

Historical Development of Forensic Pathology in the United States

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While forensic pathology has become a vital tool in solving crime over recent years, it remains a vague term to many criminal justice practitioners. Chronicling the development of autopsy and forensic pathology in the United States will introduce this modern field. An examination of forensic pathology will also explain how its role has evolved to accommodate legal and civil issues. The utility of forensic pathology extends well beyond the medical realm by affecting the core of the medicolegal investigative system in the United States.

Key words : forensic pathology, autopsy, coroner, medical examiner

Introduction

Forensic pathology has become an essential part of today's crime investigation. With advanced technology and science, forensic pathology provides vital information and evidence. Considering the critical role of forensic pathology in solving crimes and prosecuting offenders, it is time to draw more attention to this relatively unfamiliar topic. As the first step to understanding the ever evolving field of forensic pathology, I examine the historical development of forensic pathology focusing on its role in crime investigation and its technological advancement.

Forensic pathology is sometimes misinterpreted as synonymous with forensic science. The word

“forensic” is derived from the Latin *forum* which means “public,”¹⁾ and pathology comes from the Greek word for “suffering.” In addition, pathology is “a system of knowledge used to draw conclusions about illness.”²⁾ Forensic pathology is a part of a broader field called forensic science. Forensic science is comprised of a group of scientific disciplines that play a significant role in criminal, legal, and civil matters by answering specific questions in these arenas through the application of medical facts and scientific and technical knowledge. According to the American Academy of Forensic Sciences³⁾, there are eleven primary disciplines in the field of forensics: criminalistics, digital & multimedia sciences, engineering sciences, general, jurisprudence, odontology (science of teeth), pathology/biology, physical anthropology, psychiatry & behavioral

sciences, questioned documents, and toxicology. Forensic pathology is “a branch of medicine that applies the principles and knowledge of the medical sciences to problems in the field of law”⁴⁾. In other words, forensic pathology is “the application of forensic science and pathology to the investigation of death.”⁵⁾

The main duty of the forensic pathologist is the autopsy (post-mortem examination) of a dead body. Autopsy, from the Greek language, means “seeing for oneself.” An autopsy is a detailed medical examination of a person’s body and its organs after death to determine the cause of death. There are two kinds of autopsy - the medical autopsy and the forensic (medicolegal) autopsy. The medical autopsy cases are performed on people who have died of natural diseases. Thus, physicians use the autopsy to investigate the details of that natural death. A forensic autopsy, however, is performed to satisfy the law in special circumstances such as suspicious death. Therefore, the history of forensic pathology and autopsy is closely related to the development of legal systems and court procedures.⁶⁾

Early Development of Forensic Pathology

The history of the autopsy is intertwined with that of anatomy and medicine. The early anatomic descriptions mostly came from the observations of animal anatomy. This practice was widespread in the ancient world and dates to as early as fourth century BC in Babylonia. However, during this time autopsies were limited to animals. Scholars believed that autopsies were not performed in ancient time because the deceased body was regarded as sacred. Similarly, dissection was not allowed in ancient Asia either for a religious reason.

During this period, humoral theories of disease dominated ancient Greek medicine and discouraged investigation to correlate anatomy with disease. The humoral theory believed that four humors - black bile, yellow bile, phlegm, and blood - composed the body. All diseases and disabilities were considered the result

of an imbalance in the ratio of the humors to elements within the body. This medical philosophy was accepted in Europe for centuries. Therefore, the early practice of forensic medicine was limited to investigating the circumstances without specific examination of the body.⁷⁾

However, there were some exceptions in the ancient world; Alexandria permitted dissection of the deceased. Ptolemy I Soter (367–282 BC), king of Egypt, supported pathologic anatomy and established the great university and library in Alexandria. Herophilos of Chalcedon (335–280 BC), a Greek physician who is widely considered the first anatomist, performed autopsies on a regular basis in Alexandria and wrote a treatise on human anatomy. Another contributor at the time was Erasistratus (310–250 BC) who denied the humoral theories and associated disease with changes in the organs. During the Roman Empire, Galen of Pergamum (129–201AD), a physician, performed anatomic dissections on animals and produced a great amount of written work about the human body. His texts, however, were based on the humoral doctrine. Most Roman physicians followed the teaching of Galen, and his influence continued into the late Middle Ages. The Greek and Roman physicians, however, were more interested in the principal of exact clinical observation than in the nature of disease and the effect that disease had on the body.⁸⁾

Development of Pathology and Forensic Science in the Middle Ages

During the Dark Ages of medieval time in Europe, there was no significant development or advancement in pathology as autopsies were forbidden. The first law that authorized human dissection was established in 1231, during the rule of Frederick II (1194–1250), Holy Roman Emperor. During the 13th and 14th centuries, restriction against opening the human body after death eased, and various pictures describing autopsies indicate that dissections were being done in Italy between 1266 and 1275. Medicolegal autopsies,

autopsies to help solve legal problems, were first performed in Europe in Bologna in 1302.

