



## LASIK; EFFECT ON TEAR FILM STABILITY

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**Article received on:**  
10/10/2016  
**Accepted for publication:**  
30/12/2016  
**Received after proof reading:**  
14/02/2017

**ABSTRACT... Objectives:** To determine the effect of LASIK on tear film stability. **Study Design:** Cross sectional, prospective study. **Setting:** The study was conducted in D. G. Laser Vision and Diagnostic Center, D.G. Khan, South Punjab, Pakistan. **Period:** From March 2016 to September 2016. **Materials and Methods:** One hundred patients (two hundred eyes) were selected for this study. SPSS version 20 was used to analyze the data. Categorical variables presented as frequency and percentages and numerical variables presented as mean  $\pm$  standard deviation. **Results:** It is observed that values of tear break up time, Schimer I and Schimer II were decreasing at one week and one month post LASIK as compare to one week pre LASIK values. Mean tear break up time at one week of pre LASIK was  $14.72 \pm 1.08$  seconds ( $P=0.000$ ), at one week post LASIK was  $13.64 \pm 1.507$  seconds ( $P=0.000$ ) and at one month post LASIK was  $13.02 \pm 1.695$  seconds ( $P=0.000$ ). **Conclusion:** Laser in situ keratomileusis (LASIK) significantly changes tear film stability and tear secretions for at least one month post operatively.

**Key words:** Laser in situ keratomileusis (LASIK), Tear breakup test (TBUT)

**Article Citation:** Fatima K, Saddique Z, Akram SN, Furqan A. Lasik; effect on tear film stability. Professional Med J 2017;24(2):293-295.  
**DOI:** 10.17957/TPMJ/17.3666

### INTRODUCTION

Many techniques have been used to for correction of vision. But Laser in situ krotmilasis (LASIK) is most commonly used technique for permanent correction of vision. With this benefit this technique also have some side effects such as dry eye (dry eye syndrome) is a major side effect of LASIK.<sup>1,2,3</sup> A study conducted by Albiez et al to evaluate persistence of dry eye after LASIK from some weeks to six months and he reported 48% cases of dry eye.<sup>4</sup> It is observed that frequency of dry eye syndrome is specifically high in women, older patients and in contact lens users. Some preexisting conditions may be labeled as risk factors of dry eye after LASIK such as blephritis, low blink rate, low corneal sensation and low hormonal level.<sup>5,6</sup> Dry eye syndrome can be diagnosed on basis signs and symptoms (diagnostic test) and Schimer I, II test is also useful for evaluation of tear secretions and tear breakup test (TBUT) for tear film stability.<sup>7</sup>

### MATERIALS AND METHODS

This study was prospective, non-comparative

analysis of 100 patients (200 eyes) who undergoing LASIK surgery. For ethical concerns, approval of study will be obtained from ethical review board of department of optometry, University of Faisalabad. An informed consent form will be distributed to gain consent from participants for their voluntary participation by briefly describing the study topic, its purpose, duration and assuring for confidentiality of respondents personal information. E mail address and phone no. of researcher will also be provided to respondents if they ask for it. Informed consent of the patient will be taken prior to their inclusion in study. Patient's history for contact lens wearing also taken. Patients with re-operation of LASIK, under treatment for dry eye, active disease of ocular surface and adnexa were excluded from the study. A flap of 9.5 mm wide and 130 micron thick was created with Hansatome Microkeratome and surgeries were performed with Schwind 500E LASIK machine. Tear film stability will be checked by TBUT using Flourecein strips in cobalt blue light of slit lamp in pre LASIK and post LASIK patients. Schirmer test will also be performed by

schirmer strips to check the tear secretions in pre LASIK and post LASIK patients.

## RESULTS

A total of hundred patients (two hundred eyes) included in this study. There was a significant difference in demographic variables and a large number of subjects were contact lens users. There were 110 (55%) male subjects and 90 (45%) female, mean age of patients was  $1.53 \pm 0.715$ . out two hundred 20 (10%) were contact lens users and 180 (90%) were not wearing contact lenses (Table-I).

When we concern about our outcome variables, tear film stability and tear secretions, it is observed that values of tear break up time, Schimer I and Schimer II were decreasing at one week and one month post LASIK as compare to one week pre LASIK values. Mean tear break up time at one week of pre LASIK was  $14.72 \pm 1.08$  seconds ( $P=0.000$ ), at one week post LASIK was  $13.64 \pm 1.507$  seconds ( $P=0.000$ ) and at one month post LASIK was  $13.02 \pm 1.695$  seconds ( $P=0.000$ ) (Table-II).

