue aphakic glasses and 125 (26%) would give the option of contact lenses for visual rehabilitation, and 67 (14%) did not comment.

**Comparison in practice patterns for aphakia management between anterior and posterior segment surgeons**

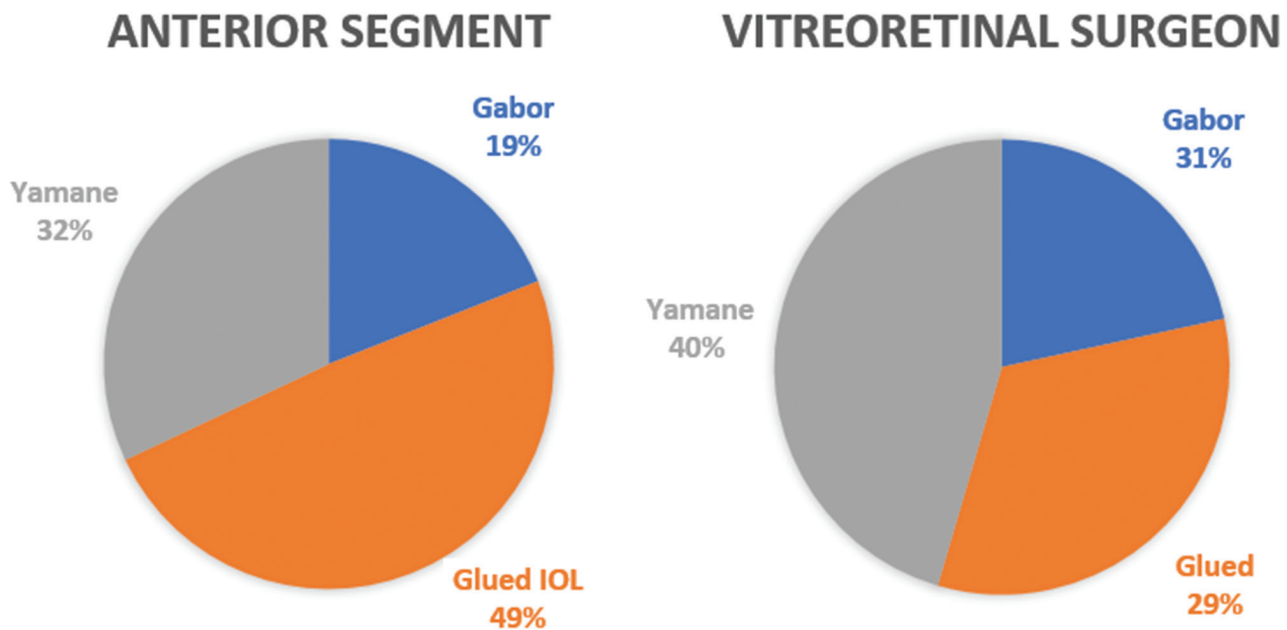
Table 2 shows a comparison of practice patterns between AS and VR surgeons. There were more AS surgeons with >20 years of surgical experience. Only about half of the AS surgeons preferred to manage cases of aphakia when seeing them in the OPD compared to nearly all VR surgeons. In aphakia without



**Figure 1:** Management patterns in case of PCR with inadequate capsular support



**Figure 2:** Response time interval between primary cataract surgery and a secondary IOL placement



**Figure 3:** Difference in the choices among AS surgeons and VR surgeons while doing sutureless SFIOL

adequate capsular support, AS surgeons preferred to use retrofixated iris-claw IOLs most commonly (50%) as opposed to VR surgeons who preferred SFIOL (65%) [Table 2]. Another difference was that while opting for an SFIOL, more than half of the AS surgeons preferred sutured SFIOLs, whereas more VR surgeons opted for the sutureless techniques. While doing sutureless SFIOL, AS surgeons opted for the glued IOL most frequently (49%) while VR surgeons chose the Yamane technique (40%) [Fig. 3], though these differences were not statistically significant [Table 2].

