

## How a Scoville aneurysm clip fought in the Cold War and helped to establish neurosurgery in Iceland

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It can be said that the specialty of neurosurgery in Iceland had its beginnings on November 30, 1971, with the arrival of a huge American C-130 Hercules aircraft. It was carrying a small package containing Scoville aneurysm clips. They were sent to the late Bjarni Hannesson (1938–2013), who had received his neurosurgical training in 1967–1971 at the Dartmouth-Hitchcock Medical Center (then known as Mary Hitchcock Memorial Hospital and located in Hanover, New Hampshire). He used one to clip the right posterior communicating artery aneurysm of a 34-year-old fisherman, who recovered well. The apparent reason for the use of such a huge aircraft for such a small payload is to be found in the sociocultural politics of the Cold War. It involved the continued presence of the American base at Keflavík, where the C-130 landed. The base was under pressure to be closed by Iceland's left-leaning, nominally communist government. The C-130's arrival generated welcome publicity for the continued operation of the American base, which is still there.

<https://thejns.org/doi/abs/10.3171/2023.5.JNS23214>

**KEYWORDS** Iceland; neurosurgery; Cold War; cerebral aneurysm clip; history; vascular disorders

At 0600 hours on Tuesday, November 30, 1971, a massive C-130 Hercules aircraft of the US Air Force (Fig. 1A) touched down on the runway in the Arctic darkness of the American base in Keflavík, Iceland. When it came to a stop on the tarmac, a small, battered, green Volkswagen pulled up below the cockpit—rather like a mouse meeting an elephant (Fig. 1B). The pilot climbed down and handed the driver a small package—a minuscule cargo (Fig. 1C) for such a behemoth—and the pilot said, “When will you operate, doctor?” Thus continued a modern-day Icelandic saga with international dimensions.

### Bjarni's Story to November 30, 1971

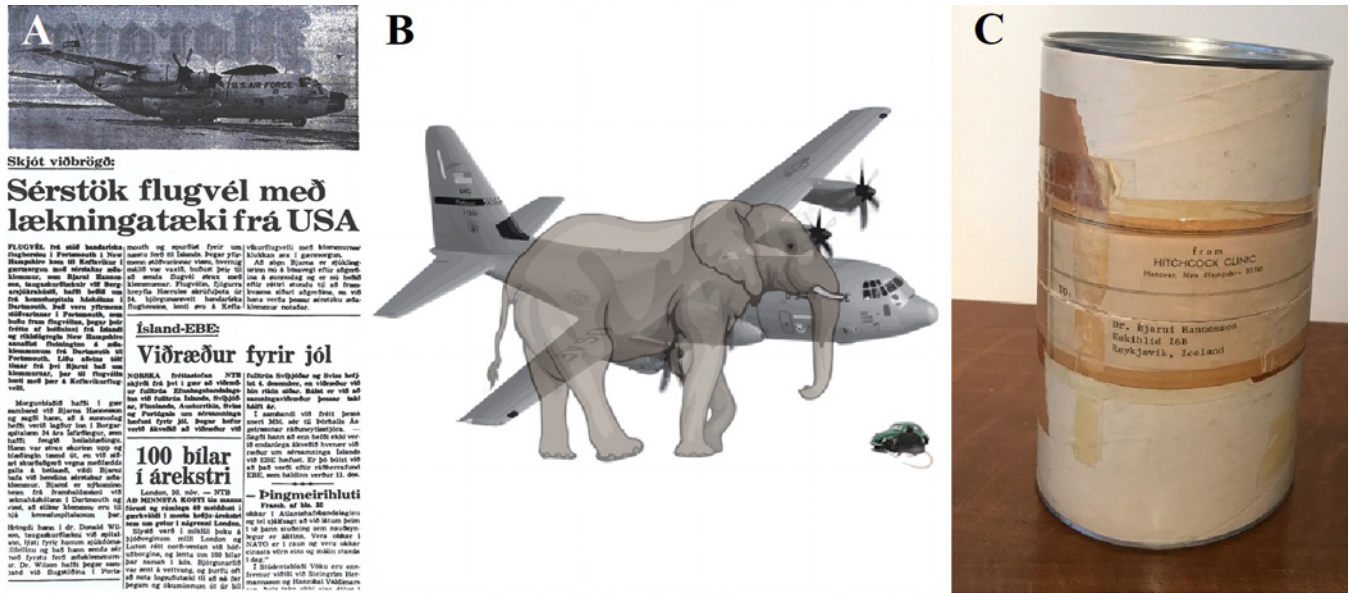
The doctor in the saga was the late Bjarni Hannesson (1938–2013; Fig. 2A). He was a proud Icelander who obtained his M.D. at the University of Iceland in 1965. After 4 months of internship at Reykjavík's Landspítalinn (National Hospital, now National University Hospital), Bjarni and his young family moved to Stamford, Connecticut.

