Sebaceous Tumors

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Outline

• Normal sebaceous glands
• Sebaceous hyperplasia
• Sebaceous adenoma
• Sebaceous epithelioma
• Sebaceous carcinoma
• Muir-Torre Syndrome
• Other sebaceous tumors
Sebaceous Glands

- Many on face (especially nose)
- None on palms and soles
- Ectopic glands on mucous membranes are called Fordyce spots
- Meibomian glands on eyelids and Montgomery tubercles on areolae are sebaceous glands
- Large at birth, smaller pre pubertal, then enlarge again during puberty (under hormonal control)
• Glands empty into HF at level of the follicular infundibulum

• Sebaceous glands, being **holocrine** glands, form their secretion by decomposition of their cells
A sebaceous gland may consist of only 1 lobule, but often has several lobules leading into a common excretory duct composed of stratified squamous epithelium.
Embryology

• Sebaceous glands usually develop as lateral protrusions from the outer root sheath of hair follicles
  – But at certain sites (eyelids, lips, areolae, nipples, labia minora), they appear to arise independently and drain directly onto skin's surface
Sebaceous glands consist of several lipid-containing lobules. Each lobule is composed of an outer layer of small cuboidal or flattened basophilic germinative cells, from which arises the inner zone of lipid-laden vacuolated cells.
Sebum

• Sebum, lipid mixture that includes
  – Triglycerides (57%)
  – Wax esters (26%)
  – Squalene (12%).

• Function includes
  – Waterproofing
  – Control of epidermal water loss
  – Protective function, inhibiting the growth of fungi and bacteria

• Secreted sebum undergoes significant changes due to presence
  – *Propionibacterium acnes* (*triglyceride hydrolysis* within the pilosebaceous canal)
  – *Staph. epidermidis* (*cholesterol ester formation* on the perifollicular skin)
Case
Diagnosis
Sebaceous hyperplasia
Sebaceous hyperplasia

- Benign proliferation of enlarged sebaceous glands
- Clinical:
  - Small yellow papule with central dell or pore, usually on face.
  - Predisposing factors: genetic predisposition, seborrhea, immunosuppression
  - Usually biopsied to exclude BCC
Case
Diagnosis
Ectopic Sebaceous glands
Case
Diagnosis
Sebaceous adenoma
Sebaceous adenoma

• Benign neoplasm of sebaceous origin

• Germinative cells are present beyond the normal one to two layers seen in sebaceous hyperplasia, but still make up proportionally less of the lesion than mature sebocytes

• Associated with MuireTorre syndrome
Histopathology

- Multibolular tumor with sebaceous differentiation.
- Cells mature from small germinative peripheral cells at the margin of the tumor to mature sebocytes with increasing amounts of lipid in their cytoplasm.
- Mature sebocytes outnumber small germinative cells.
Case
Diagnosis
Sebaceous epithelioma
Sebaceous epithelioma

- Controversy exists regarding the nomenclature of this benign tumor
- Associated with MTS
Histopathology

• Basaloid cells with sebaceous differentiation.
• Germinative cells outnumber sebocytes, a feature differentiating this tumor from sebaceous adenoma
• Neoplasm is surrounded by a sclerotic stroma
Case
Diagnosis

- Additional work-up ????
Sebaceous adenoma with KA-like architecture
Sebaceous tumors showing a keratoacanthoma-like architecture are likely to indicate MTS.
Case
Diagnosis

• Additional work-up
Sebaceous epithelioma showing cystic change
Sebaceous tumors showing cystic change are suggestive of MTS
Case
EMA +ve
Diagnosis
Sebaceous carcinoma
Sebaceous carcinoma

- Malignant neoplasm is most often found in the periocular area
- Nonspecific appearance
- Mohs surgery may be more efficacious than wide excision
- Associated with MTS
Histopathology

- Nuclear pleomorphism, prominent nucleoli, and mitotic figures can be seen.
- Prominent pagetoid spread
Association of sebaceous neoplasms with MTS
MTS

• Rare autosomal dominant genodermatosis characterized by the occurrence of
  
  – Sebaceous gland neoplasms and/or keratoacanthomas
  
  – Visceral malignancies that include GI and GU cancers
Cutaneous sebaceous neoplasms as markers of Muir-Torre syndrome: a diagnostic algorithm

Table 1. Percentage of MTS among patients presenting with sebaceous neoplasms

<table>
<thead>
<tr>
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<th>SA as marker of MTS</th>
<th>SE as marker of MTS</th>
<th>SC as marker of MTS</th>
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</thead>
<tbody>
<tr>
<td>Popnikolov et al.⁶</td>
<td>(3 of 12) 25%</td>
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<tr>
<td>Kruse et al.⁷</td>
<td>(2 of 6) 33%</td>
<td>(5 of 16) 31%</td>
<td>(2 of 3) 66%</td>
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<tr>
<td>Chhibber et al.⁹</td>
<td>(9 of 15) 60%</td>
<td>(6 of 7) 86%</td>
<td>(5 of 5) 100%</td>
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MTS, Muir-Torre syndrome; SA, sebaceous adenoma; SE, sebaceous epithelioma; SC, sebaceous carcinoma.
Underlying mutations: MMR genes

• MTS is usually the result of germline mutation in one or more of the DNA mismatch repair (MMR) genes which include
  – *MLH-1*
  – *MSH-2*
  – *MSH-6*

• Recent evidence suggests *that* IHC is very sensitive and effective in detecting these defects in cutaneous tumors in MTS
Fig. 1. Representative example of immunohistochemical staining demonstrating lack of expression of *MLH-1* in a sebaceous neoplasm.
Fig. 2. Representative example of immunohistochemical staining demonstrating lack of expression of MSH-6 in a sebaceous neoplasm.
Fig. 4. Positive predictive values (PPVs) of MMR proteins (MLH-1, MSH-2, MSH-6) in MTS.
Fig. 5. Diagnostic algorithm for a patient presenting with an unselected sebaceous neoplasm.
Case
Diagnosis
BCC with sebaceous differentiation
Case
Diagnosis
Steatocystoma multiplex
Steatocystoma multiplex
Histopathology

- Collapsed empty cyst lined by squamous epithelium which contains sebaceous glands
- A thick, wavy refractile hyaline cuticle covers the surface of the epithelium
Case
Diagnosis
Nevus sebaceus
Nevus sebaceus

- Scalp

- Yellow cerebriform appearance

- Hamartoma with epidermal, follicular, sebaceous, and apocrine elements

- The risk of malignant neoplasms is small and occurs primarily in older individuals
Histopathology

- Papillomatosis with hyperkeratosis
- Increased sebaceous glands which may communicates directly with the epidermis
- Absence of hair follicles
- Dilated apocrine glands
References

• Calonje JE, Brenn T, Lazar A, McKee PH. McKee's Pathology of the Skin, 4th Edition
• David E. Elder. Lever’s Histopathology of the Skin, 10th edition.
Thank you