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Interesting Gross Case Workshop to Remedy Disconnect in Surgical Pathology Curriculum

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Abstract

Introduction: This workshop was created by pathologists' assistants (PAs) who undertake specialized training programs heavily focused on grossing, which is the macroscopic inspection, evaluation, and sampling of pathology specimens for histologic evaluation by a surgical pathologist. Typically, pathologists or their trainees, during training, focus upon microscopic features, with less emphasis on the macroscopic appearance of disease. **Methods:** We developed monthly hour-long "interesting gross case workshops" (IGCWs) led by PAs to aid in the process of educating and refining pathology residents' grossing skills and abilities to diagnose at a macroscopic level. Our workshops include gross photography, grossing vocabulary, reference to standardized sampling manuals, and viewing of a specimen library to reinforce subject matter. This workshop was designed to train multilevel pathology providers including PA students, residents, fellows, and medical students, in addition to actively practicing PAs. This resource offers the audience preparation materials to host a workshop in any medical training facility. **Results:** Our use of the IGCWs has been evaluated positively over a 3-year period, with 78 of 150 participants stating they have increased confidence and capabilities to accurately assess and diagnose at the macroscopic level.

Discussion: Utilizing this workshop can be valuable to teach the importance of a thorough gross description and tissue sampling for the diagnostic process. Future work includes expansion to additional pathology learners, improving photography database quantity and quality, and incorporating microscopic correlation when necessary.

Keywords

Specimen Photography, Grossing Conferences, Grossing Workshops, Pathologists' Assistant Instructors, Pathology Residency Training, Pathologists' Assistant Training, Gaming in Medical Education, Gross Specimen Library

Educational Objectives

By the end of this workshop, learners will be able to:

1. Utilize systematic approaches for evaluating certain surgical specimens and demonstrate a greater understanding of descriptive pathology terms.
2. Reference nationally recognized staging protocols for larger and complex surgical resections.
3. Demonstrate increased confidence in grossing complex specimens utilizing a teaching stand-alone curriculum outside of the anatomic pathology laboratory.
4. Produce precise gross descriptions by clearly describing the macroscopic features of disease.

Introduction

The current trend in pathology education for residents emphasizes microscopic review and less time spent grossing, the macroscopic inspection, evaluation, and sampling of pathology specimens for histologic evaluation by a surgical pathologist. The current literature and various residency program curricula show the existence of periodic microscopic teaching conferences but little recurring macroscopic teaching. In our department, the residents requested this form of teaching from the pathologists' assistant (PA) who designed the interesting gross case workshop (IGCW).

Appendices

- A. PowerPoint Template.pptx
- B. Questions and Directions Assigned to Cases.docx
- C. Grossing Vocabulary.docx
- D. Evaluation.docx
- E. PowerPoint Template PDF Version.pdf

All appendices are peer reviewed as integral parts of the Original Publication.

PAs are specialized physician extenders who perform the macroscopic review and tissue selection of specimens in the same tradition as pathologists, allowing pathologists microscopic diagnostic review. In academic medicine, PAs can also be employed as faculty members to teach pathology residents and PA students and are invaluable resources disseminating knowledge in various forms for multilevel pathology providers.¹

The abilities of the residents are evaluated monthly, but a grossing review to address perceived weaknesses did not exist, nor was there a review of teaching cases. For 18 months after the orientation period, the pathology residents cover anatomic pathology services requiring grossing once or twice a week. The residents have roughly 72-148 days of grossing practice for the American Board of Pathology certification.² PA students have grossing experience for at least 10 months in most programs. In a PA's second and last year of training, where he or she may be grossing for up to 5 days per week, 250 possible days of gross learning can occur. Therefore, the PA faculty, through more experience and repeated exposure, can offer their expertise and serve as primary gross instructors while the pathologists can primarily use their time to teach at the microscopic level during case sign-out. The PA instructor is positioned at the grossing bench simultaneously with the residents and can observe any weaknesses and retain the teaching cases for future review.

