

FRACTURE OF CERVICAL VERTEBRÆ.

CLINICAL LECTURE DELIVERED AT THE BUFFALO GENERAL HOSPITAL.

BY ROSWELL PARK, M.D.,

Professor of Surgery in the Medical Department, University of Buffalo.

THE first patient this morning is a boy of eleven, whom I first saw a moment ago. On the 9th of August he got under a horse attached to a wagon, and was hurt, nobody knows exactly how, about the upper part of the trunk and the neck. He was unconscious for a number of hours, and his parents think that he just escaped with his life. When he recovered consciousness, the peculiar condition of his arms to which your attention will be called was noticed. He stands now with his abdomen far forward; his mother says that he used to stand straight like other boys. The lower angles of his scapulæ project a good deal, as if he were sprouting wings, and there is atrophy of the muscles above the spines of the scapulæ. Over the cervical spine there is a swelling. This was not noticed for some days after the injury, for he had a hemorrhage from the left lung after the accident, and his head could not be lifted from the pillow. As soon as he was able to be raised, this peculiar alteration of the contour of the neck was noticed. It is now very much smaller than it was. Without attracting his attention by asking if it hurt, I have handled the swelling without eliciting any expression of pain, and on pressing downward on his head and having him jar himself by rising on the toes and coming down suddenly on the heels, I find that there is no sensitiveness of the vertebræ, as there would be if there were some acute inflammation. On bending his head backward, pain is produced. He cannot raise his arms except to an angle of forty-five degrees from the body. He cannot extend the wrists, and there is almost complete loss of power in the hands. There is some contracture of the stronger flexor muscles of the arm. On inquiry, I learn that his arms have not been straight since he was hurt, and that the dropping of his hands was noticed as soon as he recovered consciousness, a few hours after the injury. This time is too short to

allow us to account for the condition on the theory of inflammation in the spinal cord or nerves. Here is certainly an alteration in the contour of the cervical spine, and the case lacks the symptoms of acute inflammation, while there is no present suffering nor evidence of general paralysis. The boy, as you see, stoops over to pick up an object from the floor, and could seize it if it were not that he has lost prehensile power. How can we account for the condition here present?

My diagnosis is that something happened either at or immediately following the moment of injury, from the effects of which the boy is still suffering, and that this something, so far as the spinal cord and nerves are concerned, was a hemorrhage. If it were in the substance of the cord there would be greater paralysis. He has, you observe, motion in the shoulders and arms but not in the forearms and hands. The hemorrhage was probably between the dura mater and the bone, or possibly between the dura and the pia mater. The lesion, as far as the bones of the neck are concerned, is probably a partial dislocation and fracture of one or more vertebræ, since a dislocation without fracture, I should think, would cause more paralysis than we have here. The tumor which is now felt in the neck, I presume, is due to the throwing out of callus. The boy has lost the flexibility of the cervical spine on account of this mass of callus, and he raises the head by bending the dorsal and lumbar spine. This accounts for the marked protrusion of the abdomen, to which I called your attention when he first entered the room.

I suppose that what the family care for more than for my diagnosis is to know what prospect there is for the improvement or entire relief of this condition, and what treatment is to be instituted. This condition has now existed for seven weeks, and any nerve which is not permitted to accomplish its function for such a length of time, even without losing its integrity, would lose its sensitiveness, and its power to transmit motor impulses would be impaired. I presume there is still some blood-clot pressing on the nerve-trunk, and the absorption of that clot is desirable. About the only means of accomplishing absorption is to resort to alteratives, especially potassium iodide and mercurials. We may further use cauterization or other forms of counter-irritation over the spine. We must also avail ourselves of massage and passive motion of the joints and the stimulus of electricity in order to bring back so much of function as may be. I should think the boy would be able to recover at least a useful degree of power in the upper extremities, but I should not like to promise perfect recovery. For the parents, much more specific information will be necessary, so

that they may carry out the manœuvres of massage. The manipulation must begin at the finger-tips, and each digit must be worked at separately; the hand should then be manipulated. At least fifteen minutes should be devoted to each extremity twice a day. The constant current should also be used for five minutes, on account of its action on the nerves. Faradic electricity must also be employed, for its action on the muscles.

