Cytology as a Diagnostic Tool in the Autopsy Suite

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As a physician who has worked for more than 20 years as both a cytopathologist and an autopsy pathologist for an institution that pioneered the use of the decedent affairs office and places great value on the autopsy, it is a pleasure to see articles that tout the value of cytodiagnosis in the autopsy suite. Andrade et al provide evidence showing that postmortem tissue scrapings have reasonable accuracy in comparison with histology, and they suggest the use of scraping cytology as a means of performing a minimally invasive autopsy. A recent editorial supports the use of cytology in providing rapid and more comprehensive provisional reports. The accuracy and utility of postmortem cytology for both neoplastic and nonneoplastic conditions are supported by 3 previously published cytology-histology/final autopsy diagnosis correlation studies that used scrapings and fine-needle aspiration (FNA), touch preparations, and scrapings, respectively. It has also been suggested that postmortem cytology has the potential to cut autopsy costs either by providing a rapid, relatively inexpensive cytodiagnosis or by offering a screening tool with which pathologists can select cases that require histology and ancillary studies such as immunohistochemistry. In addition, it has been noted that that postmortem cytologic preparations are of better quality and require less personnel time and equipment than frozen sections and that cytology precludes the potential for cryostat contamination and aerosolization of infectious agents.

One of the arguments for the use of cytodiagnostic techniques in the autopsy is the potential for minimal disruption of the corpus in an era when next-of-kin full-autopsy consent has become more difficult to obtain and decedent affairs officers, trained to communicate with family members, are rare and vanishing. However, cytodiagnostic techniques also have the potential to contribute to the full autopsy, especially in an academic institution where complete autopsies are needed to train house officers and for multidisciplinary conferences. I have used scrapings, FNA smears, and FNA and fluid cytocentrifuge preparations since 1991 to establish preliminary autopsy diagnoses (PADs) and direct the use of ancillary testing such as microbial cultures and special stains. We have limited the use of postmortem cytologic sampling to regions with either visible or palpable lesions, diffuse consolidations, or organs with clinical or radiologic evidence of disease; we have thus increased the likelihood that cytology will provide useful information. Gradually, postmortem cytology has been introduced into our armamentarium of postmortem diagnostic tools and has been used, albeit selectively, at our institution for many years. Whenever possible, a cytopathologist has reviewed cytologic preparations with residents or faculty on the autopsy service before the PAD is issued, and occasionally, images of interesting cytologic findings have been shown during gross organ conferences. Ideally, this should be done after residents and faculty participants discuss their gross differential diagnoses.

Using a combination of Romanowsky and Papanicolaou staining with occasional use of special stains, cytologic diagnostic techniques can 1) generate a more specific PAD, 2) be used to make gross organ conferences
more educational by providing immediate feedback to gross diagnoses, 3) guide the judicious use of ancillary tests (especially microbial cultures), 4) provide an early introduction to cytdiagnosis to junior-level residents with the intent of not only educating but also generating enthusiasm for cytology, and 5) provide diagnoses from FNA of joint cavities, the face, deep nasal sinuses, and regions that are not readily accessed by incision and from cytocentrifuge preparations of body cavity fluids. We have used FNA to diagnose such conditions as bacterial infections of the paranasal sinuses, septic gouty arthritis of the knee joint, gouty tophus of the elbow region, and parotid gland abscesses. Postmortem cultures can readily be performed from FNA of these regions.

Given that our institution’s patient population has a high prevalence of AIDS, tuberculosis, and other infectious diseases, we have found that cytology is an accurate diagnostic strategy for both nonneoplastic (especially infectious) disorders and neoplastic diseases.5

There are several additional advantages of cytology in the academic autopsy suite. It has been our experience that occasionally cytology can detect findings not noted either by gross examination or in histologic sections, can provide the prosector with additional insight into the disease process, and can generate some interesting and unusual material for educational presentations, textbooks, and publications by faculty and house officers.10–12 During the past 25 years, we have used cytology preparations for intramural morbidity and mortality conferences, grand rounds presentations, and regional and national meeting presentations, and we have thus emphasized the educational opportunities provided by autopsy cytology. We have found, as others have, that despite occasional limitations due to autolysis, cytologic postmortem preparations tend to be of good quality.

