

# Difficult Refractive Femtosecond Laser Cases



## Background

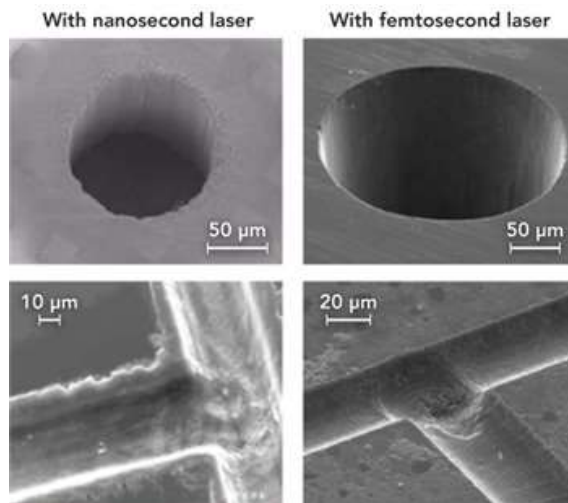
Femtosecond (FS) laser is an infrared laser with a wavelength of 1053nm.

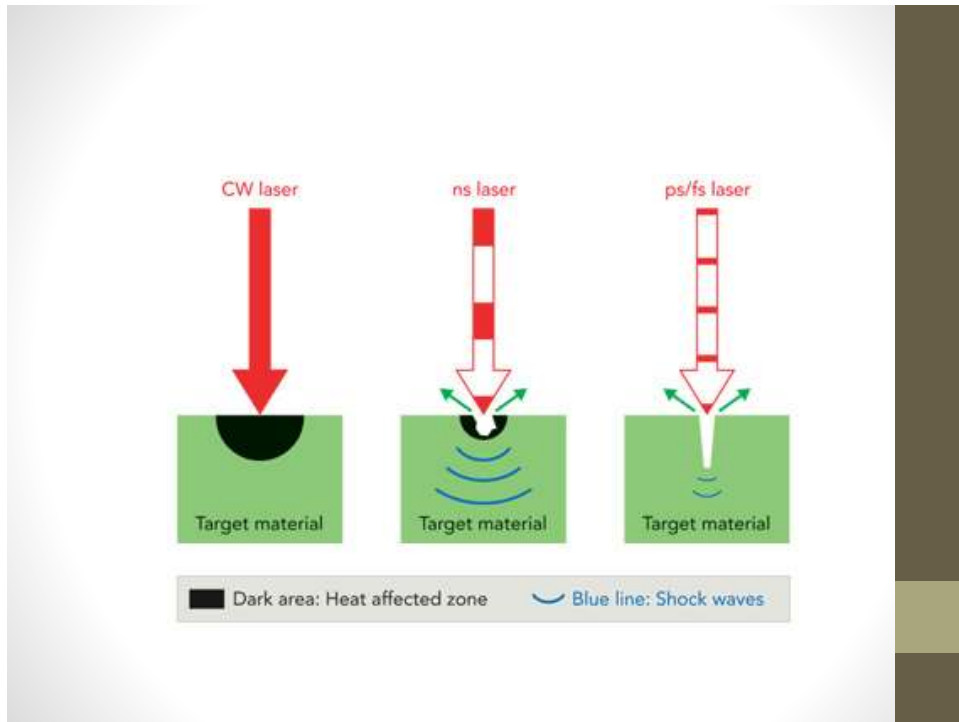
Works by producing photodisruption or photoionization of the optically transparent tissue such as the cornea.

FS laser has pulse duration in the femtosecond range (10-15 second)



Femtosecond laser differ significantly from Yag Laser in the amount of collateral damage they cause. Nd:YAG laser has a pulse duration in the nanosecond range ( $10^{-9}$  second) where as FS laser has pulse duration in the femtosecond range ( $10^{-15}$  second).





## Femtosecond Laser in Ophthalmology

### Uses:

- Femtolasik
- Femtosecond cataract surgery
- Femtokeratoplasty
- Femtosecond laser in keratoconus



