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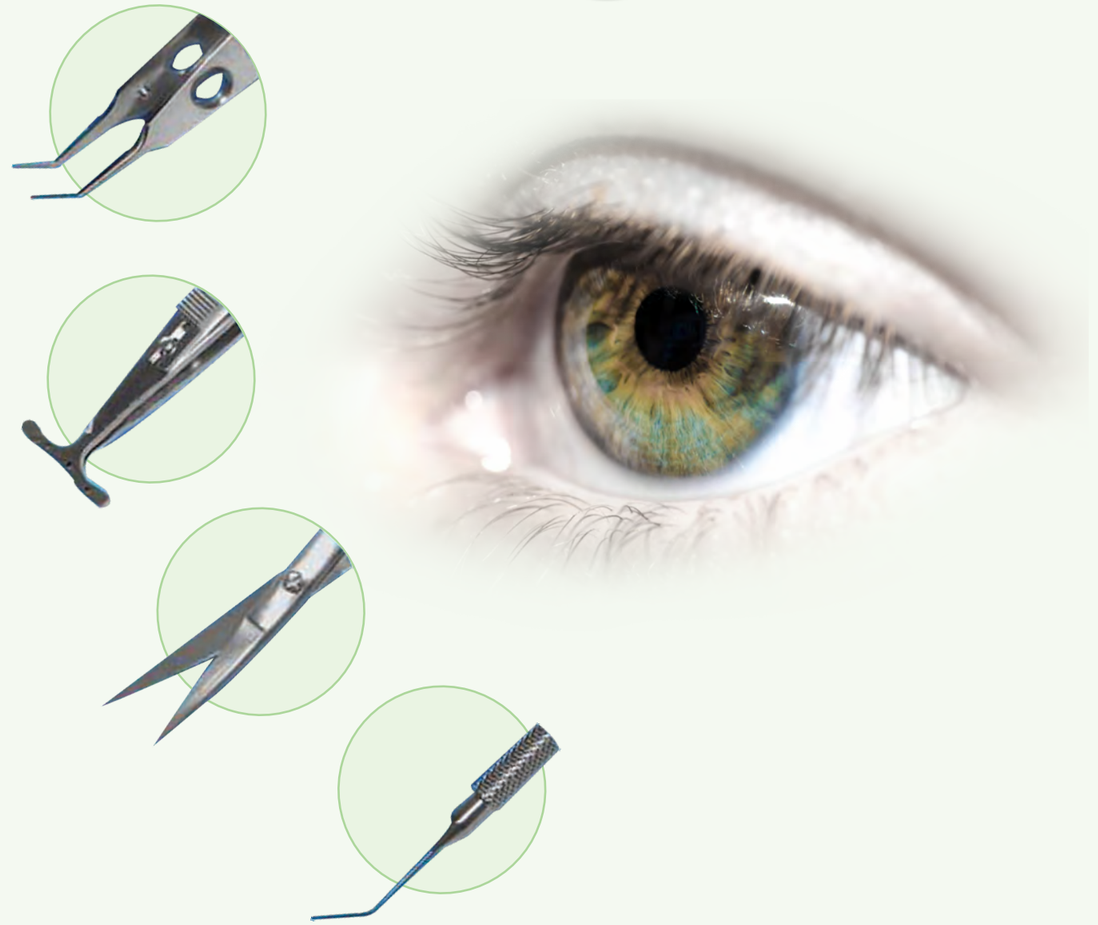

Surface Ablation Techniques

ISSUE - 4

A REVIEW ON SURFACE ABLATION TECHNIQUES

Adapted from: J Cataract Refract Surg 2011; 37: 392-408

Uncorrected refractive error is the most common cause of reversible blindness in India. Studies from urban India suggest that 49.3 million of those aged ≥15 years may have refractive errors. Dandona et al. studied an urban population in south India and reported that 42.16% of the population had refractive errors with a prevalence of 17.8% and 18.8% for myopia and hyperopia, respectively, in the 40- to 49-year age group, 29.6% and 39.6% in the 50- to 59-year age group, 44.8% and 29.7% in the 60- to 69-year age group, and 50% and 30.4% in the >70-year age group.[1]