Meanwhile in Asia, Muslim physicians discovered infectious disease and contributed to the advancement of its pathology. Ibn Zuhr (Avenzoar) (1091–1161) was one of the earliest physicians known to perform postmortem autopsies. These scientists understood the pathology of contagious disease such as leprosy, mange, and sexually transmitted diseases. In China, human dissections were performed occasionally during the Song Dynasty. Between 1102 and 1106, Li Yee Siung, a government official, assembled physicians and artists to dissect a criminal and record the anatomic findings. Song Ci wrote a handbook called *Xi Yuan Lu* (the washing away of wrongs) which was published in 1247. It contained guidelines for the postmortem examination and dissection techniques of bodies. It also illustrated methods to use during the investigation of suspicious deaths and other forensic issues such as poisoning, decomposition, wounds from various weapons, strangulation, and fake wounds.

Development of Pathology during the Renaissance

With the Italian Renaissance, the doctrines of Galen began to break down and medicine, medicolegal science, and medical education were transformed. Until the early modern period, dissections were permitted only on executed criminals. Yet, by the 1500s, the autopsy was generally accepted by the Catholic Church. The written records of the development of forensic pathology in Europe began during the 16th century. Many scholarly works in forensic medicine were published and universities began to teach forensic medicine courses. Antonio Benivieni (1443–1502), a Florentine physician, is regarded as one of the founders of pathological anatomy due to his utilization of anatomic dissection to determine cause of death. His recording was published in 1507 as *The Hidden Causes of Disease*. By the end of the 16th century, death investigations that

included autopsies became more common and were reinforced by laws such as the *Constitutio Criminalis Carolina* (1530). This first German Criminal Law made provisions for medical expert testimony to be required by judges in cases involving murder, wounding, poisoning, hanging, drowning, infanticide, and abortion. These documents show the importance in position that forensic pathology had gained in the legal system.

In the latter half of the sixteenth century, as a result of advancement of knowledge by many pioneers, the judicial authorities and the police in Europe began to call upon physicians to aid in solving fatal crimes, and most large jurisdictions established institutes of forensic medicine for experts to carry out their investigations. Giovanni Bathista Morgagni (1682–1771) is considered to be the founder of the autopsy. His argument that a correlation existed between pathological findings and clinical symptoms made major contributions to the understanding of disease in medical science. Morgagni's work was considered the most influential in the history of medicine, and many practitioners began to investigate more thoroughly the internal changes associated with diseases. In England, William Hunter (1718–1783) and John Hunter (1728–1793) established the first English museum for the teaching of pathology. Matthew Baillie (1761–1823) published the first atlas of pathology in 1793. Postmortem examinations also became common at Guy's hospital in London, and the findings were used to advance the field of medicine.⁷⁾

Modern Forensic Pathology

For the first time pathology was recognized as a distinct scientific discipline in 1819 when the University of Strassburg appointed Jean Lobstein (1777–1835) to the position of the Professorship of Pathology. The latter part of the nineteenth century experienced the emergence of the science of pathology as a subspecialty of medicine. At the same time, other related fields of the forensic sciences such as chemistry, physics, biology and microscopy began to

develop as well. Mathieu Joseph Bonaventure Orfila (1787–1853), the father of toxicology, attempted to bring chemistry into forensic medicine. Through the chemical investigation of human fluids and tissues, pathologists could detect the signs of medical disorder and the presence of alcohol and other drugs in a body. A Criminologist Edmond Locard (1877–1966) was a pioneer in forensic science in France. He developed a forensic science theory that “every contact leaves a trace,” which is known as Locard’s exchange principle. One of his greatest works was a creation of crime laboratory in 1910. This crime laboratory in Lyon, France was the first lab that brought together all these specialties for the purpose of criminal investigation. The success of Locard’s laboratory led to the formation of similar laboratories in other parts of Europe and America.

The microscope was first used by pathologists during the middle of the 19th century. A German pathologist Rudolf Virchow (1812–1902), who is referred to as the “Father of Pathology,” realized the importance of the microscope in pathological research. He also developed the Virchow method of doing autopsies, which is one of the main techniques used among forensic pathologists today. Another contributor to forensic pathology during this era was Dr. Bernard Spilsbury, who became the Home Office Pathologist for Scotland Yard in 1908. He convinced Scotland Yard detectives of the importance of having a forensic specialist in medicine at murder scenes.

