

# The Assassination of John F. Kennedy: Revisiting the Medical Data

Rod J. Rohrich, M.D.  
Purushottam Nagarkar,  
M.D.

Mike Stokes, M.A., M.B.A.  
Aaron Weinstein, M.S.

*Dallas, Texas; and Chicago, Ill.*



**Summary:** Doubt continues to surround the assassination of President Kennedy to this day. Unfortunately, the controversy was not diminished by the multiple commissions and panels that were convened to investigate it. This was in large part because these various panels continued to propagate much of the confusion and lack of precision that plagued the initial medical reports, and introduced some new confusion of their own. Much of this controversy was driven by incomplete information, poor documentation and analysis, and the puzzling decision to withhold key medical evidence both from investigators and the public. However, the preponderance of evidence does show that the single-shooter, three-bullet theory is plausible both medically and scientifically. (*Plast. Reconstr. Surg.* 132: 1340, 2013.)

**F**riday, November 22, 1963, was turning out to be a beautiful, sunny day in Dallas. President John F. Kennedy and First Lady Jacqueline Kennedy landed at Love Field Airport at 11:40 a.m. They took their seats in an open convertible, and the motorcade set off shortly after 11:50. A little more than an hour later, President Kennedy would be declared dead at Parkland Memorial Hospital.

The fall of 1963 was an eventful period for the Kennedy Administration and the world. The Vietnam crisis was escalating; there had been a military coup just 3 weeks earlier. The South Vietnamese government had been overthrown and President Ngo Dinh Diem had been killed. The world had been to the brink of nuclear war during the Cuban Missile Crisis only a year earlier. The 1964 election was just a year away, and the president felt that Texas and Florida were key states in his re-election strategy.<sup>1</sup> There was also concern that a feud among Democratic Party leaders in Texas might cost President Kennedy the state. On November 12, at a planning session for the upcoming election, the president made plans to visit Texas in the next 2 weeks for a 2-day, five-city tour. On November 21, he visited San Antonio and Houston before ending the day in Fort Worth.

He spent a rainy morning on the 22nd greeting thousands of well-wishers outside the Texas Hotel (Figs. 1 and 2), followed by a breakfast speech to the city's Chamber of Commerce. A quick 13-minute flight brought him to Love Field (Fig. 3).

At the airport, the president and first lady took their seats in a limousine. Texas Governor John Connally and his wife, Nellie, were already seated in front of them. Two Secret Service agents, Roy Kellerman and William Greer (the driver), were in the front.<sup>2</sup> Because the rain that had met them in Fort Worth had cleared, the plastic bubble top had been left off the convertible limousine. Directly behind them was a car that carried eight Secret Service agents. Several cars and buses followed, carrying the vice president and his wife, more Secret Service agents, as well as other dignitaries and press representatives. The motorcade left the airport and traveled along a predetermined route that snaked through downtown Dallas before ending at the Trade Mart, where the president was to give a luncheon speech. The

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*From the Department of Plastic Surgery, University of Texas Southwestern Medical Center, and American Society of Plastic Surgeons.*

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**Fig. 1.** President Kennedy speaks at a parking lot rally in Fort Worth, Texas, at the Texas Hotel, November 22, 1963. Left to right: President Kennedy, [unidentified], Senator Ralph W. Yarborough, Governor John Connally, Vice President Johnson. Photograph courtesy of Cecil Stoughton/John F. Kennedy Presidential Library and Museum.

route had been publicized in the local newspapers, starting November 19 (Fig. 4), to allow the greatest number of people an opportunity to see the president (this was the last time a U.S. president's location and schedule were publicized in this way).<sup>3</sup>

The cars wound their way through downtown. At Dealey Plaza, the motorcade turned onto Houston Street from Main Street (Fig. 5). As they approached the intersection of Houston

and Elm streets, the Texas School Book Depository building stood directly ahead (Fig. 6). Abraham Zapruder, an amateur photographer, stood on a concrete pedestal on Elm Street and began filming the motorcade as it turned onto the street at approximately 12:30 p.m. A few seconds later, as Zapruder's camera recorded the scene, several shots rang out and President Kennedy and Governor Connally were struck. (Watch the Zapruder Film, courtesy of the Zapruder Family Collection/



