

Current Trends in Cataract and Refractive Surgery in Japan: 1998 Survey

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Purpose: A seventh annual survey was carried out by mail in February 1999 to investigate the current trends in cataract and refractive surgery in Japan.

Methods: Questionnaires were sent to 925 ophthalmologist members of the Japanese Society of Cataract and Refractive Surgery. Data received from 411 (44.4%) of the recipients were cross-analyzed and compared with those from the previous surveys.

Results: In cataract surgery, 93% of respondents preferred phacoemulsification, 58% employed the self-sealing wound closure technique, and 23% used topical anesthesia for phacoemulsification.

Conclusions: There have been trends toward more surgical procedures performed by a surgeon, shorter period of hospitalization, and increased number of outpatient procedures. In refractive surgery, surgeons remained rather conservative; with 26% and 5% of surgeons doing astigmatic keratotomy and refractive keratotomy, respectively. Photorefractive keratectomy, laser in situ keratomileusis, phakic intraocular lens, and intrastromal corneal ring were judged to be useful refractive surgical procedures by 58.2%, 69.5%, 25.4%, and 8.8% of the respondents, respectively. **Jpn J Ophthalmol 2000;44:268–276** © 2000 Japanese Ophthalmological Society

Key Words: Cataract surgery, intraocular lens, Japanese Society of Cataract and Refractive Surgery, refractive surgery, survey.

Introduction

Since cataract and refractive surgical procedures are now among the most successful and the most common in medicine, a clear understanding of the current situation and future trends in these fields has become increasingly important. In the United States and European countries,^{1–17} surveys have been conducted on the procedural styles and preferences of anterior segment surgeons, giving a detailed view of the trends taking place in those countries. Since 1992, we have conducted annual mail surveys of

members of the Japanese Society of Cataract and Refractive Surgery.^{18–20} The current study represents the seventh such survey on cataract and refractive surgical practices in Japan.

Materials and Methods

Survey forms with 47 multiple-choice questions were mailed in February 1999 to 925 ophthalmologist members of the Japanese Society of Cataract and Refractive Surgery. To maintain the confidentiality of the respondents, no name was indicated on the return envelopes and questionnaires.

Results

Replies were received from 411 (44.4%) of the recipients prior to the cutoff date of March 31, 1999. We used personal computer database programs (Par-

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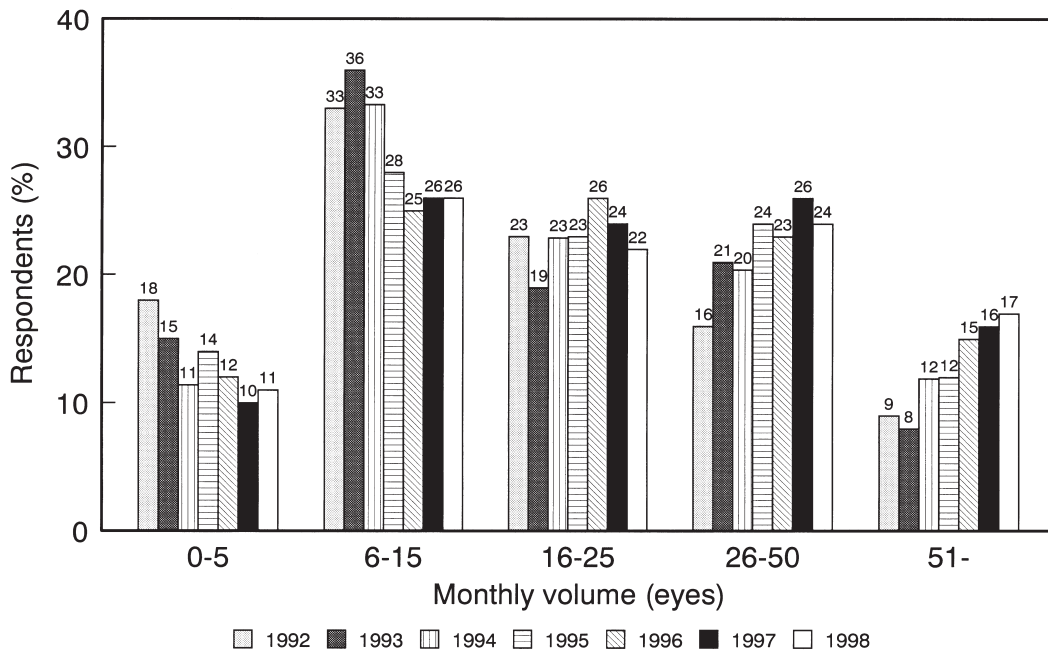


Figure 1. Cataract surgery volume per month (eyes).

