Q & A Column, 2/13

Submit your pathology-related question for reply by appropriate medical consultants. CAP TODAY will make every effort to answer all relevant questions. However, those questions that are not of general interest may not receive a reply. For your question to be considered, you must include your name and address; this information will be omitted if your question is published in CAP TODAY.

Submit a Question

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[pulledquote]Q. What are the limitations of using myoepithelial markers in diagnostic breast pathology?[/pulledquote]

A. Immunohistochemical studies using antibodies to highlight myoepithelial cells (MEC) can be useful adjuncts to traditional morphologic diagnosis in the practice of breast pathology.

Antibodies commonly used to detect MEC include smooth muscle actin, calponin, smooth muscle myosin heavy chain, p63, CD10, cytokeratin 5/6, and p75, and each shows varying sensitivity and specificity.[1–4] The presence of MEC may indicate a noninvasive process, but there are several settings in which caution should be exercised when interpreting immunohistochemical results. For example, sclerotic lesions, such as radial scars and sclerosed papillomas, may show decreased numbers of MEC or decreased intensity of expression of MEC markers.[4,5] Moreover, if the lesion has been previously biopsied, MEC may not be well preserved due to disruption and reaction to the procedure. Myoepithelial markers may also be absent in the setting of ductal carcinoma in situ (DCIS), especially high-grade DCIS.[5] The question of microinvasion associated with high-grade DCIS is a common diagnostic dilemma. One can be confident of a noninvasive process if at least some MEC are present surrounding the suspicious area. However, the absence of MEC in this setting does not *guarantee* an invasive process. It is recommended that a panel of MEC markers be used, rather than relying on a single antibody.

In general, the presence of MEC supports a noninvasive process, but there are instances when invasive carcinoma may show myoepithelial differentiation. For instance, adenoid cystic carcinoma expresses p63. Metaplastic carcinomas, as well as triple-negative carcinomas with basaloid features, express myoepithelial markers.[6] In general, the irregular infiltrative pattern on H&E is characteristic of invasive carcinoma, but being aware of myoepithelial differentiation in these settings will prevent confusion in interpretation.

In summary, the presence of MEC supports a noninvasive process, but the results of immunohistochemical studies for MEC expression should be interpreted within the morphologic context.

References

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Jean F. Simpson, MD
Vanderbilt University, Nashville
Member, CAP Immunohistochemistry Committee

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[pulledquote]Q. Our neonatal blood specimens are frequently hemolyzed. Our Beckman Coulter instrument gives a hemolysis index (0–10). [/pulledquote]
If the hemolysis index is greater than 4, no value for K+ is reported and the lab generates an order for a repeat K+. If the second specimen is too hemolyzed for analysis of K+, we call the pediatrician to ask if a third specimen should be drawn. Often the pediatrician will ask that we "release" the K+ result on the hemolyzed specimen. How does the CAP recommend handling this situation? What do you think about "corrected" K+ as described by Owens, et al. (Correction of factitious hyperkalemia. Am J Emerg Med. *2005;23:872–875)? I have been reluctant to attempt these "corrections."*

A. Hyperkalemia is common, especially in hospitalized patients, but it is commonly an artifact. Spurious hyperkalemia (also called pseudohyperkalemia) is almost always caused by the release of intracellular potassium during phlebotomy or specimen processing.

It may also be seen in serum specimens due to the release of potassium by platelets during the clotting process (especially if there is thrombocytosis) and in plasma specimens when the patient has leukemia (because the tumor cells may be unusually fragile). But certainly any degree of red blood cell lysis will significantly raise the potassium level.

Phlebotomists should avoid drawing blood through intravenous catheters or injecting blood into evacuated tubes using a syringe. Even though the red blood cells of neonates may be slightly more resistant to traumatic hemolysis than adult red cells, drawing blood from small patients without some degree of trauma may be difficult.

The CAP checklist item CHM.11900 (specimen rejection) recommends "instructions for the special handling of suboptimal specimens" but does not offer much detail. Most laboratories that screen specimens for hemolysis using "index" measurements employing bichromatic wavelength pairs probably do exactly what your laboratory does. The maneuver described in the report you cite (measuring plasma hemoglobin and using an estimate of the amount of potassium presumably released to correct the elevated level) is probably not widely used. The authors wisely acknowledged that, because their study was performed using adult blood, using the same correction factor for neonates would have to be validated. I was unable to find a subsequent report showing this.

The best solution for neonates in whom it is not possible to obtain a venous blood sample without hemolysis is to measure whole blood potassium in capillary blood, using a blood gas analyzer or point-of-care device.

James D. Faix, MD
Stanford Clinical Labs at Hillview
Stanford University School of Medicine, Palo Alto, Calif.
Member, CAP Chemistry Resource Committee,
Standards Committee, Council on Scientific Affairs

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Dr. Kiechle is medical director of clinical pathology, Memorial Healthcare, Hollywood, Fla. Use the reader service card to submit your inquiries, or address them to Sherrie Rice, CAP TODAY, *325 Waukegan Road, Northfield, IL 60093;* srice@cap.org.