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How Much Time Do General Surgical Pathologists Spend on Diagnostic Data Entry?

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mastocytosis, and mast cell sarcoma. A 45-year-old woman presented with pancytopenia and high fever for 3 months. The bone marrow biopsy was markedly hypercellular with interstitial immature infiltrate, perivascular and paratrabecular spindled and atypical mast cell infiltrate (hypogranular with Giemsa stain). The immunohistochemistry showed 30%–40% cells positive for CD34 and CD117 (dim); and 40% mast cells positive for CD25 and CD117, and negative for CD2. The flow cytometry revealed a population of myeloblasts (positive for HLA-DR, CD34, CD117 [dim], and MPO) and a separate aberrant mast cell population (positive for CD25, bright CD123, and CD117). The molecular study showed the presence of *KIT* D816V mutation, confirming the diagnosis of systemic mastocytosis with an associated hematologic neoplasm (SM-AHN), which was acute myeloid leukemia in this case. SM-AHN is a rare entity that requires fulfillment of criteria for systemic mastocytosis and associated hematologic neoplasm for its diagnosis. As per the literature, chronic myelomonocytic leukemia is the most common associated neoplasm with this entity, though in our case the associated neoplasm was acute myeloid leukemia. This entity poses diagnostic challenges and is associated with high-risk disease. With the limited data, splenomegaly, elevated alkaline phosphatase, and mutations in *SRSF2/ASXL1/RUNX1* are considered as adverse prognostic markers in patients with systemic mastocytosis. We recommend that correlation of different techniques should be used for the proper diagnosis and characterization of the disease. This rare entity should be reported to clearly define its pathogenesis and prognostic implications.

A Pediatric Case of Erdheim-Chester Disease

(Poster No. 127)

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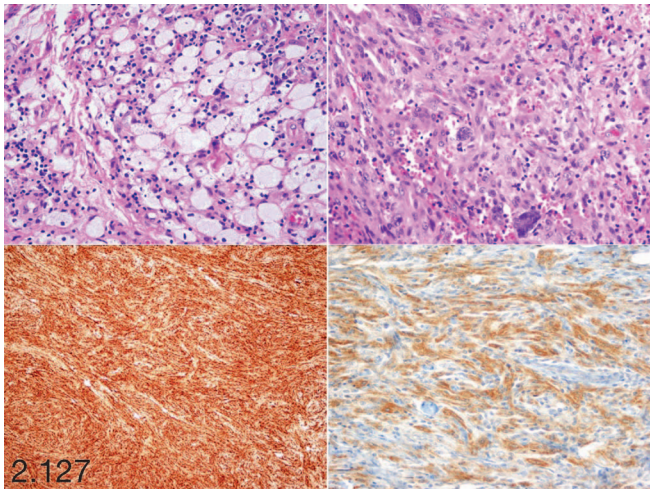
Erdheim-Chester disease (ECD) is a rare, systemic form of non–Langerhans cell histiocytosis of unknown etiology. It primarily affects adults, but rare pediatric cases have also been diagnosed. Virtually any organ or tissue can be infiltrated by ECD and some patients may not have typical bilateral and symmetric involvement of long bones. Mutation of *BRAF* V600E has been found in more than 50% of cases and it can be detected by immunohistochemistry. We report a case of a 9-year-old boy with a clinical history of Langerhans cell histiocytosis (LCH). He presented an infiltrative lesion in the frontoparietal region with skull and bilateral orbit involvement. Histology showed diffuse infiltration by histiocytes, some with single small nuclei and foamy cytoplasm, and others with eosinophilic cytoplasm. A few Touton-like giant cells were observed, and fibrosis and lymphocytes were also present (Figure 2.127). On immunohistochemistry studies, the histiocytes were positive for CD68, CD163, and BRAF protein, and negative for CD1a, S100, CD21, and CD23. *BRAF* V600F mutation testing was positive. With these findings, the diagnosis of pediatric ECD was suggested. Recently a classification system has been proposed, with EDC and LCH included in the L group. Both diseases share common properties and overlap can occur in up to 12% of ECD cases. This association was presented in this case. The rarity of the disease can make the diagnosis challenging. Therefore, a multidisciplinary approach with radiologic and histopathologic criteria is required. Furthermore, the presence, of *BRAF* mutation can be useful to confirm difficult cases.



