

인간 배자에서 전정와우신경의 초기 발생

연세대학교 대학원

의 학 과

조 창 현

인간 배자에서 전정와우신경의 초기 발생

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이 논문을 석사 학위논문으로 제출함

2000년 12월 일

연세대학교 대학원

의 학 과

조 창 현

조창현의 석사 학위논문을 인준함

심사위원 _____ 인

심사위원 _____ 인

심사위원 _____ 인

연세대학교 대학원

2000년 12월 일

.....	1
.	3
.	5
.	7
.	18
.	25
.....	26
.....	29

1.	12	.....	8
2.	14	.....	9
3.	15	.....	10
4.	16	.....	11
5.	17	.....	12
6.	18	.....	14
7.	21	.....	15
8.	22	.....	16
9.	23	.....	17

1.	5
----	-------	---

가

4

8

31

9

23

9

11

2-3

,

가

10

, 12

가

,

,

15

,

, 17

가

가
가
3
:

< >

I.

12 ,

(cerebellopontine angle)

. 가

. , ,

, , .

, 가

, , . ,

가

가

(embryo)

가

(1992)

Streeter(1906)

(embryonic period)

(developmental stage)

(O'Rahilly & Muller, 1987)

14- 15 , 6 16- 17 , 7 18- 19 , 8 20- 23
6.7

4 8

II.

1.

4 8

31

9 23

1 .

9 11

1.

9	0
10	2
11	0
12	3
13	3
14	2
15	2
16	3
17	2
18	2
19	3
20	2
21	3
22	2
23	2

2.

10%

7- 10 μ m

, 8x8cm

(caudal)

(rostral)

가

III.

2-3

가

(membranous labyrinth)

1. 10

가

(otic placode)

(neural tube)

(neural crest)

가

(anlagae)

(acousticofacial ganglion)

2. 12

(rhombencephalon)

(dorsal portion)가

가

(otocyst)

(1)

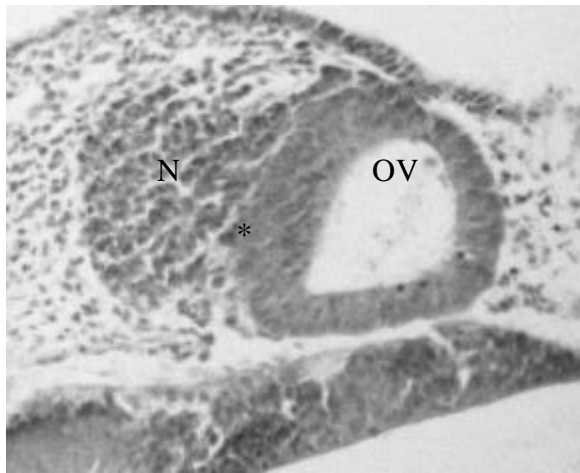
3. 13

12

가

, 12

가



1. 12

(OV)

(N)

가

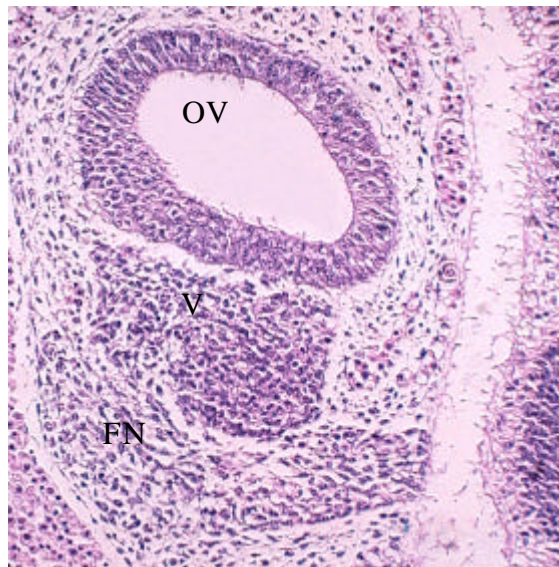
(*)

(H-E , x 100)

4. 14

□

가
가
(cochlear duct)
.(2)
가



2. 14
(OV) (V)

(FN)가
(H-E , x40)

5. 15

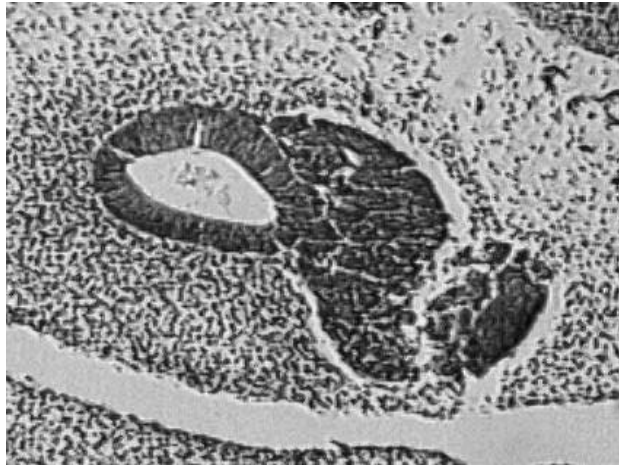
가

가

.(3)