History of Forensic Pathology in America

The first recorded autopsy in North America was an examination of conjoined twins performed in 1533 in Santo Domingo (in what is currently Dominican Republic). The goal of the autopsy, however, was not to establish cause of death but to determine whether there were two souls or one. During the 20th century, many leaders of medicine emphasized the importance of the autopsy in medical education. One of them was Sir William Osler (1849–1919), who was actively involved with autopsies. After finishing education in

Canada and Europe, Osler taught at McGill University and worked at the Montreal General Hospital. He wrote the book *The Principles and Practice of Medicine* (1892) based on his autopsy work at the hospital.⁹⁾

With the advancement of technology, microscopes became available to medical students in 1870. Influenced by Locard’s laboratory, the first complete crime laboratory was built in Los Angeles in 1923. In 1932, the Federal Bureau of Investigation organized a laboratory that made forensic sciences available on a nationwide basis for the first time in the United States. This laboratory became a model for the formation of forensic laboratories at local and state levels. In recent years, many sophisticated analytical techniques and instruments from medicine and industry have been incorporated into forensic laboratories. Typically the forensic pathologist is the leader of the forensic team and often the only full-time physician. Other specialists play an important role in the forensic team, but they are usually consultants working part-time in forensics.⁹⁾

The development of the forensic investigation system in America can be traced back to the English coroner system. The existence of an English coroner’s office dates to the year 925, but formal description is found in the Articles of Eyre (1194). This document states that the justices in Eyre (traveling circuit court judges) were required to provide elected officers - three knights and one clerk - in every county. Coroners were not physicians. The duty of the coroner included an inquiry over violent deaths, sudden and/or unexpected deaths, suspicious deaths, and cases in which a physician is not in attendance at the time of death. The training of the coroner ranged from absolutely none to 1–2 weeks. With this basic training, the coroner made decisions as to cause and manner of death that might have significant criminal and civil consequences. The coroner system in England didn’t spread throughout the country until the late 19th century. In 1877 a law was enacted requiring the inquest to be conducted whenever the coroner had reasonable cause to suspect violent or unnatural death or when the cause of death was

unknown. Therefore, the coroner system was developed as a broad spectrum investigative agency concerned with all deaths.

The early colonists brought the coroner system with them, and records of medicolegal cases in the colonies date from 1635. The separate discipline of forensic medicine began to emerge in the seventeenth century. The pathology practiced in America during the 19th century was influenced by Virchow and the German School of Pathology. The first medicolegal application of an autopsy in the United States occurred in Maryland in 1665. In 1860, Maryland enacted the "Code of Public General Laws," that authorized the coroner to require the attendance of a physician in cases of violent death. In 1868, the Maryland Legislature authorized the governor to appoint a physician as sole coroner in Baltimore. In 1890 in Baltimore, a city ordinance authorized the Board of Health to appoint two physicians and assign them the duty of performing all autopsies requested by the coroner or the state's attorney of the city of Baltimore.¹⁰⁾

The first medical examiner system was introduced in Massachusetts in 1877. Due to the controversies surrounding the Coroner's System, the Commonwealth adopted a statewide system requiring that the coroner be replaced by a physician known as a medical examiner. The state was divided into sectors and each sector had a physician medical examiner to determine the cause and manner of death. In 1945, the Massachusetts Law was amended to give discretionary power of performing autopsies to the medical examiner.¹¹⁾

The medical examiner system in effect today was created in New York City. In 1915, New York City eliminated the coroner's office and created a medical examiner system with a designated pathologist as Chief Medical Examiner (forensic pathology was not available at the time. It became a subspecialty in 1959). The medical examiner system was authorized to investigate deaths resulting from criminal violence, casualties, or suicide. The medical examiner was granted the authority to make decisions as to the

necessity of an autopsy and established a laboratory for his use; because of these innovations, some scholars regard this office as the first true medical examiner's office. Dr. Charles Norris who was appointed the first chief medical examiner for New York City in 1918, made significant contributions to forensic medicine research and service development. The New York City medical examiner's office was expanded while Dr. Milton Helpert, the third chief medical examiner, was in charge. Most medical examiner systems in the United States today have adopted the New York concept, while some newer systems require the chief medical examiner to be a forensic pathologist.⁹⁾

In 1939, Maryland also established the first statewide medical examiner's system. Under this system, the chief medical examiner was appointed by a specially assigned commission consisting of the professors of pathology in two medical schools, the executive officer of the State and Baltimore City Health Departments and the superintendent of the State Police. This meant the appointment was no longer a political process.