### Comparison in practice patterns for aphakia management with respect to surgeon experience

Participants with experience <10 years were most commonly in institutional practice while more experienced surgeons were in private practice [Table 3]. A significantly higher proportion of younger surgeons preferred the retrofixated iris-claw IOL when encountering aphakia without adequate capsular support while senior surgeons preferred the SFIOL and retrofixated iris-claw almost equally [Table 3]. Similarly, if doing sutureless SFIOL, younger surgeons preferred the

**Table 1: Choice of IOL based on whether following PCR, there is nucleus/cortex drop and whether there is adequate capsular support**

	Aphakia in OPD		Aphakia in OR, No Nucleus Drop		Aphakia in OR with Nucleus Drop	
	Capsular support present	Capsular support absent	Capsular support present	Capsular support absent	Capsular support present	Capsular support absent
Three-piece IOL in the sulcus	201 (42%)	-	275 (57%)	-	60 (12%)	-
SFIOL	6 (1%)	155 (32%)	2 (<1%)	73 (15%)	1 (<1%)	43 (9%)
Retro-fixated iris-claw	7 (1%)	109 (23%)	6 (1%)	91 (19%)	-	24 (5%)
Single-piece IOL in the sulcus	41 (9%)	-	50 (10%)	-	7 (1%)	-
Single-piece IOL in bag	46 (10%)	-	41 (8.5%)	-	5 (1%)	-
ACIOL	4 (<1%)	33 (7%)	5 (1%)	36 (7%)	-	1 (<1%)
Anterior iris claw	3 (<1%)	9 (2%)	1 (<1%)	5 (1%)	-	-
Don't put IOL or refer	173 (36%)	175 (36%)	101 (21%)	205 (43%)	408 (85%)	413 (86%)

**Table 2: Comparison of practice settings and patterns in the management of aphakia between AS surgeons vs. VR surgeons**

Variable	AS surgeon (n=369)	VR surgeon (n=112)	P
Years of practice: <5 years	47 (13%)	19 (17%)	0.012
5-10 years	72 (19%)	23 (21%)	
10-20 years	110 (30%)	45 (40%)	
>20 years	140 (38%)	24 (22%)	
Type of practice			0.17
Institutional	157 (43%)	37 (33%)	
Private	137 (37%)	47 (42%)	
Both	73 (20%)	28 (25%)	
% Urban practice	312	101	
Prefer phacoemulsification for cataract surgery	285 (78%)	90 (86%)	0.05
No. of aphakia seen per month (<10)	338 (94%)	92 (84%)	0.006
Commonest causes of aphakia seen in practice			0.02
Postoperative	276 (77%)	75 (68%)	
Spontaneous IOL dislocation	10 (3%)	10 (9%)	
Spontaneous lens dislocation	4 (1%)	3 (3%)	
Traumatic aphakia	64 (18%)	22 (20%)	
<b>Response to aphakia management</b>			
I plan and manage cases myself	210 (58%)	97 (89%)	<0.001
Choice of IOL with aphakia and capsular support with no nucleus drop:	68%	75%	0.24
3-piece IOL in the sulcus			
Choice of IOL with aphakia and no capsular support with no nucleus drop:			
SFIOL	34%	65%	<0.001
Retro-fixated iris-claw IOL	50%	30%	
PI done for iris-claw	80%	55%	0.001
If doing SFIOL, then most preferred technique	60% (Sutured)	57% (Sutureless)	<0.001
If doing sutureless SFIOL, then the most preferred technique	49% (Glued IOL)	40% (Yamane)	0.12



**Table 3: Comparison of practice settings and patterns in the management of aphakia between surgeons with more or less than 10 years of surgical experience**

Variable	<10 years (n=161)	>10 years (n=318)	P
Type of practice			
Institutional	78 (48%)	116 (37%)	0.006
Private	46 (29%)	138 (43%)	
Both	37 (23%)	64 (20%)	
% Urban practice	130 (81%)	283 (89%)	0.03
Prefer Phacoemulsification for Cataract surgery	126 (80%)	249 (80%)	0.98
No. of Aphakia seen per month (<10)	139 (89%)	291 (92%)	0.41
Commonest causes of aphakia seen in practice			
Postoperative	114 (74%)	237 (75%)	0.31
Spontaneous IOL dislocation	5 (3%)	15 (5%)	
Spontaneous lens dislocation	2 (1%)	5 (2%)	
Traumatic aphakia	33 (21%)	53 (17%)	
<b>Response to aphakia management</b>			
I plan and manage cases myself	51%	56%	0.71
Choice of IOL with aphakia and capsular support with no nucleus drop: 3-piece IOL in the sulcus	74%	76%	0.78
Choice of IOL with aphakia and no capsular with no nucleus drop:			
SFIOL	27%	40%	0.005
Retro-fixated iris-claw IOL	57%	38%	
ACIOL	10%	21%	
PI done for iris-claw	66 (47%)	117 (42%)	0.09
If doing SFIOL, then most preferred technique	50% (Sutured)	55% (Sutured)	0.50
If doing sutureless SFIOL, then most preferred technique	44% (Yamane)	49% (Glued)	0.03

Yamane technique while older surgeons preferred the glued IOL.

