Primary Parapharyngeal Tumors

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Grand Rounds Presentation
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Primary parapharyngeal tumors

- Most of the tumors in parapharyngeal space are metastatic disease or direct extension from adjacent spaces
- 0.5% of all head and neck tumors
- Benign tumor 80%
- Malignant tumor 20%
Anatomy

- 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
Anatomy

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

- **Medial:** pharyngobasilar fascia and pharyngeal wall
- **Lateral:**
  - medial pterygoid muscle fascia
  - Mandibular ramus
  - Retromandibular portion of the deep lobe of the parotid gland
  - Posterior belly of digastric muscle
Anatomy

- **Lateral:** two ligaments
  - Sphenomandibular ligament
  - Stylomandibular ligament
- **Posterior:** vertebral fascia and paravertebral muscle
- **Anterior:** pterygomandibular raphe and medial pterygoid muscle fascia
Anatomy

- Tensor-vascular-styloid fascia separates parapharyngeal spaces to two compartments:
  - Prestyloid
  - Poststyloid
Anatomy

- 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
Anatomy

- Poststyloid compartment contents
  - Carotid artery
  - Internal jugular vein
  - CN IX to XII
  - Cervical sympathetic chain
  - Glomus tissues
Differential diagnosis

- Location of the tumor
  - Prestyloid:
    - salivary gland neoplasms
    - lipoma
    - rare neurogenic tumors
  - Poststyloid:
    - Schwannoma
    - Paraganglioma
    - neurofibroma
Salivary gland neoplasm

- Most common primary parapharyngeal tumor (40%-50%)
- Pleomorphic adenoma is most common
- From deep lobe of the parotid gland
  - extend through the stylomandibular tunnel, “dumbbell” appearance on CT scan
  - displace tonsil and soft palate and cause obstruction of nasopharynx
- From minor salivary gland lying in parapharyngeal fat
FIGURE 107.14. Round tumor involving the parapharyngeal space. Three fourths (A) and axial (B) anteroposterior view.
FIGURE 107.15. Dumbbell tumor involving the parapharyngeal space. Three fourths (A) and axial (B) anteroposterior view.
Salivary gland neoplasm

- Malignant parapharyngeal salivary gland
  - Frequency varies from 24% to 75%
  - Mucoepidermoid carcinoma
  - Adenoid cystic carcinoma
  - Acinic cell carcinoma
  - Malignant mixed carcinoma
  - Squamous cell carcinoma
  - Adenocarcinoma
  - Malignant Warthin’s tumor
Neurogenic tumor

- Second most common primary parapharyngeal tumor
  - Schwannoma
    - Vagus nerve
    - Cervical sympathetic chain
  - Paraganglioma
    - Vagal paraganglioma
    - Carotid body tumors
  - Neurofibroma
  - Malignant neurogenic tumor
### TABLE II. Primary Parapharyngeal Space Tumors.

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<th>Malignant</th>
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Clinical presentation

- Clinical detection is difficult
- Tumor size 2.5 to 3.0 cm to be detected clinically
- Asymptomatic mass
  - Mild bulging of soft palate or tonsillar region
  - Palpable mass at angle of mandible
Clinical symptoms

- **Prestyloid**
  - Serous otitis media
  - Voice change
  - Nasal obstruction
  - Dyspnea

- **Poststyloid**
  - Compress CN 9th, 10th, 11th, 12th or sympathetic chain
  - Hoarseness, dysphagia, dysarthria, Horner’s syndrome

- Cranial nerve paralysis, pain, trismus suggest malignancy
CT scan

- Locates tumor to prestyloid vs poststyloid
  - Prestyloid tumor displace carotid artery posteriorly
  - Poststyloid tumor displace carotid artery anteriorly
- Fat plane between mass and parotid
- Enhancement of lesion
  - Schwannoma, paraganglioma, hemangioma, hemangiopericytoma, aneurysm
- Bone erosion due to malignancy
- Limited soft tissue detail
MRI

- Most useful study
- Relationship of mass and carotid more easily seen than with CT
- Characteristic appearances of tumor types on MRI allows preoperative Dx in 90-95% of patients
MRI

- Pleomorphic adenoma
  - Low intensity on T1
  - High intensity on T2
  - Displace carotid posteriorly

Figure 3. Axial proton density (2500/20) MR scan shows a right parapharyngeal space mass with an intermediate signal intensity. The lesion has a slightly lobulated contour and fat is present between the posterolateral margin of the mass and the parotid gland (arrow). This extraparotid benign mixed tumor is also anterior to the internal carotid artery.
MRI

- Schwannoma
  - High intensity on T2
  - Displace carotid anteriorly
MRI

- Paraganglioma
  - “salt and pepper”

Figure 6. Axial T1-weighted (700/20) MR scan shows a right extraparotid parapharyngeal space mass that has displaced the internal carotid artery anteriorly. This glomus vagale tumor has numerous flow voids within it.
- Angiogram
  - Define vascular anatomy
  - Carotid occlusion test
  - Tumor embolization 1 day prior to surgery

- FNA
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
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, mandibulotomy
Cervical-parotid approach

- Extend cervical incision up infront 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”
- 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
indications

- All vascular tumors that extend into the superior portion of the parapharyngeal space
- Malignant tumor invaded skull base or vertebral body
Conclusion

- Rare tumor in an complex anatomical area
- Subtle clinical presentation
- Radiographic imaging is important
- Prestyloid vs poststyloid space
- Surgery is the main treatment
- When not to operate