Chronic Myelocytic Leukemia With Erythro-leukemic Blast Crisis

(Poster No. 128)

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Here we report the case of a 56-year-old man who presented to his primary care office with rapid onset symptoms of dorsalgia with lower extremity paresthesia, weight loss, fevers, chills, and night sweats. Magnetic resonance imaging incidentally identified diffuse abnormal marrow signal throughout the lumbar spine and additional areas of soft tissue densities within the epidural spaces. CT of the chest, abdomen, and pelvis identified splenomegaly and scattered lytic bone lesions. The peripheral blood smear revealed a leukocytosis with a left shift and occasional blasts. Flow cytometry, on whole blood, revealed a granulocytic left shift with 0.5% circulating blasts. These results prompted a bone marrow biopsy to be performed, which demonstrated hypercellularity (95%), with increased erythroblasts, myeloblasts, and mild erythroid dyspoiesis. Immunohistochemistry for CD71 identified a significant erythroid population in the marrow as well as a prominent $CD34^{+}$ myeloblast population. Flow cytometry performed on the bone marrow detected 33.9% large myeloblast population. Bone marrow cytogenetic analysis revealed a complex karyotype. *BCR/ABL1* fluorescence in situ hybridization was positive for gene rearrangements. Molecular studies, performed on whole blood, revealed a t(9:22) *BCR-ABL1* major p210 fusion. This is an unusual case because the peripheral blood initially favored an erythroid leukemia morphologically; however, upon additional testing, the *BRL/ABL1* translocation was discovered, revealing the origin of erythroid leukemia to be from chronic myelocytic leukemia. Chronic myelocytic leukemia with erythroid crisis is a rare entity with only a few reported cases of transformation of underlying chronic myelocytic leukemia to acute erythroid leukemia.

Cost Analysis of Orchiectomy Specimens From Patients With Gender Dysphoria

(Poster No. 129)

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Context: Hormonal therapy followed by orchiectomy is an integral part of management of gender dysphoria. The orchiectomy specimens from these patients are routinely subjected to histopathologic evaluation. The histopathologic findings are usually hormonal therapy related and are consistent and uniform. We intended to perform a cost analysis of these specimens.

Design: Orchiectomy specimens from patients with gender dysphoria received at our institution from February 2019 to February 2021 were included in the study. Data including patient age, weight of the testicles, number of tissue sections, processing cost, and histologic findings were collected.

Results: A total of 66 specimens were identified. Mean age of the patients was 35.9 ± 14.2 years. Mean weight of the testes were 28.1 ± 8.8 g (right) and 27.8 ± 9.4 g (left). Histologic evaluation showed hyalinization around seminiferous tubules and diminished/absent spermatogenesis in most cases. No tumor or unexpected findings were identified in any case. Mean number of tissue sections submitted per case was 5.7 ± 1.2. The estimated cost of processing, including technician labor, was $41.75 per specimen.

Conclusions: Orchiectomy specimens from patients with gender dysphoria almost always demonstrate hormonal therapy effect and chances of discovering any incidental finding of clinical significance are negligible. Diligent gross inspection and minimal tissue sampling with additional sampling reserved for gross abnormality can adequately document the histologic findings in a cost-effective manner.

How Much Time Do General Surgical Pathologists Spend on Diagnostic Data Entry?

(Poster No. 130)

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of Pathology, Princeton Medical Center, Plainsboro, New Jersey; [3]Department of Pathology, Loyola University Medical Center, Maywood, Illinois.

Context: As many pathology institutions have eliminated transcription service by office assistants, pathologists assume the task of diagnostic data entry (DDE) into pathology reports in the laboratory information system. This is not a trivial undertaking, yet tangible data are lacking on how much DDE adds to the workload of pathologists. Without such data, it is very difficult to assess the financial benefit of such a task shift and establish benchmarks.

Design: Four practicing pathologists covering a general surgical pathology service in 3 institutions with different laboratory information systems were selected for their dominant DDE method (speech recognition, pre-text, or manual typing) to generate greater than two-thirds of their pathology reports. In each sign-out session, the starting and ending times of the session were recorded. An online stopwatch was used to collate the DDE time for each surgical case during the session. Time for other activities, such as case information retrieval, slide review, and filling out a synoptic report, was not counted.

Results: Time for DDE, out of a total of 156 hours of consecutive sign-out sessions, was recorded. Judging by the ratio of "slides/specimen part/case," the specimen-type mix appears typical of the general pathology service of a tertiary health care center. The results summarized in the Table demonstrate that pathologists spent >24.8% of sign-out time for DDE (median, 28.5%; quartile, 25.7%–29.5%).

Conclusions: With about 28.5% sign-out time devoted to DDE, the established workload of pathologists should be recalibrated. Since 1 full-time transcriptionist can cover DDE for 4–5 pathologists, the financial benefit of shifting DDE to pathologists should be reassessed.