Treatment of refractive errors with excimer laser surgery has evolved full circle since its inception. Early practitioners used a surface ablation approach, photorefractive keratectomy (PRK), but this technique can be accompanied by postoperative pain, prolonged recovery time, and frequent development of postoperative corneal stromal haze. Laser in situ keratomileusis (LASIK) soon supplanted PRK as the leading refractive surgery technique. However, with the increasing adoption of LASIK, concerns grew regarding postoperative keratectasia.[2]

The past few years have witnessed renewed interest in surface ablation with two so-called ***advanced surface ablation* techniques**: (1) laser-assisted subepithelial keratectomy (LASEK), in which the epithelium is removed with alcohol, and (2) epithelial LASIK (epi-LASIK), in which the epithelium is mechanically lifted without adjunctive agents. In both procedures, laser photoablation is performed just above the Bowman layer.[2]

According to MarketScope, surface procedures as a share of U.S. laser vision correction procedures have been climbing steadily, from less than 5% to about 15% from 2001 to 2006.[3]

Improvements in the understanding of corneal biomechanical changes, the modulation of wound healing, laser technology including ablation profiles and different methods for epithelial removal have widened the scope for surface ablation.[4]

HISTORY

The development of excimer laser ablation represented a breakthrough in the correction of ametropia. In the early 1990s, PRK became a common technique worldwide for treating low to moderate myopia because it offered a wider treatment range and more predictable and stable results than incisional keratotomy. Marguerite McDonald, performed the first PRK procedure in 1988. In 1991, Canada approved the excimer laser for use in PRK, and in 1995 it was approved in the United States.[5]

In 1990, Pillakaris and Burrato used a blade to cut a thin flap in the cornea, zap the tissue underneath, and replace the flap like a natural bandage. The flap allowed for less discomfort and a faster recovery. This procedure, now known as LASIK, was approved in the United States in 1999.[6]

The excimer laser and microkeratome certainly advanced the standing of refractive surgery and allowed LASIK to blossom. But two other developments—the femtosecond laser and wavefront technology—have become the gold standard for a contemporary LASIK procedure. The FDA approved femtosecond laser for laser-assisted creation of a corneal flap in 2001 and approved wavefront-guided LASIK for custom correction in 2002.[6]

Since its introduction, LASIK has been associated with various complications, specifically when performed on eyes with decreased corneal thickness, irregular astigmatism, dryness, preexisting ocular surface disease, or glaucoma, to the point where several of these entities have become relative contraindications to performing LASIK. For these reasons, LASEK was developed to reduce the chance of complications that occur secondary to LASIK while inducing less discomfort than PRK. Italian ophthalmologist Camellin is credited with developing the original LASEK procedure when he described the Camellin technique in ophthalmic literature in 1999.[6]

The variant of LASEK is Epi-LASIK which was first introduced by Ioannis Pallikaris, MD, PhD, and colleagues at the University of Crete, Greece in 2003. Epi-LASIK has replaced PRK primarily because it speeds visual recovery and epithelial healing.[7]

INDICATIONS FOR SURFACE ABLATION PROCEDURES

In following circumstances, surface ablation may be a better option than LASIK:

- Patients prone to traumatic LASIK-flap dislocation (eg, army personnel and contact sport athletes)[8,9]
- Patients with relatively large pupils (who may experience symptoms of glare/halos in the event of flap decentration and an abrupt border of their wider-than-the-flap-diameter ablation)[10,11]
- Patients at risk for developing keratectasia (patients with thin or irregular corneas)[12]
- Patients with very deep-set eyes, small palpebral fissures/ very prominent orbital roofs[13]

- Those with corneal surface irregularities; hemimeridional asymmetry; very high or low keratometry readings; low pachymetry; and situations that may predispose to irregular, thin, or buttonholed flaps[14-16]
- Preferable in patients with chronic blepharitis, especially if lid massages are required[17]
- Patients with recurrent corneal errosions[18]

ADVANTAGES OF SURFACE ABLATION PROCEDURES

- May save approximately 50 μm to 100 μm of corneal stroma in terms of untouched tissue depth, which may be a decisive factor in the setting of thin corneas or wide pupils and comparatively high corrections or potential formefruste keratoconus.
- May allow improved outcomes when combined with wavefront-guided customized ablations.[19-21]
- Advantage of PRK or LASEK: eliminates the residual refractive error after IOL implantation in a phakic or aphakic eye as early as refractive stability is achieved; i.e. after 4 to 6 weeks.[22-23]

