

operation I commenced Faradisation, continuing it on alternate days, in addition to the free movements; the aim was to develop the remains of the injured external rotators with other muscles which might be compensatory and to improve innervation. I picked out the deltoid in particular, the trapezius, rhomboids, &c., also the triceps; and to counteract the constant tendency of the forearm to pronation I tried to increase the development of the supinators longus and brevis, and by inducing strong contractions of the biceps with the forearm flexed to improve its action as a supinator; the radial extensors of the carpus, longior and brevior, were also treated. Rapid increase in the size of all these muscles, with quickened response to stimulus, gave encouragement, and very soon operations were extended with the small button electrode to the small muscles of the undersized thumb, index, and middle fingers, and to the palmar surface of their tips to improve tactile sensibility, with palpable benefit. Sometimes one pole was placed over a muscle and the other over the brachial plexus in the posterior triangle or over the individual nerve supply, and sometimes both poles were placed over either end of one of the longer arm muscles. Frequent intermissions were given to avoid overtiring a muscle. After a month other factors equally as effectual and important helped in the improvement. Nearly all day now the child had his good arm enveloped by a towel tied round his body; he also had a thick stall on the little and ring fingers of the other hand to prevent his customary exclusive use of them. His mother's devotion to a set purpose and her intelligent supervision were now invaluable; she daily gave all her spare time to the various amusements and devices we designed to teach the child external rotation, abduction, supination, and the use of his unaccustomed fingers; it became quite a matter of habit with all the family to discourage the tendency of the limb to internal rotation and pronation; the happy disposition of the child helped us greatly. At the end of two months there was such evident improvement in every way that our task daily grew in interest and lost all tediousness; we began to cultivate the deficient finer movements and sense of touch in the underdeveloped left thumb, index, and middle fingers; with the finger-stall over the other two he was attracted to hold and pick up things. At first he was so awkward and feeble that it was a most difficult matter to get him to take up large lumps of sugar and drop them into a basin, but before many weeks he could confidently pick up such difficult things as pills, small buttons, and safety-pins, coins, &c., with forefinger and thumb opposed in a strong and natural grasp. With his sound arm tied up he now played for hours daily with a variety of articles and with vastly improved method; he was also regularly enticed to reach out after things put round him in different positions, to lift up and take things down from places above him. At the end of four months the regular Faradisation and free movements—which were now quite painless and easy—with the persistent education of the limb, had effected improvement beyond our hopes. The humerus was very slightly shorter on the one side, but comparison revealed no differences in the muscles now. Force of habit and larger development of the internal rotators always had a tendency to reassert themselves, but the child was now rapidly learning to counteract them by the better use of his improved external rotatory mechanism, which would, however, probably be always weak. At the end of five months we thought our results interesting enough for Mr. Pearce Gould to see, and by his desire the child, now thirteen months old, was taken up to the Middlesex Hospital and shown to his class. It was an interesting case for his hearers, and gave him an object lesson to impress on them that the Schultz method of artificial respiration requires all possible gentleness. Subsequently the little patient went to Germany for a few months. Faradisation was now almost superfluous, but a battery was taken for occasional use, which the parents could competently manage themselves.

The child was taken recently to see the famous German surgeon, Professor Kraske of Freiburg. I gave him a brief history from the commencement and a statement of the treatment; he has sent me a letter written by a colleague at his request from which the following is an extract. "Besides symptoms pointing to what we call 'Erb's paralysis'—lesion of the fifth and sixth cervical roots above the clavicle—Professor Kraske found the growth of the left humerus impaired, which he was inclined to attribute to traumatic lesion of the upper epiphysis. As to the ultimate result of treatment, Professor

Kraske did not feel entitled to express any definite opinion. Since the nervous disturbance had gradually been giving way he considered further improvement very probable." Professor Kraske also says he advised the application of a bandage, which will, while it is worn, fix the humerus in a normal position and prevent its inward rotation. Seven months of treatment had so altered the condition of affairs when Professor Kraske saw the child that it was very difficult for him to realise fully the nature of the primary lesion and the true characters of the resulting deformity. Interesting as his views were, his prognosis was of far more practical importance, and was fully justified, for I now hear that since the intermittent use of Professor Kraske's bandage improvement has been even more rapid than before.

Although I anticipate ultimate success in extent greatly beyond what has been attained, I think the treatment has gone far enough and been successful enough to make the case instructive and to point the moral that in cases of this nature one need not despair of improvement; in fact, in an apparently hopeless instance the commencement of treatment may justify a prognosis which amply repays us for the experiment and encourages us to persevere.

Brighton.

A CASE OF RUPTURE OF THE LIVER SUCCESSFULLY TREATED BY ABDOMINAL SECTION.

