

Title: Beyond the Documented Diagnosis: Integrated Gross and Histologic Identification of Multiple Malignancies in a Cadaveric Donor

Authors

Theresa Prather, Elisa Castillion, Madison Lee, Bailey Roux, Evan Seicshnaydre, Sarah Garner Ph.D.

Background / Introduction

Gross cadaveric dissection in the anatomy laboratory remains a foundational component of modern medical education and is widely regarded as the gold standard for learning human anatomy. However, the educational value of cadaveric study extends beyond the completion of routine dissections. In addition to providing hands-on understanding of gross anatomical structures, cadaveric donors offer opportunities to observe anatomical variation and identify underlying pathological processes. When combined with histological analysis, findings from cadaveric donors can bridge gross anatomy and pathology, expanding the educational and scientific value of the anatomy laboratory. This report describes extensive metastatic disease identified in a cadaveric donor and highlights the value of integrating gross anatomical observations with histological analysis in medical education.

Case Presentation

During routine gross dissection of a cadaveric donor in an anatomy laboratory at Louisiana State University School of Medicine at New Orleans, widespread malignant lesions were identified across multiple body cavities and organ systems. The donor was a 73-year-old male whose recorded cause of death was primary lung adenocarcinoma. The first evidence of malignancy was identified within the thoracic cavity. A large portion of the right lung, primarily the lower lobe, had undergone extensive gelatinization and was lost upon opening the thorax. The remaining lung tissue and pleura were firmly adhered to the posterior thoracic wall by a large, dense mass on the posterior aspect of the upper lobe.

Following removal of the lungs, extensive metastatic disease was observed throughout the right thoracic cavity, including lesions on the parietal pleura of the posterior, lateral, and anterior thoracic walls, the mediastinal pleura, and the diaphragm, with involvement of the vagus nerve, phrenic nerve, and thoracic duct. Additional metastatic lesions were also noted on the left lung.

Further dissection revealed metastatic involvement of the liver and para-aortic lymph nodes, particularly near the aortic bifurcation. Additional pathological findings included splenic atrophy, diverticulosis of the descending and sigmoid colon, appendiceal adhesions, and bilateral cystic kidneys. Bilateral common iliac stents and suturing inferior to the inguinal ligaments were also identified. Dissection of the pelvic region and external genitalia revealed absence of the prostate and both testes, consistent with prior surgical removal.

Methods

Tissue samples from metastatic lesions identified during gross dissection were collected for histological analysis. Ten tissue cassettes were prepared from representative sites across the thoracic and abdominal cavities. Cross-sectional histological sections were generated from the following tissues: (1) left diaphragm; (2) left lung; (3) right pleura; (4) sigmoid colon with diverticulosis; (5) right thoracic vagus nerve; (6) right thoracic phrenic nerve; (7) right lobe of the liver; (8) left para-aortic lymph nodes; (9) thoracic duct; and (10) primary tumor within the lung.

Results / Discussion

The extensive distribution of metastatic lesions, combined with additional pathological findings observed in the donor, raised questions regarding the extent of spread of the primary lung adenocarcinoma and whether additional malignancies originating from other tissues may also have been present. Histological examination of the collected tissue samples will allow for characterization of the cellular architecture of each lesion and comparison with the primary tumor.

Future analysis will include immunohistochemical staining for appropriate biomarkers to further determine the tissue origin of each metastatic lesion. Integration of histological and immunohistochemical findings with review of the donor's medical history will provide greater insight into patterns of metastatic progression and potential interactions between malignancies of differing origin.

Beyond the pathological findings, this case highlights the educational potential of integrating histological analysis into the anatomy laboratory. The structure of the Louisiana State University Health Sciences Center medical curriculum has always facilitated sequential learning of anatomical and histological study, with gross anatomy taught in the fall semester followed by histology in the spring. With additional resources and institutional support, implementing a structured program that allows students to perform histological analysis of tissue samples collected during anatomical dissection could further enhance integration of anatomy and pathology in medical education.