TECHNIQUES OF SURFACE ABLATION PROCEDURES

A. Photorefractive Keratectomy (PRK)

- It is the oldest surface ablation procedure and was introduced in 1988.[24]
- Procedure: The epithelium is removed mechanically by manual scraping with a blade or a rotating brush or by epi-LASIK.[25,26] A 193 nm or 213 nm argon-fluoride excimer laser is then used to reshape the anterior corneal stroma by photoablation.[24] Most surgeons apply a bandage contact lens until the epithelium is healed (typically after 3 to 5 days).[27]
- Alcohol as an alternative for corneal epithelium removal[28]: Studies have shown that epithelial removal using 18% to 25% alcohol for 20 to 25 seconds is fast, easy, and safe to perform compared with mechanical debridement.[29,30]

B. Epithelial Laser in Situ Keratomileusis (epi-LASIK)

- Introduced as an alternative photorefractive treatment modality in 2003.
- Procedure: Characterized by an epithelial separation with the use of an epitome, a device that features a blunt oscillating blade. The epithelial sheet is thought to act as a natural contact lens that decreases postoperative pain and haze formation.[31] Many surgeons use epi-LASIK for definitive epithelial removal and do not reposition the epithelial flap following excimer laser ablation.[32-34] This approach is, in essence, a variant of PRK.

C. Laser-Assisted Subepithelial Keratectomy (LASEK)

- The first LASEK procedure was performed in 1996.
- Procedure: It combines elements of LASIK and PRK. Dilute alcohol is used to loosen the epithelial adhesion to the corneal stroma. The loosened epithelium is then moved from the treatment zone as a hinged sheet. Laser ablation of the sub-epithelial stroma is performed before the epithelial sheet is returned to its original position, as with the LASIK flap. The goal is to avoid flap-related LASIK complications and the biomechanical complications of LASIK-induced ectasia, as well as to reduce stromal haze after PRK. Currently, 18% to 20% ethanol is commonly used in LASEK.
- **Four major LASEK techniques have been described:**

a. **Azar flap technique**: Alcohol is applied to the corneal surface using a corneal marker. After 30 seconds, the ethanol is absorbed using a dry cellulose sponge. A hinge of 2 to 3 clock hours of intact margin, preferably at the 12 o'clock position is made using modified Vannas scissors or a dedicated rake. The loosened epithelium is peeled as a single sheet using a polyvinyl alcohol sponge or the edge of a jeweler's forceps, leaving it attached at its hinge. After laser ablation is performed, stroma and epithelial flap is hydrated with balanced salt solution. The epithelial flap is then replaced on the stroma and allowed to dry for 2-3 minutes. Topical steroids and antibiotic medications are applied, and a bandage contact lens is placed.

b. **Camellin technique**[35]: Uses a sharp, partial thickness trephination of the epithelium prior to alcohol application to allow better diffusion into the epithelium.

c. **Vinciguerra butterfly technique**[36-37]: Creates a thin paracentral epithelial line from 8 to 11 o'clock whereby a spatula is used before alcohol is placed in contact with the cornea. The epithelium is separated from Bowman layer, proceeding from the centre to the periphery on both sides. After the surface is dried, excimer laser ablation is performed.

d. **McDonald technique (alcohol free technique):** A rounded cataract blade is used to make a small linear abrasion through which a LASEK spatula is slipped. Using that hole as a fulcrum, a spatulating motion is made and the

epithelium stripped off. A dedicated curved cannula is slipped under the epithelium and a tear substituteis injected to create a dome in the epithelium. The raised epithelium is bisected with a Vannas scissors and parted sideways before ablation.[38]

OUTCOMES OF SURFACE ABLATION PROCEDURES

A. Photorefractive Keratectomy (PRK)

- The process is highly predictable, accurate, and reproducible. However, the outcome is influenced by the wound-healing response, as the central Bowman layer and anterior stroma are ablated. At times, this response leads to subepithelial haze formation.
- Comparing PRK and LASIK (results from metaanalysis and an independent case series and U.S. Food and Drug Administration (FDA) clinical trials):

  PRK results:

  - ✓ UCVA: mean percentage of eyes with UCVA of 20/20 was consistently about 60% at the 6-monthand 12-month time points. In the FDA clinical trials,63% of PRK eyes were within ±0.5D of attempted correction.
  - ✓ Safety: on average in all studies 3% to 5% of PRK eyes lost 2 lines or more of CDVA.
  - ✓ Conclusion: The results of the analysis indicated excellent efficacy, safety, and predictability for PRK. However, LASIK had superior efficacyand safety.
- Studies have shown that most PRK cases show stability of refraction by 3 months with minimal regression after this time.
- Hyperopic PRK results:
  - ✓ O'Brartet al.[39] report a 7.5 year (90 months) follow-up for hyperopic PRK.
  - ✓ In most cases, an initial overcorrection to mild myopia regressed to emmetropia over several months. The continued hyperopic shift from 12 months to 90 months was consistent with the natural hyperopic shift seen in middle-aged individuals.
- As in the long-term myopic PRK follow-up studies, higher percentages of eyes were within ±0.5D and ±1.0D of attempted correction at 1 year than at 7.5 years.
- Safety: There were no eyes with central stromal haze, but most eyes had a peripheral ring of haze with the greatest intensity seen at 6 months and then gradually declining. A remnant of this ring was seen in 25% of eyes at 90 months.

B. Laser-Assisted Subepithelial Keratectomy (LASEK)

- The safety, efficacy, and predictability of early LASEK treatments show that fewer than 0.1% of patients lost 2 lines or more of CDVA, 99% had UDVA of 20/40 or better, 76% had UDVA of 20/20 or better at 6 months, and 83% were within ±0.5 D of attempted correction.[40]
- Safety index in eyes was 1.0 and the efficacy index was 0.95. Epithelial closure occurred between 3.5 days and 4.5 days in most studies.
- Retreatment rates ranged from 0% to 6.7% over a 4-year follow-up period.
- Haze was seen in up to 31% of eyes at 3 months but resolved over the course of 1 year; it was evident in 4% of eyes at this time point. More recent reviews show similar results.[41]

C. Epithelial Laser in Situ Keratomileusis (epi-LASIK):

- In an early study of 44 eyes that had epi-LASIK:
- Mean epithelial healing time was 4.86 days.[42]
  - ✓ No pain was reported by 65% of patients, 15% reported burning pain (grade 3), and 19% reported mild discomfort. By day 3, all patients were pain free.
  - ✓ On the day of reepithelialization, 85% and 34% of eyes had better than 20/40 and 20/25 UDVA, respectively which increased steadily until 3rd month.
- Additional studies using epi-LASIK report similar results.[33]

DIFFERENCES BETWEEN PRK, LASIK, EPI-LASIK AND LASIK

Factor	PRK	LASEK	Epi-LASIK	LASIK
Range of correction	Low to moderately high			Low to moderately high
Post-operative pain	Mild to moderate 24-72 hours			Minimum 12 hours
Post-operative medications	1-3 months			1 week
Functional vision recovery	3 to 7 days			<24 hours
Refractive stability achieved	3 weeks to 3 months			1 week to 3 months
Specific complications	Haze formation, scarring	Haze formation, scarring	Haze formation, scarring, incomplete epithelial flap, stromal incursions	Free caps, incomplete pass of microkeratome, flap wrinkles, epithelial ingrowth, flap melt, interface debris, corneal ectasia, diffuse lamellar keratitis
Dry-eye sensitive	1 to 6 months			1 to 12 months
Thin corneas or wide pupils	Often not contraindicated			May be contraindicated depending on amount of intended correction
Special (relative) indications	Thin corneal pachymetry, wide scotopic pupil, LASIK complications in fellow eye, predisposition to trauma, keratoconus suspect (irregular astigmatism), glaucoma suspect, recurrent erosion syndrome, dry eye syndrome, basement membrane disease			Concern about post-operative pain, requirement of rapid visual recovery
Special (relative) contraindications	Concern about post-operative pain, requirement of rapid visual recovery	Concern about post-operative pain, requirement of rapid visual recovery	Concern about post-operative pain, requirement of rapid visual recovery, glaucoma, scleral buckle, deep-set eyes, small palpebral fissure	Thin corneas, wide pupils, recurrent erosion syndrome, glaucoma, scleral buckle, deep-set eyes, small palpebral fissure

STUDIES COMPARING SURFACE ABLATION PROCEDURES

A. PRK and LASEK[43]:

- Epithelial healing: Ranges from 3.2 to 4.35 days for PRK and 3.6 to 4.8 days for LASEK
- Pain scores: significantly higher in the PRK group (mean score of 2.3 out of 4.0) for compared with for LASEK (1.6). Some studies have shown no difference in pain scores.
- UDVA: Excellent UDVA results were seen in all studies; by 3 months, the UDVA was 20/20 or better in more than 90% of eyes with no difference in UDVA at any time point
- Haze formation:haze scores at 1 month were reported to be significantly greater in the PRK group. However, another studyreported a slight increase in haze formation in LASEK patients.
- Patient preference: A studyreported that 63% of patients preferred the LASEK procedure, stating it had faster visual recovery, better acuity, and less pain. Another study reported that on day 1, 100% of patients preferred PRK, but had no preference by day 30.

