Head & Neck Surgery Course

Parapharyngeal space: surgical anatomy

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Introduction

- Potential deep neck space
- Shaped as an inverted pyramid
  - Base of the pyramid: skull base
  - Apex of the pyramid: greater cornu of the hyoid bone
Introduction

• 2 compartments
  – Prestyloid
  – Poststyloid
Anatomy: boundaries

- **Superior:** small portion of temporal bone
- **Inferior:** junction of the posterior belly of the digastric and the hyoid bone
Anatomy: boundaries
Anatomy: boundaries

- Posterior: *deep fascia and paravertebral muscle*

- Anterior: *pterygomandibular raphe and medial pterygoid muscle fascia*
Anatomy: boundaries

- **Medial**: pharynx (pharyngobasilar fascia, pharyngeal wall, buccopharyngeal fascia)
- **Lateral**: superficial layer of deep fascia
  - Medial pterygoid muscle fascia
  - Mandibular ramus
  - Retromandibular portion of the deep lobe of the parotid gland
  - Posterior belly of digastric muscle
  - 2 ligaments
    - Sphenomandibular ligament
    - Stylomandibular ligament
Aponeurosis and ligaments
Aponeurosis and ligaments

- **Stylopharyngeal aponeurosis**: separates parapharyngeal spaces to two compartments:
  - Prestyloid
  - Poststyloid

- **Cloison sagittale**: separates parapharyngeal and retropharyngeal space
Aponeurosis and ligaments
Muscles

- stylohyoidien
- Stylopharyngeal
- And styloglossus muscles
Prestyloid compartment

Contents:

- Retromandibular portion of the deep lobe of the parotid gland
- Minor or ectopic salivary gland
- CN V branch to tensor veli palatini muscle
- Ascending pharyngeal artery and venous plexus
- Most fat
Poststyloid compartment

Contents

– Carotid artery
– Internal jugular vein
– CN IX to XII
– Cervical sympathetic chain
– Glomus tissues
Parapharyngeal space: keep in mind

- Suprahyoid

- Boundaries
  - Superior—skull base
  - Inferior—hyoid
  - Anterior—pterygomandibular raphe
  - Posterior—prevertebral fascia
  - Medial—buccopharyngeal fascia
  - Lateral—superficial layer of deep fascia
Parapharyngeal space: keep in mind

- 2 compartments:
  - Prestyloid
    - Muscular compartment
    - Medial—tonsillar fossa
    - Lateral—medial pterygoid
    - Contains fat, connective tissue, nodes
  - Poststyloid
    - Neurovascular compartment
    - Carotid sheath
    - Cranial nerves IX, X, XI, XII
    - Sympathetic chain

- Stylopharyngeal aponeurosis
  - Prevents infectious spread from anterior to posterior
Parapharyngeal space relationships

- Communicates with several deep neck spaces.
  - Parotid
  - Masticator
  - Peritonsillar
  - Submandibular
  - Retropharyngeal
Retropharyngeal Space

• Entire length of neck

• Boundaries:
  
  – Anterior border - pharynx and esophagus (buccopharyngeal fascia)
  – Posterior border - alar layer of deep fascia
  – Superior border - skull base
  – Inferior border – superior mediastinum
    • Combines with buccopharyngeal fascia at level of T1-T2
  – Lateral border – cloison sagittale
  – Midline raphe connects superior constrictor to the deep layer of deep cervical fascia.

• Contains retropharyngeal nodes.
Danger Space

- Extends from skull base to diaphragm
- Boundaries
  - Anterior border - alar layer of deep fascia
  - Posterior border - prevertebral layer
- Contains loose areolar tissue.
Prevertebral Space

• Entire length of vertebral column

• Boundaries
  – *Anterior border* - prevertebral fascia
  – *Posterior border* - vertebral bodies and *deep neck muscles*
  – *Lateral border* – transverse processes
Parapharyngeal space: surgical options and technique
Surgical Options

- Transparotid approach
- Transcervical approach
- Cervical-parotid approach
- Cervical-transpharyngeal
  (mandibular swing)
Transparotid approach

• For deep lobe of parotid lesion
  
  • Superficial parotidectomy with facial nerve preservation
  
  • Retract facial nerve from the deep parotid lobe
  
  • Dissect posterior and inferior around mandible
  
  • Improve access by mandibulotomy
Transparotid approach
Transparotid approach
(Total parotidectomy + SND of levels II-III for parotid cancer)
Transcervical approach

- **For poststyloid tumor**
- Transverse incision at level of hyoid
- Submandibular gland removed or retracted
- Incision through the fascia deep to the submandibular space
- **Increase exposure by releasing digastric, stylohyoid, styloglossus from hyoid, cut stylomandibular ligament, mandibulectomy**
Cervical-parotid approach

- Extend cervical incision up in front of ear
- Identify facial nerve
- Divide posterior belly digastric
- Divide styloglossus, stylohyoid close to styloid process
- Divide stylomandibular ligament
- Can combine with mandibulotomy
Cervical-parotid approach
Indications

- Can be used to remove majority of the parapharyngeal tumor
  - All deep lobe parotid tumors and extraparotid salivary tumors
  - Low grade malignant tumors of deep lobe of parotid
  - Many poststyloid tumors, including most neurogenic tumors and small paragangliomas
Cervical-transpharyngeal (mandibular swing)

- “Mandibular swing”
- Midline lip splitting or visor flap
- Mandibulotomy anteriorly, incise along floor of mouth to anterior tonsillar pillar
- Identify hypoglossal nerve and lingual nerve
- Divide styloglossus and stylopharyngeus muscle
- Need tracheotomy
Cervical-transpharyngeal (mandibular swing)
Indications

- All vascular tumors that extend into the superior portion of the parapharyngeal space

- Malignant tumor invaded skull base or vertebral body