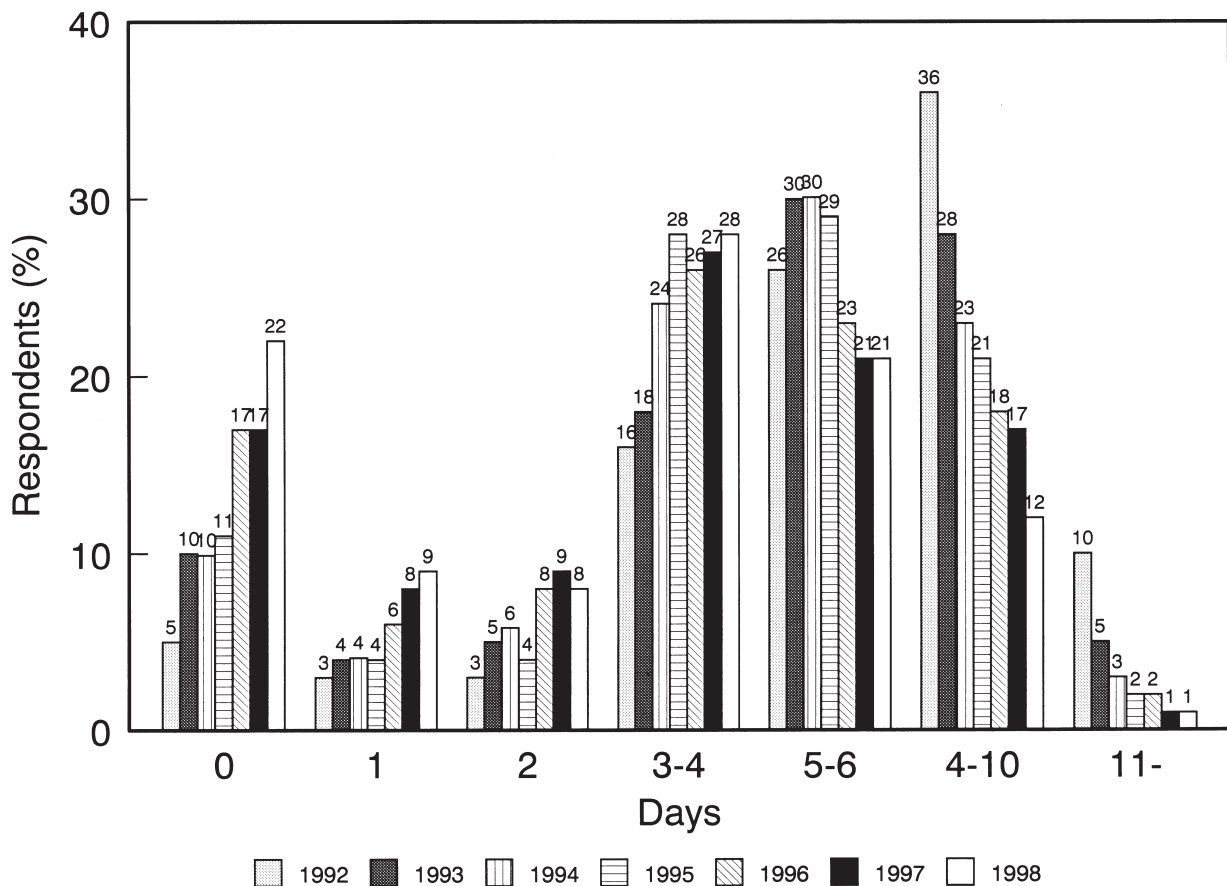


Figure 2. Duration of hospitalization for cataract surgery.

adox™ for Windows™, Borland, Tokyo, and Statistica™ for Windows™; StatSoft, Tulsa, OK, USA) for analysis. Summaries of representative data follow.

Demographics

The majority of the respondents were in the 30-39 and 40-49 year age groups, accounting for approximately 70% of all respondents again this year. The volume profile for cataract surgery showed that 26% of the surgeons were doing 6-15 procedures, 24% doing 26-50 procedures, and 22% doing 16-25 procedures per month (Figure 1). The average number of cataract surgery procedures per surgeon per month was calculated to be 29.7, against 20.1 (1993), 25.2 (1994), 26.6 (1995), and 28.7 (1996), and 30.1 (1997). Surgeons doing 75 or more cases monthly constituted 6.1%, 7.3%, 7.1%, and 7.5% of the respondents in 1995, 1996, 1997, and 1998, respectively.

Hospitalization

Most of the cataract operations were carried out on hospitalized patients. Twenty-eight percent of

Table 1. Preoperative Examination

	Always	Frequently	Occasionally	Never
Specular microscopy	80	3	6	11
Videokeratography	28	5	19	48

Values are percentages.

surgeons replied that they hospitalized their patients for 3-4 days, 21% said for 5-6 days, and 12% said for 7-10 days (Figure 2). The proportion of surgeons who hospitalize patients for longer than 1 week decreased from 46% (1992), 33% (1993), 26% (1994), 23% (1995), 20% (1996), 18% (1997) to 13% this year. Twenty-two percent of the doctors said that the majority of their patients had outpatient surgery. The average period of hospitalization was 3.9 days in 1998, compared with 5.6 days in 1993, 5.1 days in 1994, 4.8 days in 1995, 4.1 days in 1996, and 4.0 days in 1997. The percentage of surgeons who perform outpatient cataract procedures increased from 24% (1992), 26% (1993), 41% (1994), 44% (1995), 59% (1996), and 64% (1997) to 68% this year.

