Otology Seminar
Squamous cell carcinoma of the temporal bone
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Epidemiology

1. Carcinoma of the temporal bone: < 0.2% of all head and neck tumors
2. Cancer of the middle ear cleft (E-tube, middle ear cavity, and mastoid)
   Incidence: men vs. woman: 0.8 vs. 1 / 10^6 / year  (1 : 1.2)
   75~80% of middle ear tumors are squamous in type
   A peak age: in the 6th decade of life
3. Cancer of the external auditory canal:
   Incidence: approximately 1 per million population per year
   Equal incidence between men and women, peak in the 7th decade

Etiology

1. Chronic suppurative otitis media (CSOM): approximately 50% patients
2. Radiation-associated tumors: eg. NPC patients post-radiotherapy
   Mean latency times after treatment: 12.9 to 15 years
3. Ultraviolet light: well documented with regard to the pinna
4. Others: such as metastasis or chlorinated disinfectants
   (Monem et al., 1999. hypochloric acid – genetic mutation)

Clinical symptoms: not specific

<table>
<thead>
<tr>
<th>Table 1. Frequency of presenting symptoms</th>
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<tr>
<td>Obstructive</td>
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<tr>
<td>Otalgia</td>
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<td>Hearing loss</td>
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<td>Facial palsy</td>
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<tr>
<th>Symptom/symptom</th>
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<tbody>
<tr>
<td>Canal mass</td>
<td>35</td>
<td>74</td>
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<tr>
<td>Aural discharge</td>
<td>91</td>
<td>66</td>
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<tr>
<td>Hearing loss</td>
<td>27</td>
<td>57</td>
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<tr>
<td>Aural bleeding</td>
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<td>49</td>
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<tr>
<td>Otitis</td>
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<td>49</td>
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<tr>
<td>Facial nerve paralysis</td>
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<td>13</td>
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<td>Periauricular swelling</td>
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<td>13</td>
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<tr>
<td>Headache</td>
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<td>11</td>
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<tr>
<td>Neck aches</td>
<td>4</td>
<td>9</td>
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<tr>
<td>Vertigo</td>
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Clinical signs: an exophytic mass that bleeds when touched

Tumor spreads
1. lymphatic spread: uncommon, late in the disease process, poor prognosis
2. hematogenous spread: rare
3. loco-regional spread:

Diagnosis
1. Biopsy: deep biopsy, CT-guided biopsy
2. Pre-operative audiometry
3. Image study: CT and MRI (complementary)
   - CT: bony erosion (accuracy: 98%)
   - MRI: soft tissue involvement, perineural spread, dural enhancement
4. Angiography and balloon occlusion test
5. Systemic work-up: detect systemic spread

Staging: provide a therapeutic plan and evaluate the efficacy of treatment
1. 1985, Stell and McCormick
2. Pensak et al., 1996
   Grade I: tumor limited to the temporal bone
   Grade II: tumor with extratemporal bone extension
   Grade III: positive neck node metastasis or distant metastasis
3. Pittsburg tumor staging system (modified) (Hirsch BE, 2002)

![Image: University of Pittsburgh Staging System for Squamous Cell Carcinomas of the Temporal Bone]

**Treatment**

1. Primary surgery: Moffat, *en bloc* procedures
   - Lateral temporal bone resection for T1 and T2 lesions
   - Extended temporal bone resection for T3 and T4 lesions
   - Resection of mandibular head and TMJ if TMJ involvement (+)
2. Dura and brain: combined with neurosurgeon
3. Neck: SOHND for clinical negative neck disease,
   - Radical neck dissection for positive nodal disease
   - staging of the disease for post-operative radiotherapy
4. Parotidectomy: node draining the EAC
   - superficial parotidectomy for T1 and T2 lesions
   - total parotidectomy with extended temporal bone resection for T3, T4
5. Adjuvant radiotherapy: a total dose of 60 to 70 cGy,
   - but complication: osteoradionecrosis (ORN) and facial weakness
6. Chemotherapy: little benefit
   - Knegt et al., 2002: tumor debulking followed by topical 5-fluorouracil
Reconstruction
1. a pedicled myocutaneous flap
2. a free tissue transfer

Complications
1. facial nerve: sacrifice in total temporal bone resection, rehabilitation
2. Cerebrospinal fluid leak: 7%, Hamilton (in print)
3. lower cranial nerves: not common, jugular foramen (CN IX, X)

Prognosis
1. Moody (2000) and Gillespie (2001) report a success of between 78 ~ 100% with early tumors (T1, T2)
2. Cure rate for T3 and T4 tumors: between 35 ~ 47%
3. Nodal disease: most significant prognostic indicator
   Survival in this group at 2 years was 0%
4. Histology:
   poor prognosis in undifferentiated tumors and positive margins
5. Dural and cerebral involvement: in Moffat’s series,
   Dural involvement alone was not a significant prognostic factor
6. Carotid artery invasion: signifies extensive disease progression
7. De novo versus salvage:
   the first treatment protocol offers the greatest chance of cure
References