(endolymphatic appendage)

가

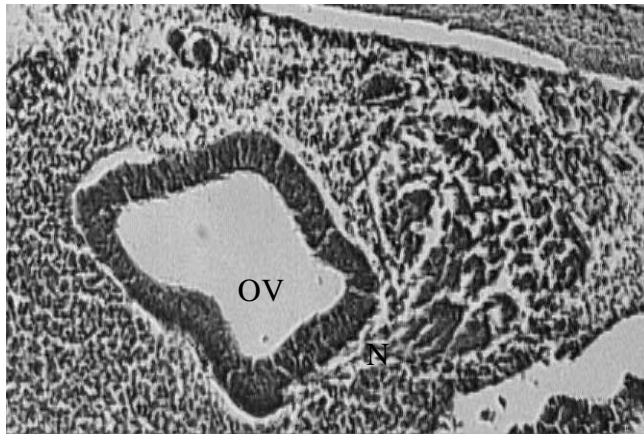


3. 15

, (H-E
, x40)

6. 16

가
,
가
,
(4)
(semicircular canal)
가



4. 16
(OV)
(N)가 (H-E
x40)

7. 17

,
가
가
가



5. 17

가

.(H-E , x40)

가

.(5)

가

가

가

가

(sacculle)

7

1/3

1/2

가

8. 18

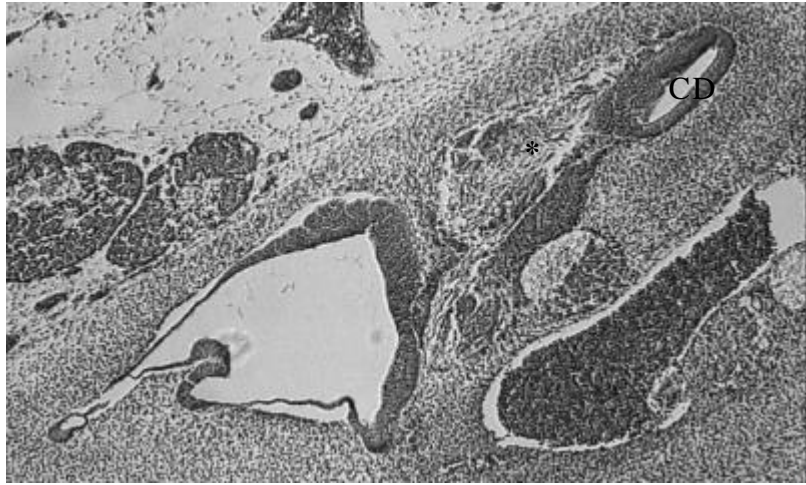
가

가

(6)

가

()

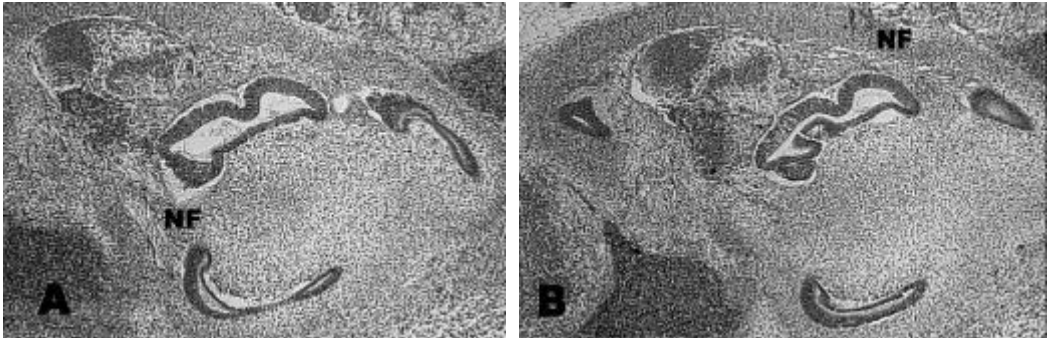


6. 18
 (CD) 가 ,
 .(*) (H-E ,
 x40)

9. 19
 가 18 가
 ,
 ,
 common crus
 가 가 ,
 crista ,

10. 21

가 , 가 가 (pars superior)
가 .
가 가 가 .(7)
가 .



7. 21

A. (NF)
B.
(H-E , x40)

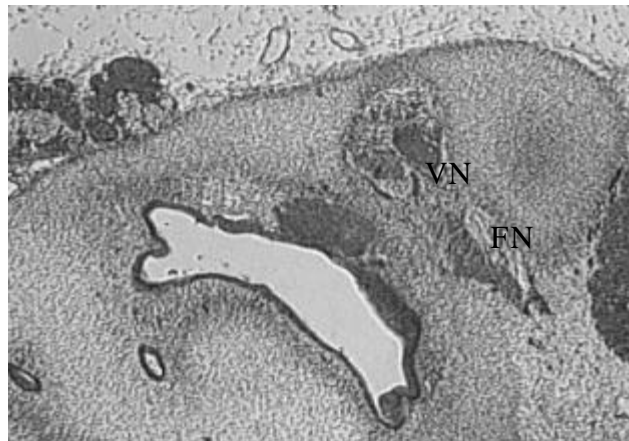
11. 22

(condensation)