By a curious coincidence, I have another and much worse injury of the cervical spine to show you. This is an Italian who was hurt September 23, while working in a sewer, something falling on his head and back. The man is completely paralyzed below the chest, and he has very nearly complete paralysis of the arms, for, though he can partly raise them, he has little control over them. One element in the prognosis of such a case is to note if any change has occurred in the area of anæsthesia and in the power of motion. The former has remained unchanged, and he moves his arms somewhat more than at first, but he still has no power over his lower extremities.

The question arises, Is this a case of dislocation, fracture, hemorrhage, or what? The patient was unconscious immediately following the injury, and when he recovered consciousness he was unable to move. This fact would point to a more sudden pressure on the nerves than that produced by blood-clot due to hemorrhage. We know about where to look for the lesion here, for he has paralysis up to and partially involving the arms, showing that the brachial plexus is partly but not entirely involved. The injury must, therefore, be between the uppermost and lowermost nerves which enter into that plexus. Without a careful electrical study we can hardly determine accurately just what nerves are affected. The injury must be looked for in the lower part of the cervical spine or at about the level of the first or second dorsal vertebra. The injury is too low to permit us to detect any displacement by an examination of the pharynx, although the examination has been made in order to be thorough. I am told that when the patient came in, the orderly and one or two members of the house-staff thought that they discovered crepitus and some displacement. That was four days ago. I find now one very tender spot behind the fifth or sixth cervical vertebra, and this is the point at which the crepitus was found. I do not get crepitus now, and I should hardly expect it so late with such effort as I should consider it proper and humane to make. When the patient entered, his bowels had not moved, and his bladder was distended almost to bursting. These conditions were, of course, relieved.

You will notice that we have on the patient's head an apparatus such as is used for vertical extension in connection with the application of plaster jackets. In this case the traction is horizontal by means of a weight and pulley. Theoretically, he ought to bear a weight of many pounds; practically, we find that he winces if more than three pounds be used. Theoretically, such cases as this ought to be operated upon; practically, the results of operation are disappointing and the operation itself is hazardous. It may be that in this particular case so little damage has been done to the cord that it is capable of spontaneous repair. Under the circumstances, therefore, I do not feel justified in operating immediately, but I shall carefully watch the further progress of the patient, and decide for or against operation as his symptoms shall dictate.

Clinic, three days later.—I call your attention again to this case of supposed fracture of the cervical spine, and I shall now do the operation before you whose propriety I canvassed at the preceding clinic, and about which I then came to no conclusion. Since you last saw the patient, his condition has in no wise improved. In fact, his temperature has risen, his paralysis seems more complete, and it is very evident that he cannot live long unless some relief is afforded him by surgical measures. In other words, I feel that the case will surely prove fatal if left alone, and will probably prove so if operated upon; yet I feel it my duty to give the patient the slight chance which operative measures offer. For this purpose he has been fortified by the usual "fortification mixture" which I like to use before operations, and which consists of the following combination:

R Acid. nitro-hydrochlor., 2;
Liq. arsenici chlor., 8;
Tinct. digitalis,
Tinct. ferri chlor., āā 30;
Tinct. nucis vom. ad 100.

Of this the dose is from thirty to fifty drops after each meal. Besides this, the cervical and occipital regions have been shaved, and there has been applied to them for twenty-four hours a green-soap poultice.

Now, the patient being anæsthetized, he is turned upon his face, care being exercised that in this position he suffers no obstruction to respiration from the pillow upon which he lies. A straight incision is made from the second to the seventh cervical spinous process. The next step of the operation consists in dissecting off from the posterior aspect of the arches of the vertebræ all the soft parts attached thereto.