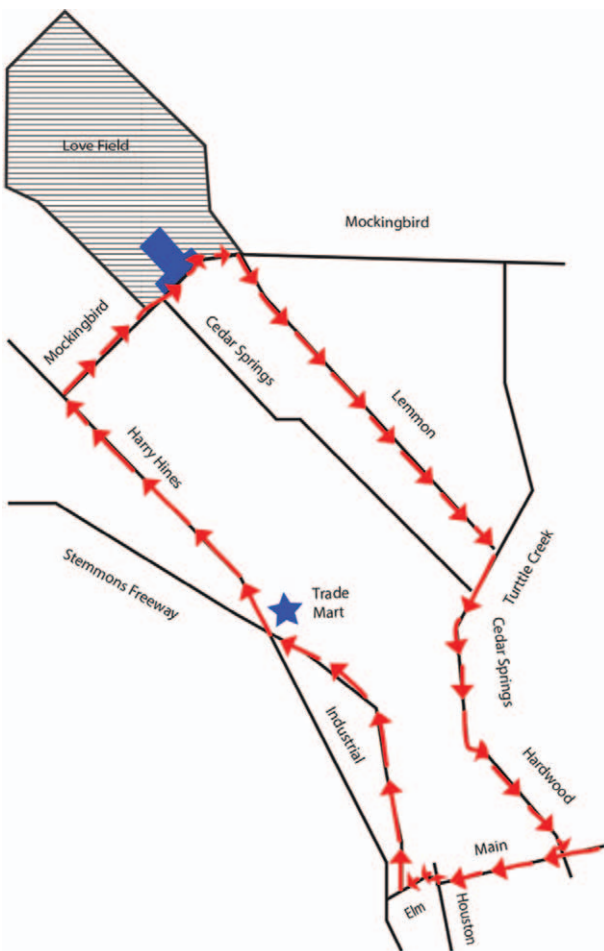
**Fig. 2.** President Kennedy greets the crowd in front of the Texas Hotel, Fort Worth, Texas, November 22, 1963. Photograph courtesy of Cecil Stoughton/John F. Kennedy Presidential Library and Museum.



**Fig. 3.** President and Mrs. Kennedy arrive at Love Field, Dallas, Texas, on November 22, 1963. Photograph courtesy of Cecil Stoughton/John F. Kennedy Presidential Library and Museum.



**Fig. 5.** Dealey Plaza, Dallas, Texas, as it currently appears. Photograph courtesy of The Sixth Floor Museum.



**Fig. 4.** Presidential motorcade route similar to what was published in Dallas newspapers in November of 1963.



**Fig. 6.** The Texas Book Depository as it appears today. The building is now home to The Sixth Floor Museum at Dealey Plaza. Photograph courtesy of The Sixth Floor Museum.

The Sixth Floor Museum at Dealey Plaza, here: <http://emuseum.jfk.org/view/objects/asitem/items@:32274>.)

Agent Kellerman looked back, and seeing that the president was hit, instructed Agent Greer to proceed directly to the hospital. The limousine sped toward Parkland Memorial Hospital. Unbeknownst to everyone, it was already too late for the president.

The assassination of President Kennedy was a tragic moment in American history. The reaction around the country and the world was of unmitigated sorrow and mourning. Although Lee Harvey Oswald was arrested and charged for the crime later that same day, many Americans immediately suspected a broader conspiracy. The Warren Commission, and later the Clark Panel, investigated the killing. None of their conclusions disputed that President Kennedy was shot by two bullets fired from above and behind him. On the other hand,



the House Select Committee on Assassinations concluded in 1979 that there were two shooters and that the president was probably assassinated as a result of a conspiracy. The committee did not, however, offer the names of any persons or groups who had conspired with Oswald.<sup>4</sup>

To this day, the assassination remains controversial, and the argument has been fed in part by the discrepancies in the reporting and handling of the medical evidence. The senior author of this article, Dr. Rod J. Rohrich, was only 10 years old at the time of these events, and his interest in the topic was piqued by the filming in Dallas of Oliver Stone's film *JFK* in 1990. The same year, he was invited to deliver a presentation on the topic by Dr. Paul Manson, who was chairing a Plastic Surgery Educational Foundation symposium in Chicago on facial injury management. In preparation for the presentation, the senior author had the privilege of interviewing several of the doctors who treated President Kennedy at Parkland Hospital—Drs. Carrico, Baxter, McClelland, Peters, Jenkins, and Giesecke.<sup>5,6</sup>

## THE MEDICAL EVIDENCE

### Arrival at Parkland Memorial Hospital

The president arrived at the Emergency Room at Parkland Hospital at 12:43 PM. Dr. C. James (“Jim”) Carrico was on duty and was the first physician to see him. He found “slow agonal respiratory efforts and scant cardiac beats by auscultation.” However, he was unable to find a pulse or blood pressure, and the pupils were fixed and dilated. He noted two external wounds, located on (1) the lower third of the anterior neck and (2) the occipitoparietal calvaria. Dr. Carrico placed a cuffed orotracheal tube, noting a ragged wound of the trachea just below the larynx.