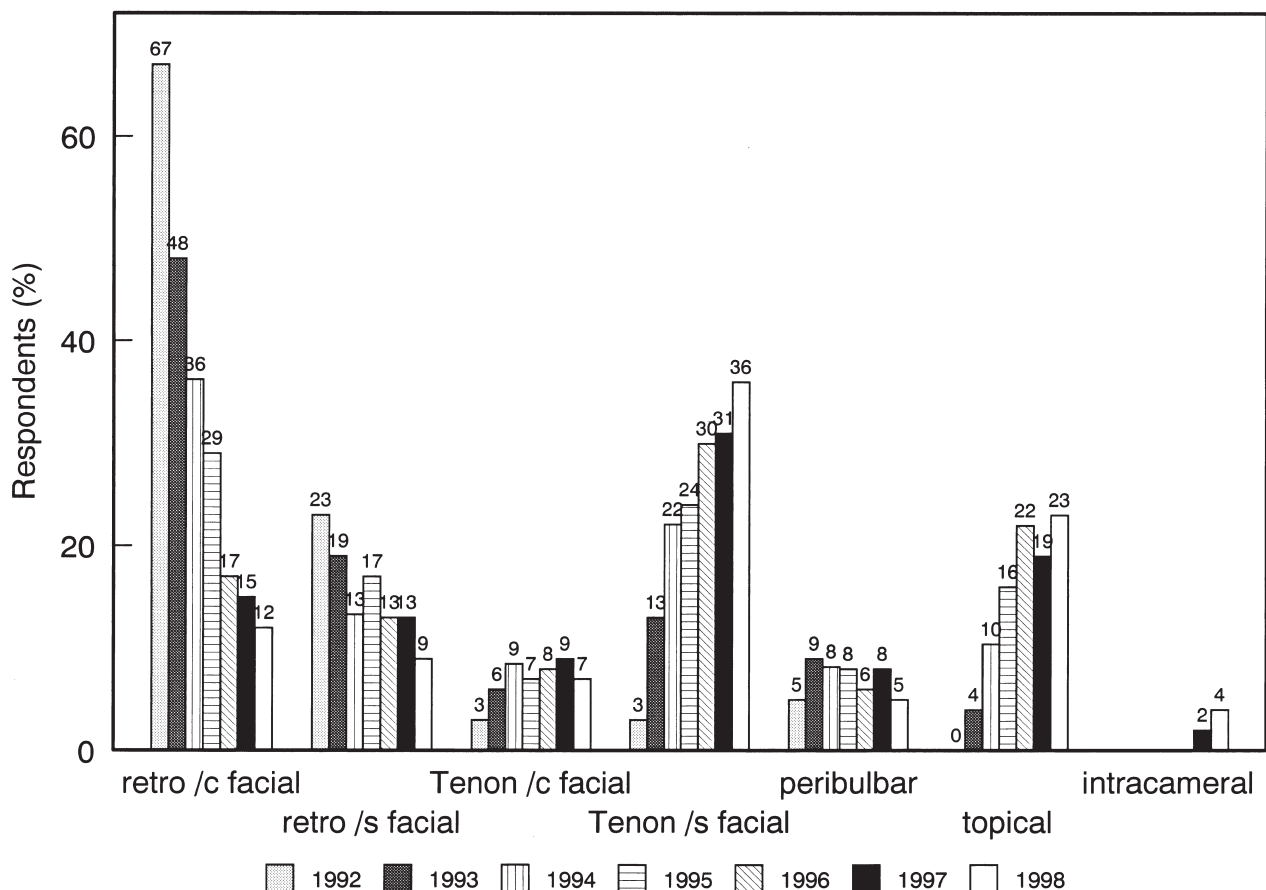


Figure 3. Preferred anesthesia. c: cum, s: sine.

Preoperative Examination

Specular microscopy and videokeratography were routinely performed by 78% and 28%, respectively, of the respondents (Table 1).

Anesthesia

The percentage of surgeons using retrobulbar anesthesia has decreased from previous years, while Tenon anesthesia and topical anesthesia have gained in popularity (Figure 3). Intracameral anesthesia was performed by 4% of the respondents.

Cataract Extraction

Preferred techniques of cataract extraction are shown in Figure 4. Phacoemulsification and aspiration (PEA) with nucleus-dividing technique grew in popularity again this year. When asked about the percentage of patients treated using PEA, 80% of surgeons replied that they used it in 95% or more of cases, a sharp increase during the last 7 years (Figure 5). Only 4% never used PEA. The data indicate that 93% of surgeons use PEA for more than half of their patients, and 7% use extracapsular cataract extraction (ECCE) for more than half of their cases. The rate of surgeons who prefer PEA increased from 59% in 1992, 71% in 1993, 80% in 1994, 83% in 1995, 90% in 1996, and 92% in 1997 to 93% this year.

As for the surface contour of wounds in PEA, 12% made the incision parallel to the limbus, 56% made it tangential to the limbus, 15% made a frown incision, and 18% made a clear corneal incision (Figure 6). Preferred size of incisions in PEA varied. The most frequently cited sizes were, in descending order, 3.5

mm (21%), 5.5 mm (20%), 4.0 mm (17%), 3.0 mm (11%), and 6.0 mm (11%).

Self-sealing wound construction was the main wound closure technique in PEA for 58% of the ophthalmologists in 1998, showing a gradual annual increase from 25% in 1992, 30% in 1993, 38% in 1994, 42% in 1995, 53% in 1996, and 54% in 1997 (Figure 7).

Intraocular Lenses

Respondents were asked about their preference in the size of the optics for PEA and ECCE. For PEA, 5.5-mm spherical was the highest ranked (53%), followed by 6.0-mm spherical (41%). For ECCE, 54% chose 6.0-mm spherical and 30% selected 6.5-mm spherical.

