Is Electron Microscopy valuable in the Differential Diagnosis of Spindle and Epithelioid Cell Tumors?

- Historically
  - EM contributed to the diagnosis of soft tissue tumors
  - Immunohistochemistry
  - Molecular genetics

Indications for Electron Microscopy

- Neoplasms
  - Unclassifiable neoplasm
  - Supporting diagnosis
  - Unknown Primary
  - Cytology
- Non-neoplastic diseases
  - Medical kidney
  - Metabolic storage disease
  - Other congenital disorders
  - Ciliary dyskinesia
  - EB
  - Infection agents
  - Nerve / muscle bx

“The pathologist confronted with a tumor that he finds undiagnosable by light microscopy who sends a sample for electron microscopic study in the hope that some feature of diagnostic significance will be found is likely to be disappointed by the results”

Disclosure of Relevant Financial Relationships

USCAP requires that all planners (Education Committee) in a position to influence or control the content of CME disclose any relevant financial relationship with commercial interests which they or their spouse/partner have, or have had, within the past 12 months, which relates to the content of this educational activity and creates a conflict of interest. Dr. Nielsen has nothing to disclose.
Gastrointestinal Stromal Tumors: An Ultrastructural Study

Rhonda K. Yantiss, MD, Andrew E. Rosenberg, MD, Martin K. Selig, BA, and G. Petur Nielsen, MD
Epithelioid Soft Tissue Tumors

- Epithelioid Sarcoma
- Malignant Rhabdoid Tumor
- Epithelioid MPNST
- Myoepithelioma
- Extra-axial Chordoma
- Epithelioid vascular tumors

Epithelioid Sarcoma

Electron Microscopy

- Cohesive oval to polygonal cells
- Junctions - desmosomes
- Abundant cytoplasm
- Numerous intermediate filaments
- Tonofilaments

Chordoma

- Round and polyhedral cells
- Flocculent matrix
- Cytoplasmic processes
- Whipping
- Villus-like projections
- Basal lamina
- Junctions etc.
Spindle Cell Soft Tissue Tumors

- Solitary Fibrous Tumor
- LGFMS
- MPNST
- IMT

MPNST

1. Malignant tumor arising in a patient with NF1
2. Arising from a peripheral nerve
3. Arises in association with a neurofibroma (schwannoma)

In the absence of these settings, the diagnosis of MPNST is based on the constellation of histologic, immunohistochemical, and ultrastructural features suggesting Schwann cell differentiation by the neoplastic cells.
MPNST
- Spindle cells with long, think intertwining processes
- Basal lamina
- Long spacing collagen

Undifferentiated/Unclassified Sarcoma
"A soft tissue sarcoma showing no identifiable line of differentiation when analyzed by presently available technology ....."
Leiomyosarcoma / myofibroblastic sarcoma

- Leiomyosarcoma
  - “...is a malignant neoplasm showing pure smooth muscle differentiation”

LMS

- Fascicular or syncytial arrangement of spindle cells, in a matrix of collagen
- Basal lamina surrounding cells (Figures)
- Thin filaments and dense bodies among filaments, within the cytoplasm proper
- Pinocytotic vesicles
- Round-ended nuclei
- Contraction indentations of nuclei
EMC
- Immunohistochemistry
- S100
- EMA
- Synaptophysin
- Chromogranin
- NSE

Ewing Sarcoma
Keratin

Hyalinizing Spindle Cell Tumor With Giant Rosettes—A Soft Tissue Tumor With Mesenchymal and Neuroendocrine Features
An Immunohistochemical, Ultrastructural, and Cytogenetic Analysis
Is Electron Microscopy valuable in the Differential Diagnosis of Spindle and Epithelioid Cell Tumors?
Electron Microscopy

- Electron Microscopy should be used in conjunction to other ancillary studies - e.g. immunohistochemistry