I now find that the spinous process of the fifth cervical vertebra is broken loose; and undoubtedly it was this that imparted the sensation of crepitus which was detected when the patient first entered the hospital. Having now exposed the arches, as intended, I find in them no solution of continuity nor any sign either of fracture or of displacement. This makes it very doubtful whether, upon cutting them away, I shall discover any abnormality at all, so far as the bony parts are concerned. With the sharp-bladed forceps I now cut through the arches of the fourth and fifth vertebræ on each side, and sever the intraspinal ligament and the ligamentum nuchæ, above and below, so that the posterior wall of the spinal canal can thus be removed *in toto*. Beneath now lies exposed the dura mater, which appears perfectly normal, and in or through which I discover no sign of displacement or injury. I next pass a probe for an inch upward and downward inside the spinal canal, in order to detect, if possible, any prominence or obstruction which might imply dislocation, but I find none. Next I cut away the posterior arch of the sixth vertebra, and repeat the examination with the probe, with the same negative result. Consequently I am forced to conclude that there is no narrowing nor distortion of the spinal canal. But the symptoms of this case point unerringly to disturbance in or about the spinal cord, and from this fact, and our present opportunities for observation, one must judge that the trouble is purely intraspinal. The only question remaining to be decided here is whether to open the dura or not. So far as previous experience enables me to judge, there is about the dura in this particular instance no appearance indicating undue tension or the presence of blood or pus. No pulsation of the cord was seen when I first exposed the dura mater, nor has any appeared since. It would seem that nothing is to be gained by opening the dura. Moreover, the patient's general condition makes me desirous to close the wound as soon as possible. Consequently, the soft parts are restored to their place as accurately as possible, and held there with buried and superficial sutures of silk-worm-gut and catgut, and an aseptic dressing is applied.

Clinic, three days later.—You will be interested to learn the fate of the case of spinal injury operated upon at the last clinic. The patient rallied well from the operation, and that evening was no worse than previously,—though, I must also say, no better. The following morning, however, the paralysis seemed to have extended, and soon after he became comatose, and during the following night died. Upon autopsy, it was discovered that no fracture nor dislocation existed in the spinal column, and that at no point was there an effusion of blood between

the cord itself and its bony canal, but that opposite the sixth cervical vertebra there was a point of softening, central and acute, with accompanying and surrounding degeneration, and to this were due both his symptoms and his death. This softening must be accounted for by some minute internal hemorrhage caused by laceration of the substance of the cord, corresponding to the condition known as contusion of the brain. It is well known that acute degeneration often follows such injuries to the cord.

Reviewing for a moment the operative features of his case: of course, if one had known exactly the internal condition, operation would not have been performed. We had in this instance, however, to do with an Italian who was not brought to the hospital until two or three days after the injury, who spoke no English, and from whom, even by means of an interpreter, we could gather very little information, and whose friends furnished absolutely no information of any value. Could we have learned accurately with regard to his condition immediately after the injury, a clearer diagnosis might perhaps have been made. Under the circumstances, it would appear that the patient was given every chance which conservative or radical surgery could afford, with the information at hand.

PIGMENTED HAIRY MOLE OF FACE; COLLES'S
FRACTURE; SPINA BIFIDA; TUMOR OF
THE SPLEEN.

CLINICAL LECTURE DELIVERED AT THE NEW YORK POST-GRADUATE MEDICAL
SCHOOL.

BY ROBERT ABBE, M.D.