The type of intraocular lenses currently being used for small incision cataract surgery included acrylic foldable intraocular lens (64%), silicone intraocular lens (43%), and small spherical polymethylmethacrylate (PMMA) intraocular lens (19%). Fifteen percent of surgeons did not use any small incision intraocular lenses (Figure 8). When asked what intraocular lens style or material held the most promise for small incision cataract surgery, 55% chose acrylic foldable, 10% silicone foldable, 5% hydrogel, and 2% small spherical optic PMMA (Figure 9).

Viscoelastics

The greatest number of respondents reported that actual use of viscoelastic material amounted to 0.4–0.6 mL, while ideal use amounted to 0.6–0.8 mL. When questioned about the usage of viscoelastic

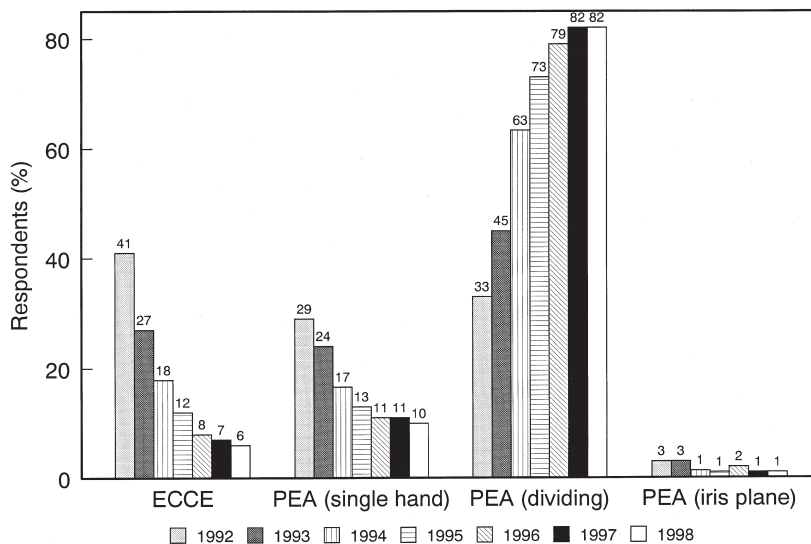


Figure 4. Preferred technique of cataract extraction. PEA: phacoemulsification and aspiration, ECCE: extracapsular cataract extraction.

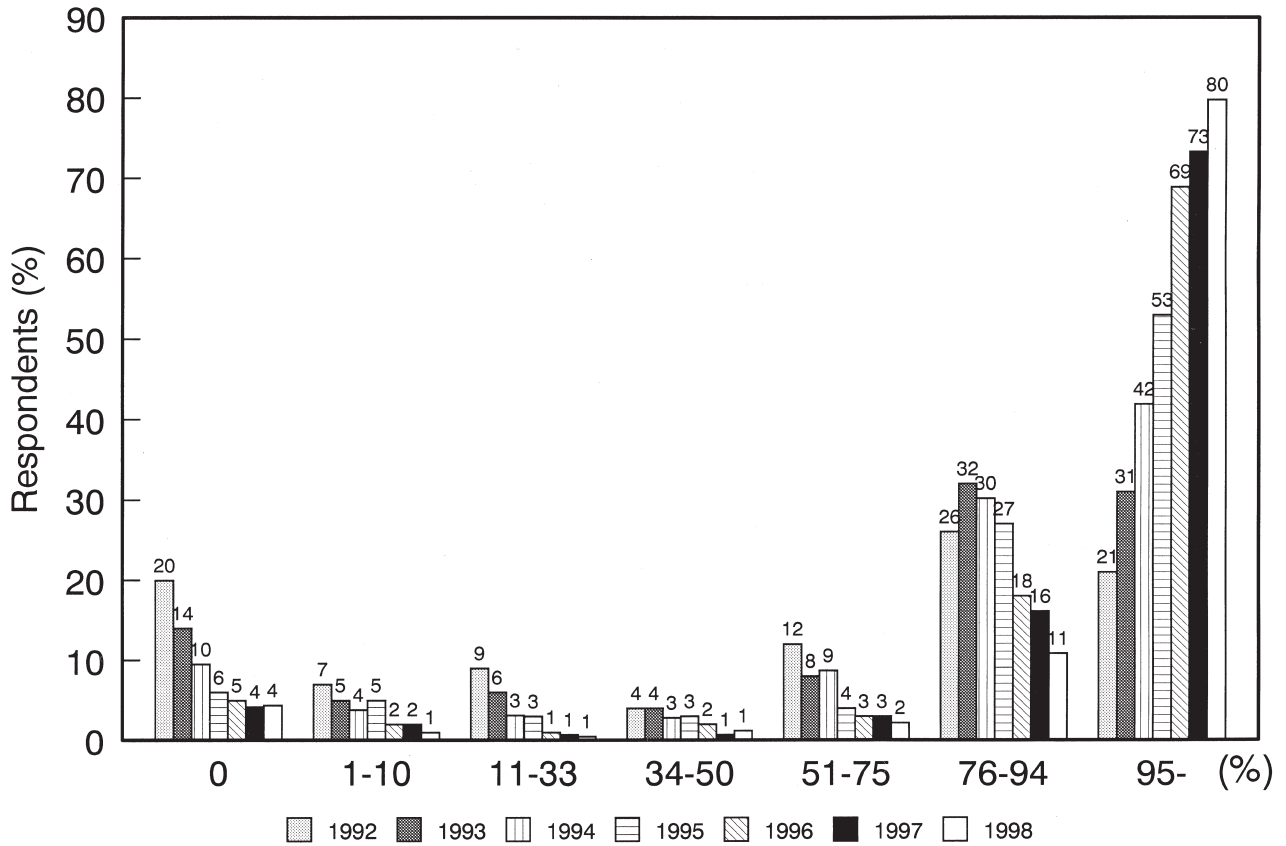


Figure 5. Percentage of phacoemulsification use.

agents during anterior capsulotomy, 85% replied that they used them in all cases, 1% used them in more than half of their cases, 7% applied them occasionally, and 7% were not using such agents at all.