A multivariable logistic regression analysis with the type of surgeon, surgeon experience, and type of practice (institutional vs. private) found that VR surgeons were more than six times likely to prefer an SFIOL (OR = 6.5, 95% CI = 3.4–12.5,  $P < 0.001$ ) compared to AS surgeons. In the same model, surgeons with >10 years of experience were more than twice likely to prefer an SFIOL (OR = 2.4, 95% CI = 1.2–4.9,  $P = 0.02$ ). Institutional practitioners did not differ from private practitioners in terms of the type of IOL and for most other parameters (data not shown).

## Discussion

This study presents data on various preferences for management of aphakia from all parts of India with a good mix of institutional vs. private practitioners and a good distribution over years of surgical practice, hence possibly representing practice patterns across India. AS surgeons managed cases of aphakia with no nucleus drop about half the time and resorted to iris-claw IOL more frequently in the same sitting. As opposed to this, VR surgeons preferred an SFIOL more often in all scenarios. While choosing an SFIOL, AS surgeons preferred the sutured SFIOL while VR surgeons chose sutureless IOL more frequently. Additionally, VR surgeons and surgeons with more experience chose SFIOL more often.

In aphakic eyes without adequate capsular support, AS surgeons were comfortable in managing cases with no nucleus drop about half the time and preferred assistance from a VR surgeon at other times. Also, they showed a trend toward using retro pupillary iris-claw IOL more frequently at the time of

the primary surgery. Interestingly, when they saw patients in OPD, they chose SFIOL more frequently, showing that iris-claw is perceived to be an easier and quicker option at the time of encountering aphakia during primary cataract surgery. As opposed to this, VR surgeons preferred an SFIOL much more often and in all scenarios. Previous studies comparing iris-claw vs. SFIOL have shown delayed visual recovery in the iris-claw group compared to SFIOL.<sup>[14–16]</sup> Additionally, the long-term data on retro pupillary iris-claw IOLs is scant,<sup>[15]</sup> and its influence on pupil dynamics has not been studied. The commonest complication with iris-claw IOLs is D-shaped disfigurement of the pupil,<sup>[14,16]</sup> localized iris atrophy, and poor mydriasis making future VR procedures difficult, likely prompting VR surgeons to avoid this approach.

While choosing an SFIOL, AS surgeons preferred the sutured SFIOL while VR surgeons chose sutureless IOL more frequently. A previous robust study showed equivalent results with sutured vs. sutureless SFIOL,<sup>[7]</sup> hence surgeon preference may not influence visual outcomes much. However, there may be a fear of IOL drop while performing sutureless SFIOLs due to the inherent maneuvers involved. This fear is also demonstrated when doing sutureless SFIOL where AS surgeons preferred glued IOL more often for security compared to the Yamane technique by VR surgeons.

Lastly, VR surgeons and surgeons with more experience choose SFIOL more often. There could be several reasons to explain this trend. It is possible that this group had more exposure to the SFIOL technique during training, or this shows changing trends with time in view of retrofixated IOLs becoming recently available with ease of fixation making them

preferable in recent times. It is also possible that retro pupillary iris-claw IOLs don't do well in the long term with pigment dispersion, secondary glaucoma, persistent uveitis, and poor mydriasis, and hence experienced surgeons' resort to SFIOL more, though these were not inquired in the survey.

The limitations of this study are possible under-representation of rural practitioners. To the best of our knowledge, this is the first survey showing the preferences of Indian surgeons in the management of aphakia to the best of our knowledge. However, surveys with a larger sample are required to confirm or refute the preferences of surgeons in managing aphakia in the Indian context.

## Conclusion

In conclusion, this survey showed current trends in the management of aphakia among Indian ophthalmologists. Retro pupillary iris-claw IOLs are preferred increasingly by AS surgeons especially in the primary cataract setting without adequate capsular support, whereas VR surgeons and more experienced AS surgeons preferred SFIOL in this scenario. A similar survey may be repeated periodically to document changing trends in the surgical management of aphakia in the future, and results from this survey can be used as a benchmark for future comparisons.

