

# Abstracts

Edited by Dr. Tahir Mahmood

## **Major shifts in corneal transplantation procedures in north China: 5316 eyes over 12 year**

Xie L, Qi F, Gao H, Wang T, Shi W, Zhao J  
Br J Ophthalmol 2009;93:1291-5.

Corneal transplantations are the main procedures performed to treat corneal blindness. Traditionally, penetrating keratoplasty (PKP) has been the procedure selected for corneal diseases such as suppurative keratitis, keratoconus and corneal stromal dystrophy. However, immune rejection, which can lead to graft opacity, remains a major problem after PKP. Even "normal" graft may have chronic corneal allograft dysfunction. With the accumulation of knowledge on corneal diseases, corneal endothelia and corneal surgery procedures, as well as the development of microsurgical technology, lamellar keratoplasty (LKP) has become more valued. Although today it is well accepted that LKP should be preferred over PKP in as many cases without major problems with the corneal endothelia as it is possible to prevent endothelium-related problems such as immune rejection and chronic corneal allograft dysfunction.

The purpose of this study was to investigate the major shifts in the ratio of lamellar keratoplasty (LKP) to penetrating keratoplasty (PKP) and in the preoperative indications for each procedure.

Medical records of patients who received LKP and/or PKP at Shandong Eye Institute between 1996 and 2007 were categorised and reviewed. The time period was divided into intervals of 1996-8, 1999-2001, 2002-4 and 2005-7.

A total of 4346 patients (5316 eyes) with integrated clinical records were included in the study. LKPs and PKPs were performed on 1558 eyes (29.3%) and 3758 eyes (70.7%), respectively. Within the first 3-year interval, the top three indications for LKP were chemical burns, keratoconus and corneal dermoid; the top reasons for PKP were viral keratitis, suppurative keratitis and corneal scarring. Within the last interval, suppurative keratitis, keratoconus and viral keratitis became most common indications for LKP and suppurative keratitis, viral keratitis and bullous

keratopathy for PKP. The ratio of LKP to PKP operations tended to increase.

Authors concluded with the remarks that following proper indications, the use of LKP has increased in number in north China and has become particularly frequent in the management of corneal infections, keratoconus, corneal degeneration, and stromal dystrophy.

## **Spectacle use after routine cataract surgery**

Wilkins MR, Allan B, Rubin G  
Br J Ophthalmol 2009; 93: 1307-12.

The standard treatment for patients undergoing routine cataract surgery is to insert a monofocal or fixed focus intraocular lens (IOL). When inserting such an IOL we frequently select an IOL power that will leave the patient with an emmetropic or low myopic prescription. Following bilateral phacoemulsification surgery where emmetropia has been targeted, spectacle dependence for distance is at least 40%.

What is not clear is what factors in the postoperative refraction predict whether a patient will be spectacle-dependent for near or distance. Knowledge of such factors would allow the surgeon, by changing the IOL power selected, or by managing preoperative astigmatism, to reduce spectacle dependence.

The purpose of this study was to measure spectacle dependence following bilateral monofocal intraocular lens (IOL) implantation and assess how it is predicted by post-operative refraction.

300 cataract patients had bilateral phacoemulsification surgery with monofocal IOL implantation. A spherical equivalent of 0 to -0.5 D was targeted. Three months after surgery, patients answered a questionnaire and had a spectacle refraction. Refractions were converted into vector notation. Logistic regression was used to evaluate whether spectacle dependence for near and distance was related to overall refractive error, spherical error, signed spherical error and astigmatic error.

169 patients attended for assessment. 38 wore distance glasses, and 160 wore reading glasses either some or all of the time. The mean right spherical equivalent was -0.03 D, and the mean right cylinder was -0.64 D. Left outcomes were similar. Patients were 34 times more likely to always use distance glasses per dioptre of astigmatic error in the better eye ( $p < 0.003$ ), but there was no significant increase in the likelihood of wearing distance glasses with spherical error (odds ratio = 3.85,  $p > 0.15$ ). Similar effects were seen for both the better and worse eyes. Near-spectacle use was not dependent on astigmatic error (odds ratio = 0.22,  $p > 0.12$ ). It was only related to the signed spherical error in the worse eye with hypermetropic patients 6.74 times more likely to always wear spectacles per dioptre of positive spherical error ( $p < 0.005$ ).

Authors concluded with the remarks that following bilateral monofocal intraocular lens implantation, small levels of overall refractive error, in either eye, particularly astigmatism, predict distance-spectacle dependence, whereas spherical ametropia in the range of +1.0 D does not. Hypermetropia in the worse eye, but not astigmatism, predicts reading-spectacle dependence.

#### **Ten years after photorefractive keratectomy (PRK) and Laser in situ keratomileusis (LASIK) for moderate to high myopia (control-matched study)**

Alio JL, Ortiz D, Muftuoglu O, Garcia MJ  
Br J Ophthalmol 2009; 93: 1313-8.

Photorefractive keratectomy (PRK) to correct myopia was introduced in the late 1980s. Because of severe postoperative pain and relatively slow recovery after PRK, laser in situ keratomileusis (LASIK) was introduced in the early 1990s and became the most performed refractive surgery modality in the 2000s with claimed advantages over PRK such as quick visual rehabilitation, higher predictability, minimal postoperative discomfort and absence of corneal haze. Although, studies with short-term follow-up reported that the risks associated with LASIK were considered to be low, postoperative flap-related complications and corneal ectasia can be sight-threatening. Consequently, excimer laser superficial keratectomy techniques such as photorefractive keratectomy (PRK), laser subepithelial keratectomy (LASEK) and epithelial laser in situ keratomileusis (Epi-LASIK) have gained popularity in recent years to correct myopia to refrain

from possible complications of LASIK such as corneal ectasia.

