Editorial Opinion

Did James A. Garfield die of cholecystitis? Revisiting the autopsy of the 20th president of the United States

Theodore N. Pappas, M.D.\textsuperscript{a}, Shahrzad Joharifard, M.D.\textsuperscript{b,*}

\textsuperscript{a}Department of Surgery, Duke University, Durham, NC, USA; \textsuperscript{b}Department of Surgery, University of British Columbia, Faculty of Medicine, 910 West 10th Avenue, Vancouver, British Columbia, Canada V5Z 4E3

Historians have reviewed the shooting and ultimate demise of James A. Garfield since 1881, the year of his assassination. Remarkably, rather than faulting the assassin, nearly every author has blamed the President’s death on the physicians who cared for him in the 80 days after the shooting. Most historians have argued that Garfield’s physicians mismanaged the bullet wound on his back, leading to iatrogenic starvation, uncontrolled sepsis, and finally death. This article reconstructs the events after the shooting and revisits Garfield’s postinjury clinical course in light of the anatomic facts revealed by his autopsy. Based on this reconstruction, we argue that the President’s medical team followed the standard of care of the era. Furthermore, our detailed analysis of Garfield’s postmortem examination leads us to contend that the President died not as a result of his physicians’ alleged incompetence but rather from a late rupture of a splenic artery pseudoaneurysm after suffering from a complicated course of acute cholecystitis.

Assassination Attempt

On the morning of July 2, 1881, James A. Garfield was en route to his 25th reunion at Williams College. The President was accompanied by the Secretary of State, James G. Blaine, with plans to board the 9 AM train for Massachusetts from the Baltimore and Potomac Railroad Station in downtown Washington, DC. Shortly after entering the station, Garfield was approached from behind by a mentally unstable attorney, Charles J. Guiteau, who twice fired his 0.44-caliber revolver at close range.\textsuperscript{1} The first shot grazed the President’s right arm, whereas the second entered his back between the 11th and 12th ribs, four inches to the right of the vertebral column. The President immediately fell to the ground, “blood streaming from his two wounds.”\textsuperscript{2} Meanwhile, Blaine and two local police officers tackled Guiteau as he attempted to escape through a nearby exit.\textsuperscript{2}

Within minutes, a throng of people surrounded the President. The first physician on the scene was the District Health Officer, Dr. Smith Townsend, who discovered Garfield “apparently dying,” the floor “covered in blood.”\textsuperscript{2} The President remained conscious, immediately complaining of...
severe pain in his back and weakness in his legs. Based on the autopsy findings, this was likely related to the bullet traversing the L1 vertebral body. The path of the bullet through L1 would not necessarily have resulted in paralysis but certainly could have created edema around the spinal cord, leading to the neurologic symptoms reported.

Dr. Townsend ordered Garfield to be moved to the second floor of the train station on a mattress, where Drs. D.W. Bliss and Robert Reyburn, two prominent local physicians, ultimately received him. Dr. Bliss, finding the patient “deathly pale, almost pulseless and apparently dying of internal hemorrhage,” proceeded to examine the flank wound, first with his finger and then with a Nélaton probe. Although this unsterile examination of the wound may be surprising to today’s readers, probing wounds was considered the standard of care for gunshot injuries in the 19th century. Given that bullet wounds are all contaminated by pieces of clothing and other foreign bodies, the use of a finger or probe to examine these wounds was thought to be of great benefit and little harm in the 1880s. The bullet was often a nidus for infection, and, thus, early removal was generally considered therapeutic. Furthermore, at a time when x-ray technology was in its infancy, fingers and probes were the sole tools at the physician’s disposal to define the course of the bullet and, therefore, the patient’s prognosis.

Based on their initial probing of the wound, Garfield’s physicians assumed that the second bullet had lodged in the peritoneal cavity, possibly after passing through the liver. Performing an exploratory laparotomy in the case of abdominal trauma was an extremely controversial notion in 1881; in fact, the procedure was not widely accepted as a viable option for penetrating abdominal trauma until the turn of the century. As such, Garfield’s physicians had little option but to follow the standard of care of the era and treat the President with nonoperative management. Thus, Garfield was moved to the White House via ambulance, where he was fully expected to die overnight. The President’s staff sent a telegram to summon Mrs. Garfield, who was recovering from a bout of malaria on the New Jersey coast. Upon arriving at the White House, the First Lady was given a private audience with her husband to say her goodbyes.

To the surprise of his doctors, however, Garfield survived the night and began a slow recovery. As the autopsy showed, after traversing L1, the bullet injured the splenic artery near its takeoff from the celiac axis. Remarkably, the President did not bleed to death despite this life-threatening arterial injury. Instead, a pseudoaneurysm of the splenic artery formed as the bleeding stopped, aided by the tamponade effect of the retroperitoneum.

