

: cadaver 31  
 8, 10, 12, 14 mm  
 (cord length)

가

: 27.9±9.0. 15. 50.  
 8 mm (p<0.05),

가

: 8 mm 10 mm  
 가 (p<0.05)

< 43(8):1528 - 1535, 2002 >

51. 6

가

가

8 V

1943 Whit<sup>7</sup> 가 ,<sup>2,3</sup> Gillie<sup>8</sup>

가

Fink<sup>5</sup>

6 mm 6 mm

< : 2002 3 11 , : 2002 8 5 >

: 134

Tel : 82-2-361-8468(8538), Fax : 82-2-312-0541  
 E-mail : 491209@yumc.yonsei.ac.kr

\* 2001 85

Fink point 8 mm

Scheie Parks<sup>6,7</sup>

3 mm 2 mm Scheie-Parks point (Fig. 1), Apt Calf Scheie-Parks point가 10.4 mm 1.0 mm

Crawford<sup>9</sup>

mm 8

cadaver

(8,10,12,14 mm)

가

(Fig. 2).

가

Vernier caliper

Castroviejo caliper  
gentian

violet

8, 10, 12, 14 mm

cadaver

31

mm

17

14

Cadaver

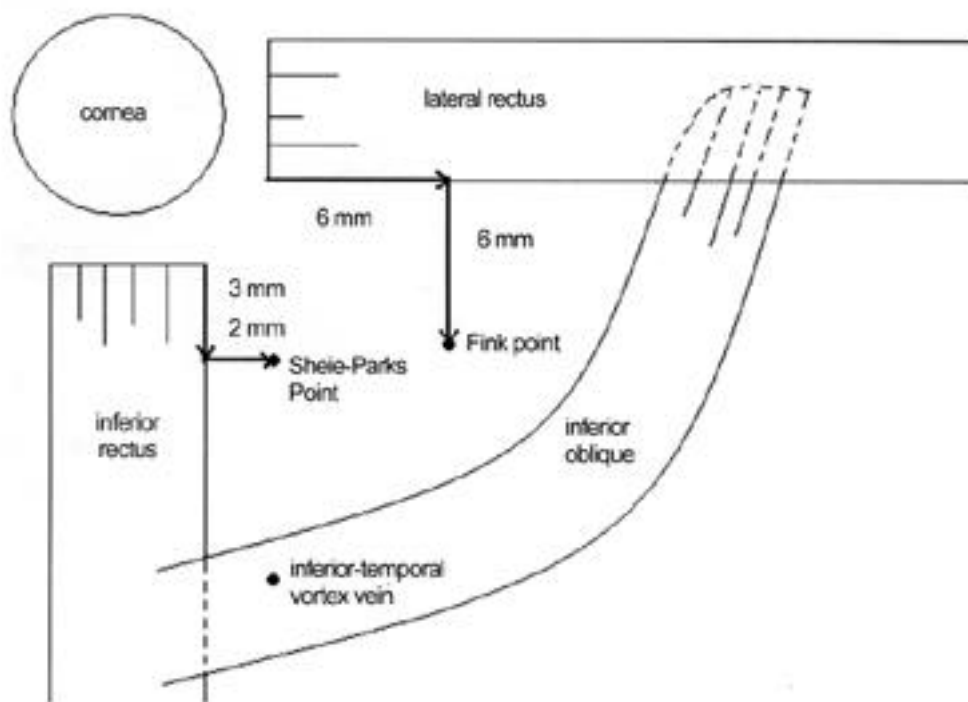
gentian

violet

2% methocel

mm

(Fig.



