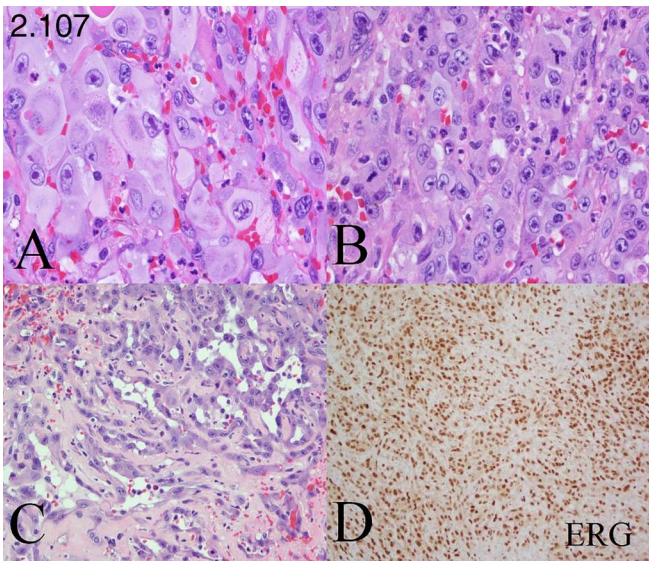

Validation of Wide-Field Optical Coherence Tomography for Microstructural Analysis of Tissue From Multiple Organs

(Poster No. 108)

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Context: The presence of positive margins following tumor resection is a frequent cause of re-excision surgery. Nondestructive, label-free, real-time intraoperative histopathologic imaging may improve the assessment of margin status at the time of surgery; optical coherence tomography (OCT) with artificial intelligence to identify areas suspicious for residual malignancy has been identified as one promising solution.

Design: This was a preclinical validation of a novel device that uses wide-field OCT (WF-OCT; OTIS 2.0 System) to image specimens intraoperatively across a variety of tissue types. Cadaveric tissues from a single autopsy were imaged using WF-OCT; specimens were subsequently processed for histology, whereafter digitized slides were reviewed and annotated. One pathologist and 1 clinical scientist evaluated the quality and resolution of WF-OCT images compared with histology.

Results: Thirty tissue specimens were collected, 3 from each of the following 10 tissue types: breast, thyroid, kidney, liver, lung, colon, heart, pancreas, spleen, and adrenal glands. For all specimens, tissue-specific microarchitecture and features consistent with the known clinical history of the patient could be identified on WF-OCT images and histology slides, and corresponding sections were correlated to each other. WF-OCT volumetric analysis was used to follow features through adjacent image slices.

Conclusions: The WF-OCT images captured in this study displayed the key identifying features of various types of normal and pathologic human tissue features with a utility comparable to histology. Thus, WF-OCT has potential as a platform technology to bridge the gap between the immediate information needs of the operating room and the longer timeline inherent to histology processing.

A Rare Case of Extragastrointestinal Stromal Tumors (EGIST) at an Unusual and Unreported Location

(Poster No. 109)

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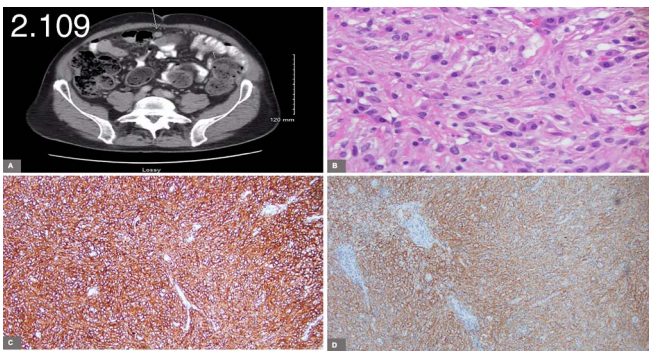
Extragastrointestinal stromal tumors (EGISTs) originate from organs outside the gastrointestinal tract and demonstrate immunohistochemical features and molecular characteristics similar to gastrointestinal stromal tumors. The diagnosis of EGIST is challenging because of rarity and unusual locations. The majority of EGISTs have been reported in intra-abdominal and retroperitoneum locations and rarely in the pancreas, prostate, testis, or abdominal wall. The behavior of EGISTs generally tends to be more aggressive. We present a case of EGISTs in spermatic cord, an unusual location that has never been reported. A 69-year-old man presented with left groin abnormality with normal testicular serum tumor markers. Ultrasound revealed a 7.1-cm extratesticular mass. A left radical orchiectomy showed a 7.7-cm circumscribed, tan mass of the spermatid cord with unremarkable testis. Histology revealed a low-grade spindle cell neoplasm demonstrating interspersed inflammatory cells, no necrosis, 3 mitoses/50 HPF, with focal SMA expression (Figure 2.109, A through D). A diagnosis of "low-grade spindle cell proliferation" was rendered. The 12-month follow-up CT of the pelvis discovered multiple, biopsy-confirmed, metastatic mesenteric masses. The patient was referred to us to discuss therapeutic options. On additional histopathologic investigation, the neoplastic cells showed strong positivity for CD117 and DOG1 and molecular testing confirmed *C-KIT* gene mutation. The patient was put on imatinib with periodic follow-up. This case highlights the possibility of this rare tumor involving spermatid cord. Risk factors for predicting a more aggressive behavior include large size, increased mitotic count, and necrosis. EGIST tends to demonstrate a more aggressive behavior, and early diagnosis with complete resection is recommended.



Thoracic SMARCA4-Deficient Undifferentiated Tumors With Unusual Presentations

(Poster No. 110)

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Context: Thoracic SMARCA4-deficient undifferentiated tumor (SMARCA4-UT) is a recently described aggressive neoplasm defined by SMARCA4 inactivating mutations. SMARCA4-UT is a poorly differentiated neoplasm characterized by cells with rhabdoid morphology, high mitotic activity, and abundant necrosis. Cases often present in young adults with a heavy smoking history. Here we describe 3 cases of SMARCA4-UT in older adults, including 1 presenting as a metastatic lesion mimicking a primary bone sarcoma.

Design: Three cases of SMARCA4-UT were identified utilizing a natural language search in CoPath. H&E-stained sections and a broad range of immunohistochemical stains including SMARCA4 were evaluated.

Results: The patients were aged 58, 70, and 70. Two patients had a significant smoking history and the third was unknown. The lesions presented as a paratracheal mass, enlarged mediastinal lymph nodes, and an iliac bone mass. The iliac mass was originally incorrectly diagnosed as an undifferentiated sarcoma, but the patient was subsequently also found to have a lung mass and mediastinal adenopathy. A fine-needle aspiration from a mediastinal lymph node demonstrated similar morphology to the iliac mass (Figure 2.110, C). All cases showed pleomorphic rhabdoid cells, frequent mitoses, and necrosis (Figure 2.110, A and B). SMARC4 immunohistochemistry was negative in all cases (Figure 2.110, D).