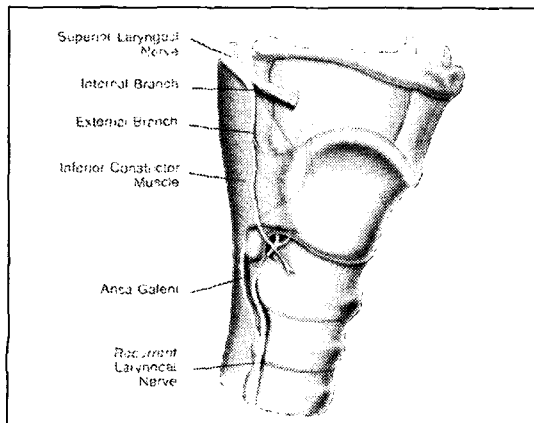
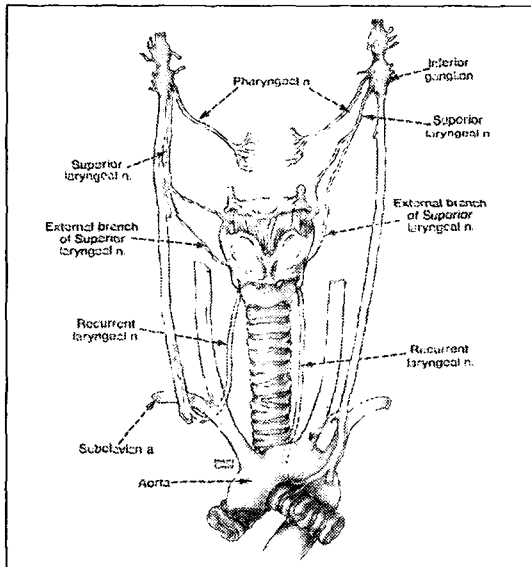


음성의 회복(편측 혹은 양측 성대마비의 치료)

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김영호

A. 미주신경의 신경해부: neuroanatomy of the vagus nerve



1) Pharyngeal nerve

- from upper part of the inferior (nodose) ganglion
- descends between external and internal carotid artery
- form pharyngeal plexus with IX, external laryngeal nerve
- distribute to the pharynx, all muscles of the soft palate except the tensor veli palatini m.

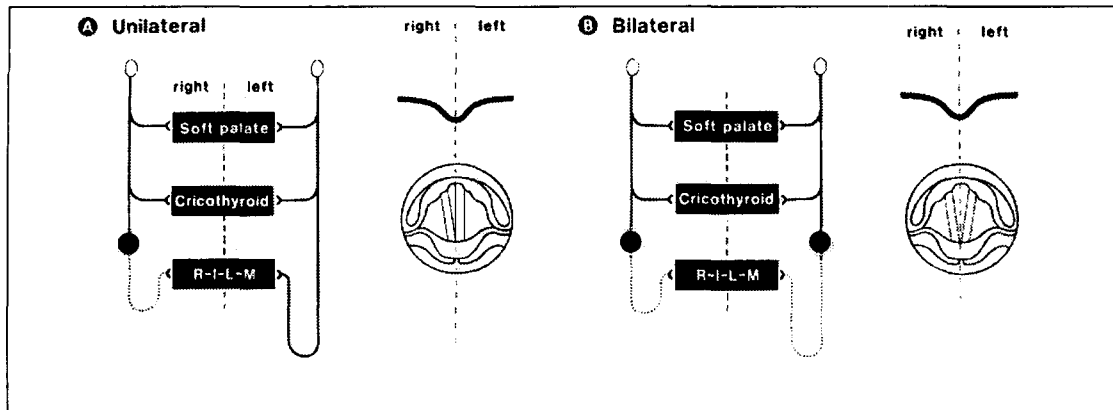
2) Superior laryngeal nerve

- from the inferior ganglion
- divides into internal & external laryngeal nerve
 - a) internal branch
 - sensory fibers from laryngeal mucosa above the level of VC and from muscle spindle & stretch receptor
 - b) external branch
 - motor branch to CT m.

3) Recurrent laryngeal nerve (RLN)

- Rt. RLN loops subclavian artery
- Lt. RLN loops arch of aorta ascend alongside T-E groove, entering the larynx behind CT joint
- nerve divides two or more branches before entering the larynx (70~80%)
- sensory fiber from laryngeal mucosa under VC level

B. Lesions of the RLN



1) Unilateral	2) Bilateral
<ul style="list-style-type: none"> • VF fixed in paramedian position • Intact CT m. • Capable of VF stretching anteroposteriorly • Act as adductor (VC closer to midline) • Breathy-hoarse voice quality • reduced loudness • Diplophonia, falsetto pitch breaks 	<ul style="list-style-type: none"> • VF adducted to close midline - Virtually normal phonation • Abductors paralysis - Inhalatory stridor - compromising airway - respiratory distress