### The Trauma Resuscitation

Attending surgeons Drs. Malcolm O. Perry and Charles R. Baxter and general surgery resident Dr. Ronald Jones arrived in the Emergency Room at this point. They were followed closely by Dr. Marion T. “Pepper” Jenkins, the director of the Department of Anesthesia, as well as staff anesthesiologists Drs. A. H. “Buddy” Giesecke and Jackie H. Hunt. The endotracheal tube was connected to a Bennett intermittent positive pressure machine providing 100% O<sub>2</sub>, and a right saphenous vein cutdown was performed. Infusion of lactated Ringer's solution as well as unmatched type O-negative blood was begun.

Attending surgeon Dr. Robert N. McClelland arrived at this time and began a tracheostomy with Drs. Perry and Baxter. (See Video, Supplemental Digital Content 1, part 1 of an exclusive three-part interview with Robert McClelland, M.D., in which he provides his first-person narrative of the events of November 22, 1963, available in the “Related Videos” section of the full-text article on PRSJournals.com or, for Ovid users, at <http://links.lww.com/PRS/A893>.) The endotracheal tube was switched to a tracheostomy tube with the additional assistance of Dr. Gene Akin. More help came with the arrival of attending urologist Dr. Paul Peters and director of neurological surgery Dr. W. Kemp Clark. Drs. Jones and Peters placed bilateral anterior chest tubes. Given the lack of a pulse or blood pressure, closed chest compressions were begun. Another infusion of blood was begun in the left arm, and 300 mg of hydrocortisone sodium succinate was administered. The intermittent positive-pressure ventilation machine was switched to an anesthesia machine, and cardiac monitors were attached. Attempts were made to slow oozing from the head injuries with packing. The chest compressions were being effectively administered, as evidenced by palpable pulses in the carotid and femoral arteries.

By now Dr. Clark, the chief of neurological surgery, had had an opportunity to more closely examine the patient. He found that the president's pupils were fixed, dilated, and deviated outward, and that he had no deep tendon reflexes or spontaneous movements. “A large wound beginning in the right occiput and extending into the parietal region” was found,<sup>2</sup> along with “a large



**Video 1.** Supplemental Digital Content 1, part 1 of an exclusive three-part interview with Robert McClelland, M.D., in which he provides his first-person narrative of the events of November 22, 1963, is available in the “Related Videos” section of the full-text article on PRSJournals.com or, for Ovid users, at <http://links.lww.com/PRS/A893>.

amount of cerebral tissue on the cart, as well as some cerebellar tissue.” By this time, the electrocardiographic electrodes had been attached, and no electrical activity of the heart or respiratory effort was apparent. At 1:00 PM, 17 minutes after the president arrived at Parkland Hospital, Dr. Clark pronounced him dead.

In the meantime, Governor Connally’s injuries were found to be severe as well. A right chest tube had been placed in the Emergency Room to evacuate a right pneumothorax and hemothorax. The governor was taken emergently to the Operating Room, where he underwent a thoracotomy, as well as operations on the right wrist and left thigh. He was found to have multiple wounds: (1) a 3-cm entry wound lateral to the right scapula, close to the axilla; (2) a ragged, 5-cm exit wound below the right nipple; (3) a 2-cm entry wound of the right dorsal wrist; (4) an exit wound on the volar surface of the wrist; and (5) a 1-cm punctate wound of the left medial thigh. Radiographs showed a small bullet fragment embedded in the body of the distal third of the left femur. A nearly whole bullet was found later that afternoon on the stretcher that Governor Connally was first placed on when he arrived at Parkland.