GENTLEMEN,—Our first patient is a boy with a large, hairy, pigmented mole of the face. (See Fig. 1.) The skin is hypertrophied; it is wart-like in parts, and the growth covers more than half of the nose, reaching nearly to the inner canthus, and extending two and a half inches out upon the cheek. It may be removed by various methods,—by escharotics, by the actual cautery, or by incision. You may shave it, but this is likely to be followed by a reproduction of the trouble, as well as by a cicatrix. The actual cautery causes probably more scarring than any other method. The use of caustics is followed by a variable amount of scarring, depending upon the particular caustic employed. You may use Vienna paste, arsenical paste, perchloride of antimony, nitric acid, or a paste of sulphuric acid and charcoal; but they all give rise to the formation of more of a cicatrix than is desirable. A recently-introduced caustic known as sodium ethylate is found to be efficient in the removal of the growth and at the same time to leave a soft cicatrix. This new caustic is simply a solution of metallic sodium in absolute alcohol, and is prepared by successive saturation of the alcohol with metallic sodium at different temperatures until a paste is obtained. Metallic sodium, as is well known, has a decided affinity for water, and its alcoholic solution, or the sodium ethylate, possesses the same property, although to a somewhat less degree. When applied to the tissues of the body, it quickly dehydrates them, and forms a pellicle on the surface. At the same time, the epidermis is destroyed and the hair-follicles are penetrated. After two or three applications at intervals of about ten days, there is usually ulceration of the pigmented area, and finally a soft and non-contractile

eschar is left. Before applying treatment to this case, the surface has been well shaved and cleaned, and then dried very thoroughly. The application is best made with a camel's-hair brush, beginning at the margin of the mole. Some apply it with a glass rod, but with this one cannot control its application so thoroughly. This application, so far, has not caused this boy any pain. The method is not applicable for the destruction of hair upon the healthy skin, as it does cause some scarring.

Small moles upon the body or face the size of the finger-nail can often be removed by an elliptical incision, which is preferable to all other methods if the growth be not too large. The edges are to be united by many very fine sutures, and in the course of two or three years all trace of it will have gone.

A CASE OF COLLES'S FRACTURE.

A glance at the deformity which this woman presents tells you that she has a fracture of the lower end of the radius, known as Colles's fracture. Good apposition of the fragments has already been secured, but there is still a little fulness low down upon the wrist, indicative of slight overlapping. Usually no crepitus is elicited in these cases, and at the time of the occurrence of the fracture there is a slight rotary displacement of the fragments: the distal portion is displaced outward, backward, and rotated. In replacing it, the forearm above the fracture is grasped by the operator's fingers and palm, the end of his thumb pressing the lower fragment into position during extreme extension. The operator's other hand grasps the patient's hand, and makes traction, extension, and rotation. Thus there are three motions executed in setting a fracture of this description, although they are performed so quickly as to appear almost as one. These are—(1) depress the distal fragment towards the ulnar side, (2) depress it towards its palmar position, and (3) rotate it slightly.

The case is being treated by the usual straight anterior and posterior splints held in position by strips of rubber adhesive plaster.

SPINA BIFIDA.

You have already seen this little four-months-old infant subjected to the operation of aspiration and drainage for a spina bifida. Since the last aspiration it has not done well; there has been an elevation of the temperature, which at present is 103°. There have been no head-symptoms, but the little one has taken but little food. The tumor evidently includes some of the nerves supplying the lower extremities,

as there is scarcely any retraction when they are pricked or pinched. Such a tumor as this is a constant menace to life; for sooner or later it will become tense and ulcerate through, resulting in loss of cerebro-spinal fluid, and death in a few days. Smaller tumors of this nature will often remain stationary for life. We find to-day that there is inflammation of the sac, and that it is considerably more swollen than it was day before yesterday. The cases which have been operated upon while the sac was inflamed, and before suppuration had occurred, have been successful, and hence we are warranted to-day in interfering, notwithstanding that the child is very sick. There is no cause for the elevated temperature other than the inflammation of the sac.

In dealing with cases of spina bifida there are only two methods to be considered,—viz., (1) injection of the sac with the iodine and glycerin solution known as "Morton's fluid," and (2) the removal of the sac. If the sac were opened with the child in the erect position, the cerebro-spinal fluid would drain out, but if this be done while the subject is recumbent, and the tumor placed at a higher level than the head, there will not be a sufficient quantity of fluid lost to injure the child. It is often difficult to obtain sufficient skin to cover the parts, on account of the extensive thinning of the integument. The opening into the spinal canal is usually not larger than the little finger; but, as a rule, the larger the sac the larger this opening. When the sac is cut off at the pedicle the opening in the bone requires to be covered, and then the skin brought together over that. Briefly, the operation for the removal of the sac consists in making an elliptical incision, dissecting under the skin in all directions until the small pedicle is reached at the small opening into the sac of the dura mater. Having opened the sac and examined its contents, the sac can then be tied off.