C. Pathophysiologic change of RLN after injury (Canine study)

In general, neuropraxia: normal recovery

axotmesis & neurotmesis : recovery after Wallerian degeneration

1) Crushing injury to RLN

- In inspiration, normal spontaneous abduction 27 weeks after injury
- In TA muscle, fibrillation potential disappeared after 27~30 weeks

2) Cut & immediate EEA of nerve trunk

- In inspiration, abnormal movement: shivering, medial bulging
 - ← misdirection of rerouting of abductor nerve fibers into TA muscle
- In TA muscle, fibrillation potential disappeared after 24~27 weeks

D. Causes of vocal cord paralysis

1) Causes of vocal cord paralysis in Korea

	Oh & Choi(1970)	Goh & Cho(1976)	Hong et al(1986)	Chang et al(1987)	Kim et al(1993)
N	60	62	194	70	127
M:F	9:1	2:1	3:2	3:2	1.4:1
Highest	6th	6th	3rd~7th	5th & 6th	4th
R:L:B	30:50:20	26:61:13	31:56:13	30:57:13	27:73:x
Causes: (%)					
<i>Tumor</i>	40.0	27.4	13.4	14.2	15.0
<i>Mechanical</i>	13.3	16.1	7.7		
<i>Trauma</i>	8.3	9.7	28.4	25.6	22.1
<i>Central</i>	3.3	1.6	2.6	10.0	2.4
<i>Others</i>	6.6			4.1	14.0
<i>Idiopathic</i>	28.3	27.4	33.0	47.1	46.5
Position: (%)					
<i>Median</i>	37	32	24	17	6
<i>Paramedian</i>	33	47	70	57	82
<i>Intermediate</i>	25	21	3	22	12

2) In children

Cause	Hollinger	(%)	Gentile	(%)
Neurologic Conditions	30/58	(52)	6/22	(27)
Idiopathic sources	8/58	(14)	6/22	(27)
Birth trauma	2/58	(3)	5/22	(27)
Surgery	11/58	(19)	4/22	(18)
Infection	7/58	(12)	1/22	(5)

3) In adult

Cause	Woodson	(%)	Hollinger	(%)
Surgery	42/103	(41)	141/240	(59)
Idiopathic source	25/103	(24)	8/240	(3)
Malignancy	23/103	(22)	16/240	(6)
Trauma	8/103	(8)	2/240	(1)
Other	5/103	(5)	21/240	(9)
Neurologic conditions	0/103	(0)	52/240	(22)

4) Tumorous origin of vocal cord paralysis in Korea

	Oh&Choi (1970)	Goh&Cho (1976)	Hong et al (1986)	Chang et al (1987)	Kim et al (1993)
N	60	62	194	70	127
<i>Lung</i>	10	3	8	2	11
<i>Thyroid</i>	3	6	4	1	2
<i>Esophagus</i>	2	1	9	2	1
<i>Metastatic LN</i>	2	1			
<i>NPC</i>	1				
<i>Parotid</i>		1	4		
<i>Mediastinum</i>		1	1	3	2
<i>Parapharynx</i>					
<i>Trachea</i>					1
<i>Skull Base</i>					1
<i>Larynx</i>	6				
<i>Hypopharynx</i>		1			

E 진단

1) 순서

- 듣기 평가
- 내시경 검사
 - Rhinolaryngo-fiberscopy
 - Rigid tele-laryngoscopy
 - Video-stroboscopy
- Electroglottography (EGG)
- Aero-dynamic tests
- Acoustic analysis of voice, etc.
- Laryngeal EMG

2) 기타 검사

- a. 필수 검사:
 - 후두내시경검사 (Laryngoscopy/Stroboscopy)
 - Chest PA
 - Neck CT including upper mediastinum
 - Esophagogram/EGD
 - Ultrasonogram(Neck)
- b. Optional:
 - Chest CT
 - Skull base CT/MR
 - VDRL/FTAABS
 - Viral marker

F. 증상 및 증후

- 1) 음성의 변화
- 2) 흡인 연하장애
- 3) 호흡곤란

G. 치료

1) 보존적 치료

- a. 기준
 - In selected cases of paramedian fixation of unilateral vocal cord
 - Compensation is possible by normal side
- b. 기간
 - Observation 6~12 months avoiding aspiration
- c. 음성치료: pushing methods, accent method

2) 수술적 치료

- a. 편측 성대마비의 치료
 - 성대내전술
 - 주입술: Gelfoam
 - Teflon & Silicone
 - Collagen: Bovine, Autologous, Micronized Allograft
 - Fat
 - Fascia
 - Type I thyroplasty
 - Arytenoid adduction
 - 신경재식술(Reinnervation)
- b. 양측 성대마비의 치료
 - Tracheotomy
 - Arytenoidectomy
 - Open
 - Laser
 - Partial
 - Cordotomy
 - Reinnervation
 - Pacemaker