Complications

The rate of posterior capsular rupture was reported by the surgeons and it varied from 0 to 10%. The average rate was 1.87%. Surgeons doing fewer

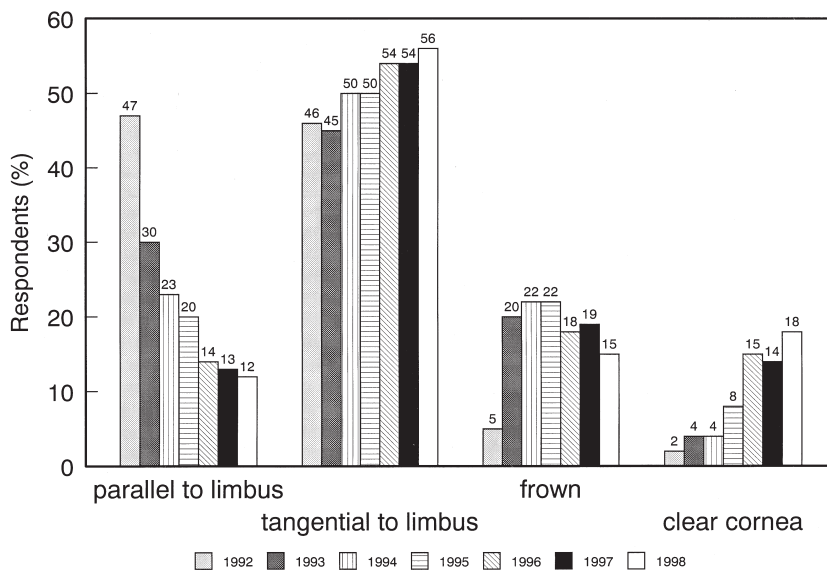


Figure 6. Preferred surface contour of wound.

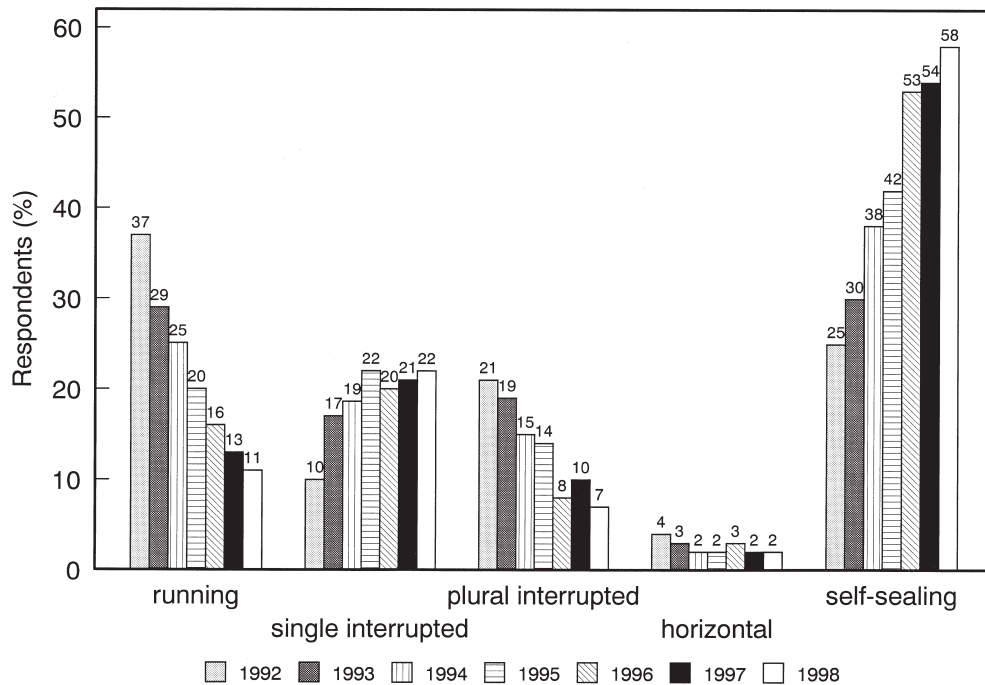


Figure 7. Wound closure technique in phacoemulsification.

surgeries per month reported higher rates of posterior capsular rupture (Figure 10).

Twenty respondents reported displacement of the nucleus into the vitreous during the past year. The occurrence rate was 0.76 cases per 1000 cataract surgeries.

For cases in which the nucleus was displaced into the vitreous, the dropped nucleus was removed intraoperatively in 55% of the cases and postoperatively in 45%.

Twenty-nine percent of respondents had experienced explanation of an intraocular lens during the past year.

