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목적 : 간혈외사시의 발생과 수술 후 재발에 안와의 크기와 안와간거리가 미치는 영향을 알기 위해서이다.

대상과 방법 : 간혈외사시로 수술받은 환자 55명(A군), 내사시로 수술받은 환자 30명(B군)과, 대조군으로 정위를 보이는 안검내반증 환자 30명(C군)에서 술전 두개안면골을 전후정면 방사선사진(skull A-P)을 촬영하였다. 좌우 안와 넓이 및 높이, 내측과 외측 안와간거리를 측정하고 안와율(내측 안와간거리/외측 안와간거리×100)을 비교, 분석하였다. A군에서 재발 혹은 속발내사시가 발생하여 재수술을 받은 각각 6명을 다시 비교하였다.

결과 : 안와 넓이와 높이는 세 군간에 차이가 없었다($p>0.05$). 평균 내측 안와간거리는 A군이 25.0 ± 3.86 mm, B군은 21.9 ± 3.95 mm, C군은 22.7 ± 4.34 mm였고, 평균 외측 안와간거리는 A군은 100.3 ± 9.75 mm, B군은 97.0 ± 8.96 mm, C군은 98.4 ± 5.61 mm였다. 안와율은 연령에 따라 차이가 없었다($p=0.23$). A군의 안와율은 25.0 ± 2.79 로 B군의 22.9 ± 2.66 이나 C군의 23.1 ± 2.79 보다 컸다($p=0.01$). A군 중에서 수술 후 정위를 보인 환자의 안와율은 24.7 ± 2.99 로 재발 환자보다 작았고(25.2 ± 2.00) 속발내사시 환자보다 컸다(23.5 ± 1.69).

결론 : 내측 안와간거리와 안와율이 크면 간혈외사시가, 작을 때는 내사시의 발생이 높았다. 수술 후에는 안와율이 큰 경우 재발이, 작은 경우 속발내사시의 위험이 높았다.

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가
20-50 %
가 10-15%
가 가
가 1,2
가
대상과 방법
2001 1 10
4-10 25 (PD)
Apert Crouzon 55 (A)
(skull A-P, antero-posterior)
3,4 30 (B)
가 30 (C ,)
A
(skull A-P)

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height),
tance),
tance)

(orbital width and
(inner interorbital dis-
(outer interorbital dis-

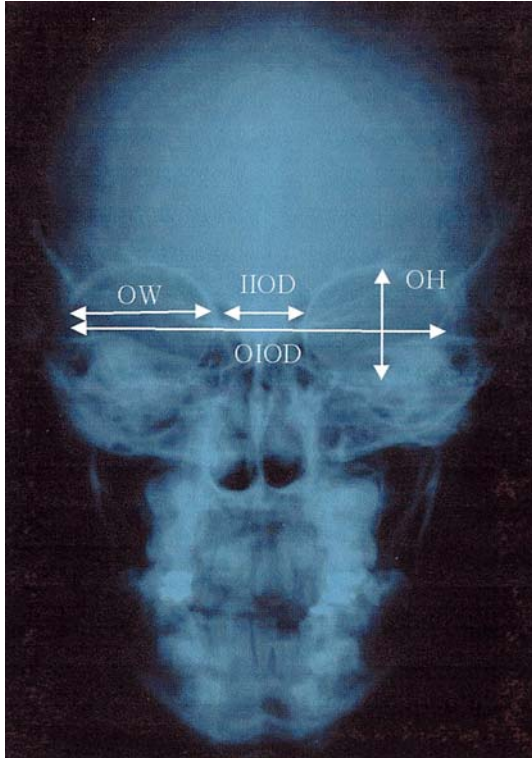


Figure 1. Skull A-P roentgenogram

OW : Orbital width.

OH : Orbital height.

IIOD : Inner interorbital distance.

OIOD : Outer interorbital distance.

(orbital index, \times / 100)⁵, (Fig. 1). Cohen⁶

가

5PD 10PD 가

3 가

ANOVA Student T-

결 과

A, B, C, A 가
19 (34%), 가 36 (66%) 가
7.74±2.02 . B 6.33±

Table 1. Age and sex distribution

	Age		No of patients (%)	
	Mean±SD	male	Female	
A	7.74±2.02	19 (34)	36 (66)	
B	6.33±2.65	13 (43)	17 (57)	
C	6.04±1.46	15 (50)	15 (50)	

A : Group of intermittent exotropia

B : Group of esotropia

C : Group of orthophoria

2.65 , C 6.04±1.46 A
(Table 1).
A 37.8±3.36 mm,
37.9±3.04 mm B 37.1±3.15
mm, 36.9±3.20 mm, C 37.7±3.29
mm, 37.8±3.86 mm

(p>0.05). A
35.1±4.35 mm, 35.2±4.41 mm
B 33.9±4.47 mm 34.1±4.37 mm, C
34.8±4.52 mm, 34.3±4.50 mm
(p>0.05)(Table 2).