Many of the physicians who attended to President Kennedy went on to have storied histories of their own as leaders in medicine. Dr. Baxter became a leading expert in the treatment of burns (and the creator of the Parkland burn resuscitation formula), and Dr. McClelland emerged as a world-renowned trauma general surgeon and founder of *Selected Readings in General Surgery*. Dr. Carrico had an impressive

career, becoming chairman of the surgery department at the University of Washington School of Medicine in 1983 and at the University of Texas Southwestern Medical Center in 1990. He was president-elect of the American College of Surgeons at the time of his death in 2002. Dr. Jones became chair of surgery at Baylor University Medical Center in Dallas, Dr. Perry became chair of vascular surgery at New York–Cornell Hospital in Manhattan, and Dr. Peters became one of the most influential urologists in the field. Dr. Clark went on to serve as the president of the prestigious American Association of Neurological Surgeons. Finally, Dr. Giesecke succeeded Dr. Jenkins as chair of the Department of Anesthesiology at Parkland, and both men made important contributions to the field during their long and illustrious careers.

### The Autopsy

In 1963, it was not a federal crime to kill the president, and Texas law required that the autopsy of any person murdered in Texas be conducted in the state. Therefore, the jurisdiction for the autopsy was firmly with Dallas County Coroner Dr. Earl Rose. However, Vice President Johnson and Mrs. Kennedy refused to leave for Washington without the president’s body. Dr. Rose attempted to enforce Texas law, but after a brief scuffle, the president’s body was removed by Secret Service agents, taken to Love Field, and carried aboard Air Force One (Fig. 7). He was transported to Bethesda Naval Hospital, and an autopsy was performed that night by senior pathologist and director of laboratories Commander James J. Humes



**Fig. 7.** President John F. Kennedy’s casket is loaded onto Air Force One at Love Field, in Dallas. Photograph courtesy of Cecil Stoughton/John F. Kennedy Presidential Library and Museum.

and chief of pathology Commander J. Thornton Boswell.

## THE INVESTIGATION

One week after President Kennedy was killed, President Johnson appointed a commission led by U.S. Supreme Court Chief Justice Earl Warren to investigate the assassination. The Warren Report was published almost a year later, in September of 1964 (and is now available online).<sup>2</sup> The report concluded that Lee Harvey Oswald acted alone and fired three shots that struck the president and Governor Connally from above and behind. Attorney General Ramsey Clark convened a panel of four physicians in 1968 to re-examine the original autopsy records, photographs, and radiographs, as well as the physical evidence, including clothing, bullet fragments, and films. This panel also agreed that President Kennedy was struck by two bullets fired from above and behind him.<sup>7</sup>

### The Ballistics

On the sixth floor of the Book Depository, the Dallas police found three spent cartridges and a rifle. A nearly whole bullet was discovered on the stretcher used to carry Governor Connally at Parkland Hospital. Five bullet fragments were found in the president's limousine. Ballistics experts who testified in front of the Warren Commission were unanimous that the nearly whole bullet, the two largest bullet fragments, and the three cartridge cases were definitely fired by the rifle found on the sixth floor of the Book Depository.

### The Bullet Trajectories

The Warren Report and, later, the Clark Panel agreed that the president was shot at three times but struck only twice. It was unclear which of the three shots missed him. The first shot that struck him did so at the base of the posterior neck, exited through the anterior neck, and then struck Governor Connally near the right axilla, exited below his right nipple, traversed the right wrist, and finally became embedded in his left thigh. It was believed that this bullet then became dislodged and fell onto Governor Connally's stretcher in the Emergency Room at Parkland Hospital. The second shot that struck the president hit him in the head, entering several inches above his occipital protuberance, and fragmented on entry, causing an explosive fracture of the right frontal and parietal bones and shredding the right side of his brain.<sup>8</sup>

## Confusion Surrounding the Medical Evidence

From the day of the assassination, many Americans suspected that a conspiracy lay behind President Kennedy's death. Several books called into question the Warren Report's accuracy and conclusions. Public interest in the subject began to wane, however, by 1979, which marked the conclusion of the last of the various commissions that investigated the topic (the U.S. House Select Committee on Assassinations). Oliver Stone's film *JFK* was released in 1991, returning the topic to the public consciousness. Partially as a result, the JFK Records Act was passed in 1992, and thousands of previously sealed documents were consequently released.