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WOMEN.

IN the early part of the afternoon of May 4th, 1896, a strong, healthy young coal miner, aged nineteen years, was caught, whilst down in the pit, between two sets of trucks and received a severe "rolling crush." He was carried to the surface and sent home in a cart, and Mr. J. M. McCarthy, of St. George's, Salop, was sent for. When he saw him, about 4 P.M., the patient had recovered from the first shock. He complained of great pain in the right side of the chest. There were signs of bruising both on the front and back of the chest, especially on the right side. His pulse was 76, his temperature 98° F., and there was nothing then in his general condition to point to any grave internal injury. In the evening he seemed to be better, and he slept during the night till 5 A.M. Next morning (the 5th) he was, however, decidedly worse, and as the day wore on well-marked symptoms of grave abdominal mischief supervened. The pulse became more and more rapid, the temperature steadily went up, the abdomen became distended, the face pinched, and the respiration sighing. Mr. McCarthy wired for me to go over at once prepared to operate. In his telegram he said: "Case of traumatic peritonitis; probably ruptured viscus." When I saw the patient, about 9 P.M., his temperature was 103°, his pulse 130, his breathing short and distressed, his face pinched, and the abdomen was hard, tense, and distended—tympanitic in front, dull at the flanks, and evidently containing much free fluid. There were, however, no signs of free gas in the peritoneal cavity—no obliteration of the liver dulness—showing that the stomach and intestine had probably escaped. There was no vomiting either of blood or bile, no hæmoptysis, and no hæmaturia. He had passed flatus and the urine was clear. The symptoms were those of progressive intra-peritoneal hæmorrhage and advancing peritonitis. These symptoms, the absence of signs of injury to the lungs, stomach, intestines, kidney, and bladder, and a consideration of the mechanism of the crush, led us to diagnose a rupture of the liver. Mr. McCarthy agreed with me that the patient's only chance lay in immediate abdominal section. To this the patient readily consented; but his parents gave way most reluctantly. The operation was done under difficulties, by the uncertain light of a paraffin lamp, in a miner's cottage, in a pit village on a Shropshire hill-side. About 9.30 P.M. Mr. H. H. Rubra put the patient under chloroform, and, with Mr. McCarthy's able assistance, I opened the abdomen in the middle line by an incision reaching from the ensiform cartilage to the umbilicus. As soon as the peritoneum was opened an immense quantity of black blood—fluid and clotted—escaped, and on examination, the liver was found to be ruptured. A rent, from one to two inches deep, ran from before

backwards on the under surface of the right lobe, from the portal fissure to as far up the posterior surface as I could reach. There were, in addition, evident signs of commencing peritonitis. I now endeavoured to clear the abdomen of blood-clot by free irrigation with hot water. Floating amongst the clots I noticed a fragment of liver substance wholly detached from the organ. This was examined microscopically by Professor Allen of Mason College, Birmingham, and it proved to be normal human liver tissue. I lay some stress on this fragment, as it is proof positive not only that the blood came from a rent in the liver, but also that the lesion of the liver must have been a severe one. Probably there were other small fragments detached, but they escaped notice amongst the clots. The question then was how to deal with the rent. Had it been on the anterior border or upper surface I could have sutured it with catgut or plugged it with iodoform gauze; but it extended so far backwards and upwards on the posterior surface that suturing was impossible, and I considered that gauze plugging was impracticable. I decided to trust to the hæmostatic effect of free irrigation with hot water, thorough removal of all effused blood from the peritoneal cavity, and free drainage. I accordingly again washed and sponged out the abdomen. In order to effectually drain the pelvic pouch I made a short incision just above the pubes. I then inserted two glass drainage-tubes—one through the epigastric incision going down to the rent in the liver, and the other through the suprapubic opening into the pelvis. The parietal wounds were closed with silkworm-gut sutures, antiseptic dressings were applied, and the patient was lifted back to bed. It was fortunate that I made the suprapubic opening, as for several hours there was a free bloody discharge from the lower tube, though practically nothing came through the upper tube. The patient stood the operation well, but a condition of grave abdominal collapse continued during most of the following day. His temperature fell markedly after the operation, but his pulse continued from 130 to 140 and was at times intermittent and uncountable. Thanks, however, to the frequent administration of brandy and beef-tea enemata, small quantities of brandy by the mouth, and small doses of morphia hypodermically, the patient rallied, and during the afternoon (May 6th) had four hours sleep. Mr. McCarthy and his assistant (Mr. Rubra) were most assiduous in their attention, and the patient owes his recovery in a large measure to their careful after-treatment of the case. After the first twelve hours there was very little bloody discharge from the drainage-tubes, and what there was came from the lower tube. That from the upper tube was scanty, serous, and for a few days bile-stained. On the 10th the glass tubes were removed and rubber tubes inserted. These were gradually shortened from day to day. On the 11th, although his abdominal condition was most satisfactory, the patient developed symptoms of pneumonia. For several days he brought up semi-purulent blood-stained sputum, had a moderate degree of fever, a troublesome cough, and quick, distressed breathing. On the 20th his temperature fell to normal, and from that date he progressed rapidly to recovery. The patient is now (April, 1897) fat, strong, and hearty.