A 25.0±3.86 mm
B 21.9±3.95 mm, C 22.7±4.34 mm
A 가 가 (p=0.02).

A 100.3±9.75 mm, B
97.0±8.96 mm, C 98.4±5.61 mm A 가
(p=0.02)(Table3).

가 (p=0.23)(Table 4)
(Table 5). A 25.0±2.79, B

22.9±2.66, C 23.1±2.79 A 가
B 가 (p=0.01)(Table 3).
A , 55

43(78%)
7.44±2.11 ,
37.4±3.11 mm, 37.4±2.83 mm

34.6±4.28 mm, 34.7±4.25 mm
24.9±4.08 mm

100.7±9.69 mm
24.7±2.99 .
(14~25PD)

6 (10.9%), (8~25PD)
6 (10.9%) .
9.66±0.51

Table 2. Size of orbit in each group

Group	Orbital width (Mean±SD, mm)		Orbital height (Mean±SD, mm)	
	Rt	Lt	Rt	Lt
A	37.8±3.36	37.9±3.04	35.1±4.35	35.2±4.41
B	37.1±3.15	36.9±3.20	33.9±4.47	34.1±4.37
C	37.7±3.29	37.8±3.86	34.8±4.52	34.3±4.50

A: Group of intermittent exotropia

B: Group of esotropia

C: Group of orthophoria

Rt: Right orbit

Lt: Left orbit

Table 3. Cephalometric values of orbit in each group (p<0.05)

Group	IIOD (Mean±SD, mm)	OIOD (Mean±SD, mm)	OI (Mean±SD)
A	25.0±3.86	100.3±9.75	25.0±2.79
B	21.9±3.95	97.0±8.96	22.9±2.66
C	22.7±4.34	98.4±5.61	23.1±2.79

A: Group of intermittent exotropia.

B: Group of esotropia.

C: Group of orthophoria.

IIOD: Inner interorbital distance.

OIOD: Outer interorbital distance.

OI: Orbital index (IIOD/OIOD×100).

40.0±3.72 mm, .
 41.0±3.90 mm 38.5±
 5.71 mm, 38.3±5.51 mm .
 27.8±2.14 mm 110.0± 가
 9.15 mm 25.2±2.00 .
 가 8.00±1.00 가 3.47-9
 38.5±2.07 mm, . Rootman¹⁰
 38.3±1.86 mm 38.5±
 1.76 mm, 38.2±2.88 mm . (anterior opening)가
 24.0±2.28 mm, 102.0±6.81 40 mm, 35 mm
 mm 23.5±1.69 (Table 6,7). 7
 가 가 (25.2±2.00), . Cohen⁶ 3
 가 (23.5±1.69). 50% 가
 가
 Morin⁵ 15
 3
 고 찰
 가

Table 4. Orbital index(mean±SD) in each age group (p>0.05)

Age (Y)	Group A	Group B	Group C
4	25.71±6.06	22.49±2.69	23.46±3.18
5	21.51±2.42	20.98±1.37	23.78±6.21
6	25.62±3.78	21.68±1.22	21.41±1.42
7	24.21±3.06	24.98±1.44	21.71±3.42
8	24.16±1.62	20.69±4.72	23.49±2.05
9	24.95±2.46	23.82±0.24	23.46±2.00

Y: Years.

A: Group of intermittent exotropia.

B: Group of esotropia.

C: Group of orthophoria.

Table 5. Orbital index (mean±SD) in each sex group (p>0.05)

Sex	Group A	Group B	Group C
Male	24.93±2.93	22.93±2.12	23.34±5.90
Female	24.47±2.74	22.19±2.98	22.83±1.42

A: Group of intermittent exotropia.

B: Group of esotropia.

C: Group of orthophoria.

가

4

가

가

(ratio)

6.33±2.65 ,

7.74±2.02

6.04±1.46

(Table 4).

Mafee¹¹ 400 (18~84)

CT(Computed Tomography)

/ ×100)

26.7 mm,

25.7 mm

10 mm

가

20

가

가 27.4±1.64 mm,

가 25.52±1.42 mm

¹²

25.0±3.86 mm,

21.9±3.95

10

mm,

22.7±4.34 mm

가 25.0 mm

가 (p=0.02).

