

PARKHILL (C.)

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TWO CASES OF FRACTURE OF THE SKULL.

By CLAYTON PARKHILL, M.D.,
Denver, Colo.

*Professor of the Principles and Practice of Surgery and Clinical Surgery, and
Dean of the Medical Department of the University of Colorado; Visiting
Surgeon to the Arapahoe County and St. Luke's Hospitals; Sur-
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We have two cases of unusual interest to show you to-day. Both were admitted yesterday, and I will ask you to examine them with me. Both give a history of head injury.

The first you see before you. He is perfectly conscious and tells me that two days ago, on alighting from a street car, he was struck from behind by a bicycle and thrown forward, striking his head against the side of the car. Yesterday he presented himself as a patient at the University of Colorado Dispensary, and walked from there to this Hospital, a distance of about a mile.

On examination several significant facts are apparent. First, the blow was received on the right side of the head, in the temporal region. You will recall that this is one of the weakest and thinnest portions of the skull. You will observe that he has on the corresponding side a "black eye," with no evidence of injury in that immediate region. In head injuries this may be a symptom of the greatest importance. In this case it probably indicates a fracture of the orbital roof, permitting an outflow of blood into the loose orbital tissues. On separating the lids we have another indication of fracture at the base of the skull in a sub-conjunctival ecchymosis. This is indicative of hæmorrhage into the sheath of the optic nerve. It is one of the most reliable indications of fracture at the base of

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the skull involving the anterior fossa. On inquiry I find that he suffered a severe hæmorrhage from the nose and from the mouth immediately following the injury. This is significant, in as much as he says he never had nose-bleed before in his life.

The hæmorrhage from the nose might come from two sources. It might either be poured out from one or both of the Eustachian tubes, indicating involvement of the petrous portion of the temporal bone, or it might come from a fracture of the cribiform plate of the ethmoid, extending into the foramen cæcum and opening the superior longitudinal sinus. In that event the hæmorrhage would probably be of dark blood, and difficult to control. This, the man says, was the case. The hæmorrhage into the mouth might either have been due to the trickling of the blood from the posterior nares or it might indicate a fracture through the basilar process of the occipital bone with rupture of the pharyngeal vault. An examination of the throat shows no ecchymosis behind the posterior pharyngeal wall, which probably eliminates basilar fracture, but it shows the pharynx smeared with blood.

He further gives a history of bleeding from the left ear. An examination shows no injury of the external ear. Some dried blood is found in the meatus. This bleeding may either be due to injury of the tympanum alone, or to a fracture through the petrous portion of the temporal bone. In as much as you will observe that he cannot hear my watch held close to the ear, it is probable that the latter condition obtains and that the auditory nerve has been destroyed. I find also that he complains of a loss of sensation in the region supplied by the first and second divisions of the right fifth nerve. The first is significant of a fracture involving the foramen lacerum anterius, and the second of a fracture involving the foramen rotundum, those being the bony openings which give exit to those divisions. He finds it impossible to protrude his tongue. This is probably not indicative of paralysis of the muscles as he complains of inability to separate the jaws to the full extent, owing, no doubt, to a contusion of the right masseter muscle, evidence of which you see in an abrasion over that region. An examination of the reflexes show them to be somewhat exaggerated on the left side. This is probably indicative of pressure from the hæmorrhage at the base of the brain. That it is not great in amount is shown by the fact that

he is perfectly conscious and has a practically normal pulse and temperature. From this examination I think you will agree with me in a diagnosis of extensive fracture at the base of the skull, involving the anterior and middle fossæ.

You might now ask me what treatment should be instituted for this man. Very little. The most important will be absolute rest in bed. We will keep the excretory organs active, because that will assist in nature's effort to absorb the effused blood at the base of the brain. We will give him light, easily digested food. Most surgeons recommend an ice bag to the head in these cases, but I have always been very skeptical as to the good resulting from such treatment. In case he should become delirious and show excessive irritability of the nervous system, we will give him some of the sedatives, preferably bromides. The nasal cavities and external ear should be cleansed with some antiseptic solution several times a day, in order to prevent infection of the wounds in this region. Such an infection may be very disastrous, and would probably result in septic basilar meningitis.