Given that refractive surgery is mostly performed on young and healthy eyes of patients with high expectations, long-term safety and efficacy are the greatest concerns. Despite millions of procedures having been performed, there is a great lack of data about the long-term comparison of PRK and LASIK. Previous studies comparing PRK and LASIK outcomes, up to 1 year after surgery, found similar or slightly better safety and efficacy outcomes for LASIK. The aim of the present study is to perform a comparative analysis of the evolution of the corneal curvature and the refractive stability 10 years after myopic PRK and LASIK for moderate myopia by means of a control-matched retrospective study.

The purpose of this study was to evaluate to compare the long-term outcomes of photorefractive keratectomy (PRK) and laser in situ keratomileusis (LASIK) for myopia between -6 and -10 D.

A retrospective, control-matched study including 68 eyes, 34 which underwent PRK and 34 LASIK, with myopia between -6 and -10 D, operated using the VISX 20/20 excimer laser, was performed. Optical zones of 5.5 to 6 mm were used. All PRK-treated eyes were matched with LASIK-treated eyes of the same age, spherical equivalent within  $\pm 1.25$  D, sphere within  $\pm 0.5$  D and cylinder within  $\pm 0.5$  D. All patients were evaluated 3 months, 1 year, 2 years, 5 years and 10 years after surgery. The main outcomes measures were refractive predictability and stability, safety, efficacy and re-treatment rate.

At 10 years, 20 (71%) and 23 (88%) were within  $\pm 1.00$  D after PRK and LASIK respectively. The re-treatment rate was 35% and 18% respectively. No eye lost more than two lines of BSCVA in both groups. The efficacy was 0.90 for PRK and 0.95 for LASIK.

Authors concluded with the remarks that both PRK and LASIK were safe for moderate myopia. LASIK demonstrated slightly better efficacy, predictability, and less rate of re-treatment after 10 years. The technical improvements should be taken into account when comparing these results with those obtained more recently.

#### **Comparison of Outcomes of Lamellar Keratoplasty and Penetrating Keratoplasty in Keratoconus**

Han DCY, Mehta JS, Por YM, Htoon HM, Tan DTH

Am J Ophthalmol 2009; 148: 744-51.

Penetrating keratoplasty (PK), the full-thickness replacement of a diseased cornea with an allograft donor cornea, has been a well-accepted surgical treatment for keratoconus over the past few decades. However, it can be complicated by allograft endothelial rejection, which will lead to concomitant endothelial cell loss with subsequent risk of graft failure. Deep anterior lamellar keratoplasty (DALK), which involves replacing the anterior part of a diseased cornea while retaining the healthy deeper tissue, has the advantage of reducing the risks of graft rejection and intraocular complications. It is, however, more technically demanding and may result in suboptimal visual outcomes because of interface and refractive irregularities.

Over the past few decades, several techniques of anterior lamellar keratoplasty (ALK) have been described. These include the earlier predescemetec procedures in which some stromal tissue and Descemet membrane (DM) are left behind, such as in the manual forms of DALK in which manual lamellar surgical dissections were performed. A recent innovation of predescemetec DALK is automated lamellar therapeutic keratoplasty, which uses microkeratome instrumentation to perform lamellar dissection. Most recently, descemetec lamellar keratoplasty procedures have been described in which total stromal removal is attempted, leaving only the DM and endothelium behind, which includes the Anwar big-bubble technique.

This study aimed to compare the optical results of PK and two subgroups of ALK in patients with keratoconus, that is, predescemetec and descemetec techniques. In our population, keratoconus is the fourth most common indication for corneal grafting after pseudophakic and aphakic bullous keratopathy, postinfectious scarring, and re-grafts. Because keratoconus represents low-risk keratoplasty and patients usually are young and free of other ocular pathologic features, they provide an ideal cohort to

study success and visual outcomes between lamellar keratoplasty and PK.

The purpose of this study was to evaluate to compare outcomes after penetrating keratoplasty (PK) and two techniques of deep anterior lamellar keratoplasty (DALK) in patients with keratoconus.

One hundred and twenty-five corneal transplantations comprising 100 PK and 25 DALK procedures for keratoconus at the Singapore National Eye Centre from April 1992 through December 2006 were included. DALK was performed with the modified Anwar technique (descemetec or DALKa group) in 14 eyes and manual lamellar keratoplasty (predescemetec or DALKm group) was performed in 11 eyes.

At 12 months, the DALKa and PK groups achieved a logarithm of the minimum angle of resolution mean best spectacle-corrected visual acuity (BSCVA) of 0.15 and 0.27, respectively ( $P = .26$ ), whereas the mean BSCVA of the DALKm group was 0.41 compared with the PK group ( $P = .12$ ). Significance level was achieved between the DALKa and DALKm groups ( $P = .013$ ). There was no significant difference in the mean spherical equivalent ( $P = .72$ ) and astigmatism ( $P = .88$ ) between the PK and DALK groups. The DALK group had a significantly lower incidence of complications compared with PK cases, including allograft rejection and glaucoma. Graft survival rate of both the PK and DALKa groups was 100%, whereas that of the DALKm group was 73% at 3 years after surgery ( $P = .000$  between PK and DALKm groups).

Authors concluded with the remarks that visual acuity outcomes of the DALKa technique are comparable with those of PK for keratoconus, whereas DALK surgery results in fewer postoperative complications than PK. DALKa is emerging as a preferred choice among the lamellar techniques for better optical outcome. Further studies are required to provide long-term analysis of these results.