

## A Comparative Study of Peripheral Anterior Chamber Depth Using Vanherick's And Shaffer's Grading System".

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**Abstract:** Angle closure glaucoma is a major cause of visual morbidity world wide. Gonioscopy is considered the current reference standard to evaluate the configuration of the anterior chamber angle. Both the techniques and interpretation of results require a considerable level of skill and experience. Our study concludes that Van herick's technique is closely coinciding upto 85%, to Shaffer's grading. 15% of Van herick's grade 4 revealed Shaffer's grade 1 & 2. Hence it is important to do gonioscopy in order to prevent Angle closure in occludable angles. Van herick's technique can be used as a screening test in mass glaucoma screening programmes as it is simple & easy.

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### I. Introduction

A major challenge in screening for angle closure and adopting universal approaches to prophylaxis is the assessment of the anterior chamber angle. Classification of glaucoma into open angle glaucoma and angle closure glaucoma is extremely important as the treatment modalities differ in the two types of glaucoma. The importance of anterior chamber evaluation in every case of glaucoma is immense and cannot be neglected. Angle closure glaucoma occurs abruptly in many cases resulting in visual impairment. The Van herick's technique was found to have a potential for use as a simple method for evaluating narrow angles. Currently the Van herick's test is regarded as the most effective surrogate for gonioscopy. Slit lamp estimation of the peripheral anterior chamber depth by Van herick's technique (2) is a non contact approach for estimating angle width and various authors have commented on its sensitivity and specificity as a screening tool for identifying narrow angles and angle closure. There are divergent opinions regarding the usefulness of peripheral anterior chamber depth measurement (1-9). Gonioscopy is considered the current reference standard to evaluate the configuration of the anterior chamber angle. The status of the bottom of the angle cannot be diagnosed with Van herick's technique. Abnormal signs such as peripheral anterior synechiae are also unable to be observed, a gonioscope is required for diagnosing glaucoma. Angle closure glaucoma has been reported to be particularly high in Asian countries. ACG differs from open angle glaucoma in that its onset can be prevented in many cases by peripheral iridectomy or laser peripheral iridotomy. Thus the detection of eyes at risk for ACG prior to the disease onset is important.

### II. Materials And Methods

The present study was conducted on 500 subjects during the period of January 2015 to December 2016, who attended the Ophthalmic out patient department. Average age of the patients were 30-60 years. Among the 500 subjects, 298 patients were females, 202 were males. Previous intraocular surgeries, previous ocular injuries, known cases of glaucoma, any other ocular morbid conditions were excluded from the study. An informed consent was taken from all the patients. Visual acuity, slit lamp examination, Ophthalmoscopic examination, IOP measurements were done for all the patients. The peripheral anterior chamber depth measurement by Van herick's method was done in all 500 subjects. Angle of the anterior chamber examination by gonioscopy was done in 500 subjects. Gonioscopy was done by glaucoma specialist and it was graded by Shaffer's grading

system. Examination by Van herick's technique(2-9), the grading of limbal chamber depth was carried out at a slit lamp, the patient was seated in a dark room.

The illumination column was offset from the axis of the microscope by 60 degrees, objective magnification was set to 1.6X , and the brightest, narrowest possible vertical beam of light was directed at the temporal limbus, perpendicular to the ocular surface and viewed from the nasal aspect.

The anterior chamber depth was graded as a fraction of the thickness of the adjacent cornea in the following categories:

Van herick's grade	Limbal anterior chamber depth: corneal Section thickness
Grade 1	< ¼
Grade 2	¼
Grade 3	¼ to ½
Grade 4	1 or >1

Gonioscopy was performed at a low level of illumination using a goldmann 3 mirror lens at high magnification(1.6x) with the eye in the primary position of gaze.

A 1mm light beam was reduced to a narrow slit and the vertical beam was offset horizontally for assessing superior and inferior angles, vertically for assessing nasal and temporal angles.