가

(p=0.23)

27.8 mm

25.0±2.79,

22.9±2.66,

23.1±2.79

가

가

가

10

(p=0.01)

가

Table 6. Size of orbit in patients with recurrence, patients with consecutive esotropia and patients with orthophoria after surgery of intermittent exotropia (p>0.05)

Patients	Orbital width (Mean±SD, mm)		Orbital height (Mean±SD, mm)	
	Rt	Lt	Rt	Lt
Orthophoria	37.4±3.11	37.4±2.83	34.6±4.28	34.7±4.25
Recurrent X(T)	40.0±3.72	41.0±3.90	38.5±5.71	38.3±5.51
Consecutive ET	38.5±2.07	38.3±1.86	38.5±1.76	38.2±2.88

Orthophoria: Patients with orthophoria after surgery of intermittent exotropia.

Recurrent X (T): Patients with recurrent intermittent exotropia.

Consecutive ET: Patients with consecutive esotropia.

Rt: Right orbit.

Lt: Left orbit.

Table 7. Cephalometric values of orbit in patients with recurrence, patients with consecutive esotropia and patients with orthophoria after surgery of intermittent exotropia

Patients	IIOD (Mean±SD, mm)	OIOD (Mean±SD, mm)	OI (Mean±SD)
Orthophoria	24.9±4.08	100.7±9.69	24.7±2.99
Recurrent X(T)	27.8±2.14	110.0±9.15	25.2±2.00
Consecutive ET	24.0±2.28	102.0±6.81	23.5±1.69

Orthophoria: Patients with orthophoria after surgery of intermittent exotropia.

Recurrent X (T): Patients with recurrent intermittent exotropia.

Consecutive ET: Patients with consecutive esotropia.

IIOD: Inner interorbital distance.

OIOD: Outer interorbital distance.

OI: Orbital index (IIOD/OIOD×100).

가 37가 .
 가 13 5 6 15 PD (p=0.01). 27.3 mm, (intere-
 PD) 35 38.1 mm 10 mm
 가 11.5 mm, 14.2
 mm 27.8 mm
 Farkas
 4-10 25 PD
 (29.6±5.70 PD) Freihofer¹⁵
 가 ()
 13
 가 Cohen⁶
 Farkas¹⁴
 (Hypertelorism)
 , , (epicanthal folds)

(illusory hypertelorism)

가

가

가

가

Apert

Crouzon

3,4

가

참고문헌

7-9

25.0±3.86 mm
±2.79 가

가

25.0

가

22.9±2.66

(25.0±2.79)

가

24.9±4.08 mm

24.7±2.99

27.8±2.14 mm, 25.2±2.00,

24.0±2.28 mm, 23.5±1.69

(27.8

mm)

(24.7) 가

가 (24.0 mm, 23.5).

가

가

가

6

5

1

가

가

가

가

(fusional convergence)

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=ABSTRACT=

Influence of Orbit Size and Interorbital Distance on Development and Outcome of Surgery for Intermittent Exotropia

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Purpose: To evaluate the influence of orbital size and interorbital distance on the development and recurrence of intermittent exotropia.

Methods: We selected 55 intermittent exotropes (group A), 30 esotropes (group B), and 30 normal children (group C). Width and height of orbit, inner interorbital distance (IIOD), and outer interorbital distance (OIOD) in both orbits were measured with skull A-P (Anterior-Posterior) roentgenogram, and orbital index (IIOD/OIOD \times 100) was calculated. The cephalometric results of the 6 recurrent exotropes and the 6 consecutive esotropes in group A were analyzed too.

Results: There is no significant difference in orbital height and orbital length among 3 groups. The IIOD was 25.0 \pm 3.86 mm in group A, 21.9 \pm 3.95 mm in group B, and 22.7 \pm 4.34 mm in group C. Mean OIOD was 100.3 \pm 9.75 mm in group A, 97.0 \pm 8.96 mm in group B, and 98.4 \pm 5.61 mm in group C. Orbital index was not different with the increase of age ($p=0.23$). It was greater in group A (25.0 \pm 2.79) than that in group B (22.9 \pm 2.66) and group C (23.1 \pm 2.79) ($p<0.05$). Orbital index of the orthophoric children after strabismus surgery in group A was 24.7 \pm 2.99. It was greatest in the 6 recurrent exotropes (25.2 \pm 2.00) and was smallest in 6 the consecutive esotropes (23.5 \pm 1.69)

Conclusions: Intermittent exotropia is more prevalent in subjects with longer IIOD and greater OI, and esotropia is more prevalent in subjects with shorter IIOD and lower OI. The possibility of recurrence after surgery was high in patients with greater OI, and the possibility of consecutive esotropia was high in patients with low orbital index.

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Key Words: Consecutive esotropia, Inner interorbital distance, Intermittent exotropia, Orbital index, Recurrence

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