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## Conflicts of interest

There are no conflicts of interest.

## References

- Lundström M, Brege KG, Florén I, Lundh B, Stenevi U, Thorburn W. Postoperative aphakia in modern cataract surgery: Part 1: Analysis of incidence and risks based on 5-year data from the Swedish National Cataract Register. *J Cataract Refract Surg* 2004;30:2105–10.
- Jacob S, Kumar DA, Rao NK. Scleral fixation of intraocular lenses. *Curr Opin Ophthalmol* 2020;31:50–60.
- Yamane S, Ito A. Flanged fixation: Yamane technique and its application. *Curr Opin Ophthalmol* 2021;32:19–24.
- Yamane S, Sato S, Maruyama-Inoue M, Kadonosono K. Flanged intrascleral intraocular lens fixation with double-needle technique. *Ophthalmology* 2017;124:1136–42.
- Bastawrous A, Parkes C, Prasad S. Choices in correction of aphakia during vitrectomy. *Ophthalmologica* 2011;226(Suppl 1):46–52.
- Gabor SGB, Pavlidis MM. Sutureless intrascleral posterior chamber intraocular lens fixation. *J Cataract Refract Surg* 2007;33:1851–4.
- Sindal MD, Nakhwa CP, Sengupta S. Comparison of sutured versus sutureless scleral-fixated intraocular lenses. *J Cataract Refract Surg* 2016;42:27–34.
- Kelkar AS, Fogla R, Kelkar J, Kothari AA, Mehta H, Amoaku W. Sutureless 27-gauge needle-assisted transconjunctival intrascleral intraocular lens fixation: Initial experience. *Indian J Ophthalmol* 2017;65:1450–3.
- Kelkar A, Kelkar J, Kothari A, Mehta H, Chitale S, Fogla R, *et al.* Comparison of two modified sutureless techniques of scleral fixation of intraocular lens. *Ophthalmic Surg Lasers Imaging Retina* 2018 1;49:e129–34.
- Narang P, Agarwal A. Glued intrascleral haptic fixation of an intraocular lens. *Indian J Ophthalmol* 2017;65:1370–80.
- Baskaran P, Ganne P, Bhandari S, Ramakrishnan S, Venkatesh R, Gireesh P. Extraocular needle-guided haptic insertion technique of scleral fixation intraocular lens surgeries (X-NIT). *Indian J Ophthalmol* 2017;65:747–50.
- Madanagopalan VG, Madhivanan N, Selvam VP. A novel sutureless scleral fixated lens that eliminates extra ocular haptic manipulation: The CMT flex lens. *Ophthalmic Surg Lasers Imaging Retina* 2020;51:648–50.
- Eysenbach G. Improving the quality of web surveys: The checklist for reporting results of internet E-Surveys (CHERRIES). *J Med Internet Res* 2004;6:e34.
- Madhivanan N, Sengupta S, Sindal M, Nivean PD, Kumar MA, Ariga M. Comparative analysis of retropupillary iris claw versus scleral-fixated intraocular lens in the management of post-cataract aphakia. *Indian J Ophthalmol* 2019;67:59–63.
- Toro MD, Longo A, Avitabile T, Nowomiejska K, Gagliano C, Tripodi S, *et al.* Five-year follow-up of secondary iris-claw intraocular lens implantation for the treatment of aphakia: Anterior chamber versus retropupillary implantation. *PLoS One* 2019;14:e0214140.
- Sumitha CV, Pai V, Thulasidas M. Retropupillary iris-claw intraocular lens implantation in aphakic patients. *Indian J Ophthalmol* 2020;68:597–602.

# ANNEXURE 1

## Aphakia Management: An online survey

### QUESTIONNAIRE TO ANALYZE THE PREFERRED MODE OF MANAGEMENT IN APHAKIA

Management of aphakia poses many challenges for ophthalmologists and involves many different approaches. This online survey attempts to identify the most preferred techniques in the management of aphakia by Indian ophthalmologists.

There are a few multiple-choice questions divided into six parts which should take about 5 min to complete. Your participation is completely voluntary and anonymous. You can take the survey only once.