There he did an old-fashioned rotating internship at Stamford Hospital in 1966–1967. At the time he had no particular intention to do neurosurgery. He had not seen any neurosurgery being performed in medical school, because there was no such practice in Iceland, whose population then was approximately 206,000 (it is now approximately 376,000).<sup>1</sup> Most Icelandic patients who needed neurosurgery were flown out to Copenhagen.

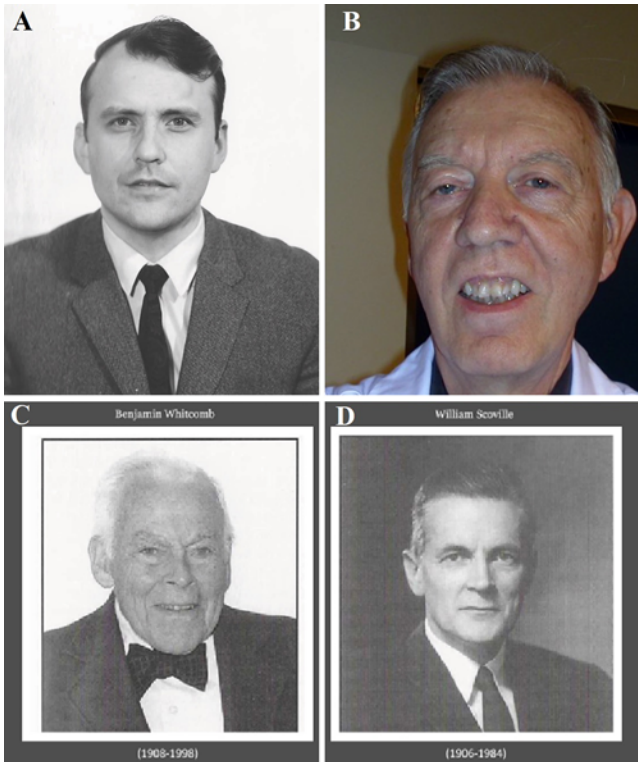
After Stamford, Bjarni did a year of surgical residency at the Hartford Hospital in Connecticut, where he encountered the senior neurosurgeons Benjamin Whitcomb (1908–1998; Fig. 2C) and William Scoville (1906–1984; Fig. 2D). The die was cast for neurosurgery, and he went on to a residency at Hitchcock in 1967–1971. When he returned home in the summer of 1971, he had to serve 3 months as a country doctor in Blönduós, a village of 900 people in northwest Iceland, in order to get his Icelandic medical license. He enjoyed that experience, except for the obstetric deliveries and the dental problems. During that time, he was called twice to do emergency neurosurgical

SUBMITTED February 2, 2023. ACCEPTED May 26, 2023.

INCLUDE WHEN CITING Published online July 28, 2023; DOI: 10.3171/2023.5.JNS23214.



**FIG. 1. A:** C-130 cargo plane carrying Scoville clips. The title of the front-page story of Reykjavik's *Morgunblaðid* (*Morning Paper*) of December 1, 1971, reads, in translation: “Fast action: a special airplane brought a surgical instrument from the USA.” © *Morgunblaðid*, published with permission. **B:** Illustration. A small Volkswagen drives up to meet the C-130 cargo plane, much like a mouse meeting an elephant. **C:** The canister that carried the Scoville aneurysm clips. Figure is available in color online only.



**FIG. 2.** Portraits. **A:** Bjarni Hannesson (1938–2013). **B:** Kristinn Guðmundsson. Panels A and B © Thorbjörg Thoroddsdóttir, published with permission. **C:** Benjamin Whitcomb (1908–1998). **D:** William Scoville (1906–1984). Panels C and D © Society of Neurological Surgeons, published with permission. Figure is available in color online only.

cases at the National Hospital in Reykjavík. But after the summer of 1971 Bjarni needed a job, and the National Hospital did not seem interested in starting a neurosurgical service. So, Bjarni contacted the chief of surgery at the recently founded Borgarspítalinn (City Hospital) in its new building in Reykjavík. Dr. Fridrik Einarsson agreed with the idea of starting a neurosurgical service, but of course he had no budget for it at that moment. Then, unexpectedly...