CASE 2—This patient gives a history of having been struck on the head with an ax about twenty-four hours ago. After the injury he was able to walk from Globeville to the city hall, a distance of about four or five miles. Since his entrance into this hospital he has been dressed, and has been anæsthetized, preparatory to our examination and operation, if necessary. On the dressing being removed you will observe that the entire scalp has been shaved. This is a point in the treatment of scalp wounds, whether associated with fractures of the skull or not, which is of great importance. It is impossible to thoroughly cleanse a wound of the scalp unless the entire head has been shaved. You will observe an irregular lacerated wound directly on top of the head, or at a point described by anatomists as the obelion. On examining this wound I find at its bottom a well marked depressed fracture of the skull. The depression is not great, but evidently corresponds to the size and shape of the pole of the ax. Before anæsthetization he did not present a single symptom referable to brain injury either in the way of mental derangement, compression or concussion.

In the absence of symptoms you might ask me what is the proper treatment for this fracture. Should we simply stitch up this

scalp wound and wait for symptoms and treat him on the "expectant plan" or should we trephine the skull and elevate the depressed bone? If you will read the books of most the older surgeons you will find that they will advise you to pursue the former method. In the light of modern surgery I insist that such is absolutely bad practice, and that every case of depressed fracture of the skull, simple or compound, with or without symptoms, should be operated upon. This depressed bone, whether giving rise to immediate symptoms or not, cannot fail to act as an irritant to the membranes of the brain or to the brain itself. This irritation is likely sooner or later to result in a pachy-meningitis or cerebritis, as a consequence of which the patient may suffer from epilepsy, from cyst of the membranes or the brain structure itself, and possibly insanity.

Before proceeding to operate on this case, however, it is necessary to remember an important anatomical fact, which is that the superior longitudinal sinus lies directly under this depressed bone. In applying the trephine we will not place it over the line of the sinus, but to one side of it. It is possible that the bone itself may have wounded the sinus as its superior wall is extremely thin, but we will take no chances in using this instrument. I find it necessary to enlarge the wound in the soft parts very considerably in order to give room for our operation upon the bone. This does not increase the risk to the patient, but no operation should be undertaken until a clear view is had of the field of injury. Permit me to call your attention to a fact which a close inspection of the line of fracture reveals. I find hair caught and retained in the fissure, around almost the entire circumference of the fracture. This may seem a trifling matter, but it still further emphasizes what I said before regarding the necessity for operation in all of these cases. The hair of the scalp is always loaded with micro-organisms and its retention here would certainly lead to infection of the wound with the probability of the dangers of septic meningitis. I will now apply the trephine as far away from the longitudinal sinus as possible. You will observe that the stylet is placed on the sound bone with only about one-third of the circumference of the instrument extending over the line of fracture. It is necessary to cut a button out of the sound bone in order to secure a solid fulcrum on which to rest the elevator with which to bring into place the de-

pressed portion. There is one rule for the use of this instrument which should never be forgotten, and that is to proceed as though this were the thinnest skull ever seen. I have trephined skulls as thin as an egg-shell. I have removed the button without wounding the dura. On using the elevator you will observe that it is impossible to bring the depressed portion of bone into its normal relationship. In this case I cut away with forceps, using the Keen rongeur for that purpose. I am careful to remove all the hair entangled in the fissure together with the irregular projecting margins. The removal of the bone has resulted in a considerable hæmorrhage. It is dark and comes from two or three points in the longitudinal sinus. This probably marks the location of the entrance of the parietal veins into the sinus.

I will now cleanse the wound with an antiseptic solution. The dura has not been opened, so we will be perfectly safe in using it. Had there been an opening in the dura we would have used simply the normal salt solution. We must now decide how to check this hæmorrhage. It may be done in two ways, either packing gauze over the sinus when we close the wound, or by enlarging the opening into the sinus and packing that great vessel with gauze. We will employ the former method in this case.

You might ask me if I will take any precautions to prevent adhesion between the tissues of the scalp and the membrane of the brain, because it is a well-known fact that such conditions frequently give rise at subsequent periods to unpleasant nervous manifestations. A heavy gold foil is the material most frequently used. It would be inadmissible in this case, however, on account of the necessity for packing over the sinus to check hæmorrhage, but if there was no bleeding and no probability of infection I would use it. This should be done at a subsequent operation. We will now suture the wound, pack a strip of iodoform gauze over the sinus, apply a dressing and return the patient to bed.