Although cytdiagnosis in the autopsy suite is underused and at least 1 autopsy textbook states that “cytologic examination has little use in standard autopsy practice,”13 several authors have now attested that cytodiagnostic techniques have considerable value in the autopsy suite.3–9

The limitations of using only cytology for autopsy diagnoses are mostly the inability to see the tissue architecture and relation of the disease process to the normal tissue, the limited material for ancillary stains and studies, and the need for an evaluation by pathologists with both interest and expertise in cytopathology. Similar limitations apply to cytology as a sole diagnostic strategy in the living; however, very few would question its value.

Declining autopsy rates are an indisputable fact, and Andrade et al3 cite a few of the reasons for this trend. Others reasons for the decrease in autopsy rates include the widespread use of antemortem imaging, blood tests, biopsies, and cytology, which leads to the sometimes incorrect assumption that the cause of death is already known and that an autopsy is thus redundant and unnecessary.1,2,14–16 Pathologists’ distaste for the autopsy procedure unfortunately aids and abets the death of the autopsy. Although clinicians’ fear of litigation has been cited as a reason for declining autopsy rates, studies have found that an autopsy does not increase litigation but, on the contrary, may prevent law suits or provide a defense for physicians by disproving clinician neglect or malpractice.2 Cost is another factor adversely affecting the autopsy because postmortem studies are not reimbursable procedures. This downward autopsy trend will be very difficult to reverse without educating patients and clinicians, using trained decedent affairs officers to discuss the autopsy with and request consent from family members, teaching pathology trainees to appreciate the autopsy, and convincing hospital administrators that the autopsy is valuable. It is not clear whether the use of scrape cytology will increase next-of-kin autopsy consent because opening the body is still required if one wishes to sample deep organs; however, limiting the cost of the autopsy by using cytology to provide rapid-turnaround microscopic diagnoses and potentially cut down on unnecessary tissue sectioning should be pleasing to both cost-conscious administrators and pro-autopsy forensic and academic pathologists. It is not my opinion that cytdiagnosis should routinely replace standard histology, but it can substitute for frozen sections and help focus tissue sampling and special studies to areas that are most likely to contain significant pathologic conditions. Scrape (and FNA) cytology could also preclude the necessity for organ removal in select cases where the family desires full retention of organs.

Postmortem diagnosis by computed tomography, magnetic resonance imaging, and endoscopy has been attempted.3,17,18 Intracorporeal gas can interfere with postmortem tissue imaging by computed tomography, magnetic resonance imaging, and ultrasonography.17,18 Postmortem portable ultrasound-guided FNA is a technique that may merit exploration because this procedure can be performed by pathologists; however, Charlier et al18 reported difficulties
with the use of ultrasound for postmortem diagnosis because of both the presence of interstitial gas and rigor mortis. Still, pathologist-performed postmortem ultrasound-guided FNA of select mass lesions may be worth investigating.

In summary, the use of postmortem cytology has recently been proposed by pathologists seeking a minimally invasive autopsy with more specific provisional autopsy diagnoses. It is my opinion that cytodiagnostic autopsy techniques contribute to pathology education, quality assurance, and scholarly activities, provide a means of providing immediate feedback and more specific PADs, and preclude the need for removing organs in cases where religious or ethnic beliefs forbid violation of the body. Perhaps the greatest potential for cytology in the autopsy suite is thus not to replace standard histology but to improve the benefits of the standard autopsy for both clinician and pathology trainee education. It is a great pleasure to see postmortem cytology introduced to the cytopathology literature. I hope that interest in this diagnostic strategy will increase and that it will be continue to be explored.

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REFERENCES