**Bjarni Found a Partner**

Unknown to the Hannessons at the time, on the same Icelandair flight that brought them from Keflavík to Kennedy Airport in 1965, there was another young Icelandic doctor and his family. Kristinn Guðmundsson (Fig. 2B) earned his M.D. in Iceland in 1963, and he knew he wanted to be a surgeon. He spent a year (1963–1964) in surgery and medicine and a year (1964–1965) in anesthesiology at home. In the United States he was an intern in surgery at Baltimore City Hospital (1965–1966) and a resident in general surgery at Cleveland Metropolitan General Hospital (1966–1967). When he attended the weekly meetings of the neurosurgical staff in the Department of Neurosurgery at the Case Western University Hospital he was hooked on neurosurgery.

Kristinn completed his fellowship in neurosurgery at the Mayo Clinic in 1971 and also returned to Iceland in that summer. Neither Bjarni nor Kristinn knew of the other’s plans until close to that time, but obviously Kristinn also needed a job. At the City Hospital, Bjarni and Kristinn were initially appointed as “residents,” Bjarni in the emergency room and Kristinn in anesthesiology. Together, the pair founded the neurosurgical service at City Hospi-

tal. They were called to do neurosurgical procedures as needed, and now an Icelandic fisherman with a ruptured aneurysm appears in the saga.

### The Patient's Initial Treatment

The patient was a 34-year-old man from the town of Ísafjörður on the north coast of the Westfjords peninsula, which is in the northwest of Iceland. The rumor mill at Hitchcock at the time said that he was some kind of VIP (Very Important Person). That was grapevine embellishment—except that all fishermen are VIPs to the Icelanders. On November 28, 1971, when he was working at a cannery, he suddenly lost consciousness while he was at lunch. He was taken to the local hospital and then flown to Reykjavík City Hospital (Fig. 3A), where an angiogram showed an aneurysm and a large intracerebral hematoma on the right side (Fig. 3B); this was before computerized imaging. There were signs of raised intracranial pressure and impending herniation—the patient clearly was not a candidate for evacuation to Denmark. Bjarni and Kristinn removed the hematoma immediately after the angiogram, and the patient regained consciousness the next day, when he was extubated. He had a mild left hemiparesis.

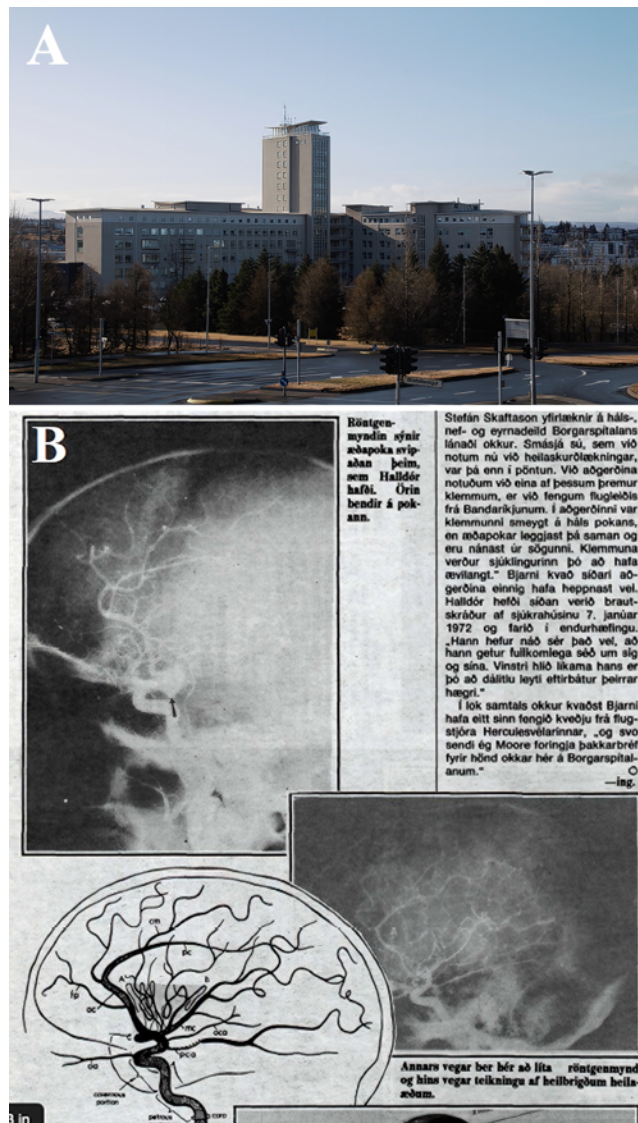
Now the truth be told, Bjarni was in less of a hurry to clip the aneurysm than the pilot assumed. In those days the data about early rebleed rates was less clear—although it was beginning to accumulate. Also, vasospasm was much more feared than it is now—we had fewer treatments for it before triple therapy. It was common practice to wait 10 days or 2 weeks posthemorrhage before approaching the aneurysm, with or without prior evacuation of a hematoma. By those lights, Bjarni had time to make some arrangements.