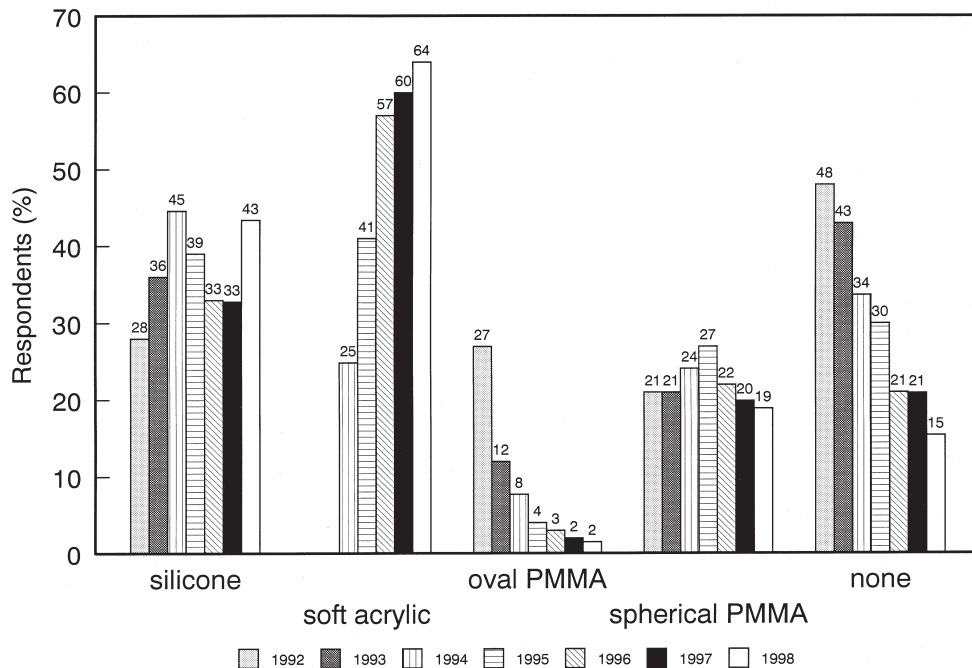


Figure 8. Small incision intraocular lenses currently used. PMMA: polymethylmethacrylate.

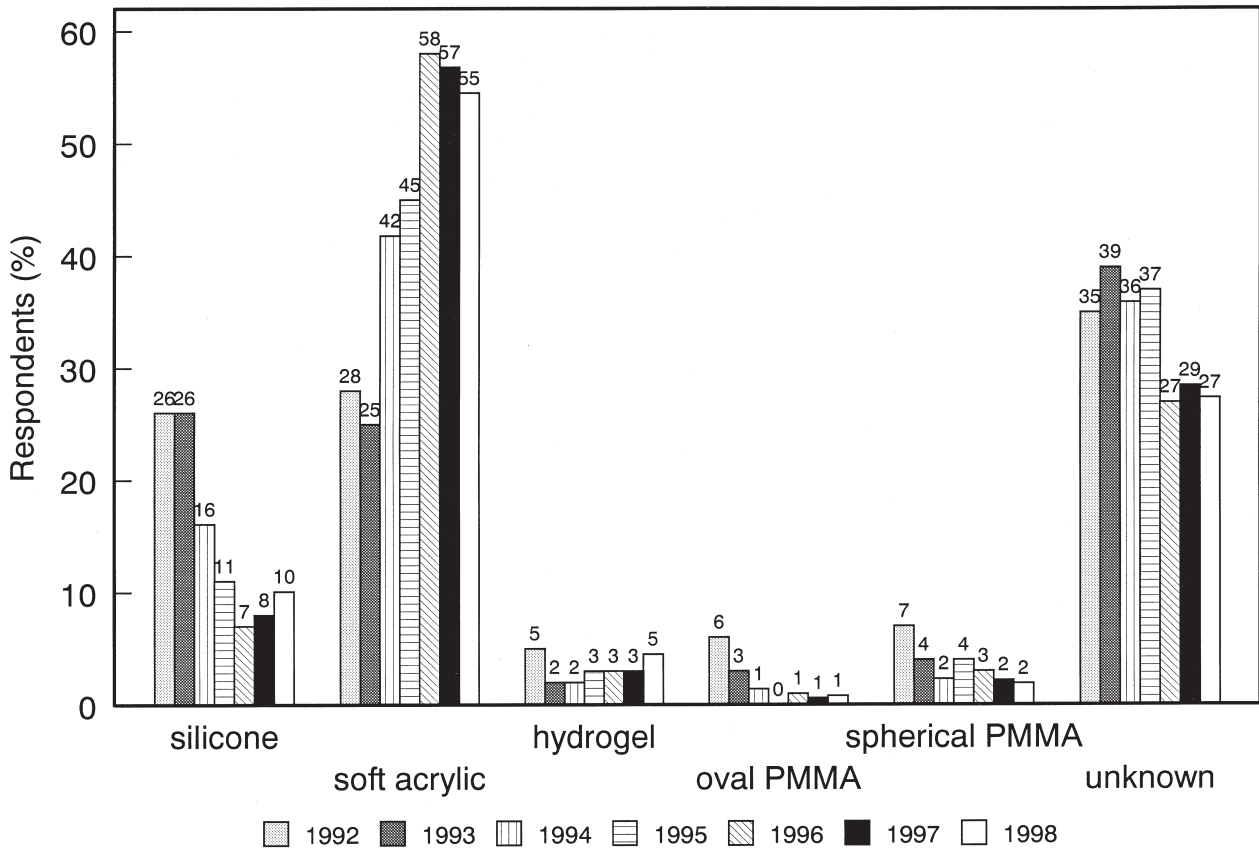


Figure 9. Most promising intraocular lens for small incision cataract surgery. PMMA: polymethylmethacrylate.

