

# From the Pages of History

## HARVEY CUSHING (1869 – 1939)

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*Harvey Cushing*

Father of Modern Neurosurgery, a great medical scientist, a gifted author – all-in-one – is what Harvey Cushing can be described in a single sentence. He was an extraordinary human being who by his untiring work, established Neurosurgery as a separate specialty, brought new concepts in the practice of medicine in general. He authored enormous amount of literature, in an era when modern medicine was just establishing itself.

Harvey Williams Cushing was born in Cleveland, Ohio, on April 8th, 1869. He came from a family of physicians. Harvey Cushing went to school in Cleveland and then to Yale where he received his A.B. degree in 1891. At the Harvard Medical School he gained his A.M. and M.D. cum laude in 1895. From this time he served for one year in surgery in the Massachusetts General Hospital and then, in 1896, he was appointed to the house-staff in surgery under Dr. Halsted at the Johns Hopkins Hospital, Baltimore where he remained until 1900 as resident in surgery. He learned meticulous surgical technique from Halsted while modeling his intellectual pursuits after William Osler, who at that time was chairman of the Department of Medicine. In 1900, he went to Berne, Switzerland along with Kocher and Kronecker, began his work in experimental neurology. Later he was associated with Sherrington in Liverpool. On his return, at the age of 32, he was made Associate Professor of Surgery at Johns Hopkins Hospital, and at the hospital was placed in full charge of cases of surgery of the central nervous system. In 1911, he was appointed Surgeon-in-Chief at the Peter Bent Brigham Hospital in Boston. He became a Professor of

Surgery at the Harvard Medical School starting in 1912. During 1917-1919, he was director of U.S. Base Hospital attached to the British Expeditionary Force in France. In 1918, he was made Senior Consultant in Neurological surgery for the American Expeditionary Forces in Europe during World War I. He served in the U.S. Army Medical Corps, attaining the rank of Colonel. After the war he returned to Boston and continued until 1932. Next year, in 1933, he went to Yale as Sterling Professor of Neurology, a position which he held until 1937. Cushing died on October 7, 1939 in New Haven, Connecticut, from complications of a myocardial infarction. He was interred at Lake View Cemetery in Cleveland. Interestingly, an autopsy performed on Cushing revealed that his brain harbored a colloid cyst of the third ventricle.

### Contributions to Medicine in general

- 1) As a medical student, he developed the first continuous record for recording pulse and respiration during surgery in 1895, which forms the basis for present day anesthesia records.
- 2) Cushing was involved in the introduction of X-ray technology into the clinical realm at Massachusetts General Hospital and Johns Hopkins Hospital after its discovery by Roentgen.
- 3) He did the first human experimentation with nerve block anesthesia for operation using cocaine.
- 4) He was the first to use blood pressure monitoring during surgery.
- 5) He studied typhoid disease and developed a pioneering approach to surgical management of perforations of the esophagus due to typhoid infection.
- 6) He showed that the gut can be sterilized by fasting and this has formed the basis for pre-operative bowel preparation.
- 7) He predicted the routine use of positive-pressure endotracheal anesthesia twenty years before it was used routinely.
- 8) He was the first to describe the tolerance of the heart to surgical manipulation, which was accepted only twenty years later.

### Contributions to Neurosurgery

- 1) He established the safe surgical method of removing intracranial tumors with meticulous surgical technique.
- 2) He was the first to establish the basic techniques in Neurosurgery like finger pressure for haemostasis of scalp; waxing the bone edges; haemostatic clips; motor driven suction during surgery, etc. He brought down the surgical mortality after neurosurgical procedure from over 50% to less than 20%.
- 3) He invented the electrosurgical cautery along with Bovie.
- 4) He was the first to map human cerebral cortex with faradic stimulation in conscious patients.
- 5) He did the first surgery for acromegaly (1909).
- 6) He described Cushing's law and Cushing's triad in relation to raised intracranial pressure.
- 7) He described the C.P. Angle syndrome and advocated intracapsular excision of acoustic neurinoma.
- 8) He described the Cushing's syndrome due to excess adrenal corticosteroids.
- 9) He described the Cushing's ulcers – the gastric ulcers due to raised intracranial pressure.
- 10) He was the first to classify brain tumours along with Percival Bailey.

**Contributions to Medical Literature:** He has authored several medical books. He won the prestigious Pulitzer prize for his biography book "Life of Sir William Osler" in 1926.

### References

1. Wikipedia: Harvey Williams Cushing
2. Biographical memoir of Harvey Cushing by W. G. Maccallum: National Academy of Sciences, 1940.