B. LASEK and epi-LASIK[44]:

- Epithelial healing: similar between treatment groups (4.2 days in LASEK and 4.9 days in epi-LASIK).
- UDVA: no statistically significant difference seen by month 3
- Efficacy index: significantly better in the LASEK group than in the epi-LASIK group (0.97 and 0.89, respectively)
- Safety index: 9% of LASEK eyes and 15% of epi-LASIK eyes lost 1 line, making the safety index significantly better in LASEK eyes (0.99) than in epi-LASIK eyes(0.93)
- Haze formation: no difference in haze formation between groups; 56% to 60% of eyes had grade 0.5 haze at 1 to 3 months, which decreased to 20% by 6 months.

COMPARISON BETWEEN LASIK AND SURFACE ABLATION TECHNIQUES

- UDVA: LASIK had statistically better UDVA until 3 months, when it was 20/20 in 82% of advanced surface ablation eyes versus 71%

- A similar percentage of eyes in each group was within±0.5 D of attempted correction, and similar numbers maintained or gained CDVA,
- More advanced surface ablation eyes (89%) achieved a UDVA within 1 line of their preoperative CDVA than LASIK eyes (72%).
- UDVA was better than preoperatively in more advanced surface ablation eyes than LASIK eyes - 66% versus 42%, respectively.
- The differences between advanced surface ablation and LASIK in this study may be because LASIK creates a stromal flap that serves as an interface that can create additional higher-order aberrations (HOAs), negating the advantages of using a wavefront- guided ablation. Since there is no interface created in surface ablation, there is no additional source of HOAs, optimizing the advantages of using wavefront-guided ablations.

COMPLICATIONS OF SURFACE ABLATION PROCEDURES

A. Pain and corneal haze:

- Most common complication of all surface ablation procedures
- Peak of corneal haze occurs between 1 - 3 months with resolution by 6- 12 months.
- LASEK and epi-LASIK procedures might decrease the corneal haze because the epithelial flap protects the surface stroma from exposure to inflammatory cells in the tear film causing less inflammatory damage and less corneal haze.
- Various methods adopted to decrease corneal haze & pain:
  - ✓ Oral intake of vitamin C, 500 mg daily, in the postoperative time period and the intraoperative use of the antimetabolite mitomycin-C (MMC) 0.02 % for 15 to 60 seconds
  - ✓ MMC for the treatment of dense haze that is recalcitrant to topical steroid eyedrops
  - ✓ Cooling the ocular surface with an ice-chilled irrigation solution before and/or after surface ablation
  - ✓ Off-label use of migraine drugs like (rizatriptan 10 mg): It should be used only in cases of severe pain on postoperative day 1and not directly after ablation because these may be associated with severe side effects and medicolegal issues.

B. Bacterial keratitis:

- The risk ranges from 0.01% to 1.0% and is likely significantly higher than after LASIK secondary to the creation of a large epithelial defect and the use of a contact lens
- Common causative organisms: Staphylococcus aureus, coagulase negative Staphylococcus spp, and Streptococcus spp.[15,45-50]

C. Ectasia:

- Risk for ectasia appears to be lower after surface ablation (4%) than after LASIK (96%).
- It is best avoided by prudent patient selection.
- Corneal collagen crosslinking offers an emerging technique that is less invasive than partial or full-thickness keratoplasty

D. Dry eye:

- Surface ablation damages fewer corneal nerves than LASIK and should therefore induce fewer dry-eye symptoms. [51,52]
- However, there is a huge variation and dry-eye symptoms, largely due to decreased corneal sensitivity and blinking rate, can also be problematic after surface ablation. [53]
- Additional mechanisms that worsen dry eye: toxic conjunctivitis medicamentosa from postoperative drops, a flattened corneal surface with altered tear flow dynamics.
- Advisable to avoid eyedrops with preservatives.
- Permanent or temporary punctal occlusion may alleviate dry-eye symptoms.
- Patients with chronic blepharitis requiring lid hygiene may resume their massage after full epithelial closure.