We have noticed that first-year residents attending the IGCW gained a fundamental skill in approaching surgical pathology specimens; by the time they graduated to postgraduate year 2, they were offering their experience to incoming first-year residents, thereby fostering the peer education process. Upper-level residents studying for board certification welcomed further critiques in their exam preparation and benefited by having a more active form of learning rather than passive lecture-based learning with little to no involvement of the audience. Our faculty development peer coach suggested adding educational gaming to the IGCW curriculum as it would assist in solidifying key points covered in that month's workshop.^{3,4} The residents requested that the PA teach more grossing review of difficult or unseen cases during their anatomic pathology rotations. The chief residents and the assistant residency director sanctioned the IGCW to begin, and it has remained part of the curriculum since 2015.

The IGCW is a deconstructed gross description organized in such a manner as to build a coherent and accurate depiction of the case submitted for histologic evaluation. We emphasize the anatomy involved in the disease process, which targets ample tissue selection. The IGCW does not merely feature the instructor explaining grossing technique or describing gross features to reach a differential diagnosis; it assesses attendees through their active gross description practice. The workshop targets training gaps, accommodates learners, and fills educational voids. Since resident training time involving recognizing macroscopic disease and sampling in the gross room has decreased over the years, this workshop offers an alternative learning experience outside the lab.

Our workshop comprises the following:

1. A PowerPoint (PPT) slide set of five case photographs, during which residents, fellows, and PA students give a practice gross inspection method and description;
2. A game to review pathologic-descriptive terms or anatomy review if needed;
3. Announcement of the best gross photograph taken for that month;
4. Evaluation of the workshop through a questionnaire given to the attendees; and
5. Review of the retained tissue from the cases in the gross room.

This workshop is unique and contributory to pathology training in that it was developed by a PA highly trained in macroscopic pathology. The workshop functions as an organized and validated training method by PAs acting as faculty for PA students during preceptorship and for pathology residents in training. Additional teaching tools were sought in the pathology field as gaps were recognized during residency training.⁵ We found little gross specimen teaching material in the literature.

The workshop has expanded to additional attendees via teleconferencing, allowing PA graduates to virtually attend and receive continuing education, as well as other pathology residents unable to physically attend the workshop. The Quinnipiac University and Loma Linda University PA programs embraced our workshop for additional training. In addition, the workshop was promoted at an annual PA convention as part of a mentor program, and there have been requests for participation from additional practicing PAs.

Methods

The target audience included multilevel pathology residents, rotating medical students, PA students, surgical pathology fellows, and practicing PAs, although this type of teaching method can be utilized for any type of active learning. In addition, through videoconferencing, informal continuing medical education was extended to practicing PAs and pathologists in the local community and at a national level.

Our workshop was held on the last Friday of every month for 1 hour and offered a review of the best teaching cases for that month. We presented photos during the workshop for 20 minutes, and each resident, fellow, or PA student openly dictated a gross description and gave his or her differential diagnosis and reasoning before the microscopic review. Our learners voiced their own method of tissue sampling. Our remote attendees virtually typed their answers, which appeared on screen to the physical workshop attendees. We then broke for 5-10 minutes for an anatomy or terminology review in the form of a game, with prizes awarded. The attendees randomly selected two slips of paper with either an anatomical part of an organ or a grossing term, defined the anatomical part or the vocabulary word for 1 point, and then gave an associated pathologic process using the pathology term, generating bonus points. At the end of the workshop, we projected the best resident monthly gross photograph. We compiled all resident photos at the end of the academic year and awarded book fund money as the prize. We encouraged the attendees to view and handle the retained teaching specimens in the gross room as a final reinforcement of what was discussed during the workshop. Via SurveyMonkey, we disseminated an electronic evaluation form regarding achieving the teaching objectives and uploaded the workshops to a shared-media drive accessible to the attendees for future reference.

