Neurosurgical Forum LETTERS TO THE EDITOR

Early achievements of Hans Brun in the surgery of intramedullary tumors

TO THE EDITOR: With interest we read the article of Pendleton et al.⁶ (Pendleton C, Rincon-Torroella J, Gokaslan ZL, et al: Challenges in early operative approaches to intramedullary spinal cord tumors: Harvey Cushing's perspective. *J Neurosurg Spine* 23:412–418, October 2015), and it certainly highlighted some of the lesser known contributions of the “father of modern neurosurgery.”

Without wanting to belittle Cushing's achievements in the surgical treatment of intramedullary spinal cord tumors to any extent, we think it is necessary to point out once more that pioneering achievements in this area were made at the same time in Switzerland.⁷ The Lucerne-based surgeon Hans Brun (1874–1946) successfully operated on 3 patients with cervical intramedullary lesions. The first procedure was carried out on February 15, 1910, notably before the first case performed by von Eiselsberg (on November 13, 1907) had been published in 1913.^{4,11} The second and third procedures followed on September 21, 1910, and November 13, 1913, respectively.^{1,9,10} Hans Brun and his colleague the neurologist Otto Veraguth from Zurich provided detailed information on the pre- and postoperative courses, as well as on the surgical techniques used and complications. In the works of Brun and Veraguth we find an extraordinary wealth of surgical details, conceptual considerations, and recommendations to an even greater extent than in the communications of Cushing or other qualified authors of that time. They felt obliged to share their experiences with this very delicate type of surgery with colleagues of their time and therefore published their cases. To put it in the original words of the authors, followed by our translation:¹

Der definitive Erfolg solcher heute noch höchst bedenklicher Eingriffe hängt aber mehr als bei manch anderer Operation von unserem technischen Können und von subtilsten Einzelheiten ab, und es lohnt sich deswegen wohl der Mühe, im folgenden nun noch näher auf die in diesem Falle gemachten chirurgischen Erfahrungen einzutreten...

[The final success of such interventions, which are still highly questionable today, depends even more than many other operations on our technical skills and on subtle details. It is thus worth the effort to go into the details of the surgical experiences gained during these cases in the following...]

Their reports convey a passion for the subtlety of medical practice that was unique for the time.⁴ In our opinion, Hans Brun should be remembered as the third surgeon after von Eiselsberg (November 13, 1907; thoracic neurofibrosarcoma) and Elsberg (January 13 and 20, 1910; cervical glioma) who successfully removed an intramedullary lesion in a patient. But more than the timing of his procedures, the important observations of this innovative surgeon have been an important contribution in his time, as recently pointed out.⁴

It was also Hans Brun who operated on herniated lumbar discs not only before the well-known works of Dandy but also those of Mixter and Barr appeared.⁷ As a more general remark, it is interesting to note that the history of our specialty is positively biased toward contributions of American surgeons. This is probably inevitable, taking into consideration that most articles on the history of neurosurgery stem from American authors who cannot take into account early works of European authors published in German, French, or other languages. In this context, we consider it important to value the achievements of European pioneers of neurosurgery.^{2–5,7,8}

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Disclosures

The authors report no conflict of interest.

Response

It is with deep appreciation that we received the comment by Prof. Hildebrandt and colleagues on our paper.

We try in our publications about Harvey Cushing to elucidate part of the history and the foundations of neurosurgery through his mentors from around the world.^{2–4,7–9,15,17–19,26} It was with this goal in mind that in our paper we presented not only the first intramedullary cases that Dr. Harvey Cushing performed at Johns Hopkins Hospital in the early 1900s, and his unpublished paper “The laminectomy,” but also provided a fresh and unique new perspective into how the founders of neurosurgery faced early challenges in the field of neurosurgery. This includes challenges in pathological classification, preoperative diagnosis, tumor localization, and surgical technique of that time. We mentioned several pioneers such as Anton von Eiselsberg of Vienna, Sir Victor Horsley and Sir William Gowers in England, Roentgen from Lennep (Germany), Forestier and Sicard from France, and J.B. Ayer and W.J. Mixter in Boston. The reader can notice that several of the original references that we used, and included, were originally in French and German.^{12,16,21}