Summary of DDE Time by Pathologists

Pathologist	Main DDE Method	Total Time, h	DDE Time, Mean, %	SD
1	Speech recognition	68.82	24.83	5.65
2	Pre-texted	31.51	28.78	5.81
3	Pre-texted	48.50	29.74	5.40
4	Manual typing	7.20	28.29	6.98
Combined		156.03	29.07	5.77

Intriguing Simultaneous Intestinal Spirochetosis and Lymphocytic Colitis in an 80-Year-Old Man With Heavy-Chain Gamma Globinemia

(Poster No. 131)

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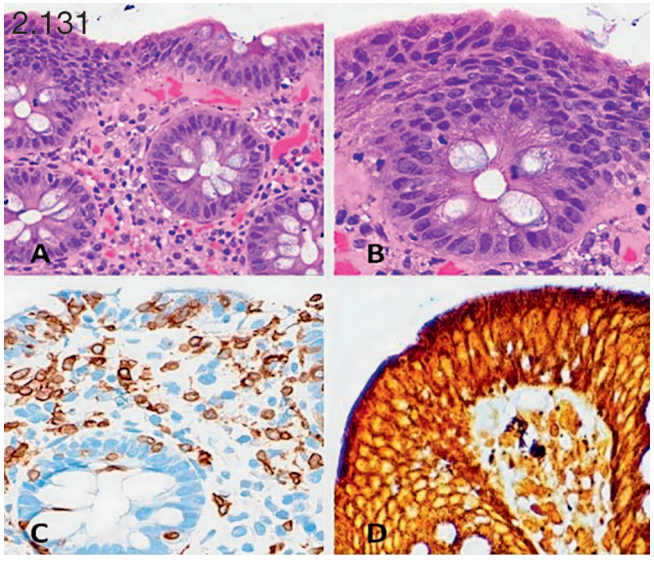
Intestinal spirochetosis and lymphocytic colitis are both rare clinical encounters in patients diagnosed with neoplastic diseases. The pathogenesis of lymphocytic colitis is not well understood, and although a possible role of pathogenic microorganisms has been proposed, there are no reports on simultaneous spirochetosis and lymphocytic colitis in a single patient in the English literature. When managing patients with neoplasm history, "nonmalignant" findings should not be missed or omitted in order to solve the puzzle and to optimize patient care. An 80-year-old man with heavy-chain γ globinemia not requiring systemic therapy reported several months of diarrhea with intermittent abdominal cramping refractory to lifestyle changes. Clinically enterocolonic amyloidosis was suspected and a colonoscopy was performed. The colonoscopy was unremarkable; hence random biopsies were obtained. Microscopic examination identified architecturally intact colonic mucosa with diffuse regeneration, intraepithelial lymphocytosis, and peculiar "false brush border," and goblet cell–sparing basophilic epithelial fringe. Findings suggest coexisting lymphocytic colitis and spirochetosis (Figure 2.131, A and B). Subsequent immunohistochemistry (Figure 2.131, C) and special stains (Figure 2.131, D) confirmed both entities and excluded the hypothesis of amyloidosis. The patient was managed accordingly, with quick resolution of his symptoms. This unique case highlights a new codiagnosis in the setting of chronic diarrhea with no endoscopic mucosal lesion. It could be easily missed, particularly in patients with neoplasm history, which could cause delays in diagnoses and treatment. This report highlights the impact of timely recognition of rare diseases in ensuring proper patient management.



Optimizing Fluorescence In Situ Hybridization Test Utilization in Unsorted and CD138-Enriched Samples of Plasma Cell Myeloma at Diagnosis Versus Persistent/Relapsed Disease

(Poster No. 132)

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Context: Fluorescence in situ hybridization (FISH) testing on enriched $CD138^+$ plasma cells assists in identifying genetic abnormalities for risk stratification in multiple myeloma. Limited specimens are often encountered, precluding evaluation using all the desired probes. Therefore, to optimize test utilization, we assessed FISH detection rates among unsorted and CD138-enriched samples.

Design: A total of 439 patients with a plasma cell neoplasm (257 unsorted, 182 CD138-enriched) were examined by FISH for abnormalities of 3, 7, 11, *TP53*, 1q21(*CKS1B*), and *IGH*. *IGH* rearrangement triggered reflex testing for t(4;14) and t(14;16), and t(11;14). Differences between enriched and unsorted cases at diagnosis and persistent and relapse (P/R) disease were assessed.

Results: Overall, abnormalities were detected more often in enriched versus unsorted samples for 1q21 (46/137 versus 36/183, $P = .005$), hyperdiploidy (46/137 versus 36/183, $P = .005$), and *IGH* (36/137 versus 22/183, $P = .001$), although no differences were seen in detection of *TP53* aberrations. At diagnosis, 1q21 and *IGH* rearrangement abnormalities were detected more frequently in enriched samples ($P = .03$ and .01, respectively) (Table), whereas no difference in detection rate was noted in P/R samples with any of the probes (Table). The frequency of t(11;14), t(4;14), and t(14;16) upon reflex testing at diagnosis was 46%, 16%, and 6%, respectively, versus 33%, 11%, and 11% in P/R disease.

Conclusions: Difference in the detection of FISH abnormalities between unsorted and enriched specimens is dependent on disease state and probe type. We therefore propose a 2-tier testing algorithm for enriched samples with *IGH* and *CKS1B* testing at diagnosis and *IGH*, *CKS1B*, and *TP53* assessment for P/R disease.