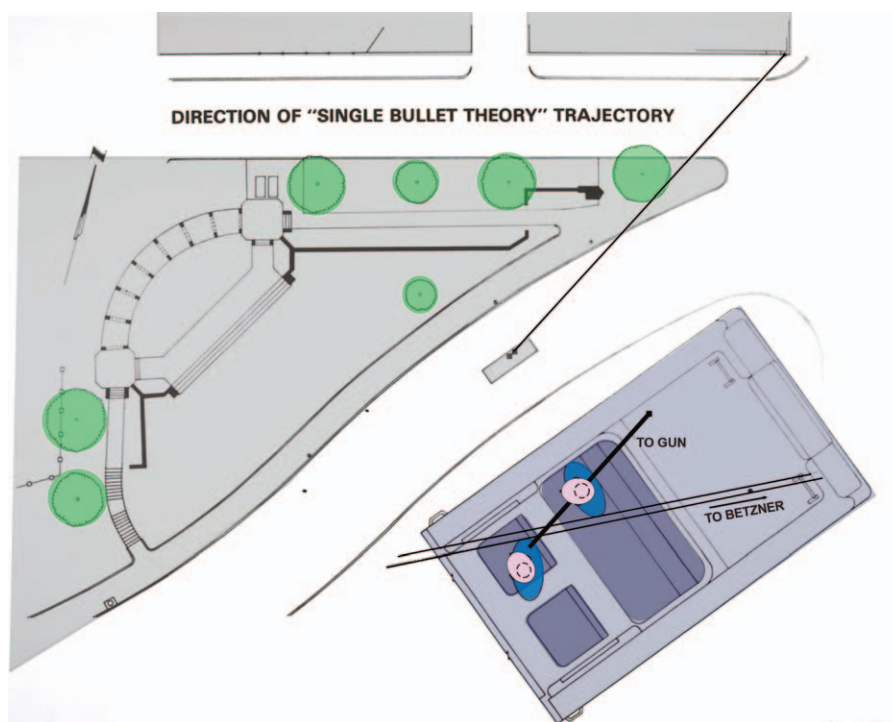
Much of the basis for the various conspiracy theories lies in the confusing and contradictory statements and reports on the medical data. The confusion was caused by both a lack of information and poor documentation.

### The Size and Location of the Wounds

At Parkland Hospital, doctors were aware of only two wounds: the anterior neck wound and the large skull wound. During the autopsy, two more wounds were discovered. One was a 15 × 6-mm wound, 2.5 cm lateral to midline and "slightly above" the occipital protuberance. The other was a 7 × 4-mm oval wound, described as being 14 cm below the right mastoid process and 14 cm medial to the right acromion process. Although this description is reasonably clear, confusion arose from several sources.

First, there had been no communication between the Parkland medical team and those conducting the autopsy—so the doctors at Bethesda Naval Hospital did not know the details of the tracheostomy. Second, the autopsy diagram had this wound marked much lower on the back, in a location not that did not correspond with the written description. Finally, the official death certificate, signed by the president's personal physician, Dr. George Burkley (who did not perform the autopsy but was present), stated that the president was struck in the back at about the level of the third thoracic vertebra. All these issues were a direct result of poor communication and poor documentation. Appropriate communication between the treating physicians and the forensic pathologist did not take place, the autopsy diagram was not drawn to scale (but no mention of this was made on the drawing itself), and Dr. Burkley's death certificate did not match either the autopsy description or the photographs, likely from a lack of attention to detail.





**Fig. 8.** Trajectory of the bullet striking both the president and the governor (from Report of the Select Committee on Assassinations of the U.S. House of Representatives. Exhibit F-144. Washington, DC: U.S. Government Printing Office. [http://www.maryferrell.org/wiki/images/8/83/Photo\\_hasca\\_ex\\_144.jpg](http://www.maryferrell.org/wiki/images/8/83/Photo_hasca_ex_144.jpg). Accessed July 5, 2013). Adapted from Figure II-24 of "The Findings of the Select Committee on Assassinations in the Assassination of President John F. Kennedy in Dallas, Tex, November 22, 1963."

### The Trajectory of the Bullets

Soon after the president had been declared dead and his body removed, a press conference was called on the afternoon of November 22. Dr. Perry, one of the attending surgeons at Parkland Hospital, was asked various hypothetical questions at this press conference. At the time, Dr. Perry was aware of only the two wounds described in the Parkland Medical records (and recounted above): the anterior neck wound and the large skull wound. He therefore speculated that the injuries could have been caused by a single bullet entering the anterior neck that was then deflected upward and exited the skull. This was purely speculation, driven by the lack of information available to the doctors at Parkland (Fig. 8).

