Iqbal Technique In iLASIK (The Quadrilateral Technique): A New Modified Technique For Lifting The Corneal Flap From The Stromal Bed

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Abstract: Purpose: To evaluate the efficacy and safety of Iqbal technique in iLASIK (the quadrilateral technique) for lifting the corneal flap created by intralase femtosecond laser. Design: A prospective nonrandomized clinical trial study. Methods: 79 eyes of 44 patients complaining of myopia and astigmatism were treated with iLASIK using Iqbal technique for lifting the corneal flap from the stromal bed. All eyes were subjected to preoperative uncorrected distance visual acuity (UDVA), corrected distance visual acuity (CDVA), manifest refraction, slit lamp examination of anterior segment, keratometry and pachymetry assessed by corneal topographies (Pentacam). All patientswere examined by idesign for customized laser ablation. Results: This brand new technique was aimed to facilitate the removal of the corneal flap from the stromal bed in a simple and easy manner however, surprisingly enough the author discovered that this technique allowed us to use the minimal energy power 0.85 mJ which was greatly helpful in decreasing the incidence of deep lamellar keratitis and postoperative corneal haze. The technique was found to be simple, safe and easy with rapid learning curve with no recorded complications. On the contrary, the first step in the technique which is complete release of the flap edge from the corneal stromal bed allowed the author to discover any incomplete separation of the edges to deal with it and separated smoothly from the bed without disturbing the uniformity of the flap. Conclusion: Iqbal technique (quadrilateral technique) showed a good sign in decreasing the power needed for flap creation by the intralase femtosecond laser. Iqbal technique proved to be a promising new simple, effective and safe procedure to lift the corneal flap from the stromal bed and less time consuming than other procedures.

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1. Introduction

iLASIK combines the most advanced measurement technology in the world, and two of the world's most advanced computer-guided lasik lasers, into one safe and highly effective procedure. It is a revolution in lasik surgery. It represents the pinnacle of blade-free, fully customised laser vision correction, and is the premium lasik solution available in the world today.¹

The technology used in the iLASIK procedure is very mature (the systems used today have been in use for years) and safe. Doctors have been performing laser vision correction procedures for over a decade and 31.4 million procedures have been performed worldwide to date, making it the most common elective vision procedure in the U.S. In fact, all branches of the U.S. military and NASA recently allowed the treatment of LASIK for their servicemen and women, thanks to studies using iLASIK Technology.²

iLASIK combines the two most advanced lasik technologies in the world. It is the first vision correction procedure to be 100% customised to the unique characteristics of each eye. iLASIK is the only laser eye surgery approved by NASA and can correct the broadest range of vision imperfections, so more people than ever can enjoy clear vision without glasses and contacts. iLASIK has been over a decade in the making, and is trusted bythousands of doctors and millions of patients worldwide.^{1,3}

The IntraLase FS and iFS Laser Systems are ophthalmic surgical lasers indicated for use in patients undergoing surgery or treatment requiring the initial lamellar resection of the cornea, in the creation of the corneal flap or a lamellar cut/resection of the cornea.³⁻⁵

To unlock the potential of results beyond 20/20 vision,* you need a truly customized procedure. That's what Advanced CustomVue Technology delivers. The unique combination of the Wave Scan Wave Front System and the STAR S4 IR Excimer Laser, Advanced Custom Vue Technology measures and treats individualized imperfections of each eye that are never treated with standard or optimized treatments, or corrected with glasses or contacts.³

Iqbal technique is a new modified technique for lifting the Femtosecond lasikflap. The new

quadrilateral technique involves separation of the femtoflap from the stromal bed in the 4 quadrants separately.

2. Patients and Methods

This study was designed as a prospective clinical trial that was performed in Iqbal Eye Center and written consents were taken from the patient after explanation of the new procedure for iLASIK.

In this study, the author decided to evaluate the efficacy and safety of Iqbal technique in iLASIK for lifting the corneal flap from the stromal bed after division of the flap into four quadrants and lifting each quadrant separately.

Seventy nine eyes of 44 patients complaining of myopia and astigmatism were treated with iLASIK using Iqbal technique to correct the refractive errors. The principle of Iqbal technique was to divide the interface between the corneal flap and the stromal bed into four quadrants and to lift each quadrant alone. All eyes were subjected to preoperative UDVA, CDVA, manifest refraction, slit lamp examination of anterior segment, IOP, fundus examination, keratometry and pachymetry assessed by Pentacam corneal topographies (Pentacam) while idesign was performed for each patient.