On attempting the operation in this case, it was found that the whole cauda equina was spread over the sac, so that it was considered inadvisable to proceed further.

TUMOR OF THE SPLEEN.

This next patient is a woman having a huge tumor of the spleen, which I have watched for some months. (See Figs. 2 and 3.)

You see the line of dulness and the edge of the spleen. She gives a history of having had this for nine months. She has had two or three children, and a miscarriage, after which she bled considerably. Since this time a swelling began in the side and has steadily grown to the present size. I first saw her when it was a little smaller than now.



FIG. 1.—Large pigmented, hairy mole of the face.

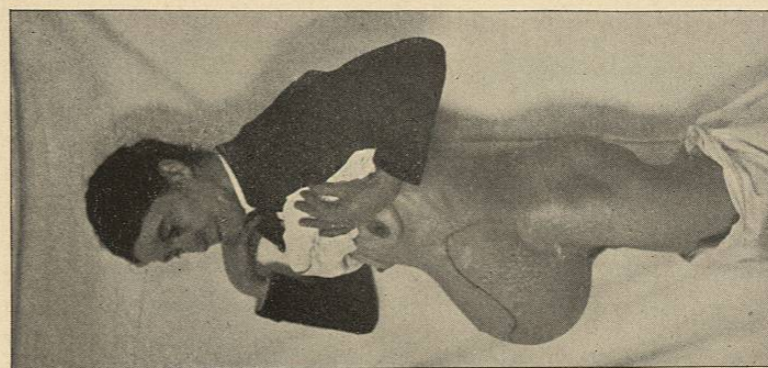


FIG. 2.—Lateral view of site and lines of dulness of a tumor of the spleen.



FIG. 3.—Anterior view of the woman with a tumor of the spleen, showing lines of dulness.

Her condition at that time was very bad ; she was pallid, feeble, and depressed, and suffered some pain. The tumor had the same kidney shape and relatively the same position in the abdomen. Her pallor suggested leucocythæmia, and a microscopical examination of the blood showed one white corpuscle to thirty red. The position and appearance of the line of dulness indicated that the tumor was not ovarian or malignant, but that it was simply a very much hypertrophied and displaced spleen. It is hard and freely movable in the abdomen. The edge is rounded on one side, and on the other is sharp. No tumor in the abdominal cavity would give this edge except the liver. The tumor is absolutely dull ; it is round, smooth on its surface, and has notches on its edge. These are distinctive signs of a displaced and hypertrophied spleen. But you say, May it not be a cystic degeneration of the liver, spleen, kidney, ovary, or uterus? May it not be a tumor of the omentum, or an ovarian tumor, or an ectopic gestation? If a uterine myoma, the tumor would be rotund ; if ovarian, it would also be rotund, and would not have this shape, unless it were one composed almost entirely of a cyst which had been tapped. But this tumor has not been tapped. A hydatid tumor is spherical and fluctuating. An hypertrophied kidney might become displaced in this way ; but the history would be different. If it were a suppurating kidney, there would be hectic and other constitutional disturbance. Such a tumor as this might be a malignant growth in the abdominal wall, in the omentum, or in the subperitoneal layer, as, for instance, a retro-peritoneal sarcoma. If it were retro-peritoneal, it would be spherical and not movable, and it would not be resonant in the region of the colon, for it would raise the colon. The same would be true if due to a large kidney. This is a most important diagnostic sign. If it were malignant disease of the omentum, it would be spread out broadly over the abdomen, and would feel hard and knotty.