### The Journey of the Scoville Clips

Bjarni and Kristinn could jury-rig a lot of equipment—they borrowed a microscope from ENT—but they needed some proper clips. At Hitchcock, Scoville clips were then standard equipment.<sup>2</sup> Thinking that the Hitchcock hospital could send some clips in the mail, Bjarni called his mentor there, Donald H. Wilson (1927–1982; Fig. 4). A week later, in a letter to Bjarni, Wilson said:

We are all anxious to hear about the outcome of last week's adventure. After you phoned [on November 29], I took what I though[t] was a remote chance and phoned the Strategic Air Command in Portsmouth, N.H. [Pease Air Force Base] There [sic] response was immediate, profound, and startling. They have a tremendous machinery geared to emergency situations but I did not expect such an enthusiastic response ... even the state police were terrific. They rushed the clips down to the base. From what I heard the clips arrived in Reykjavik [actually Keflavik] about seven hours after they left here. (D. H. Wilson, letter to Bjarni Hannesson, December 6, 1971.)

So, officers of the New Hampshire State Police picked up the clips in Hanover and drove them to Portsmouth—a distance of approximately 115 miles. This implies that the C-130 was waiting for them and ready to go. That makes sense, because Wilson talked to the commanding officer at Pease before he called the state police. We have Wilson's short note that accompanied the package. It was addressed to Commander W. E. Moore at Pease Air Force



**FIG. 3.** Hospital and angiogram. **A:** Reykjavik City Hospital. © Stefán Hrafn Jónsson, published with permission. **B:** Three angiogram pictures from *Morgunblaðid*, 1985. © *Morgunblaðid*, published with permission. Figure is available in color online only.

Base. The message said: “Thank you for your help in this urgent situation. The package contains Scoville clips for obliteration of an intra-cranial aneurysm.” (D. H. Wilson, letter to W. E. Moore, November 29, 1971.) Given that W. E. Moore was the commanding officer at Pease, most likely it was he who issued the order for the flight—probably with the stated mission as a training exercise because Pease acquired its C-130s in that year, 1971. In short, Bjarni thought the clips could be mailed to him, and Don Wilson thought there might be a military flight to Iceland already scheduled.

From the Hannesson's personal perspective, Bjarni's widow Oda (as told to T.T.) recalled:

One night late in Nov. [19]71 we were woken up by a phone call. We had been at a big ball at Hotel Borg that night, an



**FIG. 4.** Portrait of Donald H. Wilson (1927–1982). © Dartmouth-Hitchcock, published with permission.

early celebration of upcoming Independence Day, December 1. Lots of fun and we came home late.... After a few hours' sleep, about five o'clock, the phone rang. Bjarni got up to answer it and he was speaking English ... he said that he had been told to drive to Keflavik to receive a package, and it took him a moment to realize what this was about. Yes, he had asked for the clips to be sent, but he expected that it would take some time through the mail and possibly [through] the tax system.... This certainly was unbelievable!

Because Bjarni was speaking English on the phone, Oda knew that something unusual was afoot. In fact, the call from Keflavík came an hour before the C-130 arrived, and it took most of that time for Bjarni to drive the 30 miles to Keflavík on the (then) very bad road from Reykjavík.

### Successful Clipping

With the arrival of the C-130 the clips were suddenly at hand. In a conversation many years later, Bjarni told one of us (S.H.G.) that he sometimes ignored the problem of vasospasm and proceeded to early aneurysm clipping if everything was otherwise lined up well. On December 3, 1971—5 days after his initial bleed—Bjarni and Kristinn took the patient back to the operating room. Through a right subfrontal approach they clipped the lesion uneventfully. It was a posterior communicating artery aneurysm, with the dome pointing into the temporal lobe. The patient was discharged on January 7, 1972, with a very slight left hemiparesis. When our fisherman was interviewed by a newspaper reporter in 1985, at age 48, he was president of his local golf club. He died in 2009 at age 71, of an unrelated cause—probably cancer.