1. TYPE OF SURGEON?  
ANTERIOR SEGMENT SURGEON  
VITREORETINAL SURGEON  
BOTH  
Other (please specify)
2. EXPERIENCE IN THE FIELD?  
LESS THAN 5 YEARS  
5-10 YEARS  
10-20 YEARS  
MORE THAN 20 YEARS
3. PLACE OF PRACTICE IN INDIA?  
NORTH  
SOUTH  
EAST  
WEST  
CENTRAL
4. TYPE OF PRACTICE?  
INSTITUTIONAL  
PRIVATE  
BOTH
5. AREA OF PRACTICE?  
URBAN  
RURAL
6. NUMBER OF CATARACT SURGERIES PERFORMED PER MONTH?  
LESS THAN 25  
25-50  
50-100  
MORE THAN 100  
NOT DOING REGULAR CATARACT SURGERIES
7. PREFERRED METHOD OF CATARACT SURGERY?  
PHACOEMULSIFICATION  
SMALL INCISION CATARACT SURGERY
8. NUMBER OF PATIENTS WITH APHAKIA SEEN IN OPD IN 1 MONTH?  
LESS THAN 10  
10-25  
25-50  
MORE THAN 50
9. MOST COMMON CAUSE OF APHAKIA OBSERVED IN OPD CASES?  
TRAUMATIC DISLOCATION  
POSTOPERATIVE  
SPONTANEOUS DISLOCATION OF CRYSTALLINE LENS  
SPONTANEOUS DISLOCATION OF IOL  
Other (please specify)
10. IN A SCENARIO OF A PATIENT PRESENTING WITH APHAKIA IN OPD  
PLAN THE MANAGEMENT MYSELF  
REFER TO A VITREORETINAL SURGEON

11. WHEN YOU SEE A PATIENT WITH APHAKIA IN OPD, WITH ADEQUATE CAPSULAR SUPPORT, YOUR PREFERRED INTRAOCULAR LENS (IOL) OF CHOICE IS  
SINGLE-PIECE IOL IN BAG  
SINGLE-PIECE IN SULCUS  
3-PIECE IOL IN SULCUS  
SCLERAL FIXATED IOL  
ANTERIORLY FIXATED IRIS CLAW  
RETROFIXATED IRIS CLAW  
ANTERIOR CHAMBER IOL  
Other (please specify)
12. WHEN YOU SEE A PATIENT WITH APHAKIA IN OPD, WITH INADEQUATE CAPSULAR SUPPORT, YOUR PREFERRED INTRAOCULAR LENS (IOL) OF CHOICE IS  
SCLERAL FIXATED IOL  
IRIS SUTURED IOL  
ANTERIORLY FIXATED IRIS CLAW  
RETROFIXATED IRIS CLAW  
ANTERIOR CHAMBER IOL  
Other (please specify)
13. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) ON TABLE, ACCESS TO VITREORETINAL EQUIPMENT?  
Yes  
No
14. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) WITHOUT NUCLEUS/CORTEX DROP ON TABLE WITH ADEQUATE CAPSULAR SUPPORT, WHAT WOULD BE YOUR NEXT STEP OF MANAGEMENT?  
PLAN THE MANAGEMENT MYSELF IN THE SAME SITTING  
PLAN MANAGEMENT MYSELF AT A LATER DATE  
CALL A VITREORETINAL SURGEON IN THE SAME SETUP IN FOR MANAGEMENT IN THE SAME SITTING  
REFER TO A VITREORETINAL SURGEON FOR MANAGEMENT ON A LATER DATE
15. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) WITHOUT NUCLEUS/CORTEX DROP ON TABLE, WITH ADEQUATE CAPSULAR SUPPORT, WHAT WOULD BE YOUR PREFERRED IOL OF CHOICE  
SINGLE-PIECE IOL IN BAG  
SINGLE-PIECE IOL IN SULCUS  
3-PIECE IOL IN SULCUS  
SCLERAL FIXATED IOL
16. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) ON TABLE WITHOUT NUCLEUS/CORTEX DROP; IF CAPSULE SUPPORT IS INSUFFICIENT/INADEQUATE, WHAT WOULD BE YOUR NEXT STEP OF MANAGEMENT?  
PLAN THE MANAGEMENT MYSELF IN THE SAME SITTING  
PLAN MANAGEMENT MYSELF AT A LATER DATE  
CALL A VITREORETINAL SURGEON IN THE SAME SETUP IN FOR MANAGEMENT IN THE SAME SITTING  
REFER TO A VITREORETINAL SURGEON FOR MANAGEMENT AT A LATER DATE.
17. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) ON TABLE WITHOUT NUCLEUS/CORTEX DROP; IF CAPSULE SUPPORT IS INSUFFICIENT/INADEQUATE, WHAT WOULD BE YOUR PREFERRED INTRAOCULAR LENS (IOL) OF CHOICE  
SCLERAL FIXATED IOL  
ANTERIORLY FIXATED IRIS-CLAW  
RETROFIXATED IRIS-CLAW  
ANTERIOR CHAMBER IOL  
Other (please specify).
18. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) WITH NUCLEUS/CORTEX DROP ON TABLE  
PLAN THE MANAGEMENT MYSELF IN THE SAME SITTING  
PLAN MANAGEMENT MYSELF AT A LATER DATE  
CALL A VITREORETINAL SURGEON IN THE SAME SETUP FOR MANAGEMENT IN THE SAME SITTING  
REFER TO A VITREORETINAL SURGEON FOR MANAGEMENT AT A LATER DATE
19. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) ON TABLE WITH NUCLEUS/CORTEX DROP; IF CAPSULE SUPPORT IS ADEQUATE, YOUR PREFERRED INTRAOCULAR LENS (IOL) IS  
SINGLE-PIECE IOL IN BAG  
SINGLE-PIECE IOL IN SULCUS  
THREE-PIECE IN SULCUS