Shaffer's grading system

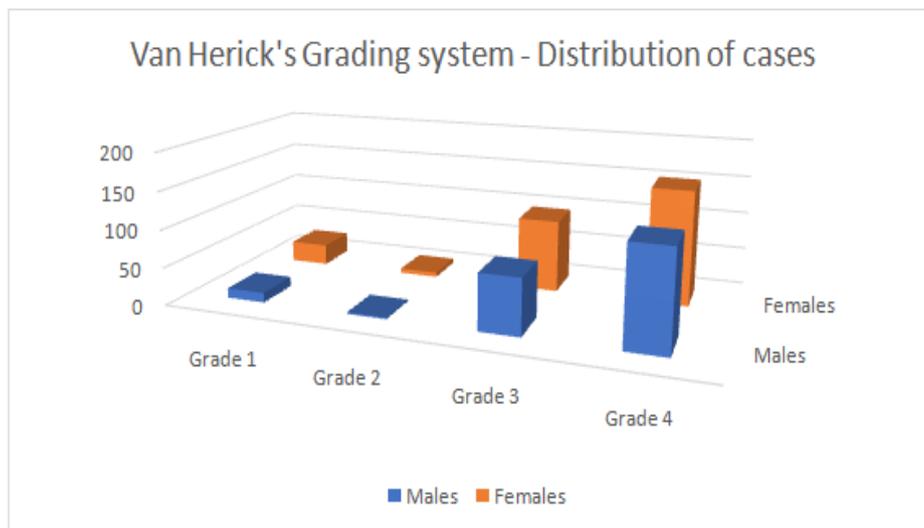
Grade 4	35 degrees more wide open, ciliary body seen, no closure.
Grade 3	20-35 degrees open angle, sclera spur seen
Grade 2	10-20 degrees narrow angle, T.M, closure unlikely
Grade 1	10degrees or less, schwalbes line, closure risk high.
Grade 0	Closed angle, imminent closure.

### III. Results

Total 500 patients of an average age 30 to 60 years were examined. Out of 500 patients, 298 were females and 202 were males. In 1000 eyes, peripheral anterior chamber depth was measured by Van herick's method and in them angle was also evaluated by gonioscopy. Out of these 83 eyes had Van herick's Grade I, 65 eyes(78.31%) had an angle as narrow as or narrower than Shaffer's grade 2. 13 eyes had Van herick's Grade 2, of these 13 eyes(100%) had an angle as narrow as or narrower than shaffer's Grade 2. 340 eyes had Van herick's grade 3, of these 255 eyes(75%) had an angle as wide as or wider than Shaffer's grade 3. 564 eyes had an angle as wide as or wider than Shaffer's grade 3.

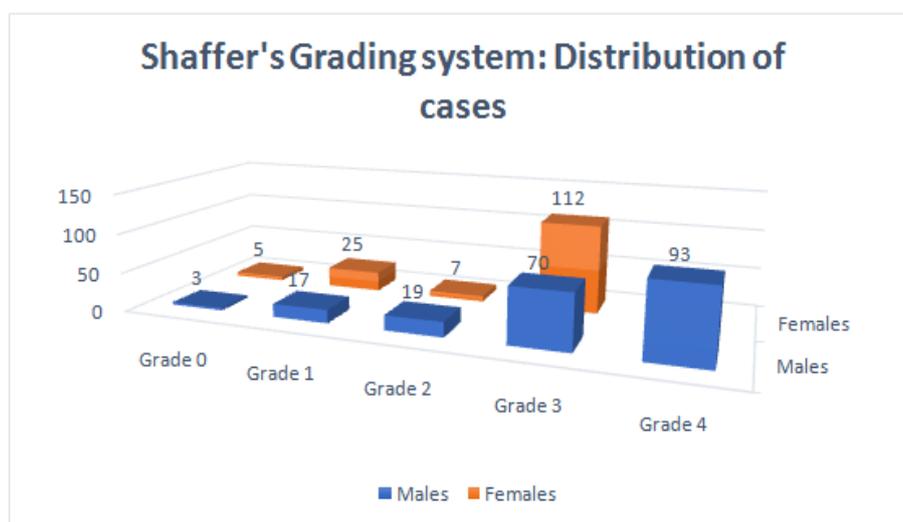
**Table 1:** showing distribution of cases by Van Herick's Grading system.