In the ensuing 80 days, the President’s medical care captured the attention of the nation. Garfield’s physicians issued daily bulletins on their patient’s condition, while newspapers and medical journals published regular commentary from physicians around the world debating the likely course of the bullet and the President’s chance of surviving.

The President’s Physicians

Garfield was cared for by some of the best trauma surgeons of the era. David Hayes Agnew, the senior-most consultant attending to the President, was perhaps the most prodigious surgeon of his day, possessing extensive Civil War experience in the treatment of gunshot wounds. He was a Professor of Surgery at the University of Pennsylvania’s School of Medicine from 1863 to 1884 and served as President of the American Surgical Association in 1887. Agnew’s most important textbook, The Principles and Practice of Surgery (1878 to 1883), was the authoritative surgical text of its day.

Doctor Willard Bliss (Doctor was his first name) was one of the most prominent physicians in the nation’s capital in 1881. Bliss received his medical training at the Cleveland Medical College and was considered an expert in ballistics, also because of his considerable Civil War experience. Additionally, he was appointed the head of Washington, DC’s Armory Square Hospital after the war. Interestingly, Garfield was not the first President that Bliss attended to; he treated Zachary Taylor, the 12th President of the United States, in 1844 for malaria.

Robert Reyburn was also a prominent medical figure in Washington, DC in the 1880s. He received his medical degree from the Philadelphia College of Medicine and Surgery in 1856. Dr. Reyburn was subsequently appointed one of the first five faculty members at Howard University’s School of Medicine and served as Dean from 1870 to 1871.

Lastly, Joseph Janvier Woodward was a Civil War surgeon who performed the autopsy of both Abraham Lincoln and John Wilkes Booth. He consulted in the care of Garfield and assisted in his autopsy.

The President’s Clinical Course

In the days immediately after the shooting, Garfield’s physicians remained preoccupied with determining the path of the bullet. The wound was probed on multiple occasions, but contrary to what previous historians have argued, this was not done with “unwashed and manure-tainted hands.” Rather, as Dr. Reyburn indicates in his day-to-day account of the President’s illness, Garfield’s physicians made a concerted effort to adhere to Lister’s emerging theories of antisepsis. “The most scrupulous cleanliness of the instruments and surgical appliances was observed, and also of the antiseptic solutions used for the daily washing out of the wound, and every effort was made to render them as antiseptic as possible.” Regardless, the frequent probing of the wound yielded no concrete information about the bullet’s path. Even Alexander Graham Bell, with his prototype metal detector, was twice unsuccessful in locating the bullet.

Over the next two weeks, the President’s condition gradually improved. Acknowledging that they might never
determine the exact location of the bullet, but assuming that it had lodged in the pelvis after traversing the peritoneum, Garfield’s physicians focused their attention on caring for his back wound with twice daily dressing changes. Initially, Garfield suffered from nightly fevers and frequent emesis, but by day 14, he was eating solid food and appeared to be convalescing. However, by the beginning of the third week, the President showed signs of a brewing infection. Surmising that Garfield’s deterioration was caused by secondary infection of the back wound, his physicians responded in kind by debriding the wound, making counter incisions, and inserting multiple tubes to optimize drainage.2 Surprisingly, as the appearance of the wound improved, Garfield’s overall condition worsened.

The autopsy showed that the aggressive local management of the bullet entry wound resulted in a cavity extending to the ipsilateral anterior iliac crest. Previous authors have suggested that this largely iatrogenic cavity was the source of the President’s sepsis and gradual decline. In actuality, however, there is no evidence in the postmortem examination that the back wound was a source of sepsis. On the contrary, it appeared to be a very large but well-drained space. There was no infection under pressure, no residual abscess, and “very appeared to be a very large but well-drained space. There was however, there is no evidence in the postmortem examination that the back wound was a source of sepsis. On the contrary, it appeared to be a very large but well-drained space. There was no infection under pressure, no residual abscess, and “very

Death and Autopsy

On September 17th, the President became febrile, tachycardic to 120 bpm, and complained of severe pain in his anterior mediastinum. Then, late in the evening on September 19th, 80 days after being shot, Garfield suffered a severe episode of chest pain and died shortly thereafter at 10:35 pm. As described in detail below, the postmortem examination showed that the President’s final cause of death was bleeding secondary to the late rupture of a traumatic pseudoaneurysm of the splenic artery. The chest pain experienced two days earlier likely represents a sentinel hemorrhage before the final rupture of the pseudoaneurysm; although the sentinel hemorrhage may have initially been contained in the retroperitoneum, the autopsy shows that rupture of the pseudoaneurysm eventually resulted in free intraperitoneal hemorrhage and death.