SCLERAL FIXATED IOL  
ANTERIORLY FIXATED IRIS-CLAW  
RETROFIXATED IRIS-CLAW  
ANTERIOR CHAMBER IOL  
Other (please specify)

20. IN AN EVENT OF POSTERIOR CAPSULE RENT (PCR) ON TABLE WITH NUCLEUS/CORTEX DROP; IF CAPSULE SUPPORT IS INADEQUATE, YOUR PREFERRED INTRAOCULAR LENS (IOL) IS

SCLERAL FIXATED IOL  
ANTERIORLY FIXATED IRIS CLAW  
RETROFIXATED IRIS CLAW  
ANTERIOR CHAMBER IOL  
Other (please specify)

21. IN THE CASE OF IRIS-CLAW IOL DO YOU PERFORM PERIPHERAL IRIDECTOMY?

Yes  
No  
I DON'T DO IRIS-CLAW

22. WHEN DO YOU PLAN SECONDARY IOL IMPLANTATION?

<2 WEEKS  
2-6 WEEKS  
6. WEEKS TO 3 MONTHS  
3. MONTHS TO 6 MONTHS  
Other (please specify)

23. IN THE CASE OF SFIOL, WHICH METHOD DO YOU PREFER?

SUTURELESS SFIOL  
SUTURED SFIOL  
I DON'T DO SFIOL

24. IN THE CASE OF SUTURELESS SFIOL, WHICH METHOD DO YOU PREFER?

GLUED SFIOL  
GABOR-SCHARIOTT'S TECHNIQUE  
YAMANE'S SFIOL

25. IF SFIOL IS PLANNED, WHAT IS PREFERRED

COMPLETE VITRECTOMY – PARS PLANA APPROACH  
ANTERIOR VITRECTOMY – PARS PLANA APPROACH  
ANTERIOR VITRECTOMY THROUGH LIMBAL APPROACH

26. IN THE CASE OF SUTURED SFIOL, WHICH SUTURE DO YOU PREFER FOR ANCHORING THE IOL?

9-0 PROLENE  
10-0 PROLENE  
GORTON SUTURED SFIOL

27. IN THE CASE OF SUTURED SFIOL, WHICH TYPE OF IOL DO YOU PREFER?

SINGLE-PIECE SFIOL (PMMA) WITH EYELETS IN THE HAPTICS  
ROUTINE 3-PIECE IOL ANCHORED WITH HAPTICS  
FOLDABLE ACRYLIC IOL WITH MODIFIED PLATE HAPTICS SUCH AS ACREOS IOL  
Other (please specify)

28. IN A PATIENT WITH UNILATERAL APHAKIA, ALREADY USING CONTACT LENSES AND COMFORTABLE WITH IT COUNSEL TO CONTINUE USING CONTACT LENSES

PLAN SECONDARY IOL

29. IN A WORKING-AGE GROUP YOUNG PATIENTS WITH BILATERAL APHAKIA AND COMFORTABLE USING APHAKIC GLASSES

ADVISE TO CONTINUE APHAKIC GLASSES  
GIVE OPTION OF CONTACT LENSES  
PLAN SECONDARY IOL  
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