Uses

## Our experience in Sohag



## After Practicing the procedure



## We faced difficult situations



### Case 1:

- 28-years-old female

Bilateral high myopia

**Rt. eye refraction:** -7.50Ds -1.00Dc @12 → **BCVA:**  
0.7

**Lt. eye refraction:** -6.50 Ds -1.50Dc @196 → **BCVA:**  
0.8

**Corneal topography: within normal**

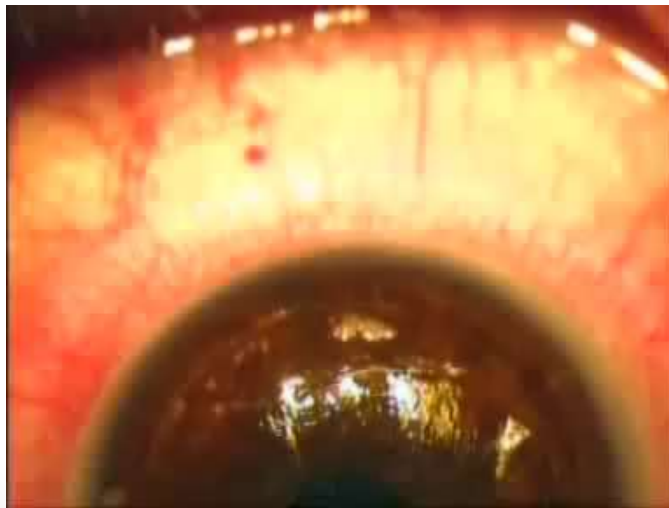
Bilateral Lasik with femtosecond laser ultrathin (90 microns) flap creation to preserve thicker residual bed.

**In the first setting:**

The created flap was found to be decentered due to patient movement during laser emission, we didn't try to lift the flap, surgery was postponed for 3 months to allow complete flap healing.

**Another trial for flap creation by femtolaser was done due to** inability to do high surface ablation because of the sunny nature of our area which increases incidence of post-surface ablation haze.

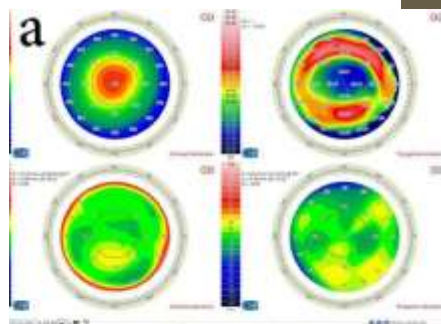
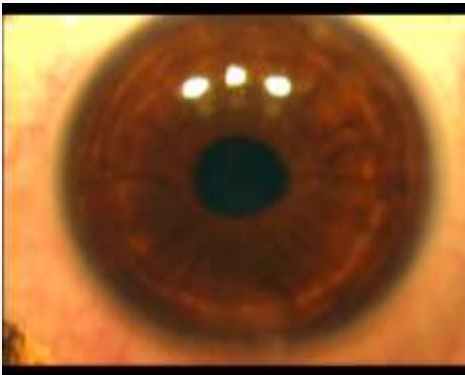
**The second trial :**



## Post operative follow up

The patient's follow up was for 2 months.  
Complete healing of the flap had occurred with normal  
postoperative corneal topography  
Uncorrected visual acuity was 0.6

## After 2 months



## Case 2:

- A **43** ys Male

Bilateral high myopic cylinder

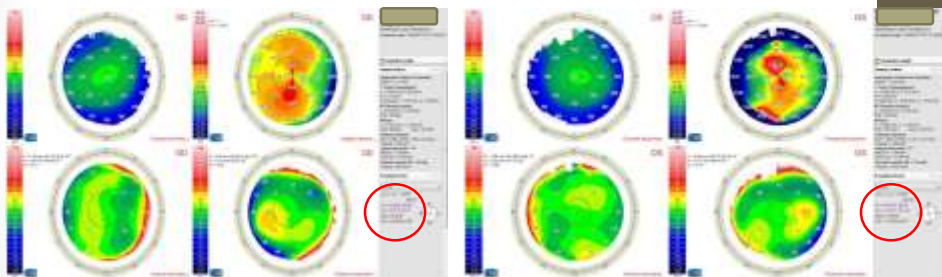
Rt. eye refraction: -2.50Ds -8.00Dc @12    BCVA: 0.2

Lt. eye refraction: -2.750 Ds -7.75Dc @16    BCVA: 0.2

### Corneal topography:

Bil. Steep Cornea with high post. elevation corresponding to corneal opacification **which may interfere with femtosecond laser ablation**

