ESTES (W.L.)

Gold-foil in the shape of a conical cup, introduced into a lacerated cavity of the cerebrum × × × × × × ×

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GOLD-FOIL IN THE SHAPE OF A CONICAL CUP INTRODUCED INTO A LACERATED CAVITY OF THE CEREBRUM FOR THE PURPOSE OF PERMANENTLY STOPPING THE OUTFLOW OF CEREBRAL TISSUE AND CLOSING A HOLE IN THE MEMBRANES.

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IT occasionally happens that the exigencies of "acute surgery" bring one to the adoption of a procedure or device not recommended by the "books," but which may serve to establish new lines of practice by demonstrating an unthought-of tolerance of foreign bodies on the part of the living tissues, or suggesting similar attempts to other surgeons. Fluhrer's case of gunshot wound of the cerebrum, with successful localization of the ball by probing through the whole diameter of the brain, gave a new impetus to cerebral surgery that has led to wonderful results. The following case is therefore related as a unique example, so far as I am aware, of plugging the cerebrum *permanently*, with a most happy immediate result and complete and rapid recovery of the patient.

Cornelius B., a negro, twenty-eight years of age, was brought to the hospital in an unconscious condition on the night of April 4, 1893. The Ambulance Surgeon was told that while the patient, with a companion, was out driving, Cornelius, by what means or agency could not be discovered, was thrown to the ground and kicked by the horse, becoming immediately unconscious. He was forthwith taken in charge by his

companion and sent by railroad a distance of some twenty odd miles, and finally was received at the hospital, still unconscious, three or four hours after the injury. No dressing or covering of any sort had been placed over the wound. Examination showed no injury anywhere, not even an apparent bruise, except on the right side of his head, where there was a *punched-out* sort of wound through the scalp and the bone and deep into the cranial cavity. The location of this wound was 6.5 centimeters above the external auditory meatus and 2 centimeters in front of a line perpendicular to the external auditory meatus; it was 5.5 centimeters behind and 3.5 centimeters above the external angle of the frontal bone. The wound in the scalp was round, but a laceration extended backward about 3 centimeters. The surrounding scalp was not lacerated or contused. Hemorrhage had entirely ceased and had not been profuse. The man's general condition was good. Although he was unconscious, enough reflex remained to cause him to move about when the wound was manipulated. After shaving and carefully cleansing and disinfecting his head, he was chloroformed, the external or scalp wound was enlarged and the bone freely exposed. It was found that the depressed fracture of the bone involved an area of a little less than 2 centimeters, and that all of this bone was driven down, at almost a right angle to the cranium, into the cerebrum; so that there was a sharply-defined rim of bone, with some radiating linear fractures, and about 3 centimeters beneath, from the inner table of the cranium, the comminuted fragments lay imbedded in the cerebrum. Outside of this bone the scalp had also been punched out and the fragment was lost. The opening in the bone was enlarged and by careful manipulation the fragments were lifted out of the cerebrum with a pair of narrow forceps. A few spiculæ were so small and sharp and deeply imbedded that much care was required to locate and remove them. When the fragments were finally removed free hemorrhage took place from

the cerebrum, but was checked by plugging the cavity with iodoformized gauze. Something like 15 cubic centimeters of lacerated cerebral tissue were washed away with a gentle stream of warm sterilized saline solution. The dura was lacerated to shreds and it was quite impossible to close the gap in the membrane. I concluded to pack the whole cavity with iodoformized gauze, and, by careful asepsis, endeavor to obtain healing by granulation. Accordingly, a careful dressing, with an outside pressure bandage was applied and the patient put to bed. He stood the operation very well, reacted quickly, and under morphin passed a quiet night. The next day he was quite conscious, answered questions readily, and had no paralysis. There had been considerable oozing and the dressings were saturated with blood. I changed the dressings. In spite of the greatest care there was an escape of more cerebral tissue, and as there was no membrane or scalp to help retain it I saw I should have trouble to prevent the escape of brain-tissue whenever I dressed the wound, and every prospect of a final hernia cerebri. I replugged and redressed the wound as before and concluded to wait a day or two. I recollected, in thinking over the matter, that Weir had recently used gold-foil to prevent adhesions between the dura and cranium and scalp, and had found it non-irritating, and that rapid and permanent healing occurred in his cases. My problem, however, was more complicated. I had to control the oozing of the cerebral tissue into a cavity and prevent its detachment and escape on account of a complete loss of all its envelopes. I concluded to try a sterilized cup made of heavy gold-foil fitted down into the cavity of the cerebrum.

On April 7th, two days after the injury, I again had the patient chloroformed, and getting the dimensions of the hole in the cranium I fashioned a cup from the gold-foil (which had been sterilized by immersion in a 5 per cent. solution of carbolic acid and then washed off in a warm sterilized saline solution, 0.5 per cent. solution of sodium chlorid) into the shape of a hollow cone,

with the base just big enough to fit closely to the inner rim of the inner table of the cranial wound and with a depth of about 2 centimeters. The plugs were removed from the cerebral cavity, with again considerable escape of brain-matter, which was washed out by a gentle stream of the warm sterilized saline solution and the cup immediately introduced, apex downward. I fastened it in place by pressing the foil into the indentations and irregularities of the rim of the inner table and packed loosely into the cup some iodoformized gauze. I incised and loosened the scalp on either side of the wound so that I could slide it over and cover in the opening, sutured it, except a small space in the center through which an end of the bit of iodoformized gauze was allowed to project, and dressed it as before.

On April 14th the wound was redressed, the sutures removed and also the packing of gauze from the cavity of the gold cup. The wound was perfectly aseptic, the cup firmly fixed and in place, and there was no bulging and absolutely no escape of brain-matter. A small bit of gauze was again introduced into the cup to give it solidity, and the dressings were reapplied.

On April 27th the wound was again inspected. There had been no suppuration, and the wound was entirely closed except where the bit of gauze projected from the cup. This was removed and the external wound was allowed to come together. In a few days this was entirely and solidly united. The patient was allowed to be up and about. His faculties were all good, locomotion was good, and in short he showed no indication in any way of having lost any function ; nor were there any signs of irritation from the cup. I kept him about two weeks, employed most of the time about the wards, doing the work of an orderly, that I might observe him and examine the seat of wound. There was absolutely no indication of any trouble or disturbance. He was discharged quite well May 20th. The wound was firmly united and there was no pulsation perceptible through the opening in the cranium.