(otic capsule)

가

.(8)



8. 22

(otic capsule)

(VN)

가

(FN)

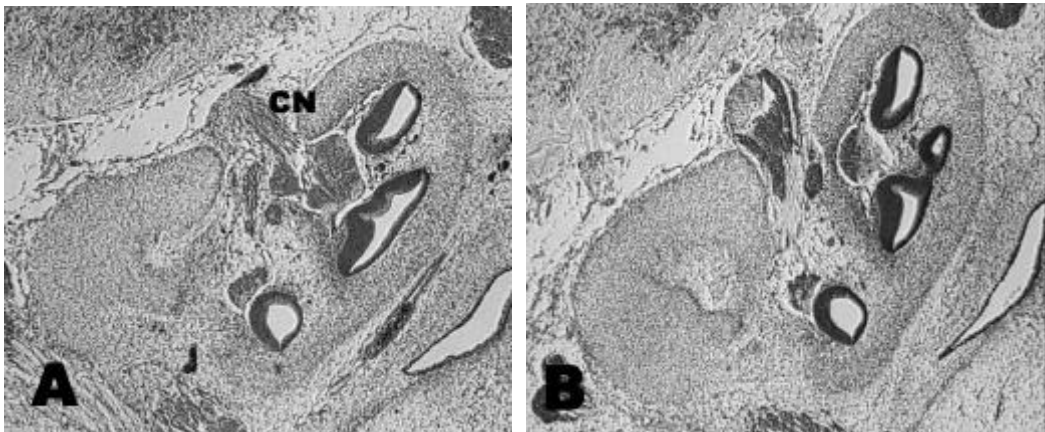
.(H-E

, x20)

12. 23

가

(9)



9. 23

A.

B.

(H-E , x 20)

IV.

(prenatal period)

(postnatal period)

9 (embryonic period)

8 (fetal period)

90%

가 가 가

가 가 가

(bleed)

(developmental stage)

가 , .

9 (rhombencephalon)

(rhombomere)

4, 5 .⁸

, (nasal placode) (optic placode) ,

가 .^{7,9} ,

(otic capsule) (bony labyrinth)

,

,

¹⁰ .

, (acousticofacial primodium) , 3 (neural groove)

¹¹ .

(geniculate ganglion) .^{12,13} ,

,

^{14,15} ,

4 (otic placode)

가

^{10,16}

,¹¹

12

,

· ,

,

·

·

,

가 4 5

, 14 (pars superior; superior division)

(pars inferior; inferior division) 가 5 6

가

·

15

, , 17 가 가

가

·

,

가 가 가

· ,

가

가 , 가 , 가
 .
 가
 ,
 7
 가 ,
 가 ,
 가 가 . 가
 가 1 가 가
 가 가 ,
 ?

Streeter(1906)

(column of ganglion cells)

가
가

가
15
21 ,
· ,
·
·

¹⁷
·

가

가

Van de Water(1988)
in vitro

(extracellular matrix molecules)

attractant field가

가

¹⁸
·

Fritzsich(1999)

neurotrophin BDNF (brain-derived neurotrophic factor) NT-3
(neurotrophin 3) trkB, trkC

, BDNF ,
NT-3

¹⁹ Hemond (1991)

가 , 가
otic crest

, 가

fibronectin laminin

²⁰

가

,

.

가

가

, protagol silver

.

,

가

, wax plate 2

3

,

,

,

V.

31

2-3

가

가

가

23

(organ of Corti)

1. , , .
1992:25:213-8.
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Abstract

**The early development of the vestibulocochlear nerve
in human embryo**

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This study attempted to reveal the early development process of the vestibulocochlear nerve(VCN), which has not been studied in Korean embryos. 31 normal Korean embryos were used and according to the Carnegie's developmental staging method, the embryos in each stage consisted of a group so that all 15 groups were composed from stage 9 to stage 23. Each embryo was serially sectioned and light microscope was used to observe the sections focusing to the VCN and inner ear development. The acousticofacial ganglion and cells of otocyst's wall were involved to make the VCN and the trunk of the facial nerve was developed from the remaining part of the acousticofacial ganglion. The ganglion mass was divided into superior and inferior parts from stage 15 and the cochlear part of ganglion was presumably originated from

inferior part of ganglion from stage 17. The course of preganglionic fibers of the vestibular nerve was clearly observed at stage 21 and the trunk of postganglionic fibers was observed running medial to the vestibular ganglions. The internal auditory meatus shaped at stage 22 and the shape and location of the VCN and facial nerve was similar to the adult form at stage 23. The end sensory organs of labyrinth, such as cupula, macula and organ of Corti did not fully developed until the end of the embryonic period.

In this study, the early development of VCN in Korean embryos was revealed to be similar to that of the foreign literature. Further studies are expected to obtain better results using more embryos, special neural tissue staining methods, and three dimensional image reconstruction techniques.

Key Words : normal human embryo, vestibulocochlear nerve, Carnegie stage