## Corneal Topography

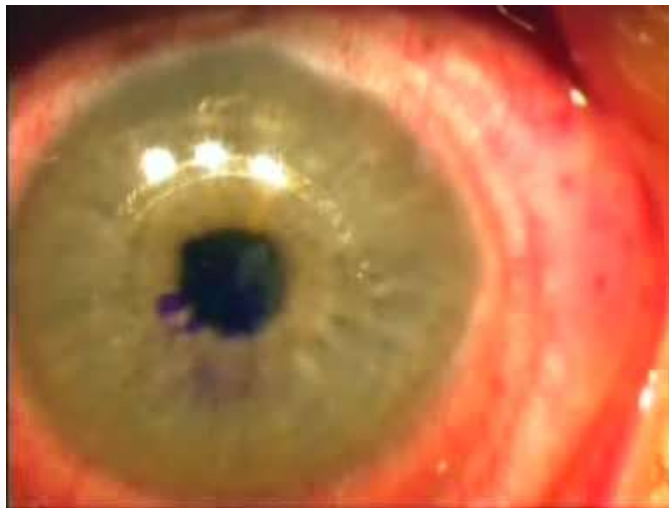




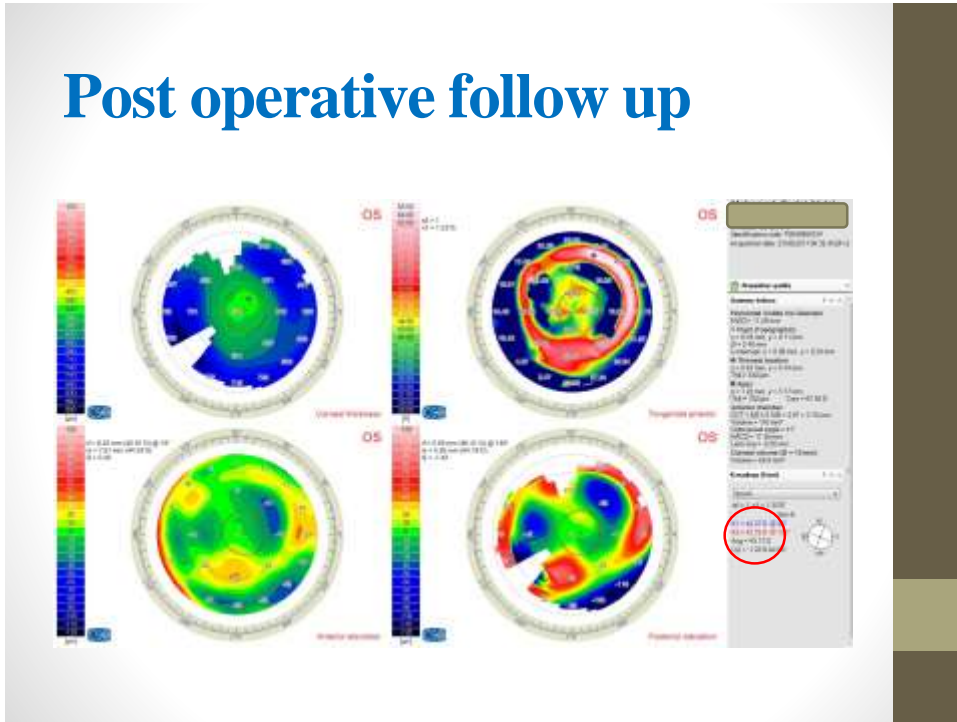
## Scheimpflug Imaging



## Lt. Keraring implantation



## Post operative follow up



## Post operative follow up

The patient's follow up was for 2 months for both eyes

### Rt. eye refraction:

-0.75 Ds -2.50Dc @52    □ BCVA: 0.4

### Lt. eye refraction:

-1.250 Ds -1.25Dc @66    □ BCVA: 0.4

## Case 3:

- A **27** ys Male

Lt. advanced Keratoconus -----→ Grade 3 KC

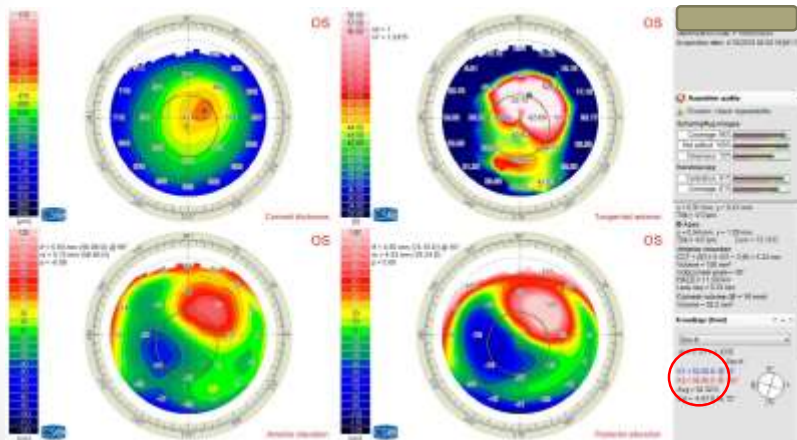
Rt. Keratoplasty ---→ **BCVA : 0.1**

Lt. eye refraction: **Unrefractable**

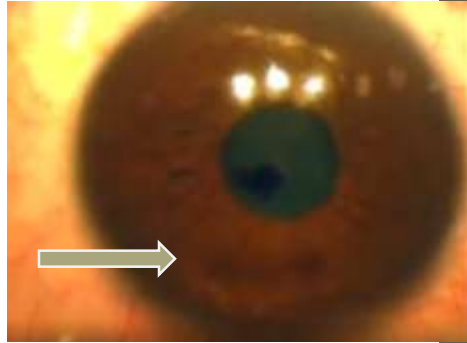
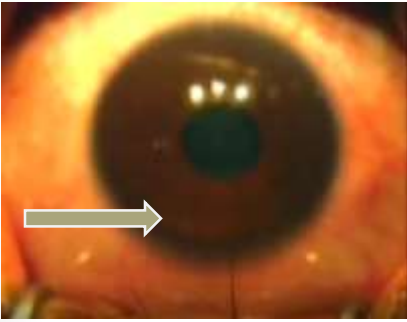
**Corneal topography:**