Values of Schimer I also decreased at one week and one month post LASIK as compare to one week pre LASIK. Values of Schimer I at one week pre LASIK was  $11.94 \pm 1.042$  mm ( $P=0.000$ ), at one week post LASIK was  $11.36 \pm 1.207$  mm ( $P=0.000$ ) and one month post LASIK was  $10.58 \pm 1.346$  mm ( $P=0.000$ ) (Table-II).

Similarly it is observed that Schimer II values also decreased at one week and one month post LASIK. Schimer II at one week pre LASIK was  $11.74 \pm 0.783$  mm ( $P=0.000$ ), one week post LASIK was  $9.08 \pm 1.1333$  mm ( $P=0.000$ ) and at one month post LASIK was  $8.36 \pm 1.207$  mm ( $P=0.000$ ) (Table-II).

## DISCUSSION

Our study concluded that there is a significant reduction in tear secretions and tear film stability after LASIK. Schimer I score was gradually decreased at seven days and one month after LASIK as compared to one week pre LASIK score.

Gender	
Male	110 (55%)
Female	90 (45%)
Age	$30.56 \pm 7.843$
Contact Lens Users	
Yes	20 (10%)
No	180 (90%)

**Table-I. Demographic Variables and Contact lens Users**

Tear Break Up Test in Seconds		P Value
One Week Pre LASIK	$14.72 \pm 1.08$	0.000
One Week Post LASIK	$13.64 \pm 1.507$	0.000
One Month Post LASIK	$13.02 \pm 1.695$	0.000
Schimer I in mm		
One Week Pre LASIK	$11.94 \pm 1.042$	0.000
One Week Post LASIK	$11.36 \pm 1.207$	0.000
One Month Post LASIK	$10.58 \pm 1.346$	0.000
Schimer II in mm		
One Week Pre LASIK	$11.74 \pm 0.783$	0.000
One Week Post LASIK	$9.08 \pm 1.1333$	0.000
One Month Post LASIK	$8.36 \pm 1.207$	0.000

**Table-II. Inferential Results**

Our results are same as study conducted by Yang B et al<sup>8</sup> in which Schimer I score also decreased at seven days and one month. Michael et al also noticed a reduction in Shimer values after LASIK. Similarly Edward et al<sup>9</sup> reported that Schimer score increased at first day and then gradually decreased at one week and one month. These all studies concluded that tear secretions post LASIK and supporting our study. Reason behind decrease in tear secretion is still under debate. Kallarckal et al<sup>10</sup> reported that decrease in tear secretions and tear film stability is due to its poor sensitivity and reproducibility. He also noticed that Schimer II value was reduced at one month and then gradually came back to normal in periode of three to six months. Edward et al conducted same study at one day, one week and one month and reported a decrease in basal tear secretions test values. We also observed same results of Schimer II in our study which decreased at seven days and one month of post LASIK.

We perform tear break up time (TBUT) to check tear film stability in our patients. Values of our test also decreased at one week and one months

after LASIK as compare to one week pre LASIK values. Mean tear break up time at one week of pre LASIK was  $14.72 \pm 1.08$  seconds ( $P=0.000$ ), at one week post LASIK was  $13.64 \pm 1.507$  seconds ( $P=0.000$ ) and at one month post LASIK was  $13.02 \pm 1.695$  seconds ( $P=0.000$ ).

Shoja et al<sup>11</sup> also observed same results in his study. Toda et al<sup>12</sup> and Siganos et al<sup>13</sup> also reported that TBUT significantly lower up to three months and then tend towards normal (pre LASIK). Similarly BUT was reported lower at one day, one week and one month by Yang et al<sup>8</sup> post LASIK.

## CONCLUSION

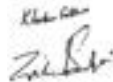


Laser in situ keratomileusis (LASIK) significantly changes tear film stability and tear secretions for at least one month post operatively.

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## AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Khushbu Fatima	Conceive idea, manuscript writing	
2	Dr. Zahid Saddique	Statistical analysis.	
3	Syed Nishat Akram	Data collection	
4	Dr. Aamir Furqan	Proof reading, Final approval	