When preparing each workshop, we recommended picturing most specimens, including those of complex resections and/or teaching interest. The PA retained teaching cases, if remaining tissue existed, within a gross specimen library in the gross room that was accessible to anyone who needed additional review of the physical specimen. We considered specimens for teaching if they were classic textbook examples or were rare in our patient population. We stored all specimens in formalin, labeled them with accession numbers and diagnostic information, and listed them alphabetically. The PA inserted the photographs into a PPT presentation and followed a structured format to present the material for each case. This format was established as follows:

1. Case number with brief case history and demographics;
2. Corresponding anatomy diagram of the specimen;
3. Audience input for a practice gross description and brainstorming of possible differential diagnoses;
4. Review of the sampling plan and critical sections to submit; and
5. Break for questions or additional input.

This format was followed for each subsequent case presented during the workshop. After the last case was presented, the winning photographs for that month were featured at the end of the presentation (Appendix A). We assigned accompanying questions and directions to the slides pertaining to each case, the slide for the gaming break, and the concluding slides asking the participants to evaluate the workshop and engage in a final review if necessary (Appendix B).

We compiled patient history after chart review for each case and consulted the College of American Pathology (CAP) protocol templates.⁶⁻⁸ We reviewed etiology and possible genetic factors in pathology textbooks.⁹ If an anatomy review was necessary, we emailed a reminder to the residents to reexamine

pertinent anatomic structures featured during the workshop.¹⁰ We also sent the macroscopic descriptive term list to the residents, uploaded it to a shared-media drive for easy access, and sent an email reminder to the residents to review the list periodically and ask questions pertaining to the terms and their associated pathology.¹¹ The PA instructor compiled the terms from previous training and experience to include correlation with radiological findings (Appendix C). Our chief residents and the instructor sent ZOOM teleconferencing instructions, directions from an internet site used for virtual meetings, to residents, PA students, and practicing PAs.¹² We asked all the attendees to fill out the evaluation at the end of the workshop by referring to the PPT projected online survey link (Appendix D). A PDF version of the slide set is also provided (Appendix E).

Results

We have used this workshop format at the Baylor College of Medicine Pathology Residency Program for 3 years (2015-2017). In total, 170 trainees (78 residents, 50 PA students, 10 practicing PAs, 12 pathology fellows, and 20 medical students) have attended the workshop (Figure 1). After the first year, residents ($n = 30$) evaluated the workshop, with a 73% response rate ($n = 22$) that showed 86% of them ($n = 19$) found the workshop useful in their grossing education. After 3 years, attendees had a 46% response rate ($n = 78$) of 92% residents ($n = 72$) and 8% PA students ($n = 6$; Figure 2), with the number of trainees in the Helpful Group much higher than the number of trainees in the Unhelpful Group (the ratio ranging from 10.1-12.0). Ninety-one percent of attendees had increased confidence in approaching complex specimens; 92% felt encouraged to reference standardized histopathologic sampling manuals, specifically the CAP's Cancer Protocol Templates; and 91% stated that the terminology review increased their macroscopic vocabulary, which aided in more precise gross descriptions (Table).

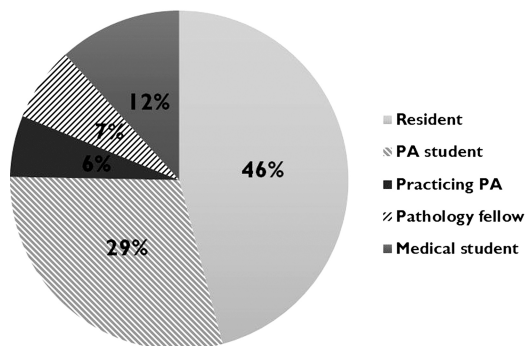


Figure 1. Distribution of participants ($N = 170$) in the interesting gross case workshop. PA, pathologists' assistant.

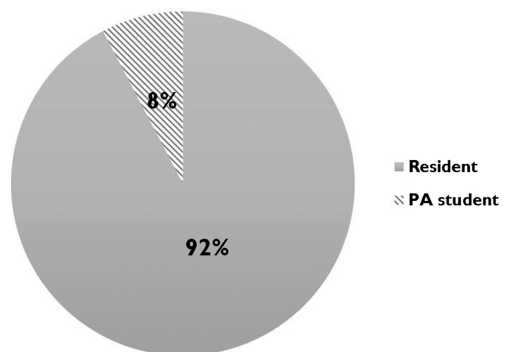


Figure 2. Distribution of responders ($N = 78$) to the interesting gross case workshop survey. PA, pathologists' assistant.

