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## Comparative study for central corneal thickness with ORB-SCAN, lenstar & USG for corneal treatment

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### Abstract

This study is led to decide the relationship between's U.S.G Pachymetry, ORBSCAN Pachymetry and LENSTAR Pachymetry. Cornea is the straightforward piece of the eye that covers the front piece of the eye. it covers the understudy (the opening at the focal point of the eye) Iris (the hued piece of the eye), and foremost chamber (the liquid - filled within the eye) The cornea fundamental capacity is to refract or twist, light. The straightforward cornea contains one 6th of the foremost eyeball. Corneal thickness is vital if there should be an occurrence of Refractive Surgery. If patient having extremely less corneal thickness He/She can't go through refractive surgery. Deciding treatment methodology as P.R.K and S.B.K The corneal thickness assumes a significant part in the event of Glaucoma. We all realize that a thick cornea gives misleading high perusing of IOP, and strangely slim cornea gives bogus low perusing of IOP. In that condition we want to apply amendment factor in the wake of estimating the IOP. Hence it is exceptionally essential that the patient is having high IOP on account of thick cornea or it is huge. Alongside these circumstances corneal thickness is significant if there should arise an occurrence of any corneal transfer.

1. Penetrating keratoplasty
2. Descemets endothelial stripling keratoplasty
3. Deep front lamellar keratoplasty
4. Collagen cross connecting

As made sense of over that we have intrusive and harmless technique to quantify corneal thickness. Non-obtrusive strategies are demonstrated in pre lasik assessment orbscan gives total corneal planning including corneal thickness too. To keep away from corneal scraped area we want to do painless examination like orbscan / lenstar. For this concentrate on 160 people groups of the age bunch 19-35 is haphazardly chosen in facilities and Eye camp where this study is directed.

**Keywords:** cornea, corneal thickness, ORB scan, lenstar USG, corneal treatment

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### Introduction

Cornea is a straightforward connective tissue that actions 10-11 mm in an upward direction and 11-12 mm on a level plane. On normal Central corneal thickness is 540.4  $\mu\text{m}$  (SD 33.6) midway and thicker towards the periphery<sup>[1]</sup>.

Clinically the estimation of Central cornea thickness (CCT) is generally significant for refractive medical procedure, glaucoma determination and screen the movement of different corneal problems<sup>[2, 3]</sup>. Measurement of focal corneal thickness is performed for both demonstrative and helpful purposes. CCT permits assurance of how much stromal removal to limit the gamble of iatrogenic keratectasia in Laser Assisted In situ Keratomileusis (LASIK) surgery. 4, 5 in different visual issues, corneal thickness estimation is of outmost significance.

There are different approaches to estimating corneal thickness. The most normally utilized clinical technique is ultrasound pachymetry (highest quality level). It is a painless contact ultrasonic procedure for estimating corneal thickness, For the estimation of corneal thickness, it is viewed as a famous gadget due to its productivity and precise approach to estimating corneal thickness and address the unwavering quality and repeatability of these estimation techniques<sup>[8, 9]</sup> Its benefits incorporate convenience, conveyability, and minimal expense. Nonetheless, the opportunities for patient distress created even after effective sedation for deadness and the opportunity to initiate corneal epithelial harm, disintegration and disease with this contact technique and furthermore, mistakes brought about by space of the cornea have likewise been reported<sup>[10, 11]</sup> It is performed by putting a ultrasonic test on the focal cornea, after the cornea has been anesthetized with an effective sedation. There is additionally a more current age ultrasound pachymeter that utilizes a composite probe<sup>[12]</sup>.

The Pentacam HR (Oculus) is a non-contact gadget in view of the Scheimpflug standard, which produces exact and sharp pictures of the foremost eye portion, it gives thickness of the whole cornea inside under 2 seconds,

where 50 pictures with 500 genuine rise focuses can be recorded alongside a 3-layered checking of the front fragment of the eye.<sup>3, 13</sup> Anterior chamber point and volume can likewise be documented <sup>[14, 15]</sup>.

Because of different corneal issues like keratoconus and increasing prevalence of myopia, hypermetropia etc and this study is carried out on the 100 randomly selected people of different age groups.

Corneal Thickness measurement is very important for many conditions and for treatment.