Current Medicolegal System in the United States

All states sanction autopsy in suspected criminal cases. Currently, three different medical legal systems exist in the United States - the coroner, the medical examiner, and mixed systems. As of 2000, 12 states had coroner systems; 19 states had state medical examiner systems; 3 states had county or regional medical examiner's offices but no coroner's offices'; and 16 had a mixture of medical examiner and coroner systems. Some states have a mixed system with the large metropolitan areas served by the medical examiner's system while the rural counties are served by the coroner's system. Over the years, coroner systems have been replaced by medical examiner systems; however, coroner systems still cover a significant proportion of the American population.¹²⁾

A coroner is a public official, sometimes elected and sometimes appointed, whose main duty is to inquire into any death that seems unnatural. The coroner is usually an elected county official serving a four to six year term. The coroner in America is considered to be an executive branch official who has quasi-judicial power such as the power of subpoena and the power to hold inquest. In England, the coroner is a judicial officer who is under the control of the Ministry of Justice. Only four states (Ohio, Kansas, Louisiana and North Dakota) require the coroner to be a physician. The major function of the coroner is to determine cause and manner of death.

One of the most critical problems the current coroner system presents is political influence. Because most coroners are elected administrators subject to political influence, they can ignore their employed experts, physicians. The other issue is a coroner's qualifications. Many legal and medical field professionals argue that non-physicians cannot make medical decisions regardless of their training. The physician-coroners practicing with minimal training in pathology also creates a problem. They are likely to produce inaccurate results and thus risk malpractice lawsuits. An even more extreme situation is the coroner system in California. California still uses sheriff-coroner systems in a number of its counties, which can cause a conflict of interest in certain situations. For example, a deputy sheriff might kill a civilian and then the sheriff could rule the cause and manner of death. In many areas of the United States, the coroner is also a funeral director, which can further generate a conflict of interest. The coroner-funeral director may not want to make a ruling that might offend a family and cost his business or potential votes in the next election.⁴⁾

In many states, the office of coroner has been replaced by that of medical examiner. The medical examiner's office is an independent agency that supposedly holds a neutral position on its findings. Medical examiners are mostly physicians (except for Minnesota and Wisconsin) and are typically appointed. In some jurisdictions, the medical

examiners are required to be forensic pathologists.

A pathologist is a physician who identifies, interprets, and diagnoses changes caused by disease in tissues and body fluids, either before or after death. In 1936, the American Board of Pathology began certifying pathologists. Forensic pathology is a subspecialty within the medical specialty of pathology. A forensic pathologist needs special training and certification in forensic pathology to serve as medical examiner and to conduct laboratory or postmortem studies of apparently unnatural or crime-related deaths. The special training includes a four-year or longer period of postgraduate training in anatomic and general clinical pathology followed by at least one year of subspecialty training in forensic pathology.¹³⁾

Today's forensic pathologists have several duties that include investigating certain types of deaths, performing forensic autopsies, identifying decedents, determining causes of death, and determining manner of death. The forensic death investigation may be divided into three parts: 1) the initial investigation (scene investigation); 2) the examination of the body; and 3) the follow-up investigation. Thus, the duty of the forensic pathologist is not limited to postmortem examination. Forensic pathologists are involved in inspection of the site where the body was found and the collection and preservation of evidence obtained at the scene as well. The responsibility for these investigations differs from one jurisdiction to another, and forensic pathologists may or may not be responsible for these aspects of death investigations. However, forensic pathologists do interact with investigators and the conclusions on a particular death may rely on their investigative work.¹⁴⁾

Two of the most important duties of the forensic pathologist are the determination of the cause and manner of death. The cause of death is any injury or disease that results in death such as bullet wounds or strangulation. The manner of death explains how the cause of death came about. Manner of death categories include homicide, accident, natural or suicide. In some cases, the manner of death can be "unclassified" when the cause and circumstances of

death are known but the death does not fall into any of the usual categories.

The medical examiner system also has several issues and problems including “defective laws, underfunding, and political interference.”⁴⁾ As mentioned in the beginning of this paper, forensic pathology is intertwined with the legal system. Therefore, legal issues can challenge medical examiners to perform their job effectively. For example, in New York City in the mid 1980s, the medical examiner system suffered from a change in the law that allowed families to prevent the performance of autopsies in cases where the manner of death didn’t appear to be homicide. This meant the forensic pathologist had the authority to perform an autopsy only in cases that were obviously homicide. The problem was that sometimes it was not always possible to recognize a homicide until an autopsy was performed.

Issues related to the government include funding and organizational structure. A shortage in government funding can hinder the effective function of the system. Placing the office under state government agencies that should not be supervising the medical examiner’s office also can create problems. One example is the medical examiner’s office under the supervision of police agency.

Discussion

Examination into the history of pathology and autopsy has revealed the effects of forensic pathology on both the legal system and advancements in science and technology. Even though advanced technology and instruments have improved the accountability of forensic pathology investigation, today’s pathology is constantly challenged by new trends in crime, drugs,

and disease/disorder. Considering the vital role that forensic pathology plays in today’s crime investigation, more study is necessary in order to acknowledge its contribution and to improve the effectiveness of the system.

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