Surgical procedure

The device used was iFS[™] Advanced Femtosecond Laser (Figure 1A). The device was released by AMO which is now Abbott Medical Optics Inc. (a separate entity within Abbott's medical device division, USA).STAR S4 IR Excimer Laser was used for the unique Advanced Custom Vue Technology together with idesign and Wave ScanW ave Front System.

Figure 1B showed the appearance of the femtosecond laser during descend of the patient interface (PI or the cone) on to the suction ring giving the appearance of what I called the spaceship landing on the earth.



Figure 1: The used device. A, Advanced Femtosecond Laser (iFS, Abbott). B, application of the PI or cone of the femtosecond laser onto the suction ring giving the appearance of the spaceship landing on the earth. Iqbal technique included 3 main steps:

- 1- Fixation of the glow
- 2- Release of the edges of the corneal flap from the stromal bed
- 3- Separation of the flap in four quadrants

Iqbal technique was shown well in these figures. Figure 2 showed the start releasing the edge of the flap from the stromal bed at 6 o'clock. Figure 3 showed the moving the hook on one side until the edge of the upper hinge thus releasing one half of the flap edge. Figure 4 showed theStart releasing the edge of the flap from the stromal bed on the other side till the whole edge of the corneal flap totally free from the stromal bed. Figure 5showed introducing the blunt tipped hook from one side under the flap till passes from the other side. Figure 6 showed the incomplete withdrawal of the blunt tipped hook to start separation of the flap in quadrants. Figure 7 showed the separation of the flap in the first quadrant. Figure 8 showed the separation of the flap in the second quadrant. Figure 9 showed the separation of the flap in the third quadrant. Figure 10 showed the separation of the flap in the fourth

quadrant. Figure 11 showed the lifting the flap from the stromal bed after complete separation. Figure 12 showed appearance of the stromal bed after Iqbal technique.



Figure 2: Start releasing the edge of the flap from the stromal bed at 6 o'clock.



stromal bed on the other side till the whole edge of the side under the flap till passes from the other side. corneal flap totally free from the stromal bed



Figure 6: Incomplete withdrawal of the blunt tipped Figure 7: Separation of the flap in the first quadrant. hook to start separation of the flap in quadrants.



Figure 3: Moving the hook on one side until the edge of the upper hinge thus releasing one half of the flap edge.



Figure 4: Start releasing the edge of the flap from the Figure 5: Introducing the blunt tipped hook from one





Figure 8: Separation of the flap in the second quadrant.



Figure 10: Separation of the flap in the fourth quadrant.



Figure 9: Separation of the flap in the third quadrant.



Figure 11: Lifting the flap from the stromal bed after complete separation.



Figure 12: Appearance of the stromal bed after Iqbal technique.

3. Results

This brand new technique was aimed to facilitate the removal of the corneal flap from the stromal bed in a simple and easy manner however, surprisingly enough the author discovered that this technique allowed us to use the minimal energy power 0.85 mJ which was greatly helpful in decreasing the incidence of deep lamellar keratitis and postoperative corneal haze.

The technique was found to be simple, safe and easy with rapid learning curve with no recorded

complications. On the contrary, the first step in the technique which is complete release of the flap edge from the corneal stromal bed allowed the author to discover any incomplete separation of the edges to deal with it and separated smoothly from the bed without disturbing the uniformity of the flap.

4. Discussion

The main idea of Iqbal technique is to make lifting of the corneal flap simple and less time consuming which was proved in this study. The traditional way in lifting the corneal flap was showing some difficulty specially to the beginners while this difficulty increases if there is incomplete separation of the flap from its edges. This difficulty was overcomed to a great extent by using Iqbal technique or the quadrilateral technique which facilitate discovery and smooth separation of the incomplete separated parts of the flap.

According to my knowledge there were no other techniques for removal of the corneal flap which makes Iqbal technique a unique technique in this subject. And what makes it more interesting is the surprise that we discovered by allowing us to use the lowest energy available by the intralase femtosecond laser to separate the flap that became reflected only postoperative results by absence of the corneal haze glare or deep lamellar keratitis.

5. Conclusion

Iqbal technique (quadrilateral technique) showed a good sign in decreasing the power needed for flap creation by the intralase femtosecond laser. Iqbal technique proved to be a promising new simple, effective and safe procedure to lift the corneal flap from the stromal bed and less time consuming than other procedures.

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