

A CASE OF FRACTURE OF THE SKULL FORTY CENTIMETRES IN LENGTH, RESULTING IN DEATH FORTY-TWO DAYS AFTER, FROM ENCEPHALITIS AND PYÆMIC INFECTION.¹

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On the afternoon of December 18, 1879, J. A., a blacksmith weighing two hundred and sixty-eight pounds, while riding at a break-neck speed in an open buggy, collided with a coal cart, and was thrown out, striking the top of his head upon some part of the cart, producing a bruise upon his scalp, extending diagonally across the head from the left frontal eminence to the right parietal bone, a severe concussion and injury to the brain, and fracture of the skull.

He was found senseless, bleeding from the nose and mouth very freely, losing a large quantity of blood. He lay, quietly, where he had fallen, without moving save a slight spasmodic motion of the legs, and his breathing was scarcely perceptible. After a few moments he was taken into a house near by, and Dr. Hazelton, of Grantville, saw him. In the course of an hour he regained his consciousness so as to answer questions and soon after said he was cold. A suitable conveyance was procured and he was taken home, a distance of six miles. On arriving, with the assistance of a man at each arm, he walked from the wagon into the house, up a long flight of stairs to his bedroom. I was then called, saw and examined him with Dr. Hazelton. He was undressed, in bed, lying partially upon his left side, breathing somewhat noisily, and blood was trickling from his nose and running down his throat. There was a bruised line half an inch in width and four to five inches in length on the top of his head; the scalp in the vicinity of this bruise was swollen and the swelling extended to the eye, which was very much swollen, protruding, and black; blood had settled beneath the eye, and the bridge of the nose was also contused and swollen. He was in a half-conscious condition; on questioning him, he described the accident, and answered correctly all questions. He complained only of the back part of his head and neck when he was moved. Twelve hours after the accident he vomited nearly a quart of blood which he had swallowed.

The second day, January 19th, there was a higher temperature, quicker pulse, and later in the evening a flushed face and hot head; at 11.30 P. M. he had a very severe convulsion involving both sides of body; at twelve he had a second convulsion, lasting twenty to thirty minutes, from which he passed into a comatose condition. His pulse was full, hard, and bounding. I brought him quickly under the influence of *veratrum viride*, bringing his pulse down to eighty. Temperature was then 102.2° F. For the next ten days his pulse was kept near that number, and his temperature became normal. After the convulsions there was considerable difficulty in swallowing, the left side of the mouth was awry, the tongue pointed to the left, the left eye was immovable, the pupil constantly dilated and insensible to light, and the whole left side of the face presented the peculiar expressionless appearance indicative of paralysis. He called his milk cider, his broth whiskey, the sense of smell seemed much diminished if not wholly lost; and there was loss of hearing in the left ear. He continued in a semi-comatose state for sev-

eral days; could be roused from it, when he would for a few moments seem himself, would then relapse into a mild delirium and talk of his business or amusements.

On the sixth night after the accident, the nurse watching him said that twice during the night, while apparently sleeping quietly, he straightened out his legs and arms, and a slight trembling passed over his body; he made no noise, there was no difference in breathing that he noticed, and there was no increase of heat in the head, or any change of color in the face; both times the action was but momentary. The next morning I found the paralysis in the parts above named more complete, and for twelve hours he could not put out his tongue, or swallow anything, choking in an alarming manner if he attempted it. He had no control over his mouth, the fluids offered him would run out of the corners, and finally he refused to take anything. His left arm was also paralyzed. In the course of the following night and the next day he managed to swallow a little liquid, spilling most of it however.

December 26th, Dr. Z. B. Adams of Framingham was called in consultation and diagnosed a fracture of the base of the skull, and gave an unfavorable prognosis; but said "under certain conditions, there was a possible chance of recovery." Then was noticed for the first time a fetid odor coming from his nose and mouth. After the bleeding had stopped he had had a clear, almost colorless, fluid running from his nose requiring the constant use of a handkerchief. From December 24th to January 9th his pulse ranged from 80 to 100. Temperature did not vary much from normal, being 98.6° F. on the 9th. The 5th, 6th, and 7th he was more restless and delirious, and not as easily controlled. On the 8th both eyes were more injected; up to this time the left eye had been constantly dilated, and did not respond to light, the ball itself being perfectly immovable. January 10th, three weeks after the accident, pulse was 88 and feeble, temperature 98.6° F. Hands were cold, presenting a mottled appearance. For a few nights, 10th, 11th, and 12th, he had sinking spells; hands white and cold, pulse feeble and face pale, temperature below normal. Food, stimulants, and friction relieved these symptoms somewhat. January 13th. Pulse 88; temperature 97° F. He passed a very restless night, wanting to go home, asking for his pants, asking if he was in for life, etc.

