The Edwin Smith Surgical Papyrus

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Abstract The Edwin Smith Surgical Papyrus is undoubtedly one of the most significant medical texts ever discovered. It is of particular interest to neurosurgeons because of its specific references to ancient neurosurgical cases and is the first written record of many terms of neurosurgical interest. This review describes the colorful and controversial history of the Edwin Smith Papyrus and gives translations of four cases of neurosurgical interest.

Key words Ancient · Edwin Smith Papyrus · Egyptian · History · Neurosurgery

Introduction

When perusing historical reviews of neurological surgery such as Greenblatt's (editor) A History of Neurosurgery [3], it is interesting to find references to the Edwin Smith Papyrus in the first paragraph of multiple chapters concerning varied topics. This is not surprising, given that the Edwin Smith Papyrus, dated at approximately 1700 B.C., is believed to be the oldest known treatise on the specific endeavor of “surgery.” It was written on a papyrus scroll 15 feet long by a single anonymous Egyptian author, who was, in fact, attempting to copy a much older manuscript that dated from approximately 3000–2500 B.C. The author of the manuscript, which now lies with the collections of the New York Academy of Medicine, was apparently not very meticulous with his replication. He made frequent errors, often scribbling the corrections in the margins of the scroll and, more importantly, he never completed the job and never signed his name. The beginning of the manuscript is missing and its last sentence ends in the middle of a line, in the middle of a sentence, in the middle of a case, with 15 inches of blank papyrus below. The nature of the broad, heavy black lines of the last sentence indicates that the scribe’s pen was very full of ink and that the scribe himself was probably intent on completing the text. The interruption must have been sudden and unexpected, and the project, for unknown reasons, was abandoned before completion [1]. Despite its faults, the papyrus was recognized for its intrinsic value when it was purchased in 1862 by Edwin Smith, an American living in Egypt.

Edwin Smith has been variously described as an adventurer, a money lender, a dealer and forger of antiquities [2, 4, 5], a pioneer in the study of Egyptian science, and a man of “great intellectual gifts” [1]. In 1862 Smith, while in Luxor, acquired the papyrus in controversial circumstances. While some believe that Smith purchased the scroll legitimately from an Egyptian businessman named Mustafa Agha, others claim that he bought it illegally from unscrupulous tomb raiders [1]. Regardless of the methods by which he obtained the manuscript, Smith recognized its importance and made efforts towards a first translation. The papyrus remained in Edwin Smith’s possession until his death in 1906, after which his daughter donated it to the New York Historical Society. No further inquiry was made into the secrets of the papyrus until 24 years later, when it was “rediscovered” and turned over to James Henry Breasted, an American Egyptologist, archaeologist, and historian. As one of the foremost authorities on ancient Egyptian hieroglyphic translation, Breasted was the ideal choice to analyze the document, and in 1930 he published the papyrus with transcription, English translation, commentary, and introduction in a two-volume text [1]. As a re-
sult of Breasted’s work, the Edwin Smith Papyrus was revealed as the oldest known surviving scientific treatise and disclosed the extraordinarily advanced medical knowledge of the ancient Egyptians.

The Edwin Smith Papyrus appears to have originally been intended as a surgical textbook. The surviving text consists solely of surgical cases, beginning with the head and then systematically moving down the body. There are a total of 48 cases, each divided into four or five sections: title, examination, diagnosis, treatment (if recommended), and “gloss” (explanation of obscure terms). Surprisingly, most of the recommended treatments are secular, with only 1 out of the 48 cases requiring a magical remedy. Of the 48 cases, 27 concern head injuries (cases 1–27), 6 throat and neck injuries (cases 28–33), 2 injuries to the clavicle (cases 34, 35), 3 injuries to the arm (cases 36–38), 8 injuries to the sternum, ribs, or breast (cases 39–46), 1 injury to the shoulder (case 47), and 1 injury to the lumbar spine (case 48). Although the papyrus reveals ancient Egyptian knowledge about the heart and its relationship to the pulse and about the functions of the stomach, bowels, and vascular system, the majority of the cases in the text concern topics of neurosurgical interest. It is not surprising, therefore, that some of the oldest descriptions of the brain, cerebrospinal fluid, meninges, skull, and cranial sutures can be found in the Edwin Smith Papyrus. In addition to direct observations of trauma and anatomy, the Egyptians were surprisingly observant, as seen from the discussions of the relationships between injuries to the brain and spinal cord and their functional consequences in other parts of the body.

**Illustrative cases**

The following four cases (6, 20, 31, 33) are reproduced from Breasted’s classic translation of 1930.

**Case Six (Fig. 1)**

**Title:**

Instructions concerning a gaping wound in his head, penetrating to the bone, smashing his skull, and rending open the brain of his skull.

**Examination**

If thou examinest a man having a gaping wound in his head, penetrating to the bone, smashing his skull, and rending open the brain of his skull, thou shouldst palpate his wound. Shouldst thou find that smash which is in his skull like those corrugations which form in molten copper, and something therein throbbing and fluttering under thy fingers, like the weak place of an infant’s crown before it becomes whole – when it has happened there is no throbbing and fluttering under thy fingers until the brain of his the patient’s skull is rent open – and he discharges blood from both his nostrils, and he suffers with stiffness in his neck...

**Diagnosis**

Thou shouldst say concerning him: “An ailment not to be treated.”

**Treatment**

Thou shouldst anoint that wound with grease. Thou shalt not bind it; thou shalt not apply two strips upon it: until thou knowest that he has reached a decisive point.