The postmortem examination was conducted 18 hours after the President’s death by Drs. Bliss, Reyburn, Agnew, and Woodward, in addition to other members of the medical team. On external examination, the physicians commented on the President’s severely emaciated state and his extensive peripheral wasting. They also noted an ulceration behind his right ear in addition to multiple purpuric macules and pus-filled pustules covering the deceased’s back, shoulders, axillae, and buttocks.

Early in the course of the autopsy, a flexible catheter was inserted into the back wound, the purpose of which was to define the bullet tract from the outside. Garfield’s physicians assumed that when they exposed the abdomen the catheter would be visible in the peritoneal cavity, most likely in the pelvis; however, when the abdominal contents were explored, it became obvious that the bullet had never entered the peritoneum. Rather than finding the bullet upon exposure of the abdomen, Garfield’s physicians discovered extensive adhesions, particularly between the transverse colon and the anterior edge of the liver. In the left upper quadrant, they discovered a “mass of black, coagulated blood that covered and concealed the spleen and the left margin of the greater omentum.” When they pulled back the omentum, they saw that the blood tracked down into the pelvis where “more than a pint of bloody fluid” was found.

At this juncture, the medical team concluded that the President died from secondary hemorrhage, the source of which was yet undiscovered. Only after removing the abdominal organs and engaging in detailed dissection did the examiners find “a rent, nearly four-tenths of an inch long in the main trunk of the splenic artery, two inches and a half to the left of the coeliac axis.” Together these findings led Garfield’s physicians to determine that the President’s proximate cause of death was a late rupture of a traumatic splenic artery pseudoaneurysm. “This hemorrhage,” they wrote in a bulletin that was reproduced in The New York Times, “is believed to have been the cause of the severe pain in the lower part of the chest complained of just before death.”

A good part of the remainder of the autopsy was focused on determining the path of the bullet. Tracing the catheter inserted before making the initial incision, Garfield’s physicians found an iatrogenic tract leading down from
the wound, behind the right kidney, along the iliac fascia, and almost into the right groin. On the other hand, the original bullet tract was “completely obliterated by the healing process” and therefore had to be dissected in order to decipher the ultimate path of the bullet. Much to their surprise, Garfield’s physicians soon discovered that the bullet was encysted below the pancreas, not in the pelvis as they had thought:

It was found that from the point at which it had fractured the right eleventh rib (three inches and a half to the right of the vertebral spines) the missile had gone to the left obliquely forward, passing through the body of the first lumbar vertebra, and lodging in the adipose connective tissue immediately below the lower border of the pancreas, about two inches and a half to the left of the spinal column and behind the peritoneum.

After discovering that the bullet tract was “almost free of pus,” and thus an unlikely source of infection, Garfield’s medical team was forced to look elsewhere for the source of the President’s septic condition. Although there was certainly evidence of a congestive pneumonia in the right lung, Garfield did not complain of cough until very late in his postinjury clinical course. Moreover, the parotitis and disseminated pustules appeared after the commencement of fever and rigors. Upon completing the autopsy, Garfield’s physicians opined that the “fractured, spongy tissue of the vertebrae furnish[ed] a sufficient explanation of the septic condition which existed.” In arriving at this conclusion, however, the President’s medical team overlooked a major unexpected finding of the autopsy—the discovery of a large abdominal abscess. The original description of this finding merits inclusion in its entirety:

The abdominal viscera was then carefully removed from the body, placed in suitable vessels, and examined seriatim, with the following result: The adhesions between the liver and the transverse colon proved to be [be] bound [by an] abscess cavity between the undersurface of the liver, the transverse colon, and the transverse [mesocolon], which involved the gallbladder, and extended to about the same distance on each side of it, measuring 6 inches transversely and 4 inches from before backward. This cavity was lined by a thick pyogenic membrane, which completely replaced the capsule of that part of the under surface of the liver occupied by the abscess. It contained about two ounces of greenish yellow fluid—a mixture of pus and biliary matter. This abscess did not involve any portion of the substance of the liver except the surface with which it was in contact, and no communication could be detected between it and any part of the wound.

The location of the abscess between the liver and the transverse colon, combined with the fact that it was reportedly filled with “greenish yellow fluid,” points toward a perforation of the gallbladder. An alternate explanation of the pericholecystic fluid collection is that it was an abdominal abscess caused by hematologic seeding of the peritoneal cavity from the infected back wound. This interpretation, however, does not explain the presence of bile in the abscess. Furthermore, the autopsy report states that the bullet did not pass anywhere near the liver or gallbladder, while later clearly indicating that there was no connection between the abscess and the back wound. Therefore, the only explanation that seems probable is that the abscess formed because of the perforation of the President’s gallbladder three to four weeks after he was shot. Moreover, this gallbladder abscess was the most logical source of the President’s sepsis, which was, in turn, the cause of Garfield’s unrelenting downhill course.

