Intracranial Hemorrhage in the Seventeenth Century
A Reappraisal of Johann Jacob Wepfer's Contribution Regarding Subdural Hematoma

GIAN-FORTUNAT HOESSLY, M.D.
Neurosurgical Section, Veterans Administration Center, and Department of Surgery (Neurosurgery), University of California, Los Angeles, Center for Health Sciences, Los Angeles, California

SCHAFFHAUSEN, situated on the Rhine river in Northern Switzerland, although a small town, has produced over the centuries a number of outstanding scientists. Three hundred years ago it was the home of two eminent physicians, Johann Conrad Peyer, and Johann Jacob Wepfer. Both men are still well remembered, Peyer as the discoverer of the lymphatic nodules now called Peyer's patches, and Wepfer, the subject of this communication, known to pathologists and neurosurgeons as the author of the first report of a chronic subdural hematoma. Cases of acute traumatic subdural hemorrhage had been reported earlier, for example by Ambroise Paré. The case of Wepfer's which has become a "classic" was presented in a now equally classical paper by Putnam and Cushing on chronic subdural hematoma as follows:

"In 1656 Johannes Wepfer performed a necropsy on a patient of seventy who died some hours after an 'apoplectic' stroke, with aphasia and hemiplegia. He was assisted at the postmortem by Harderus. A bloody cyst, about the size of a hen's egg, was found beneath the dura. He believed that he could demonstrate multiple ruptures of the meningeal artery."

Putnam and Cushing then continue with discussion of other early reports of this condition in the literature, and state in a footnote:

"These earlier reviews do not apply the rigid criticism that seems necessary nowadays to the cases reported in them. . . . Few of the early histories can be accepted without reserve. . . ."

Ironically, as we shall see, a similar statement must be attached to part of their own work.

In the course of recent investigations related to the history of intracranial hemorrhage it appeared worthwhile to take recourse to some of the actual sources of early reports. The case quoted by Putnam and Cushing, and quoted again and again since their paper appeared in 1925, was taken from Wepfer's book, "Observationes Anatomicae ex Cadaveribus eorum quos sustulit Apoplexia." The first edition was published in Schaffhausen, in 1658; a second appeared in 1675. So little has the original text apparently been consulted, that, by 1939 in a German report on subdural hematoma, Wepfer's patient who actually, as we shall see, was a woman, had become a man! A few years ago this same "old man" with the "bloody cyst under the dura" again appeared in a publication from the University of Zurich, not thirty miles from Schaffhausen. A more thorough scrutiny of Wepfer's book reveals a different picture.

The patient in question, reported in case history No. 2 (page 5 in the edition of 1675) was a woman, an approximately 70-year-old widow named Barbara Zuberin. When she was taken to the hospital, she had never been seriously ill before, but had had slight diminution of vision over the previous few years. For several months, however, "prodromi" of apoplexy had been noted by others, including sudden episodes of difficulty with speech. In Wepfer's own words, translated from the Latin with some omissions:

"On January 29, 1637, at three in the afternoon, in the presence of friends, she was apparently well and engaged in spinning, when suddenly she lost her speech and collapsed. She was put to bed. It was noted that she moved the right leg and lifted her right hand to her head, trying to say something which was, however, unintelligible. Immediately she lost all senses and motions and only pulse and respiration continued, the latter becoming stertorous. The face was reddened. Since she could not swallow, no medications were given. She died at six o'clock on the same evening."

"On the following day I performed an autopsy assisted by my eminent colleague, Dr. Harder. I opened the skull, cut the dura meninx in circular fashion, then the falx at its attachment at the crista galli, and dissected the lateral sinuses."

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(Wepfer here undoubtedly implies the cutting of the tentorium.)

"I then inclined the brain sideways, cut all pairs of nerves, the carotid arteries near the infundibulum, the infundibulum itself, and the vertebral arteries where they emerge in the occiput, and finally the medulla oblongata at the foramen magnum, and having released the brain by this procedure from all attachments, extracted it in toto in order to delve deeper into the cause of this sudden demise."

"After taking out the brain, I lifted up the dura which was still covering it. The right side of the brain superiorly and posteroinferiorly, but, not quite as far down as the base, was found suffused with blood all over. The brain itself was soft, and one could manifestly feel to the touch some fluctuation inside. The brain on this side, upon removal, showed a cleft out of which there emanated clots of very dark blood in an amount about the size of a nutmeg. After gently inserting my finger into this cleft I then enlarged it with the knife. I found a large cavity reaching forward almost to the front, backward to beyond the half mark of the brain, upward toward the falx and equally so downward. This space contained a clot of blood the size of a hen's egg, besides smaller clots and liquid blood, the total amounting to about eight ounces. At first we believed that this was the lateral ventricle, but after a more exact search we found that this was not the lateral ventricle, but a peculiar cavity formed by extra-vasated blood, resulting from some ruptured branch of the important anterior ramus of the carotid artery, which, after it passes the optic nerves in the anterior and lateral part of the brain, enters into a remarkable convolution and, not far from its origin, divides into many branches which enter between all the midline convolutions of the brain and continue upward along the median gyri and sulci to the falx, dividing into many very small branches. Of these branches many, and in many places, enter the substance of the brain. And we could indeed clearly, and without doubt, recognise that one or more branches of this artery were ruptured in this area... Following the rupture of one or the other of these arteries, the blood poured out of one of the deeper convolutions with the arrival of more and more fresh blood, much as wave is driven upon wave; thus the space of the fissure was more and more dilated and easily grew to great magnitude, just as it occurs in the case of an aneurysm, except that in the brain, because of its softness, such a cavity will be formed more quickly than in any other part of the body."

"The surface of the convolutions above was intact, held together by the pia, and neither was the base of this cavity broken, as a result of the existence of the roof, or fornix of the right ventricle, which is richer in fibres and more tenacious than the interspace between the gyri... In the entire space which lies between the dura and pia mater there was no fluid anywhere, not even any at the base or occiput. The right ventricle was intact and contained hardly as much slightly bloody serum as one-half of a walnut's shell. The left ventricle was empty. In the third we found a clot of blood of pea size. In the left half of the brain no abnormality was noted. Therefore, this aneurysm appeared to be sufficient cause to explain this severe apoplexy..."

So much for Wepfer's report on this case. There is nothing to be found here of a "bloody cyst" under the dura which, centuries later, when Wepfer is quoted, appears repeatedly among various authors. There is nothing in this text to indicate, as has been quoted later, that Wepfer had demonstrated "rupture of the meningeal artery." In fact, Wepfer's words make it quite unmistakable that he demonstrated rupture of one or more branches of the anterior cerebral artery. Elsewhere in the same book Wepfer makes a specific point of demonstrating that the internal carotid arteries send no branches at all to supply the dura mater as had been the belief among anatomists before him, and in the description of the case above he leaves no doubt that the ruptured vessels which he found were branches of the anterior cerebral artery.

It therefore remains a mystery as to how the case of Barbara Zuberin came to be considered an example of subdural hematoma rather than of an extensive intracerebral hemorrhage from rupture of a branch or branches of the anterior cerebral artery.

It seems, therefore, that Wepfer has been misquoted for at least three generations. So far, I have been unable to trace this misquotation further back than Putnam and Cushing's paper, or to determine their source of information about Wepfer's case. They quote Wepfer directly but obviously did not consult the original.

However, there still remains no reason to deprive this eminent physician and pathologist of the honor of having given us the first description of a chronic subdural hematoma. Further detailed study of his "Observationes Anatomicae" reveal among nu-