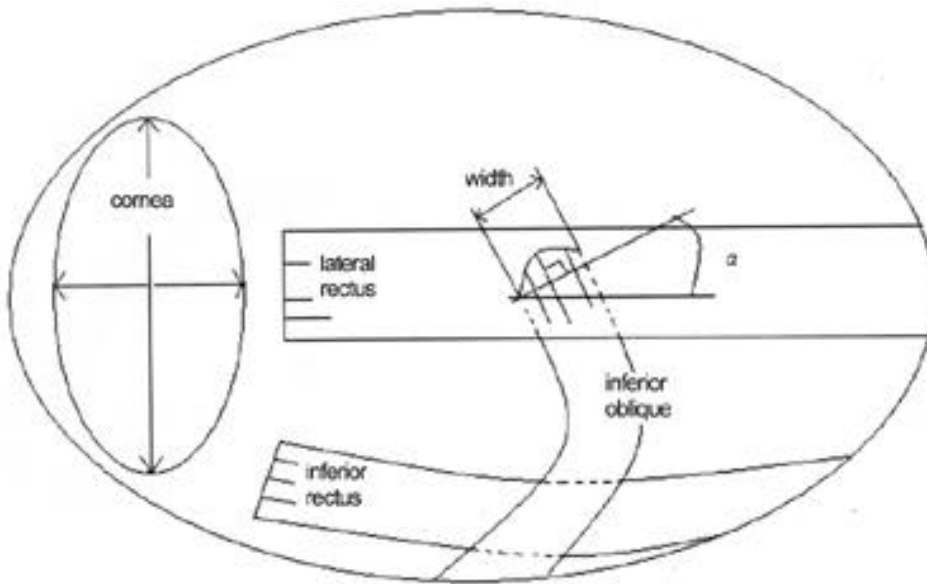
Fink point : This point is 6 mm posterior and 6 mm inferior to inferior insertion of lateral rectus.

Sheie-Parks point : This point is 3mm posterior and 2 mm lateral to lateral insertion of inferior rectus.

**Figure 1.** Inferior oblique recession landmark using inferior rectus and lateral rectus

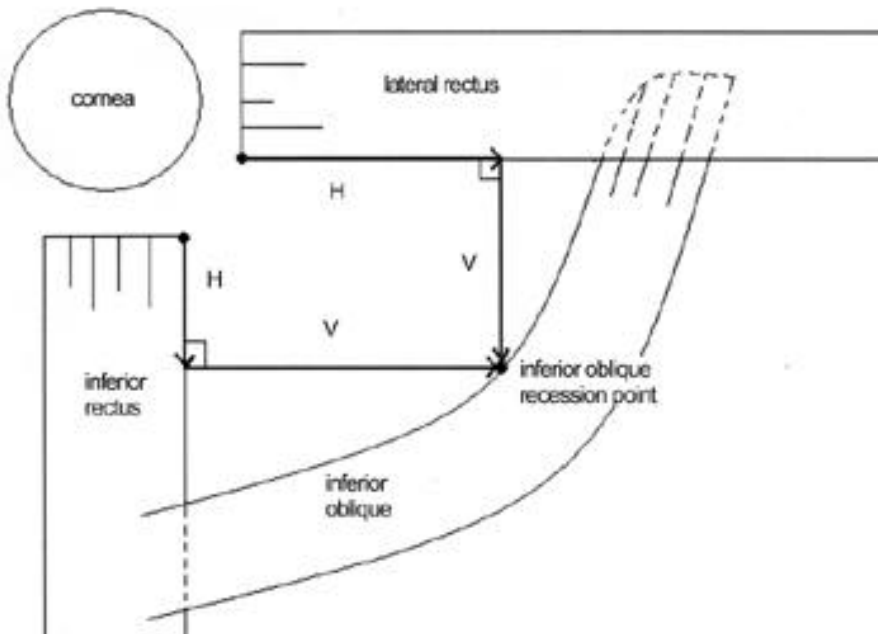
Fink point: This point is 6 mm posterior and 6 mm inferior to inferior insertion of lateral rectus.

Sheie-Parks point: This point is 3 mm posterior and 2 mm lateral to lateral insertion of inferior rectus.



Angle (  $\alpha$  ) : The angle between lateral rectus direction and inferior oblique insertion.  
 Width : Width of inferior oblique insertion.

**Figure 2.** Schematic drawing of anatomical characteristics of inferior oblique insertion  
 Angle( $\alpha$ ): The angle between lateral rectus direction and inferior oblique insertion.  
 Width: Width of inferior oblique insertion



H(horizontal cord length) : length measured posterior from inferior insertion of lateral rectus or from lateral insertion of inferior rectus to inferior oblique recession point.  
 V(vertical cord length) : length measured from inferior border of lateral rectus or lateral border of inferior rectus to inferior oblique recession point.