Nothing has this perfectly smooth surface except the spleen or a cyst connected with some of the viscera. But here there have been no disturbances of the intestines, stomach, or other viscera, and therefore by exclusion we have arrived at a diagnosis of enlarged spleen. The spleen is a part of the lymphatic system, and yet in this case there is no lymphatic enlargement elsewhere. When smaller than this one, these splenic enlargements are due to malaria ; but this is too large, and the history excludes this origin. A wandering spleen will often be somewhat enlarged, but not so much as this. A hypertrophic change in the spleen occurs in two diseases,—viz., leukæmia and malaria. Examining the blood, we find this leukæmic condition.

Cases have been known to run a course of six weeks and terminate fatally by exhaustion; others last for months or years. When first seen by me, she had been ill only about three months, and she was then leucocythæmic. She has improved a great deal since then, and I think she will recover, but she is troubled with prolapse of the uterus and rectum, due to pressure of the tumor.

In the treatment of this condition, the most satisfactory results have been obtained from the administration of arsenic, quinine, and iron. Arsenic is a favorite remedy for all troubles of the lymphatic system. A free inhalation of oxygen is reported to have cured three such cases. In this instance we used first oxygen, and subsequently "electro-ozone," which is water saturated with ozone through the agency of electricity. It acts very much like peroxide of hydrogen, and is an active oxidizing agent. It was given in tablespoonful doses, three times a day, and has produced a striking effect on this patient in increasing the processes of oxidation. During the summer she has been taking it constantly, and has improved in color, tone, and strength. She is taking now some arsenic. As yet, surgical interference is attended by too great fatality to be thought of. It has been proposed to tie the splenic artery with a view of preventing its growth, and the method seems worthy of consideration. I shall perhaps at some future time propose to make an exploratory incision to determine the exact condition of the surface of the tumor, and also the existence and extent of adhesions. Of course the spleen has been removed many times,—about eighteen times for leucocythæmia, about fifteen times for traumatism, hydatids, abscesses, or for painful enlargement of the spleen due to malaria. Out of sixty-six cases, twenty-two have recovered. This spleen would probably weigh from twelve to fifteen pounds. There is no reason to think it is malignant, except in the sense that leucocythæmia borders on malignancy.

TWO CASES OF TUMOR OF THE PAROTID REGION.

CLINICAL LECTURE DELIVERED AT THE UNIVERSITY HOSPITAL, ANN ARBOR,
MICHIGAN.

BY CHARLES B. NANCREDE, M.D.,

Professor of Surgery and of Clinical Surgery in the University of Michigan, Surgeon to University College Hospital, etc.

LADIES AND GENTLEMEN,—My first case to-day is a woman, aged forty-nine, with a tumor in the right parotid region, which has been growing for four years. I think that the facial nerve may be involved in the tumor, and if I can dissect it out, so as to prevent hopeless paralysis of that side of the face, I will do so; but I have warned the patient that the facial nerve may be unavoidably cut.

I think it is probably a fibroma or enchondroma much like one we had last year, but I am afraid, from the age of the patient and its rapid increase in size within the past few months, that it may contain sarcomatous elements. I shall not make a bold cut, but shall dissect cautiously, as I might divide the facial nerve with my first incision.

These tumors are deceptive as to their apparent mobility, because the more superficial portions may move upon the deeper, while these are really firmly attached to the surrounding tissues.

Here you see this portion of the tumor, about the size of a hen's egg, passes deeply behind the lower angle of the jaw. I think it is an outlying lobule of the parotid gland; if the whole gland was involved we should have more fixity and the growth would involve the deepest portion of the gland, which is not the case here.

I make my incision through the skin, carefully dissecting down to the capsule of the gland, watching for any nerve-filaments that may cross my line of incision; then, starting from above, I shall try to enucleate the gland from above downward towards its pedicle, which contains the blood-vessels, effecting this by dry dissection as much as possible. Always tie the pedicle of these tumors, as there may be a small arterial branch, which if cut off close to the main trunk will cause such bleed-