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An historic case of jaw fracture

On April 14, 1865, at Ford's Theater, President Lincoln was fatally wounded by John Wilkes Booth. That same night, an attempt was made on the life of William H. Seward, Lincoln's Secretary of State. For 100 years, the exact nature of Seward's wounds has been debated. New evidence gives detailed description of these injuries and Dr. Thomas Brian Gunning's successful new technics of jaw fracture treatment.

At about 10:30 P.M. on the night of April 14, 1865, an intruder armed with a Whitney revolver and a bowie knife gained entry to the Washington home of William H. Seward, Lincoln's Secretary of State. At about the same time that an army surgeon was trying to revive the mortally wounded Lincoln in the presidential box at Ford's Theater, the would-be assassin pushed by the Negro house-boy at the Seward residence and demanded ad-

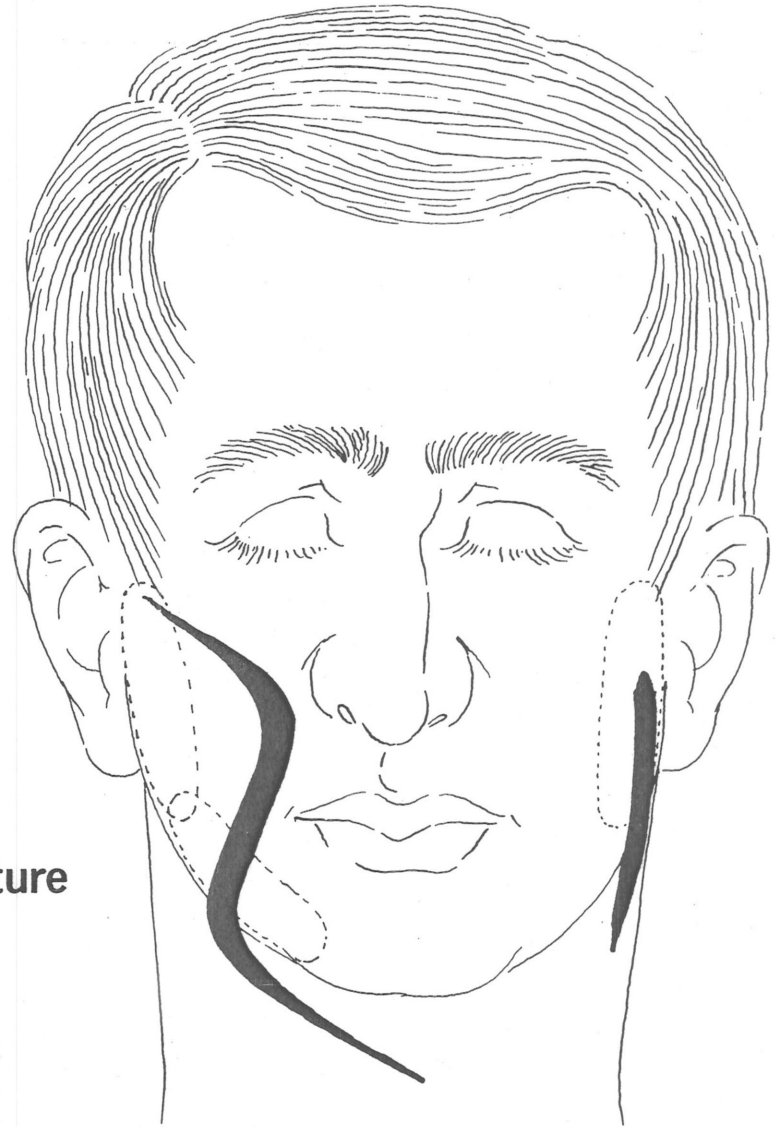


Fig. 1 ■ Locations of stab wounds of Secretary Seward, from descriptions of witnesses. Long cut on right cheek was inflicted as he looked up and to his left side. It exposed 9-day-old fracture of his right lower jaw.

mittance to the Secretary's sickroom. Holding a packet of "medicine," he represented himself as a messenger from the Seward family physician, Dr. Thomas S. Verdi.

Seward had suffered severe injuries 9 days previously in a carriage accident. He lay half propped up in his bedroom. He was attended by an army male nurse, Private George T. Robinson, himself convalescing from wounds, and the Secretary's

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daughter, Fanny Seward. The gas was turned low and Seward lay on the extreme right-hand edge of his bed, farthest from the door, to avoid painful contact of the bedding against his broken right arm.