**Figure 3.** Schematic figure of method of measuring cord lengths  
 H (horizontal cord length): length measured posterior from inferior insertion of lateral rectus or from lateral insertion of inferior rectus to inferior oblique recession point  
 V (vertical cord length): length measured from inferior border of lateral rectus or lateral border of inferior rectus to inferior oblique recession point

3). , , , 10.74±0.9 mm,

가  
(correlation analysis)

27.9±9.0 가

t-test 12 , 13 (Table 2, 3).

가

8 mm

( : 0.612, P=0.045),

8 mm

( : 0.634,

P=0.036)(Table 4).

Vernier caliper

24.3±1.3 mm,

10.4±0.6 mm

11.4±0.5 mm,

(Table 1).

**Table 1.** Corneal diameters and axial lengths measured in Korean cadavers

	Mean ± SD <sup>†</sup> (mm)	Range (mm)
Axial length	24.8 ± 1.3	22.1-28.1
Corneal diameter		
Horizontal	11.4 ± 0.5	10-12.5
Vertical	10.4 ± 0.6	9-11.5

SD<sup>†</sup> : standard deviation

**Table 2.** Width and angle with lateral rectus direction

Inferior oblique insertion		
	Mean ± SD <sup>†</sup>	Range
Width (mm)	10.74 ± 0.9	7-11.5
Angle (°)	27.9 ± 9.0	15-50

SD<sup>†</sup> : standard deviation

**Table 3.** Morphologic classification of inferior oblique insertion

No.	Shapes of Inferior oblique insertion	
	linear	curved
	12	13

**Table 4.** Correlations between cord length and angle of inferior oblique insertion with lateral rectus direction

			Angle		
†Rec. point	‡C.C.	p-value	†Rec. point	‡C.C.	p-value
8mm (hIR)	0.00415	0.9903	12mm (hIR)	-0.21707	0.5214
8mm (vIR)	0.61231	0.0452*	12mm (vIR)	0.31154	0.3510
8mm (hLR)	0.63414	0.0361*	12mm (hLR)	0.08245	0.8096
8mm (vLR)	-0.45265	0.1621	12mm (vLR)	-0.29081	0.3856
10mm (hIR)	0.17798	0.3381	14mm (hIR)	0.02058	0.9125
10mm (vIR)	0.08545	0.6476	14mm (vIR)	-0.03507	0.8514
10mm (hLR)	0.05510	0.7685	14mm (hLR)	-0.05090	0.7857
10mm (vLR)	0.07681	0.6813	14mm (vLR)	0.09350	0.6169

†Rec. point : recession point

‡C.C. : correlation coefficient

vIR : vertical cord length measured from inferior rectus to recession landmark of inferior oblique.

hIR : horizontal cord length measured from inferior rectus to recession landmark of inferior oblique.

vLR : vertical cord length measured from lateral rectus to recession landmark of inferior oblique.

hLR : horizontal cord length measured from lateral rectus to recession landmark of inferior oblique.

\* : p value < 0.05

가 가 : 0.627, P=0.04),  
 8 mm 가 10 mm 가  
 가 ( : 0.370, P=0.04)  
 , (Table 5).  
 10, 12, 14 mm (Table 6).  
 mm 10  
 8 mm mm  
 ( ( : 0.372, P=0.04)(Table 7).

**Table 5.** Correlations between cord length and corneal vertical diameter

Corneal diameter (Vertical)					
<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value	<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value
8mm (hIR)	0.43580	0.1803	12mm (hIR)	0.35252	0.2876
8mm (vIR)	0.62735	0.0388*	12mm (vIR)	0.55811	0.0744
8mm (hLR)	0.00988	0.9768	12mm (hLR)	0.22278	0.5102
8mm (vLR)	-0.19077	0.5742	12mm (vLR)	0.00822	0.9809
10mm (hIR)	0.07889	0.6731	14mm (hIR)	0.23451	0.2041
10mm (vIR)	0.17399	0.3492	14mm (vIR)	0.09240	0.6210
10mm (hLR)	0.37059	0.0401*	14mm (hLR)	0.27272	0.1377
10mm (vLR)	0.16005	0.3898	14mm (vLR)	0.27776	0.1303