E. Steroid-induced intraocular pressure (IOP) elevation

- Patients who have surface ablation are typically maintained on steroid eyedrops for longer periods of time than those who have LASIK.
- Because of the longer duration of steroid treatment, there is a higher risk for developing steroid-induced IOP elevation.
- One study reports steroid induced IOP elevations in 3% of eyes that had PRK.[54]

F. Glare and halos:

- Increased glare and halos are reported in up to 30% to 50% of eyes. [55]
- Decentered ablation profiles may lead to increased symptoms of glare/halos.
  - ✓ Most studies report mean decentration between 0.3 mm and 0.7 mm.
  - ✓ Decentrations less than 1.0mm are likely to be visually insignificant, but those more than 1.0 can cause glare, halos, monocular diplopia, and decreased vision. [56,57]

DISCUSSION AND CONCLUSION

At present, all surface ablation techniques seem to be valuable options when patients request refractive surgery, especially when the goal is to preserve 50 to 100 μm of corneal stroma.

Some investigators think surface ablation may regain popularity in the near future with the use of more sophisticated laser ablation profiles and more precise laser spot delivery, as the benefit of thesecomplex ablations may not be negated by variable iatrogenic aberrations due to a stromal flap.[58-61] However, the greater wound-healing response in surface ablations compared with LASIK may limit the resolution of a customized ablation by masking the fine contours provided by wavefront- or topography-guide dablations[62]. The wound healing itself may cause significant aberrations, as haze formation is visible at the slit-lamp in a certain proportion of eyes. Even if high-contrast visual acuity seems unaffected and current aberrometers may not be capable of detecting these subtle changes, this haze may be the cause of light sensitivity and slightly reduced mesopic vision.

A separation below Bowman layer and an alternative to the use of MMC may be desirable to minimize haze formation and quicken visual recovery.

In conclusion, surface ablations appear to be safe and effective refractive surgical options. It may be possible to perform surface ablation safely in patients not deemed suitable for LASIK. However, surface ablations are associated with greater inconvenience, discomfort, and slower recovery than LASIK.

References:

1. Invest Ophthalmol Vis Sci. 2004; 45: 4268–4272.
2. Cataract & Refractive Surgery Today EUROPE May 2013: 26-29. http://www.eyeworld.org/printarticle.php?id=4095
3. Last accessed on 23rd June 2014.
4. Ref: Clinical & Experimental Ophthalmology 2010; 38(2): 168-182 http://one.aao.org/munnerlyn-laser-surgery-center/surface-ablation-photorefractive-keratectomy-lasek
5. Last accessed on 23rd June 2014. http://emedicine.medscape.com/article/1222702-overview#a0101
6. Last accessed on 23rd June 2014. http://www.eyeworld.org/printarticle.php?id=4095
7. Last accessed on 23rd June 2014.
8. J Cataract Refract Surg 2007; 33: 1332–1335
9. Semin Ophthalmol 2003; 18: 2–10
10. Cataract Refract Surg 2004; 30: 1929–1933
11. J Cataract Refract Surg 2006; 32: 779–784
12. J Cataract Refract Surg 2007; 33: 859–861
13. Am J Ophthalmol 2006; 141: 733–739
14. Cornea1998; 17: 459–467
15. J Cataract Refract Surg 2007; 33: 2041–2048
16. Curr Opin Ophthalmol 2002; 13: 242–245
17. Clin ExpOptom 2005; 88: 89–96.
18. J Refract Surg 2005; 21: 406–407
19. J Refract Surg 2007; 23: S1021–S1028
20. Invest Ophthalmol Vis Sci 2010; 51: 2800–2804
21. Ophthalmol Clin North Am 2004; 17(2): 247–260; viii
22. Ophthalmologe 2008; 105: 832–835
23. Eur J Ophthalmol 2005; 15: 1–7
24. Graefes Arch Clin Exp Ophthalmol 1988; 226:273–276
25. Ophthalmic Surg 1992; 23: 618–621
26. Curr Opin Ophthalmol 2006; 17: 389–393
27. Optom Vis Sci 2008; 85: 884–888.
28. Ophthalmology 1997; 104: 1566–1574
29. J Cataract Refract Surg 1997; 23: 1160–1163
30. J Refract Surg 1998; 14: S212–S214
31. J Cataract Refract Surg 2003; 29: 1496–1501
32. J Refract Surg 2006; 22: 151–154
33. Int Ophthalmol Clin 2006; 46(3): 105–115
34. J Refract Surg 2007; 23: 637–638
35. J Refract Surg 2003; 19: 666–670
36. Refract Surg 2002; 18: S371–S373
37. J Refract Surg 2003; 19: S223–S226
38. Azar DT, Taneri S. LASEK. In: Azar DT, ed, Refractive Surgery, 2nd ed. St. Louis, MO, Elsevier-Mosby, 2007; 239–248.
39. J Cataract Refract Surg2005; 31: 1104–1113.
40. Surv Ophthalmol 2004; 49: 576–602
41. Clin Exp Ophthalmol 2010; 38: 183–191
42. Cataract Refract Surg 2005; 31: 879–885
43. Arch Ophthalmol 2004; 122: 11– 16
44. J Cataract Refract Surg 2008; 34: 2073–2078
45. Am J Ophthalmol 2007; 143: 629–634
46. J Cataract Refract Surg 2005; 31: 2008–2011
47. J Cataract Refract Surg 2003; 29: 2001–2006
48. Eye Contact Lens 2003; 29: 187–189
49. Ophthalmology 2003; 110: 743–747
50. Ophthalmology 2006; 113: 520–525
51. J Refract Surg 2007; 23: 709–715
52. J Cataract Refract Surg 2007; 33: 1515–1521
53. J Refract Surg 2008; 24: 591–599
54. Zhonghua Yan Ke Za Zhi 1999; 35: 179–182
55. Ophthalmology 1997; 104: 1535–1553
56. Ophthalmol Clin North Am 2001; 14(2): 359–376; ix
57. Ophthalmology 1995; 102: 42–47
58. Curr Opin Ophthalmol 2004; 15: 333–341
59. J Cataract Refract Surg 2004; 30: 653–657
60. Am J Ophthalmol 2009; 147: 77–83
61. Graefes Arch Clin Exp Ophthalmol 2010 May 7
62. J Refract Surg 2010; 26: 625–637

NOTES

Surgical Insights 1st Issue
Immediate sequential bilateral cataract surgery (ISBCS)

Summary :

Cataract extraction with intraocular lens (IOL) implantation is the most common surgical procedure worldwide. The frequency of second-eye surgery accounting for approximately 30% to 45% of all cataract extractions has increased.

Today, majority of surgeons perform delayed sequential bilateral cataract surgery (DSBCS), scheduling surgery in the two eyes approximately 4 to 6 weeks apart. An emerging trend, however, is to perform both surgeries on the same day. Immediate sequential bilateral cataract surgery (ISBCS) is being performed with increasing frequency worldwide and a number of surgeons believe this may be the future of cataract surgery.

This issue of surgical insights gives a brief update on the ISBCS indications, contraindications, guidelines for performing ISBCS, benefits and a look at the controversies with the use of ISBCS.

Surgical Insights 2nd Issue
Femtosecond Laser Cataract Surgery

Summary :

Cataract surgery has evolved tremendously since it was first performed. In 2010, the US Food and Drug Administration (FDA) approved femtosecond laser system for cataract surgery. This technology has the potential to significantly impact cataract surgery as the laser offers an opportunity to better meet patients' expectations.

This issue of surgical insight is an update on femtosecond laser cataract surgery wherein it gives an overview of the uses of femtosecond laser in cataract surgery, its benefits, and limitations and also mentions Indian experience of femtosecond laser cataract surgery.

Surgical Insights 3rd Issue
Complications of Phacoemulsification & Manual Small-Incision Cataract Surgery (SICS)

For a number of years, phacoemulsification has been the method of choice for cataract extraction in developed countries. Phacoemulsification can offer a safe and elegant disassembly and aspiration of the lens and a rapid recovery for patients. However, it can also lead to serious complications when used to remove extremely dense cataracts commonly encountered in developing countries. Manual small-incision cataract surgery (SICS) has emerged as a cost-effective alternative to phacoemulsification in the developing world.

This issue of surgical insights gives a brief comparison on the complications occurring due to phacoemulsification as well as manual small-incision cataract surgery.

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