Van Herick's Grading	Male	Female
Grade 1	13	28
Grade 2	02	06
Grade 3	74	96
Grade 4	130	152
Total	202	298



**Table 2:** showing distribution of cases by Shaffer's Grading system

Shaffer's Grading	Male	Female
Grade 1	03	05
Grade 2	17	25
Grade 3	19	47
Grade 4	70	112
Grade 4	93	109
Total	202	298



#### IV. Discussion

Primary angle closure glaucoma show significant biometric variation from normal eyes. Ocular risk factors for primary angle closure glaucoma includes shallow anterior chamber, short axial length, small corneal diameter, thick crystalline lens, a shallow Anterior chamber is the most consistent risk factor. The van herick's technique can be used to detect persons affected by various clinical stages of angle closure disease.

In our study, on an average 85% of van herick's grading of peripheral anterior chamber depth is coinciding with the Shaffers' grading system. Our study results are almost similar to the Japanese study by K. Kashiwagi. Van Herick's technique provides little or no information on angle morphology, making it unsuitable for specific clinical presentations such as plateau iris syndrome.

Accurate observations are also heavily dependent on the integrity of peripheral cornea (10).

#### V. Conclusion

- Angle closure glaucoma is a major cause of visual morbidity world wide. Gonioscopy is considered the current reference standard to evaluate the configuration of the anterior chamber angle.
- Both the techniques and interpretation of results require a considerable level of skill and experience. Our study concludes that van herick's technique is closely coinciding upto 85%, to shaffer's grading. 15% of van herick's grade 4 revealed shaffer's grade 1 & 2.
- Hence it is important to do gonioscopy in order to prevent Angle closure in occludable angles.
- Van herick's technique can be used as a screening test in mass glaucoma screening programmes as it is simple & easy.

#### References

- [1]. Friedman DS, Minnuang H. Anterior chamber angle assessment techniques. *Surv Ophthalmol* 2008;53:250-73 •
- [2]. Van Herick W, Shaffer RN, Schwartz A. Estimation of width of angle of anterior chamber. Incidence and significance of the narrow angle. *Am J Ophthalmol* 1969;68:626-29 •
- [3]. Congdon NG, Quigley HA, Hung PT, Wang TH, Ho TC. Screening techniques for angle-closure glaucoma in rural Taiwan. *Acta Ophthalmol Scand* 1996;74:113-19.
- [4]. Thomas R, George T, Braganza A, Muliylil J. The flashlight test and van Herick's test are poor predictors for occludable angles. *Aust NZ J Ophthalmol* 1996;24:251-56. •
- [5]. Kashiwagi K, Tokunaga T, Iwase A, Yamamoto T, Tsukahara S. Usefulness of peripheral anterior chamber depth assessment in glaucoma screening. *Eye* 2005;19:990-94. •
- [6]. Salmon JF. Predisposing factors for chronic angle closure glaucoma. *Prog Retin Eye Res* 1999;18:121-32.
- [7]. Alsbirk PH. Anatomical risk factors in primary angle closure glaucoma. A ten-year follow-up survey based on limbal and axial anterior chamber depths in a high risk population. *Int Ophthalmol* 1992;16:265-72. •

- [8]. Devereux JG, Foster PJ, Baasanhu J, Uranchimeg D, Lee PS, Erdenbeleg T, et al. Anterior chamber depth measurement as a screening tool for primary angle-closure glaucoma in an East Asian population. *Arch Ophthalmol* 2000;118:257-63. •
- [9]. Bonomy L, Marchini G, Marraffa M, Bernardi P, De Franco I, Perfetti S, et al. Epidemiology of angle closure glaucoma: prevalence, clinical types, and association with anterior chamber depth in the Egna-Neumarkt glaucoma study. *Ophthalmology* 2000;107:998-1003.4.
- [10]. Foster PJ, Devereux JG, Alsbirk PH et al (2000) Detection of gonioscopically occludable angles and primary angle closure glaucoma by estimation of limbal chamber depth in Asians: Modified grading scheme. *Br J Ophthalmol* 84, 186-92. •
- [11]. Kenji Kashawagi, Takaharu Tokunaga, Aiko, Tetsayayamamoto, agreement between peripheral anterior chamber depth evaluation using the van Herick's technique and angle width evaluation using the Shaffer's system in Japanese: *Jpn J Ophthalmol* 2005;49:134-136.