Of interest, the patient was one of 8 siblings, and 4 were deceased. One had died in Copenhagen with documented subarachnoid hemorrhage. Another was later found to have an aneurysm that was clipped by Bjarni. In 1977 the study “Epidemiological investigation of cerebrovascular disease in Iceland, 1958–1968 (ages 0–35)”<sup>3</sup> showed an unusually high incidence of nonocclusive cerebrovascular disease in Icelanders of that age group. On another, later occasion, Bjarni also operated on the patient's lumbar disc herniation.

### The Clip Saga in the News—American and Icelandic

Now if this unlikely story had occurred today, surely it would have gone viral. However, in 1971 there was no internet. As might be expected, the story was picked up by regional newspapers in the Upper Connecticut River Valley, where Hitchcock is located, and also (belatedly) by the Dartmouth College Office of Information Services. Still, it was the reaction in Iceland that mattered much more, because that small country was one of the pieces in the international chess game that was the Cold War. In translation, the front-page story of Reykjavík's *Morgunbladid* (*Morning Paper*) of December 1, 1971 (Fig. 1A) reads: “Fast action: a special airplane brought a surgical instrument from the USA.” A reporter for the newspaper had contacted Bjarni, so the news had spread. From the international perspective, the story in the *Morgunbladid* was exactly the outcome that the Americans might have hoped for, and that conclusion now requires some historical context.

### History of Iceland and the American Base to 1971

Iceland was settled by Norsemen in approximately 870 CE.<sup>4</sup> It can claim to have been a democracy since the founding of its parliament—the Althing—in 930. Before World War II the country was largely autonomous, although still formally connected to the Kingdom of Denmark. However, in April 1940 Denmark was occupied by Germany, so in May 1940, the British simply moved in and occupied Iceland without so much as a “how-do-you-do?” Iceland has never had any formal defense forces, and the British wanted to be sure that the Nazis did not take over the island and use it for a submarine base in the critical North Atlantic shipping lanes. In turn, the British handed over the defense of Iceland to the United States in 1942—hence the American base at Keflavík. Initially there were promises for the Americans to leave entirely at the end of the war, but the deadlines got stretched out, especially after the Cold War got hot in the later 1940s. So the American base at Keflavík was controversial from the beginning.

After a long struggle, Iceland gained full independence in 1944. Thus, it was effectively under foreign military occupation as it was getting organized internally, and it was trying to find its footing as a microstate on the international scene. With the Danes out of the picture, the British and later the American forces were a formidable presence, which did not sit comfortably with the nation-building project. Also there were other nationalistic currents in Icelandic society, especially concerns about cultural con-

tamination—American movies, American music, etc., as well as a threat to the ancient Icelandic language. Some of the perceived threat was simply racist—a concern about Black soldiers impregnating Icelandic girls—or about any soldiers marrying Icelandic women and taking them away from the country. There actually was a governmental agreement to limit the number of African American servicemen on the base!<sup>5</sup>

Another strand of opposition to the base was Cold War politics and radicalization of the youth. Inevitably, the youth movement of the 1960s washed over Iceland. There was opposition to the Vietnam War, but the focal point of a leftist antiwar movement was the American base. In the late 1930s the old Icelandic Communist Party reinvented itself as the Socialist Party, which merged with the left wing of the Social Democratic Party in 1968. The new party—the People’s Alliance—shed much of its pro-Soviet past. Instead, it built on the new radical youth movement, and it made the closing of the base one of its defining goals.

In the Icelandic election of 1971, the People’s Alliance got 17% of the votes, so it became part of the left-of-center government that formed on July 14, 1971—just 4.5 months before the C-130 flight. The new government reflected both leftist and nationalistic opposition to the American base. Pursuing that issue was actually part of the new governmental agreement. There was a very real possibility that the Americans would simply be asked to leave.

Thus, there was a battle for the hearts and minds of the Icelanders. In this the Cold War competition of the US versus the USSR was certainly important. Icelanders debated both the global strategic picture and the local implications. Would the Soviets invade if the Americans left? In the event of a war, would Russia bomb Iceland because of the base? There were also huge financial interests. The US government was flooding the system with money, through a consortium of contractors associated with political parties, who had exclusive rights to work on the base—at astronomical rates. At the cultural level, TV and radio broadcasting from the American base was a thorn in the side of the older generation, but it was loved by many young people.