Why Did Garfield’s Physicians Miss the Significance of the Gallbladder-Associated Abscess?

The simplest answer is that Garfield’s physicians may not have previously seen autopsy evidence of cholecystitis, nor would they have expected to discover this pathology in an abdominal gunshot victim. Although reports of cholecystitis after the treatment of non-gallbladder disease first emerged in 1844, the disease process was not well characterized until Frank Glenn’s treatise on the subject presented at the American Surgical Association in 1947. Furthermore, the association between post-traumatic conditions and acalculous cholecystitis was not well documented until 1970, when Lindberg and Grinnan reported their experience with 12 American Vietnam War soldiers who developed cholecystitis within 10 to 35 days after the management of their war injuries. Given the somewhat recent delineation of the pathophysiology behind the development of cholecystitis in the context of treatment of non-gallbladder disease, it is not surprising that Garfield’s physicians not only failed to recognize that the President had developed cholecystitis during his recovery from the shooting but also failed to recognize the significance of the gallbladder abscess they encountered during the postmortem examination.

Why Did Garfield’s Historians Miss the Significance of the Gallbladder-Associated Abscess?

The reason why historians have failed to recognize the significance of the four by six inch abscess discovered during the President’s postmortem examination is harder to delineate. Perhaps the failure of Garfield’s medical team to recognize the importance of this critical autopsy finding has led historians to similarly choose to look beyond the obvious. In addition, it has always been convenient to accuse the President’s doctors of malpractice, suggesting that Garfield’s demise was secondary to iatrogenic sepsis from repeated probing of the bullet wound. This allegation is made ever so more enticing given that it was mimed by Guiteau at his trial; when asked why he killed the President,
the assassin replied, “I simply shot him, it was the doctors that killed him.”

Everyone from Alexander Graham Bell to David Hayes Agnew had an opinion about the President’s declining health during his postshooting clinical course. There was speculation from a variety of sources that Garfield’s physicians were at best in disagreement and at worst incompetent. One of the main conclusions of the autopsy—namely the fact that the President’s doctors had completely misjudged the bullet tract—seemed to support the contention that Garfield’s medical team had been mistaken in their approach. Although the presumption of intraperitoneal injury certainly colored much of the medical team’s thinking and care, it is not clear that Garfield’s physicians would have managed the case differently had they known that the bullet tracked toward the President’s left side extraperitoneally through the L1 vertebra. As the pre-eminent surgeon J. Marion Sims so eloquently argued after Garfield’s death, the President’s physicians adhered strictly to the standard of care of the time:

But if the course of the ball could have been ascertained, the result would have been precisely the same. The surgeons could only have kept the pus pouch between the fractured ribs and spine, and the one extending down into the pelvis, empty and clean. This they did all the time as the history of the case and the autopsy show.

Furthermore, even if Garfield’s physicians had possessed the means to ascertain that the President had developed an abscess around his gallbladder, it seems highly unlikely that they could have intervened. The first reports of a cholecystotomy and cholecystostomy had only recently been published in 1866 and 1878, respectively. The first successful cholecystectomy, moreover, was not reported by Langenbuch until the year after the President’s death.

Comments

Most contemporary authors have chosen to take the obvious errors in diagnosis that were unveiled by the autopsy as proof that Garfield’s physicians committed gross negligence. Although the postmortem examination made it abundantly clear that the President’s proximate cause of death was a ruptured pseudoaneurysm, many historians are happy to continue to place all responsibility on Garfield’s physicians. Why some historians have been unwilling to distribute the responsibility for the President’s death at least partially on the assassin is unclear; perhaps it makes for better historical reading to blame the doctors and not the individual who was holding the gun.

Still, one cannot ignore the unexpected discovery of a gallbladder-related abscess. Placing this autopsy finding in context with the patient’s overall clinical course leads the reader to two plausible conclusions. First, President Garfield died of a ruptured pseudoaneurysm of the splenic artery, a complication of the initial gunshot wound. Second, the President’s clinical course, highlighted by recurrent episodes of anorexia, extreme weight loss, recurrent fevers, abdominal pain, and small subcutaneous abscesses, was not caused by an infected bullet tract but was more likely secondary to complications of an undiagnosed and unmanaged course of cholecystitis.

References

9. Condition of the President at one o’clock Sunday morning. Baltimore Sun; July 4, 1881:5.