<sup>†</sup>Rec. point : recession point

<sup>‡</sup>C.C. : correlation coefficient

vIR : vertical cord length measured from inferior rectus to recession landmark of inferior oblique.

hIR : horizontal cord length measured from inferior rectus to recession landmark of inferior oblique.

vLR : vertical cord length measured from lateral rectus to recession landmark of inferior oblique.

hLR : horizontal cord length measured from lateral rectus to recession landmark of inferior oblique.

\* : p value < 0.05

**Table 6.** Correlations between cord length and corneal horizontal diameter

Corneal diameter (Horizontal)					
<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value	<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value
8mm (hIR)	0.43835	0.1774	12mm (hIR)	0.21678	0.5220
8mm (vIR)	0.22130	0.5131	12mm (vIR)	0.25022	0.4580
8mm (hLR)	-0.15135	0.6569	12mm (hLR)	-0.23244	0.4916
8mm (vLR)	-0.05717	0.8674	12mm (vLR)	-0.07571	0.8249
10mm (hIR)	-0.01827	0.9223	14mm (hIR)	0.15298	0.4113
10mm (vIR)	-0.00883	0.9624	14mm (vIR)	-0.08098	0.6650
10mm (hLR)	0.30594	0.0942	14mm (hLR)	0.16803	0.3662
10mm (vLR)	0.08284	0.6577	14mm (vLR)	0.22782	0.2177

<sup>†</sup>Rec. point : recession point

<sup>‡</sup>C.C. : correlation coefficient

vIR : vertical cord length measured from inferior rectus to recession landmark of inferior oblique.

hIR : horizontal cord length measured from inferior rectus to recession landmark of inferior oblique.

vLR : vertical cord length measured from lateral rectus to recession landmark of inferior oblique.

hLR : horizontal cord length measured from lateral rectus to recession landmark of inferior oblique.

**Table 7.** Correlations between cord length and axial length.

			Axial length		
<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value	<sup>†</sup> Rec. point	<sup>‡</sup> C.C.	p-value
8mm (hIR)	0.16417	0.6295	12mm (hIR)	0.40219	0.2201
8mm (vIR)	0.44716	0.1679	12mm (vIR)	0.22732	0.5014
8mm (hLR)	0.40042	0.2223	12mm (hLR)	-0.13312	0.6964
8mm (vLR)	0.21639	0.5228	12mm (vLR)	0.28213	0.4006
10mm (hIR)	0.13479	0.4697	14mm (hIR)	0.24781	0.1789
10mm (vIR)	0.08338	0.6556	14mm (vIR)	-0.09243	0.6209
10mm (hLR)	0.37223	0.0392*	14mm (hLR)	0.18752	0.3124
10mm (vLR)	0.02396	0.8982	14mm (vLR)	0.25549	0.1654

<sup>†</sup>Rec. point : recession point

<sup>‡</sup>C.C. : correlation coefficient

vIR : vertical cord length measured from inferior rectus to recession landmark of inferior oblique.

hIR : horizontal cord length measured from inferior rectus to recession landmark of inferior oblique.

vLR : vertical cord length measured from lateral rectus to recession landmark of inferior oblique.

hLR : horizontal cord length measured from lateral rectus to recession landmark of inferior oblique.

\* : p value < 0.05

가 . point Parks 가 8 mm  
 10.4 mm 1.0 mm  
 . Parks 10 mm  
 .<sup>8</sup> Crawford  
 8 mm  
 6 가 가 , Parks  
 .<sup>1</sup> 가 14 mm .<sup>10</sup>  
 , , , , cadaver  
 , .<sup>11</sup>  
 .  
 가 . Fink<sup>5</sup> cadaver  
 6 mm 6  
 mm Fink point 8 mm  
 , Apt Call Fink  
 4.0±0.7 mm 4.4±  
 0.8 mm Fink point .<sup>8</sup> Scheie  
 Parks<sup>6,7</sup> 3 8 mm  
 mm, 2 mm Scheie-Parks

가 8 mm . Cadaver  
 가 가  
 10, 12, 14 mm .  
 가 .  
 가 .  
 가 .  
 가 .  
 8 mm 10 mm .  
 가 8 mm .  
 가, .  
 가 가 .  
 가 가 .  
 가 가 15 50. .  
 가 .