His physician described his injuries from the carriage accident in the following way: "His right arm was broken close to the shoulder joint and his jaw [mandible] was broken in two places; but the serious injury. . . was concussion." Despite the distress and pain the elderly Seward "was getting along well."¹

Ignoring the protests of the houseboy, William Bell, the assailant insisted that Bell lead him up the two flights of stairs to Seward's room. The intruder, Lewis Paine, alias Powell, was a young, heavily muscled man, more than 6 feet in height. On the third floor landing, Seward's middle son, Frederick Seward, Assistant Secretary of State, intervened, saying his father could not be disturbed. The persistent Paine finally persuaded young Seward to look in on his father to see if he was really asleep, thus identifying the bedroom of his intended victim.

When the son would not permit him to enter, Paine pretended to start down the stairs, then whirled and, catching Frederick off guard, pulled the trigger of his revolver at close range. The gun misfired, whereupon Paine clubbed the son, striking at least two heavy blows with the gun barrel, the first crushing the outer table of the left parietal bone, the second inflicting a deep wound on the left side of the frontal bone at about the line of intersection with the parietal. "Young Seward did not lose consciousness for more than an hour, but was unable to articulate, and then became comatose for the next several days, recovering so slowly that it was six months before he was able to resume his duties at the State Department."²

Despite his wounds, Frederick grappled with Paine from the hall to the door of the bedroom. Seward's nurse, Robinson, opened the door to see what the noise was, and the onrushing Paine bowled him over onto the floor. Paine leaped on the bed and struck several times at the propped-up Seward, but only two of the slashing blows found their marks on Seward's face and neck, as Robinson grappled him from behind, and was cut repeatedly by the assassin's knife.³ No clear understanding of the events of the next few minutes is possible because of conflicting testimony of those involved in the furious struggle in the darkened room. Eventually Robinson was aided by another son, Augustus, who was also cut.¹

Paine fought his way to the stairs and escaped,

severely wounding a State Department employee, Hansell, at some point in his flight from the bedroom and down the stairs.

Secretary Seward, with the weight of the assassin's body removed, rolled to the floor, where he was found by the nurse Robinson, who administered first aid until the attending physician, Doctor Verdi, could be summoned.

Students of this night of assassination have been puzzled as to the exact nature of Seward's knife wounds, which have been variously and indefinitely described. Now, 102 years later, one of the authors (J.K.L.) has found a careful and precise clinical description by Dr. Thomas Brian Gunning, a New York dentist, who was called to the case on April 16. Doctor Gunning said:

Unsuccessful attempts had been made to hold the jaw in place by bandages and also with ligatures on the teeth, by the Surgeons first called on the case. On the fourteenth, [April] the patient was attacked by an assassin and a cut inflicted which reached from under the zygoma to the left of the trachea. Attending Surgeon Basil Norris, USA, informed me that the jaw was fractured on the right side between the bicuspid teeth and also in the ramus of the same side; that the jaw had been bandaged against the upper gum [edentulous] but this proving insupportable to the patient, the bandages were removed. On examination, I found discoloration caused by the accident still remaining on the right side of the face. A cut [inflicted by Paine] commenced under the zygoma, passed forward about three inches, then downward and backward an equal distance, to the lower border of the jaw, from whence it crossed over the front of the throat to the left of the trachea. On the skin, its first direction fell somewhat from a horizontal line, the second passed down at a little less than a right angle to the first, while the third went forward and downward.

These three divisions, of nearly equal length, appeared to have been made by one sweep of the knife. Across the throat the wound was superficial, but above the border of the jaw it grew deeper as it split the cheek—the point of the knife making no entrance into the mouth, except so far as it may be considered to have done so by laying open the right fracture externally, the gum being already lacerated internally from the great displacement of the bone following upon the original injury. The knife was evidently aimed at the throat, but the head being thrown over, the cheek and jaw received the brunt of the blow. No arteries had been ligatured. The wound was neatly sewed up, and healing by first intention, except immediately under the fracture [Fig. 1].

The swelling and stiffness made the examination difficult, but the ramus proved uninjured. There was, however, a second fracture, but on the other side of

the mouth, the jaw being fractured on both sides between the bicuspid. The [lower] jaw contained all ten forward teeth. The right wisdom tooth and root of the left were all that remained back of the bicuspid. The part in front, containing eight teeth, was drawn down out of place, while the right back fragment with the wisdom tooth and second bicuspid was drawn up, showing its fractured end white and bare. The fracture was square across, vertical and smooth, and the parts were separated vertically over a quarter of an inch when at rest, sometimes more. On the left side, the first bicuspid fell downward and forward from the second, one-quarter of an inch. This fracture passed forward somewhat in descending. Here the bone could not be seen, as the gum had separated from both teeth and lay swollen over it. Pus discharged profusely from both fractures. The gum was pale and flaccid, in keeping with the general condition of the patient. The upper jaw was entirely without teeth. [It was] important to set the exposed bone in place as early as possible and also to give the patient time to recuperate—as he had already been subjected, during the morning, not only to a relation of the President's [Lincoln's] death, but to much that has been said and written upon the subject.⁴