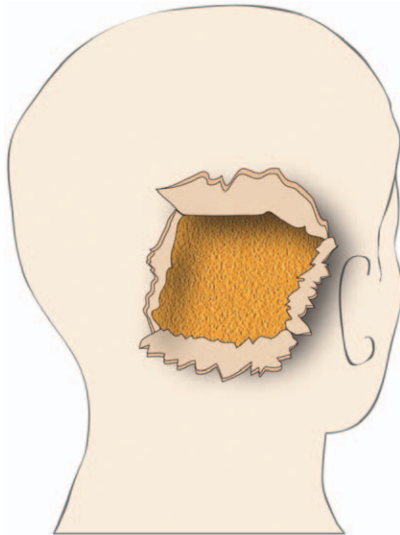
### Lack of Photographs and Radiographs

Dr. McClelland, one of the physicians who attended to the president at Parkland Hospital, is one of the many who believe that there is more to the story. (See **Video, Supplemental Digital Content 2**, part 2 of an exclusive three-part interview with Robert McClelland, M.D., in which he discusses how his first-hand observations

compounded with additional evidence and media to formulate his conclusions about the JFK assassination, available in the "Related Videos" section of the full-text article on PRSJournal.com or, for



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**Fig. 9.** A Pictorial representation of President Kennedy's head wound as described by Dr. Robert N. McClelland of Parkland Hospital. Redrawn based on an image in "Six Seconds in Dallas," by Josiah Thompson (November 1976).

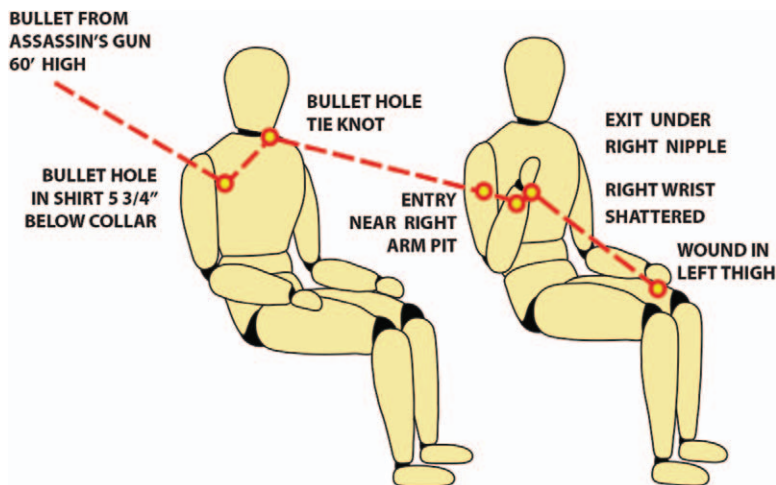
Ovid users, at <http://links.lww.com/PRS/A894>.) In the Emergency Room, he stood a mere 18 inches above and behind the president's head for several minutes, looking directly into the head wound and the skull cavity, holding a retractor while the tracheostomy was being performed. Although he did not have an opportunity to turn the president over for an examination of his back, from the view he got of the skull wound during this time, he is convinced that this was an exit wound (Fig. 9).<sup>6,9</sup> (See Video, Supplemental Digital Content 3, the final part of an exclusive three-part interview with Robert McClelland, M.D., in which he provides



**Video 3.** Supplemental Digital Content 3, the final part of an exclusive three-part interview with Robert McClelland, M.D., in which he provides additional details regarding the medical treatment of Lee Harvey Oswald and his thoughts on the lasting impact of the Kennedy assassination, is available in the "Related Videos" section of the full-text article on PRSJournal.com or, for Ovid users, at <http://links.lww.com/PRS/A895>.

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Each of the commissions that examined the available medical evidence concluded that this was not the case. However, although the official autopsy findings were included in the Warren Commission's report, the photographs and radiographs taken during the autopsy remained sealed. The JFK Records Act of 1992 mandated release of most official documents related to the



**Fig. 10.** The single bullet theory, as depicted in the book *High Treason: The Assassination of JFK & the Case for Conspiracy*.<sup>10</sup> Image is redrawn with permission from the book; copyright is retained by authors.