The earliest documented attempt at resection of an intramedullary spinal cord tumor that we found in the literature and cited in our paper was performed by Christian Fenger of Chicago in 1890.⁵ We also mentioned that the earliest successful resection was performed in 1907 by Anton von Eiselsberg in Austria,²⁵ followed by Charles Elsberg of New York who developed a 2-stage operation to minimize manipulation of the spinal cord during resection.¹¹ The contributions of Hans Brun and Otto Veraguth were missed in our paper. We agree with Prof. Hildebrandt that Brun and Veraguth's work is not well documented and that they should be remembered as an early and successful team of surgeon and neurologist who removed some of the few first intramedullary spinal cord tuberculomas in history.^{23,24} We are happy that Prof. Hildebrandt and colleagues feature Dr. Brun's work in 2 of their recent papers,^{14,22} and we are indeed pleased that

FIG. 1. Portrait of Harvey Cushing photographed by Arnold Klebs in 1919 on the Axenstrasse, along the rocky shores of Lake Lucerne, in central Switzerland. Cushing gave signed copies of this photo to a number of his associates, such as this one signed to Richard U. Light, one of Harvey Cushing's last residents. From the collections of the Medical Historical Library, Harvey Cushing/John Hay Whitney Medical Library, Yale University, New Haven, CT. Published with permission.

our work has promoted an open discussion in which other influential figures in the field whom we may have missed in our paper, such as Hans Brun, have been remembered.

As Prof. Hildebrandt details in his comment, Hans Brun and his colleague the neurologist Otto Veraguth from Zurich were pioneers in the field of spine surgery, including some of the first cases of herniated lumbar discs and intramedullary spinal cord lesions.^{14,22} By 1926, Brun had performed 458 operations on the skull and brain. However, contrary to Harvey Cushing's beliefs, and as Hildebrandt et al. mention in their article, Brun was a clear

opponent of subspecialization.¹⁴ Some of those surgeries were conducted in the private hospital “Im Bergli,” in Lucerne, Switzerland.¹⁴ It is curious that one of the most famous portraits of Harvey Cushing, the one that he selected to sign to his mentees, was taken there in Lucerne (Fig. 1).

We want to take this opportunity to highlight the time that Harvey Cushing spent in Europe and particularly his Switzerland connections. As we mentioned in our paper, Harvey Cushing spent 1 year in Europe in 1900. He was fluent and published in several languages, including French and German. When Cushing began his postgraduate studies in Berne, Switzerland, he joined the physiology laboratory of Prof. Hugo Kronecker and Theodor Kocher. There, he initiated his research in brainstem control of systemic blood pressure during raised intracranial pressure that led to the “Cushing reflex” theory.¹³ Harvey Cushing returned to Switzerland later in 1931 to give a keynote speech at the First International Neurological Congress.¹⁰

Dr. Hans Brun was well known in the early 1900s for his work, and one particular monograph on cranial fractures (based on 20 years of practice and 470 cases at the Cantonal Hospital in Zürich¹) was mentioned by Cushing in his discussion of a monograph titled *Consequences of Cranial Injuries*, published in 1907.⁶ Harvey Cushing wrote:

It is difficult to tell how often cranial traumatism is the forerunner of actual insanity. [...] in his exhaustive study of four hundred and seventy cases of fractured skull from Krönlein's clinic, Brun has shown that thirty-four per cent subsequently showed psychic disturbances, though in but a small number of these were there permanent alterations in mentality.

We continue to learn and discover more details about the Founders of Neurosurgery throughout the world. We agree that Brun and Veraguth, together with many others, should be remembered as pioneers who, despite the limitations of the time, allowed the field to be what it is today, and we congratulate Prof. Hildebrandt and colleagues for reminding us of these important historical facts.

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INCLUDE WHEN CITING

Published online April 1, 2016; DOI: 10.3171/2015.11.SPINE151300.

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