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Cytology cases of the week: an educational tool that improves trainee exposure to cytology

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Introduction The Accreditation Council for Graduate Medical Education requires residents to examine 1500 cytology specimens by the end of residency. Cytology cases of the week (COWs) were instituted in 2010-2011 in an effort to increase trainee exposure to cytology.

Materials and methods Images of 2 to 5 cases with basic clinical information are sent to residents weekly. Residents have 1 week to respond by e-mail; after which, correct answers are e-mailed. Cytology resident in-service examination (RISE) scores were used to assess the effectiveness of COWs. Additionally, a feedback survey was distributed to trainees to determine the perception of COWs as a teaching tool.

Results An unpaired two-sided *t* test showed residents who participated in COWs scored 15.4% higher on the RISE than residents who participated minimally or not at all over the 5-year period ($P < 0.05$). In 2014-2015 and 2015-2016, when COWs were minimally and not at all offered, we saw a significant decrease in average cytology RISE scores compared with prior years when COWs were offered ($P < 0.05$). There was no correlation between percentage of correctly submitted answers for COWs and RISE scores. The vast majority (83%) of trainees reported participating in COWs for self-study, and the majority (86%) felt participation in COWs increased their cytology knowledge. Major reasons for not participating included technical challenges and time limitations.

Conclusions COWs are an effective educational tool that increase resident fund of knowledge in cytology. Residents who participate in COWs perform higher on the RISE, regardless of percentage of correctly submitted answers. Published by Elsevier Inc. on behalf of American Society of Cytopathology.

Introduction

Cytopathology is a major subspecialty in Anatomic Pathology practice. Topics pertaining to cytopathology account for a significant proportion of questions on the

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American Board of Pathology Primary Certifying Examination. The Accreditation Committee for Graduate Medical Education requires residents to examine at least 1500 cytology specimens by the end of their training.[1] The American Society for Cytopathology further recommends a minimum of 3 months dedicated to cytology, preferably interspersed as weeks throughout the entire training period.[2]

Cytology training for a resident can be widely variable across and even within programs because of the daily variation in the number and quality of cases. Many residency programs are spread across multiple campuses, which also contributes to the variability in cytology training within a program. Additionally, residents may be pulled from their cytology experience for cross-coverage or to take vacation, complicating efforts to offer residents a standardized cytology curriculum. In an attempt to enhance the cytopathology training experience, we started cytology cases of the week (COWs) in the 2010-2011 academic year at the University of California, San Francisco (UCSF).

The resident in-service examination (RISE) administered by the American Society for Clinical Pathology is a well-established method of assessing pathology knowledge, used by 100% of the pathology training programs in the United States.[3] Rinder et al found that senior residents with higher RISE scores are more likely to pass the American Board of Pathology (ABP) certifying examination on the first attempt, and, further, "mean scores for the cytopathology and surgical pathology subsections were higher for residents who passed the exam when compared to residents who failed.[3] Here, we use cytology RISE scores to measure the effectiveness of COWS as a teaching tool.

Materials and methods

COWs are offered weekly. Basic clinical information for 2 to 5 cases are sent each week via e-mail to trainees. Images for the cases are stored on the UCSF secure server as well as the password-encoded portion of our intradepartmental Web site. Typically, 1 image is provided per case; occasionally, additional images and/or immunohistochemical stains are included. Examples of how cases are formatted are seen in Figs. 1 and 2.

Cases are selected to demonstrate a wide variety of cases ranging from straightforward classic features of common entities to more challenging or rare cases. Trainees have 1 week to respond by e-mail; after which, answers and a new set of cases are provided. Trainee participation is voluntary. All cases are archived by organ system on the UCSF secure server and available for residents to access for future self-study purposes. COWs were routinely offered in academic years 2010 through 2013. In 2014-2015, very few COWs were offered, approximately 15% of what is typically offered in a year. In 2015-2016, no COWs were offered.

Cytology RISE scores were used to measure the effectiveness of COWs as an educational tool. An unpaired two-sided *t* test was used to compare average cytology RISE scores during years COWs were routinely offered (2011-2014) and years prior to the initiation of COWs (2005-2010) as well as to the years when COWs were minimally or not at all offered (2015 and 2016). An unpaired two-sided *t* test was also used to compare cytology RISE scores between participants and nonparticipants in COWs. Minimal participation was defined as participating in fewer than 30% of the COWs available for a given year. In addition, multiple linear regression analysis was performed for each individual year from 2011 to 2015 to determine if the percentage of correctly submitted answers for COWs (compared with simply participating) or postgraduate year level influenced RISE cytopathology scores between the participant and nonparticipant groups.

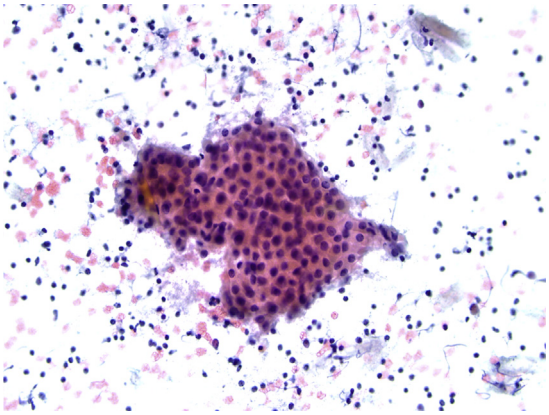

Figure 1 COW example: 60-year-old man with history of lung carcinoma now with PET-positive parotid mass (FNA). Answer: Warthin tumor.

An anonymous feedback survey (Fig. 3) was distributed to trainees using Qualtrics Survey Software to assess perception of COWs as a teaching tool and to obtain feedback on how they could be improved. Postgraduate year and completion or intent to complete cytology fellowship training was recorded. Trainees were queried on how often they participated in COWs, whether or not they submitted answers if they participated, and factors hindering or promoting participation. Trainees were asked to evaluate their current level of cytology knowledge with their pre-training level and comment on COW contributions to any educational growth.

Results

There was a trend toward higher average cytology RISE scores for the residents as a group in the years COWs were routinely offered (2011-2014) compared with prior years (2005-2010), with the difference ranging from 15% to 20%, but this finding did not reach statistical significance ($P = 0.06$). Average cytology RISE scores for 2015 and 2016 (when COWs were minimally or not at all offered)