Histopathology in a Cadaver Population of a Medical School Anatomy Laboratory

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Citation

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Abstract

This “mini-study” was conducted to determine how much pathology could be harvested in one month’s time in a modern medical school anatomy laboratory consisting of 38 cadavers. Based only on gross observations, specimens were collected from various organs of selected cadavers to examine microscopically. The cadavers used had only exposed thoracic and abdominal/pelvic cavities during this time period. These were inspected for interesting or “abnormal” findings by a 4th year medical student along with the first year medical students assigned to the table. Therefore, not all organs were sampled, and not all cadavers were selected. This was done purposely to determine if significant pathology could be obtained even under “limited” conditions.

INTRODUCTION

The first year medical school anatomy laboratory is a traditional rite of passage. Observation and dissection of internal human organs and structures are vital to the foundation of medicine. Students painstakingly cut into each body with diligence trying to remember the names of the vessels, nerves, ostia, sphincters, foramina, and fossae. This is a very overwhelming though necessary exercise in acquiring both medical knowledge and skill. Though more schools are leaning toward videos and virtual dissection, it might be argued that the anatomy laboratory itself is a fertile source of information which can supplement other disciplines in medicine such as histology and pathology (1). Each organ has tissues and cells which have a story to tell for each cadaver - the medical student’s first patient.

This “mini-study” was conducted to determine how much pathology could be harvested in one month’s time in a modern medical school anatomy laboratory consisting of 38 cadavers. Based only on gross observations, specimens were collected from various organs of selected cadavers to examine microscopically. The cadavers used had only exposed thoracic and abdominal/pelvic cavities during this time period. These were inspected for interesting or “abnormal” findings by a 4 th year medical student along with the first year medical students assigned to the table. Therefore, not all organs were sampled, and not all cadavers were selected. This was done purposely to determine if significant pathology could be obtained even under “limited” conditions.

METHODS

Within four weeks time, a variety of pathology was collected (see Table 1).

Figure 1

TABLE 1

MICROSCOPIC FINDINGS IN CADAVER ORGANS OVER 4 WEEK PERIOD

Organ	# of different samples	Findings
Lung	10	Bronchopneumonia Emphysema, mild edema Acute necrotizing pleuritis Small cell carcinoma Organizing pneumonia Emphysema, org. pneum., subpleural fibrosis Atelectasis Congestion Calcified pleural plaque, mild interstitial fibrosis Aspiration pneumonia, emphysema
Liver	8	Cirrhosis Steatosis, chronic hepatitis, Mallory bodies Mild edema Chronic active hepatitis Normal Bile duct dilatation Bile duct dilatation Chronic passive congestion
Heart	4	Interstitial fibrosis Myocyte hypertrophy Possible remote myocardial infarct Remote myocardial infarct
Kidney	4	All four showed changes consistent with chronic interstitial nephritis with chronic inflammation, interstitial fibrosis, and thyroidization; medial hypertrophy of vessels consistent with hypertension also present
Uterus/fallopian tube	5	Endometrial polyp Paratubal cysts Leiomyoma Leiomyoma Leiomyoma

Figure 2

Organ	# of different samples	Findings
Ovary	3	Stromal hyperthecosis with cortical cysts Corpora albicantia and lutea Metastatic pancreatic adenocarcinoma
Testes	1	Dilated epididymis and decreased sperm
Pancreas	2	Pancreatic adenocarcinoma to peripancreatic lymph node Pancreatic adenocarcinoma metastatic to omentum, stomach, and ovary
Stomach	4	all severely autolyzed
Appendix	3	all three showed fibrofatty obliteration of tip
Breast	4	all four showed fibrocytic changes with stromal fibrosis and dilated cyst formation
Vessels	3	Aneurysmal dilation with atherosclerosis, thrombus Aneurysmal dilation with atherosclerosis, thrombus Abdominal aortic aneurysm with atherosclerosis, bleed
Spleen	2	Congestion Congestion and extramedullary hematopoiesis
Soft tissue/muscle	4	muscle rupture, mild focal muscular atrophy Intramuscular lipoma with focal fat necrosis Intramuscular lipoma Intramuscular lipoma

RESULTS

Of the 38 cadavers, 27 were sampled in some capacity. The majority of the specimens came from the lung which showed findings such as emphysema, bronchopneumonia, aspiration pneumonia, and small cell carcinoma. The next major organ sampled was the liver which showed findings which included cirrhosis, chronic hepatitis, and good examples of Mallory bodies. Myocardial samples in a few enlarged hearts indicated myocyte hypertrophy and interstitial fibrosis, and two cadaver hearts showed evidence of a possible remote myocardial infarction. Kidney findings included chronic interstitial nephritis with chronic inflammation, interstitial fibrosis, and thyroidization in several separate samples as well as evidence of hypertension in the renal vasculature. The female reproductive system was represented by an endometrial polyp, ovarian stromal hyperthecosis, paratubal cysts, and leiomyomata. There was one sample of a testicle with dilated epididymis and decreased sperm production. Although a few examples of the appendix showed fibrofatty obliteration of the tip, typical in an elderly population, the gastrointestinal system (as evidenced by sections from the stomach) was not amenable to microscopic examination secondary to severe autolysis. However, the pancreas, which is usually very autolyzed had two examples of extensive adenocarcinoma. In one case, the pancreatic carcinoma had metastasized to the omentum and ovaries. Miscellaneous lesions included vascular aneurysms, extramedullary hematopoiesis of the spleen, fibrocystic changes of the breasts, cardiac valves with nodular calcific degeneration and fibromyxoid degeneration, and several intramuscular lipomas.

DISCUSSION

The information gathered from this small, short study allows some elucidation on the opportunities afforded by the medical school anatomy laboratory other than strict gross dissection. Each cadaver not only offers histological review, but different pathologies accessible for learning. Nothing can replace a “hands-on” approach to medical education, and integration of curricula – anatomy, histology, and pathology- by a simple, already in-place process (i.e. the anatomy laboratory), can serve the medical student well. This is something that on-line, computer generated programs cannot reproduce. Each cadaver becomes an important source of anatomy, histology, and pathology with its own story. The original rite of passage thus becomes richer because of its breadth and depth.

References

1. Wood, Struthers, Whiten et al, “Introducting gross pathology to undergraduate medical students in the dissecting room” Anat Sci Educ 3:97-100, 2010

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