Table. Interesting Gross Case Workshop Evaluation Data From Postworkshop Survey in 2017 (N = 78)

Question	Helpful Group			Unhelpful Group		Helpful/Unhelpful Ratio
	Always	Often	Sometimes	Never	N/A ^a	
Does the workshop increase your confidence level when approaching and/or grossing complex specimens, clarify the anatomy encountered, and allow you to understand the importance of particular tissue selection?	50.0%	32.0%	9.1%	5.1%	3.8%	10.2
By revisiting the College of American Pathology cancer protocol checklist during the workshop, are you more inclined to reference it when grossing a specimen?	47.4%	28.2%	14.1%	2.6%	7.7%	12.0
Does the grossing vocabulary game help you describe more accurately and concisely?	47.4%	33.3%	10.2%	9.0%	0.0%	10.1
Do you believe that the workshop has increased your ability to recognize pathology at macroscopic level?	47.4%	33.3%	10.2%	9.0%	0.0%	10.1
Does the photo competition encourage you to photograph more specimens for a future workshop?	50.0%	32.0%	9.1%	5.1%	3.8%	10.2

^aPathologists' assistant students in their first year of training consisting only of didactics without physical specimen exposure.

The evaluators commented with the following replies:

- “I received two esophagectomies which I have never had before. Because I attended the workshop, I appreciated the review and handled them without difficulty.”
- “I am really happy that these workshops are offered and will be looking forward to more.”
- “Can we have more of these workshops?”
- “Please add microscopic review to the workshops.”
- “Thank you for sharing with us these cases we wouldn't have seen otherwise.”
- “May I have case numbers so I can add them to my portfolio to review for the board certification and remember what I saw during this workshop?”

Overall, the responses were positive, with the attendees asking for additional materials to study and review for the next workshop.

Some residents requested particular organ system reviews for future workshops. We incorporated these requests, which allowed a customized learning experience.

One learner believed the case number was excessive, which rushed the presenter's explanations and attendees' participation time. The workshop was confusing to follow and lacked enough time to ask questions. This feedback was taken into account, and the presenting faculty, through the help of a peer coach, featured fewer cases, held breaks between each case for questioning, and incorporated the terminology game review to facilitate active learning.

We emailed notices early in the week, before the workshop, and recommended that the attendees review organ systems and resource attachments before attending the workshop. In the second year of the workshop curriculum, we offered a \$100.00 book fund prize, which gave incentive to take more photos with an emphasis on quality and visual communication in mind for optimal patient care, teaching, and scholarship purposes.

We extended the workshop to PA programs as part of their curricula and to actively practicing PAs locally and nationwide.

Discussion

This workshop significantly increased attendees' confidence in their abilities while handling complex surgical cases, enhanced patient report communication, and increased review and acknowledgment of standardized optimal sampling of diseased tissue. By having a PA lead this teaching modality, the attendees received firsthand knowledge and experience from a qualified individual who was specially trained and encountered complex cases and situations daily. This workshop could also be useful for new

attending pathologists to review grossing when a PA is absent or not hired by an institution because teaching macroscopic dissection may be the job of the pathologist and not a PA instructor.

This workshop worked well for teleconferencing. Attendees could participate by typing in their questions and answers during the session. However, we experienced some limitations using ZOOM. Some distant hospitals' computer systems prevented the download of the ZOOM program, and so, the workshop could not be joined virtually unless the attendees used their personal mobile devices. We began sending the PPTs in advance and offered conference call access as an alternative.