Safety was another important factor. The Americans operated a helicopter squad that had a significant impact on the Icelandic fishing fleet—and the fishing fleet was and is sacrosanct to the Icelanders—far beyond mere financial considerations. American military helicopters would fly far out to sea to rescue fishermen in trouble, and this would be splashed across the front pages of the newspapers—especially in the *Morgunbladid*, which was the organ of the Conservative Party. This safety factor would be brought up in any debate about closing the base: “What about all the fishermen they have saved—would you have them die?” The American helicopters also provided emergency evacuation for other sick and injured Icelanders in remote villages.

In this context the optics were perfect—a huge Hercules airplane flying a tiny surgical clip across the Atlantic so a young American-trained, Icelandic doctor could save the life of a critically ill fisherman from the Westfjords. It showed that the American military would go to extraordi-

nary lengths to safeguard the people of Iceland, at a moment when a new left-of-center government seemed ready to demand the closing of the American base.

Now, as already said, it is likely that the order for the C-130 flight was issued by the commanding officer at Pease. Presently we have no documentary evidence that Cold War political considerations contributed directly to the order. We do not know for sure what was on the mind of Commander Moore. But, to those of us who remember those frightening days it is inconceivable that anyone in Commander Moore’s position would not have thought about the political implications. The Cold War was always on our minds.

## The Founding and Current Status of Neurosurgery in Iceland

Thinking back on this saga, it must have given Bjarni and Kristinn some leverage in their situation. That is, the publicity could not have gone unnoticed by the powers-that-be in the City Hospital. Bjarni resigned his emergency room position in 1972, which coincided roughly with an offer to join Dr. Scoville’s busy practice in Hartford, Connecticut. Fortunately for Iceland, the neurosurgery division at the City Hospital had been founded close to that time.

After its founding the service in Reykjavík flourished rapidly. Presently (in 2020) there are four full-time neurosurgeons in the department. In the past there has sometimes been one resident, who then finished training in North America or Scandinavia. The service performs upward of 800 cases per year, both cranial and spinal (many microdissectomies). There is a 15-bed unit and a dedicated operating room with high-tech equipment. Since the founding there have been 25,700 operations, including 800 clippings of aneurysms (approximately 18 per year). Now, however, 80%–90% of aneurysms are treated endovascularly. The only patients who are sent out routinely (to Stockholm or London) are those who require the Gamma Knife.

## Conclusions

### Epilogue—The Unused Clips Returned

In a manner of speaking, our saga went full circle on November 7, 1997. At a party for Richard Saunders, the retiring chief of neurosurgery at Hitchcock, Bjarni returned the unused clips in the original container (Fig. 4). His remarks were brief and eloquent, but unfortunately were not recorded.

The Naval Air Station Keflavik was indeed deactivated, and the base was dismantled after the Cold War in 2006. The housing facilities were transferred to the Icelandic authorities and subsequently repurposed for civilian uses, including low-income housing.<sup>6</sup> The 1951 defense agreement between the US and the Republic of Iceland<sup>7</sup> is still in force, as well as the security commitments of NATO as a whole, but the US has no plans to reestablish a permanent presence in Iceland.<sup>8</sup>

## Acknowledgments

For their assistance, it is a pleasure to thank Aron Bjornsson,

David Roberts, Richard Saunders, and especially Kendall Lane, medical illustrator in Brown University's Department of Neurosurgery.

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## Disclosures

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

## Author Contributions

Conception and design: Telfeian, Greenblatt, Thoroddsdottir. Acquisition of data: Greenblatt, Thoroddsdottir. Analysis and interpretation of data: Greenblatt, Bjarnason. Drafting the article: Telfeian, Greenblatt, Bjarnason, Guðmundsson, Hagan. Critically revising the article: Telfeian, Greenblatt, Guðmundsson, Hagan. Reviewed submitted version of manuscript: all authors. Approved the final version of the manuscript on behalf of all authors: Telfeian. Administrative/technical/material support: Telfeian, Hagan. Study supervision: Guðmundsson, Hagan.

## Supplemental Information

### Previous Presentations

First presented virtually (June 13, 2021) at Rhode Island Hospital, Providence, RI (Brown-RIH Neurosurgery grand rounds). Revised and delivered as the Victor Horsley History Lecture at the Section on the History and Culture of Neurosurgery of the AANS, Philadelphia, PA (April 30, 2022); read for Dr. Greenblatt by the section chair, T. Forcht Dagi, in person.

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