January 14th to 16th seemed to improve, slept more quietly, and was more rational. On the morning of the 16th, pulse 100, he had had a very good night; after taking his breakfast, slept soundly all the forenoon. He awoke about two P. M. and was perfectly rational, called his wife to him, kissed his little daughter, arranged his business affairs, and then advised his wife what to do after he was gone. He was asked where he was going and replied: "Going from whence there is no return;" he then said his head felt very badly, and kept constantly putting his hand to it saying "no one could know the suffering he had in his head." I saw him soon after, found his pulse 120, reapplied the cold applications to his head, and advised that he be kept quiet. He soon fell asleep; during the night following became restless and relapsed into a delirious condition. Previous to this, for some days, it had been noticed that he appeared to be swallowing something, and he would occasionally strangle as when trying to eat. On the 18th his mouth was found to con-

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tain a good deal of pus; his pulse was feeble, and he had a dusky look about the face. The muscles of his legs and arms were completely limp and flabby, showing a great loss of tone as well as of substance. Until just previous to this time, after the paralysis of the organs of deglutition had somewhat passed away, he had taken everything offered him very readily; after pus was found in his mouth his appetite failed, and he refused to take food or drink. His mouth and tongue, which had before been moist and natural, became red, dry, and parched, sordes collected on his teeth. Pulse 100 mornings, 104 at night. On the 20th of January, pulse 104, feeble, soft, compressible; hands cold; circulation sluggish; slept nearly all the day very quietly; in the evening pulse 100 and stronger, color of face and hands good, temperature, to the touch, seemed about normal. On the 21st he remained in a deep sleep all day, from which he could be readily aroused when he was required to take food or drinks. Pulse 102. Temperature 97.8° F. 22d, A. M., pulse 108. Pus again found in his mouth and nose, and he raised fetid matter from his throat. Condition of mind clearer than on the 20th and 21st. There had been a gradual improvement and lessening of the paralysis in the organs of deglutition and muscles of the tongue. January 23d, pulse 100, temperature 97.6° F. Pulse soft, compressible, surface cold, skin mottled, restless, talkative, delirious, groans, complains of "rheumatism in the knee." 24th, passed his urine in the bed for the first time, always calling for the urinal before, took nourishment readily, asked questions correctly. 26th, A. M., got up and had a natural evacuation of the bowels, would get up and sit upon a chair for that purpose. During the night evidently had another shock, as nurse said he trembled all over. On the morning following there was paralysis of the right side, right eye commenced to weep, the head sweat profusely, was hot, temperature 102° F.; pulse 130, feeble. He complained of soreness and pain, on motion, in the right knee joint. In the afternoon complained of pain and soreness in shoulder. Pulse 149, temperature 101.8° F. Flesh hot, face flushed, rested quietly most of the day, semi-conscious. Nine P. M., pulse 140, sweating very profusely from the face only. 28th, hurts him greatly to move either legs or arms. 29th, sweating of face continues; breathing through the mouth, takes no notice of any one, knows nothing, remained in this condition until about four P. M., when he had a slight convulsion, face and head became purple; there was no movement observable after this, other than that of the organs of respiration. He died at eight P. M., forty-two days after receiving the injury.

Autopsy twenty-four hours after death, section of the head only. On removing the scalp and calvaria a line of fracture was found to extend through both tables of the skull, from a point a little in front and to the left of the centre of the calvaria down to the orbital prominence, through both orbital plates, and along the line of junction of the frontal and ethmoidal bones through the sphenoid, terminating in the sphenoidal fissure. The length of this line of fracture was about forty centimetres or ten inches. The arachnoid was found adherent to the brain over nearly the whole left hemisphere, a large clot of blood just under the point of the skull where the force of the blow was received formed a mass covering nearly half the hemisphere, another mass was seen upon the right hemisphere in the temporal region, lines of pus were found extending along

the vessels and in the sulci between the convolutions of the brain which were of a yellowish greenish color. The interior of the brain presented nothing abnormal. The convolutions were somewhat flattened and softened.

Of eighteen cases of fracture of the skull from falls, reported in the Medical and Surgical History of the War of the Rebellion, thirteen were fatal, dying of encephalitis usually from the tenth to the fourteenth day. Of those dying of abscess of the brain, the average time was three weeks, chills and other phenomena of pyæmic infection being present. Of eleven cases reported of fracture involving the base of the skull the eleven died; of these, two cases only were accompanied by the peculiar colorless discharge from the ear, said to be indicative of fissure of the petrous bone.

It was observed that fissures or long linear fractures with little depression characterized the fractures of the skull from falls or railroad accidents.

RECENT PROGRESS IN SURGERY.

BY H. H. A. BEACH, M. D.

"SPONGE GRAFTING."

SURGEONS have long recognized the difficulty in removing sponges, unprotected by a fold of cloth, from raw surfaces to which they have been applied some hours before, as compressors to check hæmorrhages. Granulations shoot into the interstices with great rapidity and their rupture is necessary before the sponge can be separated from the fresh surface.

Dr. D. J. Hamilton¹ has made a careful study of the condition of the sponge and wound under these circumstances, and, with the aid of microscopical observations, determined that the sponge becomes vascularized, as in the case of a clot, and may become the medium for the construction of new material in the healing of wounds and ulcers. The paper is one of exceptional interest and is deserving of careful consideration and verification. He concludes with the following suggestions:—

"Having once recognized the principle that a porous body may become vascularized and be the medium for the construction of new tissue, the application of the method to various purposes naturally suggests itself. In applying any porous body with a view to this organization certain points must always be kept in mind. The porosity of the body must be such that all the canals freely communicate. Sponge is exquisitely suited for the purpose on account of the free anastomosis between its channels, but many other substances might be utilized in the same way. I have of late thought that charcoal or calcined bone might be employed in certain cases. For one purpose at least such a solid framework might be useful. Where it is desired to prevent contraction of the newly formed tissue when it cicatrizes, where it is of moment to retain the newly formed tissue of its original bulk, then a solid framework must be employed. A solid framework will, I feel sure, organize just as a sponge would, and will have the special quality of preventing cicatricial shrivelling. When once incorporated with the tissue it will not cause any more irritation than the calcareous matter of a bone does. A dead body of this kind is not of itself an irritant. It is the injurious application

¹ Edinburgh Medical Journal, November, 1881.