Anatomic pathology selected abstracts

Editors: Rouzan Karabakhtsian, MD, PhD, professor of pathology and director of the Women's Health Pathology Fellowship, Albert Einstein College of Medicine, Montefiore Medical Center, Bronx, NY; Shaomin Hu, MD, PhD, staff pathologist, Cleveland Clinic; S. Emily Bachert, MD, breast pathology fellow, Brigham and Women's Hospital, Boston; and Amarpreet Bhalla, MD, assistant professor of pathology, Albert Einstein College of Medicine, Montefiore Medical Center.

Metastasis to the thyroid gland: a single-institution 16-year experience

November 2021—Metastasis to the thyroid gland is a rare occurrence that may pose a diagnostic challenge. The authors reported on the clinicopathological features, immunoprofile, molecular alterations, and outcomes of 30 patients with thyroid metastases who were treated at Memorial Sloan Kettering Cancer Center from 2003 to 2019. The most common site of the primary tumor was the kidney, followed by the lung, lower gastrointestinal tract, and breast. In seven (23 percent) patients, the thyroid metastases were resected prior to diagnosis of the primary tumors. Six (20 percent) patients had thyroid as the sole metastatic site. Three (10 percent) patients harbored tumor-to-tumor metastasis. The majority of thyroid metastases manifested as a unilateral and unifocal distinct nodule within the thyroid gland. Among 13 cases that initially were diagnosed at another hospital, four (31 percent) were misinterpreted as thyroid primary. An immunohistochemical panel of thyroid follicular cell markers was most useful for differentiating primary thyroid tumors from metastases. Molecularly, the metastases showed alterations characteristic of the primary tumor, which may be helpful in establishing the diagnosis and primary site. Although the prognosis was poor, with a five-year disease-specific survival rate of 58 percent, a long-term cure was possible for patients with oligometastasis successfully treated with surgery. The authors concluded that metastasis to the thyroid gland is an uncommon phenomenon, with an incidence of 0.36 percent for all thyroid malignancies. It may present as a solitary thyroid mass before the discovery of the primary tumor, posing a diagnostic challenge. Although the overall prognosis is poor, a subset of patients with oligometastasis can be managed surgically.

Ghossein CA, Khimraj A, Dogan S, et al. Metastasis to the thyroid gland: a single-institution 16-year experience. *Histopathology*. 2021;78:508–519.

Correspondence: Dr. Bin Xu at xub@mskcc.org

Colorectal adenocarcinomas diagnosed after a negative fecal immunochemical test

The fecal immunochemical test is used every two years to screen average-risk British Columbians aged 50 to 74 years, with follow-up colonoscopy for positive results. Non-screen–detected colorectal adenocarcinomas are defined as those detected within 25 months of a negative fecal immunochemical test (FIT). The authors conducted a study to more clearly characterize these malignancies. They conducted a medical chart and focused pathology review of colorectal malignancies from 926 people who completed a FIT in the British Columbia Colon Screening Program in 2014 and whose pathology reports were available for review. This cohort was divided into two groups: people with colorectal adenocarcinomas diagnosed following a positive FIT (screen detected) and those with colorectal adenocarcinoma diagnosed within 25 months of a negative FIT (FIT-interval cancers). Rates of clinically relevant pathological parameters, as outlined in the American Joint Committee on Cancer (AJCC), eighth edition, were compared between the screen-detected and FIT-interval cancer groups. A total of 876 screen-detected and 50 FIT-interval cancers were identified. FIT-interval cancers exhibited higher rates of high-grade differentiation (including poorly differentiated and undifferentiated cases; $P < 0.01$) and aggressive histotype (signet ring cell and mucinous carcinomas; $P < 0.01$) than did screen-detected cancers after Bonferroni correction. Therefore, colorectal adenocarcinoma diagnosed after a negative FIT may be associated with worse prognostic determinants than screen-detected cancers. The authors concluded that FIT-interval cancers are associated with high-risk pathological features. The possibility that more aggressive, fast-growing lesions arise in the interval after truly negative FITs cannot be ruled out.

Steel MJ, Bukhari H, Gentile L, et al. Colorectal adenocarcinomas diagnosed following a negative faecal immunochemical test show high-risk pathological features in a colon screening programme. *Histopathology*. 2021;78(5):710–716.

Correspondence: Dr. Michael J. Steel at smike@alumni.ubc.ca

A digital pathology solution for the tissue floater conundrum

Pathologists may encounter extraneous pieces of tissue, or tissue floaters, on glass slides because of specimen cross-contamination. Troubleshooting this problem, including performing molecular tests for tissue identification, is time-consuming and often does not resolve the problem. The authors demonstrated the feasibility of using an image search tool to resolve the tissue floater conundrum. A glass slide was produced containing two H&E-stained tissue floaters. This fabricated slide, along with the two slides containing the original tumors used to create the floaters, was digitized. The slides were then embedded into a data set of 2,325 whole slide images comprising a wide variety of H&E-stained diagnostic entities. Digital slides were broken into patches and the patch features converted into barcodes for indexing and easy retrieval. A deep learning-based image search tool was used to extract features from patches via barcodes, allowing image matching to each tissue floater. The likelihood of finding a correct tumor match for the queried tissue floater when searching the digital database was very high. Search results repeatedly yielded a correct match within the top three retrieved images. Retrieval accuracy improved when greater proportions of the floater were selected. Searches were completed within several milliseconds. The authors concluded that using an image search tool offers pathologists an additional method to rapidly resolve the tissue floater conundrum, especially pathologists working in laboratories that are fully digital for primary diagnosis.

Pantanowitz L, Michelow P, Hazelhurst S, et al. A digital pathology solution to resolve the tissue floater conundrum. *Arch Pathol Lab Med*. 2021;145(3):359–364.