Seward was unable to bear the added discomfort of a poor-fitting upper denture, so Doctor Gunning proposed a new interdental splint. However, the idea was rejected by the surgeons in charge in consultation with members of the family.²

Twelve days later, April 28, Gunning was recalled to Washington. He said:

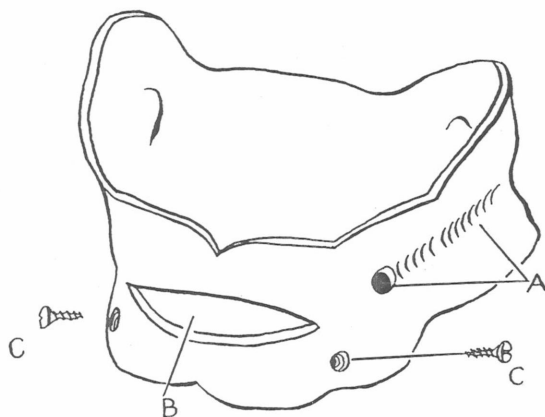


Fig. 2 ■ Gunning's vulcanite interdental splint for Seward. Saliva accumulating in buccal pocket was led by channeled vulcanite to hole A, into mouth proper. Anterior opening, B, level with incisal edges of lower teeth for food, speech, and mouth hygiene. Nut, or female screws embedded in vulcanite allowed screws, C, to be tightened against suitable mandibular teeth, immobilizing splint.

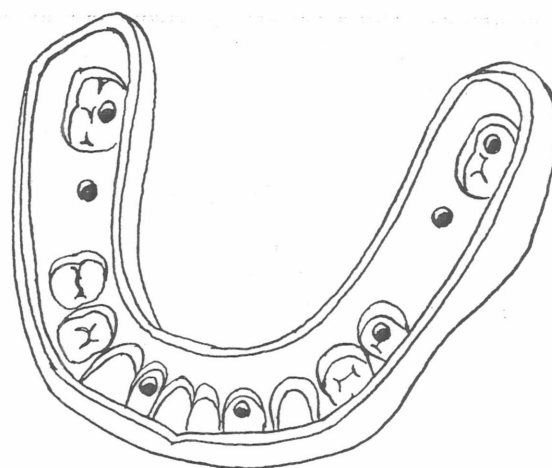


Fig. 3 ■ Gunning's basic design for vulcanite splint shows occlusal surface of mandibular splint. Dark holes through splint allowed "syringing the parts with warm water" without necessity of removal from mouth.

I found the sensation of the right side of the forehead, face, and lips deficient. The separation of the inferior dental nerve by the displacement of the bone and of branches of the facial nerve, by the knife, did not seem sufficient to account for it. There was also irregular motion in the right eye. The front of the jaw was lower and the right back fragment showed its alveolar to a greater extent. There were no indications of any tendency to union on either side. The fragments could be put precisely in place, no splinters or anything else intervening. There was little swelling, but great discharge of pus. Took wax impression of the upper jaw and removed the tartar from the lower teeth. On April 29 I set the jaw, and held it in place by wire and silk ligatures. Took a wax impression of the teeth and gum and obtained the bite directly from the teeth. The patient felt much relieved as the ligatures held the front of the jaw well up. Tried in a gutta-percha splint, arranged the wings in it, removed it carefully from the mouth, placed the upper and lower casts and female screws in it, and set them in a vulcanizing flask,⁴ [Fig. 2].

Gunning described the construction of the splint in a later article. On February 12, 1861, he had first applied a hard vulcanized rubber splint for a patient:

The radical and distinctive feature of these splints is, that, when suitable teeth are in the mouth, nothing is required on the outside, and the patient may move about. In the use of these splints fractures of the lower jaw are divided into two distinct classes; first those in which the teeth and gum of the fractured jaw are alone used to control the fractured bone, and the jaw is allowed to move naturally; second, those in which the splint is fitted to both upper and

lower teeth, the jaw being held still; but no bandage is used around the head⁵ [Fig. 3].