The most frequently cited reason was intraocular lens power miscalculation, followed by intraocular lens decenteration/dislocation, endophthalmitis, corneal endothelial damage, and retinal detachment. The incidence of other complications is listed in Table 2.

Refractive Surgery

The percentage of surgeons who were performing astigmatic keratotomy was 26% in 1998, compared with 13% in 1992, 17% in 1993, 20% in 1994, 22% in 1995, 26% in 1996, and 28% in 1997. The application

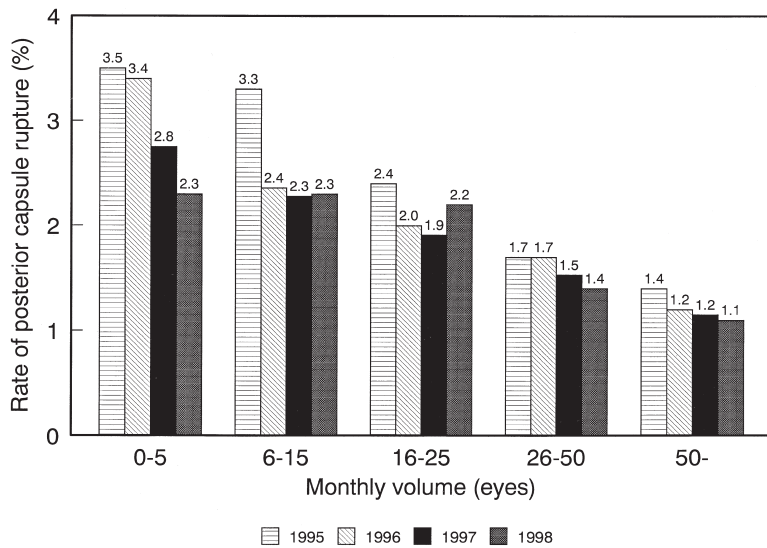


Figure 10. Monthly surgery volume and rate of posterior capsular rupture.

Table 2. Percentage of Complications Encountered During Past Year

	None	1 Case	2 Cases	3 Cases	4 Cases	5+ Cases
Expulsive hemorrhage	98.5	1.5	0	0	0	0
Endophthalmitis	87.7	10.3	1.2	0.2	0.2	0.2
Nucleus displacement	80.4	15.2	2.4	1.2	0.2	0.5
Intraocular lens Explantation	71.2	15.9	6.8	3.9	0.5	1.7

Values are percentages.

of astigmatic keratotomy was positively correlated with an increase in the volume of cataract surgery. Of those doing astigmatic keratotomy, 24% used it in combination with cataract surgery. Among the surgeons who are not currently performing astigmatic keratotomy, 46% answered that they want to perform the procedure in the future. This percentage has been decreasing during the past 4 years.

Radial keratotomy was used by 5% of respondents (3% in 1992, 3% in 1993, 4% in 1994, 6% in 1995, 6% in 1996, and 7% in 1997). Of those who are not doing the procedure at present, 9% replied that they wish to perform radial keratotomy in the future (Figure 11).

Respondents' views on astigmatic keratotomy, radial keratotomy, photorefractive keratectomy, laser in situ keratomileusis, phakic intraocular lens, and intrastromal corneal ring are listed in Table 3. Although astigmatic keratotomy and excimer laser surgery attracted notably high interest, less attention was directed toward radial keratotomy and intrastromal corneal ring.

Figure 12 shows the responses to the question of whether they would undergo refractive surgery themselves and, if so, which procedure.

Discussion

Because the respondents in this survey were members of the Japanese Society of Cataract and Refractive Surgery, results may not exactly reflect the opinions of all Japanese ophthalmologists. The sampling population might have represented a group of ophthalmologists who are more active in the field of cataract and refractive surgery. Because of the anonymous nature of the survey, it is not possible to trace the ophthalmologists who did not return the survey to see whether their replies would differ significantly from the responses of those who returned it.

This survey series, however, has covered a similar group of surgeons,¹⁸⁻²⁰ and thus we believe that the data do describe the trend and direction of cataract/refractive surgery in this country. A longer term, continuing study, similar to others,^{1,3,4} would further define the direction of our profession and contribute to the quality of medical services that future patients will receive.

The authors express their appreciation to the hundreds of surgeons who responded so comprehensively to the request for information.

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Figure 11. Plan to perform radial keratotomy in the future.

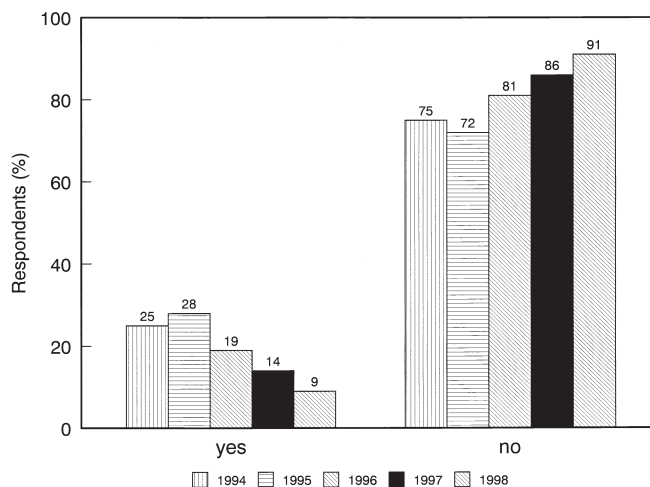


Table 3. Are Refractive Surgeries Useful for Your Future Practice?