Central Corneal Thickness can be measured using many instrument, there are Invasive and Non-Invasive Methods

Invasive Methods Includes (U. S. Gpachymetry) which is Gold standard in this field. And there is Non Invasive Method like

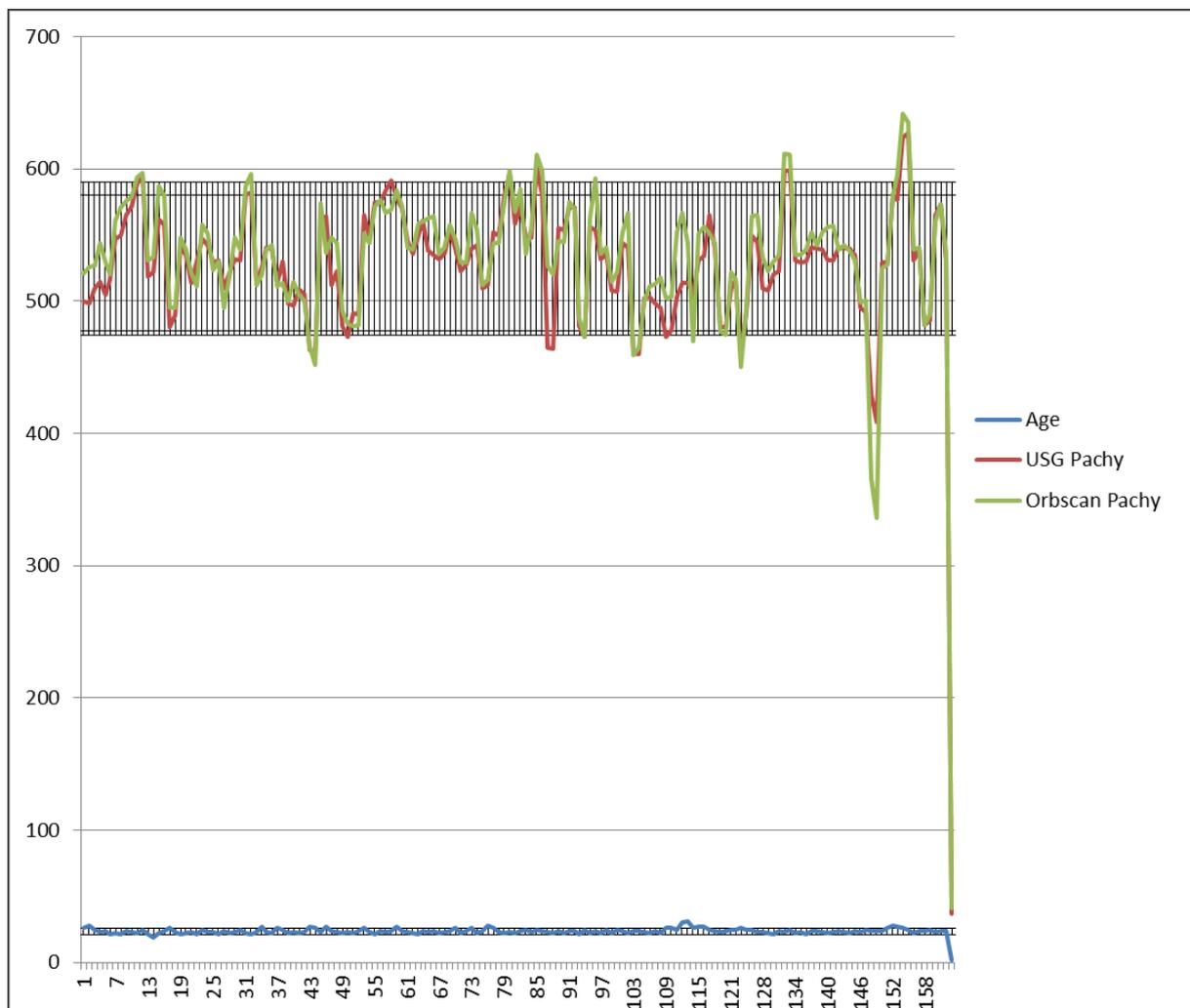
1. Non-contact Pachymetry (Lenstar)
2. Orbscan (Bausch & Lomb)
3. Pentacam
4. O.C.T

We need to measure corneal thickness precisely because it is very important in several conditions to decide mode of treatment.

