Case #3
Gladwyn Leiman, MD

45 year old male
FNA biopsy of the thyroid
Case History

- 45 yr old doctor unable to button his collar!
- Palpated his own thyroid nodule
- Referred himself to nuclear medicine [NM]
- Scan demonstrated large cold nodule 5cm
- NM physician referred him to Cyto for FNA
- Cytopathologist aspirated unilateral nodule
Differential Diagnosis

- WOW and OMG!
- Surely not pleomorphic adenoma?
- Bizarre medullary carcinoma
- Metastatic tumor – lung, melanoma, renal
- ANAPLASTIC THYROID CARCINOMA
Patient's progress

- Finally saw a surgeon!
- Surgeon called to query diagnosis
- Underwent surgery the next day
- Surgeon described a tumor "exploding from the parenchyma of the thyroid"
- Extra-thyroid musculature not invaded
- Total thyroidectomy performed
- Patient recovered well
- Pathologists had a hard time!
Surg Path differential diagnosis

- Spindle cell pseudosarcoma
- [Anaplastic thyroid carcinoma]
- Spindle cell medullary carcinoma
- Metastatic spindle-celled carcinoma
- Metastatic spindle-celled melanoma
- Primary sarcoma of the thyroid
Immunochemistry

- All epithelial markers negative
- Thyroid markers negative (calcitonin, TGB)
- All melanoma markers negative
- Desmin, SMA, MSA, Vimentin positive, Myoglobin negative
Final diagnosis

PRIMARY LEIMYOSARCOMA OF THE THYROID GLAND - T2 N0 M0

Spindle cell thyroid tumors

- Benign - leiomyoma (♀ patients)
  - post FNA spindle cell nodule
- Malignant - SETTLE
  - spindled medullary carcinoma
  - spindled anaplastic carcinoma
  - spindled metastases [ca,mel,sarc]
  - leiomyosarcoma

Course and Prognosis:
Leiomyosarcoma

- Usually advanced at time of diagnosis – spread outside capsule
- Metastases blood borne, not lymphatic
- Lungs, heart, brain and beyond
- Surgical clearance mainstay of treatment
- Chemo-radiation has minimal impact
- New finding c-kit positivity in recent case
- Tyrosine kinase inhibitors may play a role.
What happened to this patient?

- Surgical excision close but complete
- Patient and surgeon decided on watchful waiting
- At 5 years, the patient was alive, well with no recurrence.
- No further details available

What are the lessons to learn?

- Strikeout can be good for the patient!
- Stick to the rules of age and gender
- Multidisciplinary approach was ignored
- If the patient is an MD, expect anything
- The spectrum of spindle tumors of thyroid is large and increasingly interesting.
- Men should obviously wear ties!
Leiomyosarcoma of the Thyroid Gland

Both benign and malignant smooth muscle tumors may occur as primary tumors in the thyroid gland. The origin is probably in smooth muscle in the vessels of the thyroid capsule, although metaplasia from a pre-existing anaplastic carcinoma has also been suggested for leiomyosarcomas. Both benign and malignant types are incredibly rare, but their significance lies in that they expand the differential diagnosis of spindle-celled lesions of the thyroid gland. The first thyroid leiomyosarcoma ever reported was in 1969, and less than 20 cases have appeared in the literature since that time, most of these in the last twenty years. The age range is in older adults from 45 to 90, with an average of about 70 years. There does not appear to be a gender predilection. Most patients present with a fairly rapidly enlarging neck mass with or without compressive symptoms. By the time of diagnosis, tumors are usually large, in excess of 5 cm.

Preoperative cytologic diagnosis by FNA is not mentioned in the majority of cases; the few reported FNAs have been signed out as “spindle-celled tumor”. The histologic diagnosis is fairly characteristic of leiomyosarcomas as they appear elsewhere, but as this is an unexpected finding in the thyroid, the differential diagnosis is impressive and should dictate immunochemical confirmation. The chief benign diagnoses to be considered are 1] leiomyoma and 2] solitary fibrous tumor and 3] post-FNA spindle cell nodule of the thyroid, initially described ten years ago is probably the most important alternate benign consideration.

Malignant differential diagnoses include 1] SETTLE (spindle epithelial tumor with thymus-like differentiation) 2] spindle cell variant of medullary carcinoma 3] spindle cell variant of anaplastic carcinoma and 4] metastases of spindle celled tumors to the thyroid eg melanomas, sarcomas and carcinomas. In medullary carcinomas of spindle cell type, nuclei would be characteristically granular. In spindle cell anaplastic carcinomas, more cellular pleomorphism would be anticipated. The final diagnosis of leiomyosarcoma must depend on immunochemistry. Smooth muscle markers are strongly positive, including smooth muscle actin, and desmin; the tumor is also strongly vimentin positive. Staining for epithelial markers, TTF1 and thyroglobulin are negative, thus excluding primary and metastatic carcinomas. Medullary carcinoma is easily excluded by negative staining for calcitonin.

As with other sarcomas, neck nodes are not frequently involved, but blood borne metastases to heart, brain and lung have been described. Treatment is predominately surgical, with as extensive tumor reduction as possible, and total thyroidectomy as well. Chemotherapy and radiation therapy are incorporated into the management plan, particularly if the tumor has extended beyond the capsule of the thyroid - almost inevitable at the time of diagnosis. Conventional chemotherapy has been used, with limited to no success in reported cases. An interesting new development, however, is recent evidence demonstrating C-kit proto-oncogene expression in a leiomyosarcoma of the thyroid. This opens up treatment to tyrosine kinase inhibitors such as Imatinib, the results of which cannot yet be assessed. The overall prognosis of those few cases of leiomyosarcoma featured in literature reports has been very poor. The majority of patients are dead within two years, but occasional patients survive up to or longer than five years.

- Leiomyosarcoma is a very rare tumor of the thyroid. It enters the differential diagnosis of spindle-celled tumors, with broad benign and malignant differential diagnostic considerations.
- Benign differentials include post-FNA spindle cell nodules and solitary fibrous tumors
- Malignant differentials include SETTLEs, medullary carcinoma, anaplastic carcinoma, and metastatic spindle cell tumors of a variety of types.
- Surgery is the mainstay of treatment; C-kit may become important in future cases.
- The prognosis is almost inevitably poor, but occasional longer term survival has been described.
Limited Bibliography

- Wang TS, Ocal IT, Oxley K, Sosa JA. Primary leiomyosarcoma of the thyroid gland. Thyroid 2008;18:425-428