Gunning describes his basic technic of splinting as follows:

To apply these splints the fractured jaw should, if possible, be set and held by ligatures around the teeth while an impression of the teeth and gums is taken in warm wax. The plaster cast from the impression will then be precisely what is required to mold the splint. If the bone cannot be held in place an impression of the teeth may be taken in the best attainable position, the plaster cast then separated where necessary and the parts set in place. . . . I have generally used this splint without any fastenings but . . . it is sometimes advisable to secure it by . . . screws passing into or between the teeth. . . . When screws are used to hold any rubber splint fast on the teeth, metal nuts must be imbedded in the splint, for the screws to work in.⁵

In Seward's case, Gunning continues:

Although the front of the jaw containing the eight forward teeth was greatly displaced [before the setting] the silk and wire ligatures held well until May 2 when they were removed and the splint applied. It was hard vulcanized rubber, covered the roof of the mouth and adjacent gum, enclosed all the lower teeth, and went down over the gum on the outside somewhat. The opening in front was seven-eighths of an inch wide, half an inch high in the center, the wings preventing any more room sideways as they were set clear of the commissure of the lips. To have given any more room in the height by depressing the lower jaw, would have made it very difficult to prevent saliva from overflowing at the lips. Upon putting in the splint, the breathing was spasmodic for several minutes, but this soon passed off, and I screwed it fast to the lower teeth. They held it against the upper gum for the first night, but after that a cap [on the head] with adjuncts, was worn to support the splint [Fig. 4].

The upper wings only were used, as the lower jaw was held up in the splint by screws passing into the lower canines. After giving the excellent Army nurses, who were in attendance upon the patient, full direction for keeping the splint clean in the mouth and properly balanced by the cap which I had fitted to the head I left Washington May 3.

While talking was very difficult and frustrating at first, through the opening in the mouth, the patient was able to talk freely when I saw him on May 8. Saliva accumulated several times in the cheek probably from a severed Steno's [Stenson's] duct, but had been let out by lancing externally. By June 11 the left side of the jaw was well united, but the right still ununited, although the wound under it was near-



Fig. 4 ■ Gunning interdental splint. Adapting splint shown in Figure 2, iron wings tinned to prevent rusting and for easier soldering were embedded in splint. These wings, placed as far laterally as was comfortable, emerged from mouth at normal lip line and were arched to avoid contact with swollen facial tissues. Holes in wings or iron pins in some of lower wings afforded tape connection with headcap, submental sling, or both. The headcap was stabilized by tapes at rear which passed under patient's shoulders. Immobilization of mandible to maxilla was thus accomplished by one or combination of three devices: bilateral use of screws through vulcanite to tooth surfaces or interproximal areas; use of maxillary iron wings and headcap, or use of mandibular wings and submental linen sling.

ly closed, the last of several pieces of bone having been removed around the first of June.⁴

This splint had held the jaw firm for 68 days, and . . . while the right fracture was still ununited [it] did not surprise Dr. Gunning since the bone had been exposed to so much during the twenty-three days which elapsed before he had been permitted to set it. The saliva from the right parotid gland had dis-

charged through the fracture from a short time after the attack. Gunning felt that these unfavorable circumstances, with the enfeebled condition from loss of blood, had been followed by necrosis of the ends of the bone on that side, and, indeed, several pieces had come away externally during the first six weeks, as well as a long piece of bone from the inside of the jaw on the left side. Dr. Gunning removed the necrosed alveolar bone around the second bicuspid in June, but left the tooth in, as it appeared to have healthy connections with the lower parts of the socket. The other teeth had grown firm. The external appearances indicated the saliva followed the course taken by the point of the knife. By July 9, Stenson's duct proved to be completely closed. Gunning could not pass the smallest probe into it and the saliva discharged entirely through the ununited fracture on the right side. A second splint was inserted and worn from July 9 to August 4, and another one until October 1865.²

Dr. Gunning stated: "In a letter to me of March 29, 1866, the patient says: 'The whole jaw moves quite well and firmly. Thus at last I begin to regard my cure in that respect as complete. I have not seen him myself since October 1865, therefore cannot speak of it by personal observation'."²

Summary

A case of mandibular jaw fracture treatment is described. Historically interesting, because the patient was Lincoln's Secretary of State, William H. Seward, the clinical picture and treatment described by a New York oral surgeon, Dr. Thomas

Brian Gunning, may be, also, a dental landmark. The patient, Seward, suffered a concussion, arm fracture, and bilateral fracture of the mandible on April 5, 1865. Nine days later, Seward again suffered serious injury—knife wounds inflicted by an assailant on the night of Lincoln's assassination.

Doctor Gunning had to treat a mandibular fracture complicated by concussion, weakness from blood loss, arm fracture, face bruises and contusions, and deep facial knife wounds. Gunning's suggested treatment, refused by the army surgeons 2 days after the attack, was begun 12 days later, 23 days after the accident when severe suppuration further complicated the picture.

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