Correspondence: Dr. Liron Pantanowitz at lironp@med.umich.edu

Aberrant GATA3 staining in prostatic adenocarcinoma: a potential diagnostic pitfall

Distinguishing between poorly differentiated urothelial carcinoma and high-grade prostatic adenocarcinoma in genitourinary pathology can be challenging, particularly when the tumor involves the bladder neck or prostatic urethra. Distinguishing between these two tumors can also be difficult from a clinical perspective. Proper diagnosis of patients with these tumors is essential as they have differing prognoses and clinical management. GATA3 is considered a sensitive and relatively specific marker of urothelial carcinoma. However, there is scant data regarding GATA3 labeling of high-grade prostatic adenocarcinoma. The authors conducted a study to describe rare cases of prostatic adenocarcinoma with strong aberrant GATA3 staining as a potential diagnostic pitfall. They identified nine cases of prostatic adenocarcinoma with aberrant positive GATA3 staining, from 2015 to 2020, through a large consultation service at their institution. All nine cases were grade group five; eight had a Gleason score of 5 + 5 =10; and one had a score of 4 + 5 = 9. Five cases were from the prostate, three from the urinary bladder, and one from the prostatic urethra. All cases were morphologically typical of high-grade prostatic adenocarcinoma but were sent for consultation due to uncertainty about the diagnosis. GATA3 positivity was strong diffuse in four cases; strong patchy in two cases; and strong focal in three cases. All cases were positive for NKX3.1, while six were positive for p501s and six were positive for PSA. Seven of nine cases showed expression of at least two prostate-specific markers. The study indicated that rare cases of prostatic adenocarcinoma can show focal or diffuse strong staining for GATA3. To avoid this diagnostic pitfall, undifferentiated carcinomas involving the prostate, bladder neck, or trigone should be evaluated not only with GATA3 but also prostate-specific markers.

McDonald TM, Epstein JI. Aberrant GATA3 staining in prostatic adenocarcinoma: a potential diagnostic pitfall. *Am J Surg Pathol*. 2021;45(3):341–346.

Correspondence: Dr. Jonathan I. Epstein at jepstein@jhmi.edu

Adequacy of breast carcinoma margins in radioactive seed and wire-guided localization lumpectomies

Image-guided preoperative localization helps surgeons resect nonpalpable breast cancers. The authors conducted a study to compare the adequacy of specimen margins for invasive breast cancer (IBC) and ductal carcinoma in situ (DCIS) after radioactive seed localization (RSL) versus wire-guided localization (WGL). They retrospectively reviewed 600 cases at a Canadian academic center from January 2014 to September 2017. The authors compared surgical margins, re-excisions and re-operations, localization accuracy, major complications (migration, accidental deployment, and vasovagal reaction), and operative duration between RSL and WGL cases. Invasive breast cancer margins were positive in seven percent of RSL and six percent of WGL cases ($P=0.57$). Tumor size ($P=0.039$) and association with DCIS ($P=0.036$) predicted positive margins in invasive carcinoma. DCIS margins were positive in six percent and eight percent and close (2 mm or less) in 37 percent and 36 percent ($P=0.45$) of RSL and WGL cases, respectively. Extensive intraductal component predicted positive DCIS margins ($P<0.0001$). No significant differences in intraoperative re-excisions ($P=0.54$), localization accuracy ($P=0.34$), and operation duration ($P=0.81$) were found. Re-operation for lumpectomies and mastectomies was marginally higher for WGL than RSL ($P=0.049$). The authors reported 11 (four percent) WGL and no RSL complications ($P=0.03$). Overall, positive margins for IBC, close or positive margins for DCIS, intraoperative re-excision, localization accuracy, and operation duration in RSL and WGL were similar. The fact that the re-operation rate was higher in WGL than RSL may reflect practice changes over time. RSL was safer than WGL and had lower complication rates.

Law W, Cao X, Wright FC, et al. Adequacy of invasive and in situ breast carcinoma margins in radioactive seed and wire-guided localization lumpectomies. *Breast J*. 2021;27(2):134–140.

Correspondence: Dr. Wyanne Law at wyanne.law@gmail.com

Use of timestamp data to assess voice recognition for grossing biopsies

Studies on the adoption of voice recognition in health care have primarily focused on turnaround time and error rate and less on the impact of voice recognition on provider efficiency. The authors conducted a study to assess the impact of voice recognition on the efficiency of grossing biopsy specimens. They retrieved timestamps corresponding to barcode scanning for biopsy specimen bottles and cassettes from their pathology information system database. The time elapsed between scanning a specimen bottle and the corresponding first cassette was the length of time spent on the gross processing of that specimen and was designated as the specimen time. For the first specimen of a case, the specimen time also included the time spent dictating the clinical information. Therefore, the specimen times were divided into first-specimen time and subsequent-specimen time. Univariate and multivariate analyses were used to study the impact of voice recognition on specimen times. The major determinants of specimen times were specimen complexity, prosector variability, length of clinical information text, and the number of biopsies the prosector grossed that day. The authors found that adopting voice recognition had a negligible impact on specimen times. They concluded that using voice recognition in the gross room removes the need to hire transcriptionists without negatively impacting the efficiency of the prosectors, resulting in cost savings. Using computer scripting to automatically enter clinical information (received through the electronic order interface) into report templates potentially may increase grossing efficiency in the future.

Ye JJ, Tan MR, Shum CH. Using timestamp data to assess the impact of voice recognition on the efficiency of grossing biopsies. *Arch Pathol Lab Med*. 2021;145(5):599–606.

Correspondence: Dr. Jay J. Ye at jye@dahlchase.com