After reviewing the monthly compilation of photos, we found many to be of poor quality, while some of the cases were never photographed. In a clinical setting, grossing these specimens remains under a time constraint because turnaround time predominates as a critical factor in patient care. Due to the camera's technical limitations or its being removed for other purposes, specimens were grossed and not retained for photographing. Photography of specimens received during the intraoperative frozen section process may have been forgone as attention was directed towards yielding a pathologic diagnosis within a 10- to 20-minute time period, per CAP protocols. Some of the attendees were scheduled to be on call for the frozen section service and were paged to care for emergent cases, which resulted in their missing the educational content, since the workshop was not considered protected educational time for pathology residents.

We encountered photography issues among the limitations in this workshop setup. Increasingly photographing more specimens, however, offered more photography practice to residents and PA students and boosting the likelihood of utilizing the images for publishing case reports, clinical imaging studies, and poster and platform discussions at conferences.

Another limitation of the workshop was that we scheduled it only once per month (every 4 weeks) for an hour. The faculty and a peer coach suggested reducing the number of cases presented, which resulted in some cases being carried over to the next month's workshop. Technical difficulties limited our process since our IT staff was remotely available to troubleshoot immediate problems. We considered this issue when establishing the teleconferencing aspect of the workshop, and progress was made with the IT department to mitigate any future problems or errors in the presentation.

Moving forward, we anticipate enhancements to our photography system for better photo quality. With the continued success of the IGCW on a small scale, we planned and sponsored an all-city PA-directed symposium at Baylor College of Medicine hosted by Pathologist of Texas in Houston. The symposium took place in 2017, with the targeted audience being residents, fellows, medical students, college students, and practicing PAs. The symposium aimed to accomplish the same goals as the monthly IGCW by showing similar cases presented in the past; however, it also included cases from other residency programs and other institutions within the Texas Medical Center and nationwide. This expanded platform allowed these education tools to reach a greater audience with a goal in mind of widespread anatomic pathology education.

Even though the attendees rarely requested microscopic correlation following each case presented, adding microscopic accompaniment may increase attendance of trainees and offer further continual education and teaching platforms for practicing pathologists and PAs.

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Ethical Approval

The Baylor College of Medicine Institutional Review Board approved this study.

References

1. Pickard M. An argument for pathologists' assistants generated literature. *Cutting Edge: J AAPA*. 2016;6(1):6-7, 14-16.
 2. Maintenance of certification (MOC) booklet of information. American Board of Pathology website. http://www.abpath.org/images/booklets/MOC_BOI.pdf. Updated February 2018.
 3. Boctor L. Active-learning strategies: the use of a game to reinforce learning in nursing education—a case study. *Nurse Educ Pract*. 2013;13(2):96-100. <https://doi.org/10.1016/j.nepr.2012.07.010>
 4. Pettit J, Rosenbaum M. Strengthening your teaching toolbox. *MedEdPORTAL*. 2014;10:9873. https://doi.org/10.15766/mep_2374-8265.9873
 5. Talbert ML, Ashwood ER, Brownlee NA, et al. Resident preparation for practice: a white paper from the College of American Pathologists and Association of Pathology Chairs. *Arch Pathol Lab Med*. 2009;133(7):1139-1147.
 6. Lester SC. *Manual of Surgical Pathology*. 3rd ed. Philadelphia, PA: Elsevier Saunders; 2010.
 7. Westra WH, Hruban RH, Phelps TH, Isacson C. *Surgical Pathology Dissection: An Illustrated Guide*. 2nd ed. New York, NY: Springer; 2003.
 8. Cancer protocol templates. College of American Pathologists website. http://www.cap.org/web/oracle/webcenter/portalapp/pagehierarchy/cancer_protocol_templates.jspx?_afzlLoop=132781536500974#!%40%40%3F_afzlLoop%3D132781536500974%26_adf.ctrl-state%3Djvk9ugh5p_4
 9. Kumar V, Abbas AK, Fausto N, eds. *Robbins and Cotran Pathologic Basis of Disease*. 7th ed. Philadelphia, PA: Elsevier Saunders; 2004.
 10. Netter FH. *Atlas of Human Anatomy*. 5th ed. Philadelphia, PA: Elsevier Saunders; 2011.
 11. Blackboard website. <http://www.blackboard.com>
 12. ZOOM website. <http://www.ZOOM.us>
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