Correction of hyperopia and presbyopia by lasik

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Hypermetropia is a condition in which parallel light rays come to a focus in a point behind the retina. The old techniques of corneal refractive surgery for hyperopia include: Epikeratophakia , keratophakia , keratomileusis , hexagonal keratotomy and automated lamellar keratoplasty (ALK). The recent techniques of corneal refractive surgery for hyperopia include: Laser thermal keratoplasty (LTK) , conductive keratoplasty(CK), photorefractive keratectomy (PRK) and laser in situ keratomileusis (LASIK). With the success of excimer laser ablation for treatment of myopia and astigmatism, investigation into the ability to treat hyperopia was a logical step. The main advantage of LASIK over PRK is a presumably attenuated wound healing response causing less regression compared with PRK as a result of the overlying flap and preservation of the corneal epithelium and Bowman’s layer. Other advantages include earlier postoperative stabilization of refraction, less postoperative patient discomfort, faster improvement in visual acuity, less stromal haze formation, possibly improved (predictability, stability, and corneal clarity in higher correction groups), shorter duration of postoperative medication use, and easier enhancement procedures. Hyperopic LASIK (H-LASIK) is performed in the form of annular ablation in the peripheral cornea to increase the steepness of central part of the cornea to achieve the desired refractive effect. Most of published studies indicate reasonable predictability for low to moderate hyperopic corrections, up to +4 D in most series , but with less satisfactory results for the correction of higher order treatments. Complications can occur with hyperopic LASIK, as they can with myopic LASIK. Both procedures have several complications in common; however, some are unique to hyperopic treatments.Presbyopia is the reduction in the range of accommodation and the near point, while the far point is not affected. The non – surgical correction of presbyopia can be achieved by spectacles (a single pair of glasses and multifocal lenses) or by contact lenses (Monovision with contact lenses and bifocal contact lenses). The surgical correction of presbyopia can be achieved by Scleral expansion bands (SEB), anterior ciliary sclerotomy (ACS), laser anterior ciliary excision (Laser ACE), intraocular lenses (IOLs) and recently by LASIK. Application of monovision LASIK technique aims at correction of presbyopia in emmetopes, myopes, and hyperopes, where the non-dominant eye generally is corrected for near vision and the dominant eye for distance vision. The main advantage for choosing monovision is freedom from glasses for both distance and near. Presbyopic LASIK using a multifocal ablation profile, where the central zone is steepened for near vision and the medium zone targeted for distance. But because the central cornea provides an excellent site for distance vision as it is relatively

aberration free, while the peripheral aberrations may actually be useful for near focusing, so the trials now are directed to compensate for presbyopia with the contrary concept i.e., distant vision in central cornea and near vision in medium cornea . (PARM) technique i.e., the Presbyopic-Avalos and Rozakis Method is a LASIK technique that allows the patient to focus on near objects while retaining his ability to focus on far objects, taking in account the refractive error in the eye when the treatment is performed. With this LASIK technique, the corneal curvature is modified, creating a bilateral multifocal cornea in the treated optical zone. A combination of hyperopic and myopic LASIK is done aiming to make a multifocal cornea. In presbyopic multifocal LASIK (PML), multifocality of the cornea is created using a multi-step LASIK treatment in which several independently calculated ablations are performed at various optical zones. Depending on the patient's refractive error, there may be anywhere from 3 to 8 different concentric zones. The goal is to treat the central cornea for distance vision, with applying a multifocal ablation to the peripheral cornea to provide functional near vision.