**Superior Keratoconus** with Upper corneal ectasia .

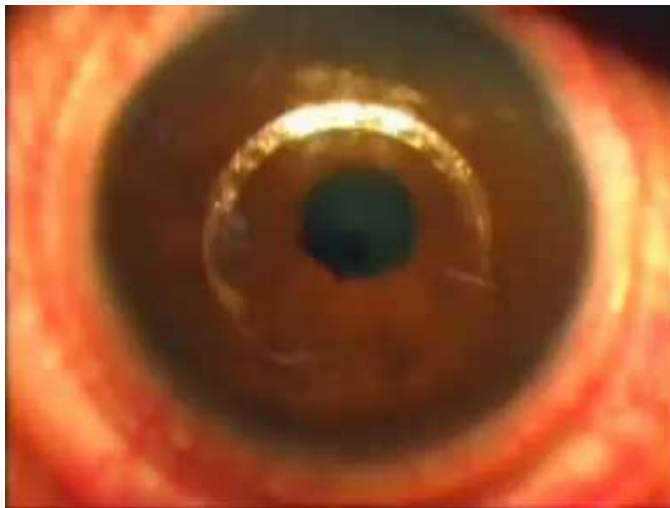
## Corneal Topography



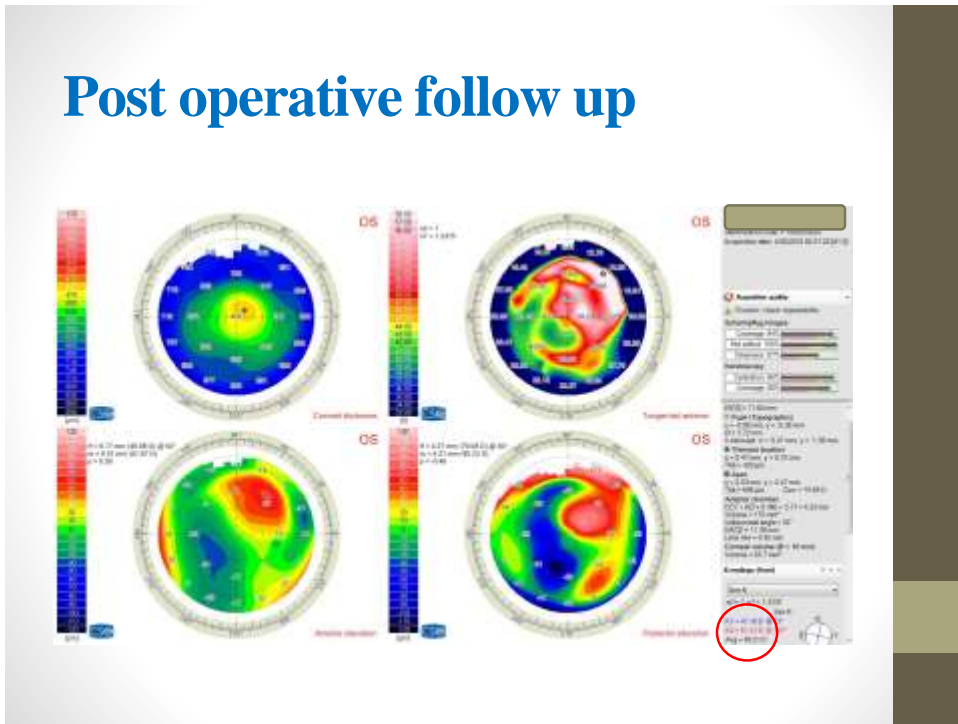
## Superior cone



## Lt. Keraring implantation



## Post operative follow up



## Post operative follow up

The patient's follow up was for 2 weeks for Left eye

**Lt. eye refraction:**

**-7.250 Ds -4.25Dc @66 □ BCVA: 0.4**



The End

## Home Message

**Femtosecond laser in refractive surgery is a relatively new procedure with many advantages.**

**Femtosecond laser has many advantages in Lasik and Keratoconus surgeries.**

**Difficult situations can be managed easily with this technology with satisfactory results.**

Thank You