	Yes	No	Unknown
Astigmatic keratotomy	49.5	13.1	37.4
Radial keratotomy	11.5	52.0	36.5
Photorefractive keratectomy	58.2	10.8	31.1
Laser in situ keratomileusis	69.5	3.9	26.6
Phakic intraocular lens	25.4	35.4	29.3
Intrastromal corneal ring	8.8	36.8	54.4

Values are percentages.

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References

1. Leaming DV. Practice styles and preferences of ASCRS members—1985 survey. *J Cataract Refract Surg* 1986;12:380–4.
2. Kraff MC, Sanders DR, Karcher D, et al. Changing practice patterns in refractive surgery: results of a survey of the American Society of Cataract and Refractive Surgery. *J Cataract Refract Surg* 1994;20:172–8.
3. Leaming DV. Practice styles and preferences of ASCRS members—1997 survey. *J Cataract Refract Surg* 1998;24:552–61.
4. Leaming DV. Practice styles and preferences of ASCRS members—1998 survey. *J Cataract Refract Surg* 1999;25:851–9.
5. Shein OD, Steinberg EP, Javitt JC, et al. Variation in cataract surgery practice and clinical outcomes. *Ophthalmology* 1994;101:1142–52.
6. Steinberg EP, Bass EB, Luthra R, et al. Variation in ophthalmic testing before cataract surgery. Results of a national survey of ophthalmologists. *Arch Ophthalmol* 1994;112:896–902.
7. Bass EB, Steinberg EP, Luthra R, et al. Variation in ophthalmic testing prior to cataract surgery. Results of a national survey of optometrists. *Arch Ophthalmol* 1995;113:27–31.
8. Schein OD, Bass EB, Sharkey P, et al. Cataract surgical techniques. Preferences and underlying beliefs. *Arch Ophthalmol* 1995;113:1108–12.
9. Wong D, Steele ADM. A survey of intraocular lens implantation in the United Kingdom. *Trans Ophthalmol Soc UK* 1985;104:760–5.
10. Beckett R, Rosen ES. The results of the 1986 survey of cataract surgery and intraocular lens implantation in the United Kingdom. *Eur J Implant Refract Surg* 1987;5:52–8.
11. Beckett R, Rosen ES. Results of the 1988 survey of cataract

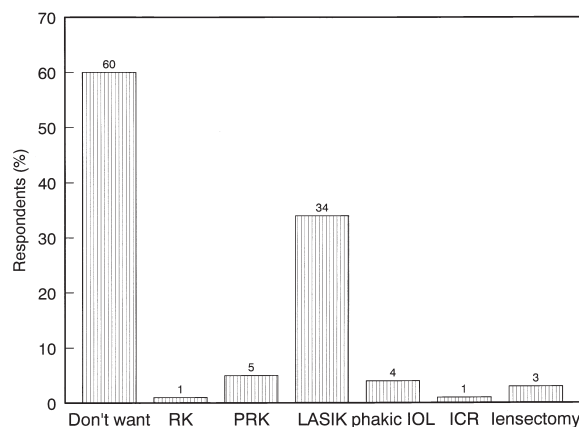


Figure 12. Percentage of respondents who would undergo various refractive procedures themselves. RK: radial keratotomy, PRK: photorefractive keratectomy, LASIK: laser in situ keratomileusis, phakic IOL: phakic intraocular lens, ICR: intrastromal corneal ring.

surgery and intraocular lens implantation in the United Kingdom. *Eur J Implant Refract Surg* 1989;1:231–5.

12. Hodgkins PR, Luff AJ, Morrell AJ, et al. Current practice of cataract extraction and anaesthesia. *Br J Ophthalmol* 1992;76:323–6.
13. Campbell DN, Spalton DJ. A national survey of the use of local anaesthesia for cataract surgery. *Eur J Implant Refract Surg* 1992;4:213–7.
14. Courtney P. The national cataract surgery survey: I. Method and descriptive features. *Eye* 1992;6:487–92.
15. Ninn-Pederson K, Stenevi U. Cataract surgery in a Swedish population: observations and complications. *J Cataract Refract Surg* 1996;22:1498–505.
16. Hansen TE. Practice styles and preferences of Danish cataract surgeons—1997 survey. *Acta Ophthalmol Scand* 1997;75:577–80.
17. Norregaard JC, Schein OD, Anderson GF. International variation in ophthalmologic management of patients with cataracts. *Arch Ophthalmol* 1997;115:399–403.
18. Oshika T, Masuda K, Hayashi F, Leaming DV. Current trends in cataract and refractive surgery in Japan—1992 survey. *Jpn J Ophthalmol* 1993;37:432–44.
19. Oshika T, Araie M, Hayashi F, et al. Current trends in cataract and refractive surgery in Japan—1996 survey. *Jpn J Ophthalmol* 1998;42:227–41.
20. Oshika T, Masuda K, Hayashi F, et al. Current trends in cataract and refractive surgery in Japan—1997 survey. *Jpn J Ophthalmol* 1999;43:139–47.