- 1) Von Noorden GK. Biocular Vision and Ocular Motility, 5th ed. St. Louis: The C.V. Mosby Company, 1996; 57.
- 2) White JW. Recession of the inferior oblique muscle. Arch Ophthalmol 1943;29:1033-7.
- 3) White JW. Surgery of the inferior oblique at or near the insertion. Am J Ophthalmol 1943;26:586-91.
- 4) Gillies WE. Simple technique for recession of the inferior oblique muscle. Br J Ophthalmol 1970;54:736-9.
- 5) Fink WH. Surgery of the Vertical Muscles of the Eye, 2th ed. Springfield: Charles Thomas, 1962;404.
- 6) Parks MM. The weakening surgical procedures for eliminating overaction of the inferior oblique muscle. Am J Ophthalmol 1972;73:107-22.
- 7) Parks MM. A study of the weakening surgical procedures for eliminating overaction of the inferior oblique. Trans Am Ophthalmol Soc 1971;69:162-87.
- 8) Apt L , Call NB. Inferior oblique muscle recession. Am J Ophthalmol 1978;85:95-100.
- 9) Crawford JS. Recession of inferior oblique muscle. Trans Can Ophthalmol Soc 1961;24:196-201.
- 10) , , , . 2000;41: 2124-31.
- 11) , . 1992;33:649-52.

= ABSTRACT =

## The Correlations Between Landmark of Inferior Oblique Muscle Recession and Adjacent Globe Structures

Dae Hong Kim, M.D.<sup>1</sup>, Seung Hyuck Lee, M.D.<sup>2</sup>, Jong Bok Lee, M.D.<sup>1</sup>,  
In Hyuk Chung\*, M.D.<sup>3</sup>

*The institute of Vision Research, Department of Ophthalmology<sup>1</sup>,  
College of Medicine, Sungkyunkwan University, Seoul, Korea<sup>2</sup>  
Department of Anatomy<sup>3</sup>, Yonsei University College of Medicine, Seoul, Korea<sup>1</sup>*

**Purpose** : This study aimed to find out whether there are relationships among anatomic characteristics of inferior oblique muscle insertion, corneal diameter, axial length and inferior oblique recession landmark.

**Methods** : Thirty-one Korean cadaver orbits were dissected to expose the full length of extraocular muscles and sclera, and then we measured the length from the recession landmark of inferior oblique to the lateral edge of insertion of inferior rectus and to the inferior edge of insertion of lateral rectus.

**Results** : The mean of angles between the inferior oblique muscle insertion and lateral rectus direction is  $27.9 \pm 9.0^\circ$ , and the range is from  $15^\circ$  to  $50^\circ$ . There is a statistically significant correlation between cord length of 8 mm recession landmark of inferior oblique and angles of inferior oblique insertion with lateral rectus direction. We divided the shapes of inferior oblique insertion into straight and convex curves. Twelve insertions are straight and thirteen insertions are curved. There is no statistically significant correlation between shape of inferior oblique insertion and cord length from recession landmark. In corneal diameter and axial length, we found correlations with cord length of 8 mm and 10 mm recession landmark of inferior oblique.

**Conclusions** : We conclude that there are some correlations among anatomic characteristics, axial length and corneal diameter with recession landmark of inferior oblique.

J Korean Ophthalmol Soc 43(8):1528-1535, 2002

**Key Words** : Cord length, Inferior oblique recession, Inferior oblique insertion, Corneal diameter, Axial length, Landmark.

---

Address reprint requests to **Jong-Bok Lee, M.D.**

Department of Anatomy, Yonsei University College of Medicine

#134 Shinchon-dong, Seodaemun-ku, Seoul, 120-140, Korea.

Tel : 82-2-361-8468(8538), Fax : 82-2-312-0541, E-mail : 491209@yumc.yonsei.ac.kr