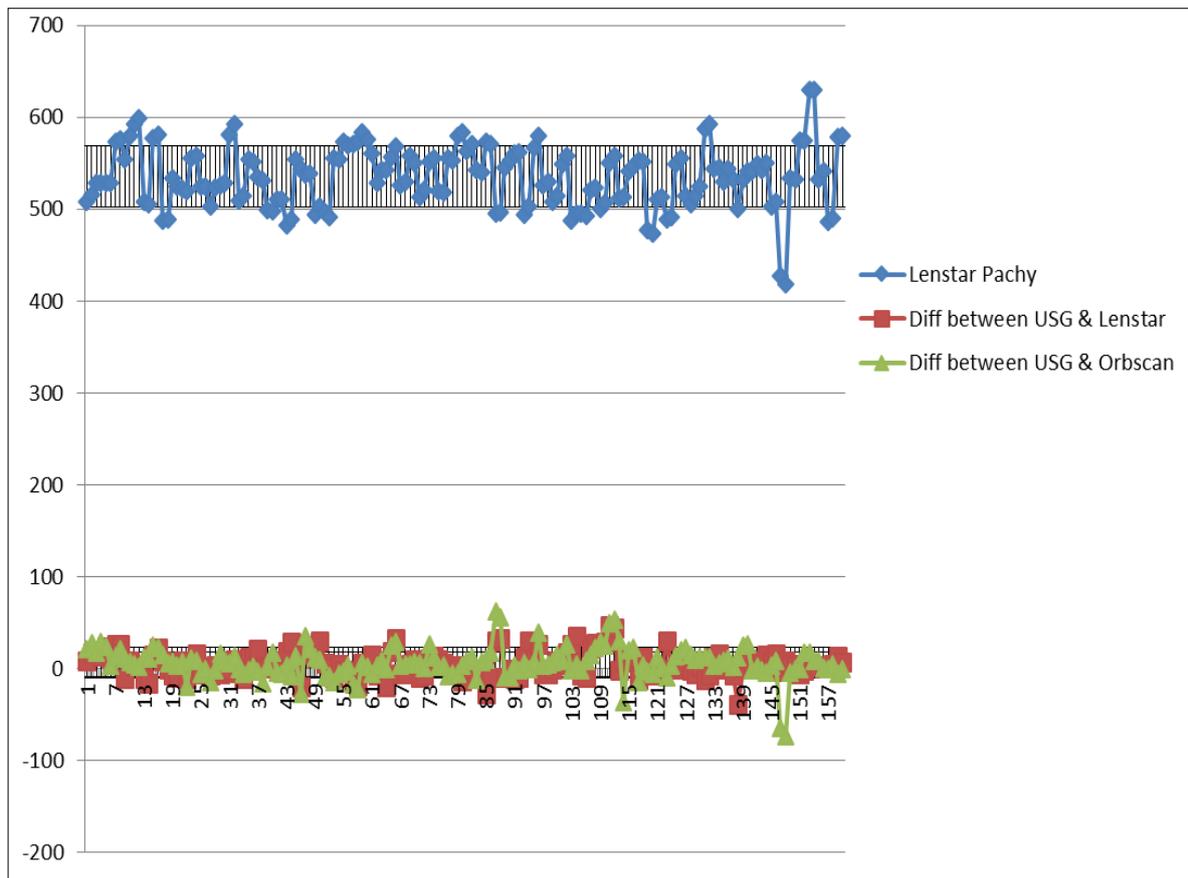
### Methodology

This Cross sectional study is carried out in private clinics with 160 myopic and Keratoconus participants: in this study we choose the age group of 19 to 35 and we examine 160 patients, which includes complete ocular and systemic history Medication history, visual acuity, refraction, IOP, dilated refraction, orbscan, lenstar, usgpachymetry. There are few study which compare the pachymetry of USG and pentacam Which states that pentacam slightly over estimates the pachymetry. There is no study done before to compare USG from slit scanning method. So the purpose of the study is to compare the pachymetry values of three different methods and the correlation with gold standard USG pachymetry on various age group peoples for the diagnosis of corneal thickness.

### Findings



**Fig 1:** This graph show the comparison between USG Pachy and Orbscan Pachy



**Fig 2:** This graph show the comparison between USG of Lenstar and Orbscan

### Result and Discussion

Orbscan (b&l) pachy and lenstarpachy both are significantly different from USG pachy. Which is clinically significant. None of the device is in agreement with ultrasonic But the difference is statistically insignificant for orbscan (41.17) Lenstar p (33.53).

The has the aim to determine the agreement between the USG and ORBSCAN, LENSTAR pachymetry. Which are we calculated the mean values of all three variable which are for orbscan536.71 for lenstar 535.24. We calculated the difference of each value from the ultrasonic pachymetry for both the instruments derived the p values and the graph has been plotted between mean values of corneal thickness yielded from all three instruments by which we can say that orbscanpachy values and lenstarpachy values are not much different orbscan is measuring 1.47 microns more than lenstar which is neither clinically nor statistically significant but both devices are providing about 5-6 microns overestimation which is significant in terms of deciding factor for refractive surgeries.

### Conclusion

Measurements of central corneal interchangeable when used in normal thickness done with ORB-SCAN and Lenstar are closely related to each other and are refractive error cases although ORB-Scan offers comfort and convenient to the patients during corneal evaluation because of non-touch technique. While in Keratonus patient's ultrasound pachymetry is preferred because of its reliability.

### Acknowledgement

I am thankful to all the authors who done the required work and do needful changes for the same. I am also thankful to my family members and friends who always supported and guided me throughout the work.

### Funding

None

### Ethical Statement

Not Applicable

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