Goat in a silk dress

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“If you put a silk dress on a goat he is a goat still.”

-Irish proverb
Signalment & History

• 6-year-old, female (entire), mixed breed goat

• Large (20-cm diameter) firm, subcutaneous, ventral cervical mass present for approximately 9 months, with rapid growth in the 2 months prior to presentation

• Initial therapy: approximately 4 liters of serosanguinous fluid and necrotic material drained from the area
Initial diagnostics

Small, superficial wedge biopsy taken: Diagnosis was **probable apocrine gland adenocarcinoma**, based on presence of acini lined by two layers of epithelial cells and surrounded by spindle-shaped cells resembling myoepithelial cells.
Initial diagnostics

• The goat was scheduled for surgical debulking but died suddenly with acute respiratory distress
Gross pathology

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Gross pathology
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Cervical mass, cross section
Gross pathology

Intrathoracic mass, cross-sections
Gross pathology

Liver

Spleen

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Gross pathology
Histopathology-cervical mass

40x H+E
Histopathology-cervical mass

Cytokeratin AE1/3

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Histopathology-cervical mass

Vimentin 40x
Histopathology-cervical mass also

Permission granted only for viewing on SEVPAC website.
Histopathology-cervical mass also
Histopathology-cervical mass also

Permission granted only for viewing on SEVPAC website
Histopathology-cervical mass also

4x Alcian blue
Histopathology-thoracic mass
Histopathology-thoracic mass

20x H+E

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Histopathology-thoracic mass
Histopathology-liver mass

Low mag H+E
Histopathology-liver mass
Histopathology-liver mass

40x CD3

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## Immunohistochemistry

<table>
<thead>
<tr>
<th>Antibody</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytokeratin AE1/3</td>
<td>Strongly positive, ovoid and spindle cells</td>
</tr>
<tr>
<td>Vimentin</td>
<td>Negative</td>
</tr>
<tr>
<td>Muscle-specific actin</td>
<td>Negative in tumor cells, positive in fibroblasts in surrounding band of fibroblasts in the subcutis</td>
</tr>
<tr>
<td>S-100</td>
<td>Negative, with some nonspecific multifocal cytoplasmic staining (it’s called S-100 because it stains 100 things!)</td>
</tr>
<tr>
<td>CD3</td>
<td>Positive in intratumoral lymphocytes</td>
</tr>
<tr>
<td>CD79a</td>
<td>Negative</td>
</tr>
</tbody>
</table>
Morphologic diagnosis

(Malignant) thymoma, epithelial-predominant, with metastasis to the spleen and liver
Thymoma

- Neoplasms of thymic epithelial cells, accompanied by variable infiltration of benign lymphocytes; rare (except in some breeds of dairy goat)

- In veterinary medicine, classification is based solely on the density of lymphocyte infiltration into lymphocyte-predominant, epithelial-predominant, and mixed

- In human medicine, classification is essentially based on the shape of the neoplastic cells: oval or spindle-shaped (type A), round or polygonal (type B) or a combination of the two (type AB)
Thymoma

- Grossly, the masses are usually well-encapsulated and lobulated or nodular

- They are generally present in the cranial mediastinal region, but can occur anywhere from the high cervical region to the caudal mediastinum

- Compression, but not invasion of adjacent tissues is common

- Metastasis is uncommon, but when it occurs does not necessitate a diagnosis of thymic carcinoma
Thymoma

- A common histological feature of thymomas in goats (and normal thymus in goats) is the presence of myoid cells
  - Antiapoptotic in vitro
  - Modulate T-cell development
  - Role in myasthenia gravis

- Cysts or pseudocysts may be present, and may represent cystic degeneration, invaginations of overlying mesothelium, or dilated and fused lymph cavities

- The epithelial cells in thymomas can be arranged as solid, trabecular, cribriform, whorled, or rosette-like
Thymoma

- Paraneoplastic syndromes associated with thymomas are uncommon in veterinary medicine, but include
  - myasthenia gravis (most common)
  - autoimmune skin disease
  - hypercalcemia
  - polyuria/polydipsia
  - polymyositis

- Cytokeratin staining profiles have proven to be of prognostic benefit in people but not in animals
In conclusion

Sooo remember....

Common things occur commonly!

(like thymomas in goats)
In conclusion

But...

Sometimes they present in uncommon ways

(like multiple cervical and intrathoracic masses with strange histomorphology and metastasis to multiple organs)
In conclusion

And....

“ If you put a silk dress on a goat he is a goat still.”
References

Thanks

• Goldie’s family for allowing the necropsy
• Dr. Misty Edmondson – *submitting clinician*
• Dr. Calvin Johnson – *slide review*
• Histotechnicians Ms. Beth Landreth and Ms. Kristina Cammack – *for doing a thousand and one immunos*
• My resident mates and the AU Department of Pathobiology faculty