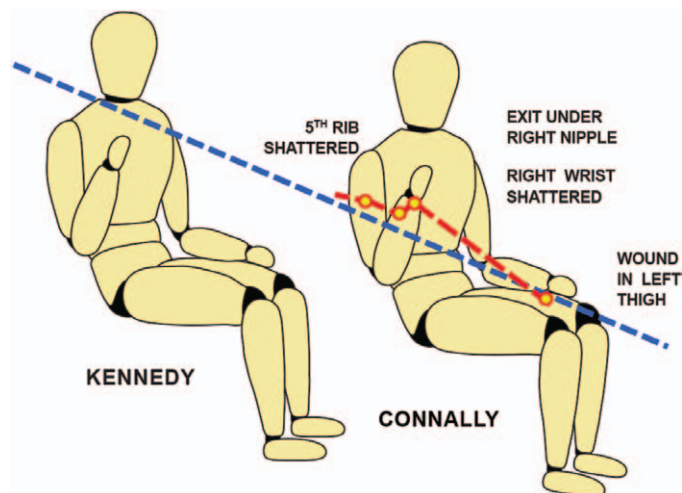


**Fig. 11.** (Above) Frame 256 of the Zapruder film. (Below) Relative positions of the president and governor from Zapruder's film (from Zapruder Family Collection. Dallas: The Sixth Floor Museum at Dealey Plaza). Used with permission from The Sixth Floor Museum at Dealey Plaza. Zapruder Film ©1967 (renewed 1995), The Sixth Floor Museum at Dealey Plaza.

investigation, but the autopsy photographs were specifically exempted from this requirement. An artist's reproductions of a handful of photographs were included in the public exhibits of the House Select Committee. Unofficially released (leaked) photographs were published in 1988 and are easily obtainable. Nevertheless, the lack of availability of this key primary evidence, combined with the small number and poor quality of the unofficial photographs that *are* available, introduced a lasting element of uncertainty and fed endless conspiracy theories.

The single-bullet theory has often been attacked. Indeed, the contradictory and confusing findings from the Parkland medical records,

the autopsy sheet, the autopsy report, and the death certificate, in addition to the lack of photographic evidence, provided weight to these criticisms. For example, the book *High Treason: The Assassination of JFK & the Case for Conspiracy* contends that the single-bullet theory involves an absurdly unlikely trajectory (Fig. 10).<sup>10</sup> This is based on the neck wound locations described in the death certificate. The confusion is centered around the location of the posterior neck wound and the relative heights of the president and the governor in their car. If these are taken into account (Fig. 11), the trajectory seems possible (Fig. 12).<sup>11</sup>



**Fig. 12.** Diagram from Figure 10 roughly adjusted for relative positions of the president and the governor. Image redrawn with permission from *High Treason: The Assassination of JFK & the Case for Conspiracy*; copyright retained by authors.

### SUMMARY

To this day, doubt continues to surround the assassination of President Kennedy. Unfortunately, the controversy was not diminished by the multiple commissions and panels that were convened to investigate it. This was in large part because these various panels continued to propagate much of the confusion and lack of precision that plagued the initial medical reports, and they introduced some new confusion of their own. For example, the report of the House Select Committee on Assassinations in 1979 relied on an analysis of audio recordings from the day of the assassination to conclude that although the president was shot from behind by Oswald, there had been a second shooter who missed, and, therefore, there was a conspiracy to kill the president. Although this audio analysis was later widely debunked by the National Academy of Sciences, it only added fuel to the widely held belief that there was more to the story of the assassination.

Much of this controversy was driven by incomplete information, poor documentation and analysis, and the puzzling decision to withhold key medical evidence from both the investigators and the public.

**Rod J. Rohrich, M.D.**  
 Department of Plastic Surgery  
 1801 Inwood Road  
 Dallas, Texas 75390-9132  
[rjreditor\\_prs@plasticsurgery.org](mailto:rjreditor_prs@plasticsurgery.org)

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  12. Report of the Select Committee on Assassinations of the U.S. House of Representatives. Exhibit F-144. Washington, DC: U.S. Government Printing Office. [http://www.maryferrell.org/wiki/images/8/83/Photo\\_hsca\\_ex\\_144.jpg](http://www.maryferrell.org/wiki/images/8/83/Photo_hsca_ex_144.jpg). Accessed July 5, 2013.
  13. Zapruder Family Collection. Dallas: The Sixth Floor Museum at Dealey Plaza.

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