# An opinion: fornix depth measurement in ophthalmic socket

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The precise measurement of fornix depth in ophthalmic science is a challenging task for the correct diagnosis of Symblepharon. In the present scenario, the precise method of fornix depth measurement is not available in the public domain. There are some methods, which have been emerge as beneficial but in the routine work, it was observed that these methods are not accurate as per the require procedure to diagnose the severity of the disease. It is essential to evaluate the anti-scarring treatment require objective evaluation of the scarring with understanding of standard fornix structure. In all existing methods probability of error is very high.

Symblepharon is a type of conjunctival problems, which occurs when adhesions arises between bulbar and palpebral conjunctiva<sup>1</sup>. This can happen in a number of situations like a burns injury with recurrent pterygia, in Stevens-Johnson syndrome  $etc^2$ .

The quantifying amount of conjunctival fibrosis used for records of development within conjunctival scarring illness is a medical confront. The purpose, this opinion was to highlight the existing methods with some critical points to resolve the current problem. It will define the boundaries of normal conjunctival fornix anatomy, which may be helpful to normative information of superior and inferior fornix depths (FDs) to assess variability in deferent gauging of fornix depth, area as well as fornix intercanthal space (FICS) in a healthy population. It will be also a need for the information about the effect of age and sex. In view of the current methods, the problem should be address in the depth. Therefore, we require a method, which should be beneficial in future for evaluating the cruelty of symblepharon in addition to determination of the post-surgical prognosis. Conjunctival foreshortening is considerable to ascertaining phase of the progression cicatrizing conjunctivitis (PCC) disease.

### Purpose

There are some studies related to the investigation of normal conjunctival FD in different methods but the measurement from these have been a challenges, which we are addressing in the present write up. Quantify the amount of conjunctival fibrosis used for the records of expansion into conjunctival scarring illness has been herculean task since the starting of the disease. The amount of conjunctival foreshortening facilitates monitoring of this disorder and summarized in present paper.

In this diagnosis pattern, the main purpose is to identify the limitations of the standard human conjunctival fornix, to observe that how these change through age along with present normative facts in favour of superior as well as inferior FDs in addition to FICS in a healthy population<sup>3</sup>. **Various approaches:** Various approaches for fornix depth and area measurement include:

1. In the month of July at 2008, the new approach has been approved for the measurement of fornix depth and area: a novel method of determining the severity of fornix shortening was published and purpose of this study "To measure the depth and area of the fornix in normal adults and patients with symblepharon<sup>1</sup>."

2. In Jan 2011, The British Journal of Ophthalmology has published "Validation of a fornix depth measurer: a putative tool for the assessment of progressive cicatrising conjunctivitis<sup>2</sup>."

**3**. In Ophthalmology, ELSEVIER has published with some modification in pervious study in Feb. 2014 "Defining the limits of normal conjunctival fornix anatomy in a healthy South Asian population<sup>3</sup>."

**4.** A study has also published in Oct. 2016 by the Scientific Journal of the Royal College of Ophthalmologists "Upper and lower conjunctival fornix depth in healthy white caucasian eyes: a method of objective assessment<sup>4</sup>."

#### Credible remarks about existing procedures

Note these all studies, which discussed in the previous section, were not found so accurate in the various situations. The measured value does not give accurate information regarding the fornix depth. In these studies, the rode/ Polymethylmethacrylate biconcave were inserted in the fornix to get the measurement, which may be causes mechanical injury like tearing and laceration of the conjunctiva. The hand force of insertion rod may be vary in different time by same person that is why the fornix measurement value can be different in the same fornix; which is not acceptable and accurate due to loose and flexible junction between the bulbar and palpebral conjunctiva.

The diameter of the rod/ Polymethylmethacrylate is also a reason for error in measurement. In other mention studies, the similar problem arises with the measurement of the invasive value as well as anatomy of the fornix in each point of the fornix. It gives motivation to define the most accurate and non-invasive method for the measurement of fornix depth.

Shallow (fibrosis) fornix may cause restrictive movement of the eye ball which will be cause of double vision, restrictive field of vision, headache and confusion. Better management of the cause can be made, if we got this information in initial stage. Before this ophthalmologist need normal and accurate fornix depth value each and every quadrant for reference, which may be comprisable to the defective/ abnormal fornix

## **Conclusions and Future prospective**

In future, we need a method, which will be helpful for the measurement of normal value of the fornix in eye. Value can be use as a reference for some diseases like symblepharon, conjunctival scarring, post-surgical prognosis and the input during in the direction of control of conjunctival scarring chaos etc. A method which we needed for the solution should consist of important factors like fornix depth in deferent gauge, area of fornix, volume of fornix, intercanthal space and anatomy of the fornix to express. Anti-scarring therapies required continuous assessment of the fornix for the detection of prognosis of the diseases and it needs a method for the assessment of the fornix.

A method or clinical tool to provide the information about the effect of fornix to the different ages and sex, to seeing increased/decreased conjunctival shrinkage or development of symblepharon and documentation of progression plays significant impact. The conjunctival scarring

disease is a clinical challenge in the prior detection of conjunctival fornix reduction (foster phase II), ideally earlier than the expansion of (foster phase III) symblepharon.

Now a days, only we are depend on the objective estimate which based on the experience of the examiner. It may be the better method to measure the fornix depth in ophthalmic socket, which will be advantageous over the existing methods.

#### **References:**

1. Kawakita, T., Kawashima, M., Murat, D., Tsubota, K. & Shimazaki, J. Measurement of fornix depth and area: a novel method of determining the severity of fornix shortening. *Eye* 23, 1115–1119 (2009).

2. Williams, G. P. *et al.* Validation of a fornix depth measurer: a putative tool for the assessment of progressive cicatrising conjunctivitis. *Br. J. Ophthalmol.* **95**, 842–847 (2011).

3. Khan, I. J. *et al.* Defining the limits of normal conjunctival fornix anatomy in a healthy South Asian population. *Ophthalmology* **121**, 492–7 (2014).

4. Jutley, G. *et al.* Upper and lower conjunctival fornix depth in healthy white caucasian eyes: a method of objective assessment. *Eye* **30**, 1351–1358 (2016).