Remarks.—Rupture of the liver, though by no means a rare accident, is a terribly fatal one. The chief causes of death are shock, hæmorrhage, and peritonitis: (a) shock from the bruising, tearing, and pulping of a vital organ; (b) hæmorrhage from the laceration of the great vessels at the portal fissure and traversing the liver substance; and (c) peritonitis from secondary septic changes in the extravasated blood and bile. At the same time it is not an absolutely mortal injury. There have been several instances in which, from the nature of the accident, the clinical signs and symptoms and the after progress of the case, it is extremely probable that the liver was ruptured, and yet the patient recovered. Still more conclusive are four cases (published by Heath, Erichsen, Morris, and Hammond) where the patients survived the accident—14, 16, 21, and 38 days—and then died from other causes. In each case a post-mortem examination showed that the liver had been ruptured—more or less severely—and that a spontaneous cure was taking place. Such cases, however, form an extremely small minority. In the vast majority—probably 99 per cent.—death rapidly takes place. In the above case I am convinced that had the patient not been operated on he would certainly have died. After the first shock of the accident passed off he had no bad symptoms for sixteen hours, during which time he had several hours' sleep. Then he began to show signs of progressive intra-peritoneal

hæmorrhage and advancing peritonitis. Hour by hour his condition became graver, and when I saw him some thirty hours after the accident it was evident that he was doomed—unless we could save him by abdominal section. But how did the operation save him? I attribute the good result to the free irrigation of the peritoneal cavity with hot water and to the thorough drainage. By the irrigation I checked the bleeding from the rent in the liver, and removed a vast quantity of effused blood and lymph from the peritoneum. The drainage tube—properly used—is itself an excellent hæmostatic, as all who have had much experience of pelvic surgery are well aware. By draining away the blood as soon as it was poured out it promoted the natural arrest of hæmorrhage. Furthermore, the removal of the effused blood, lymph, and bile checked the progress of peritonitis and prevented its further development. I lay stress on the importance of draining the pelvic pouch by an opening just above the pubes. It is significant that most of the discharge came through the pelvic drainage-tube. In conclusion, I trust that the successful issue of this case will encourage other surgeons to try to save, by timely operation, cases in which the same terrible accident has occurred.

Birmingham.

A Mirror

OF

HOSPITAL PRACTICE, BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Proœmium.

GUYS' HOSPITAL.

EXTENSIVE MALIGNANT DISEASE OF THE TONGUE AND
FAUCES; REMOVAL; RECOVERY.

(Under the care of Mr. J. N. C. DAVIES-COLLEY.)

THE very great extent of the structures in the mouth involved in the following case necessitated a departure from the usual Whitehead operation, and the buccal incision, which is generally associated with the name of Furneaux Jordan, though previously described by F. J. Gant, exposed the affected parts better than any other of the numerous incisions which have been employed for removal of the tongue. The approximation of the edges of the mucous membrane and the use of an antiseptic locally account in great part for the rapid healing. As to the prognosis nothing can be said; but whether the disease returns or not the patient is much the better for the removal of so extensive a malignant ulcer. For the notes of the case we are indebted to Mr. H. W. Dudgeon, clinical assistant.

A man, aged fifty-six years, was admitted into Guy's Hospital on March 24th, 1897, complaining of disease of the tongue. He had first noticed a pimple far back on the right side of the tongue just after Christmas, 1896. Thinking it was due to chewing tobacco he gave up the practice, but the pimple steadily grew larger, and continued growing up to the time of the patient's presenting himself at the hospital. For the last seven weeks before admission he had not been able to swallow solid food, and consequently his diet had been entirely fluid. Six days before admission he had, he said, vomited about two quarts of liquid blood with a small mass of solid blood clot. He had never had any pain in the tongue, throat, or stomach except the pain caused by attempting to swallow solid food. For some weeks an offensive purulent discharge had run from the mouth. He had, he thought, lost a good deal of flesh in the last few months, but he attributed it to the abstinence from solid food. On admission the patient was seen to be a well-formed man, but thin. On the right side of the tongue were two extensive ulcers situated for the most part on the posterior half of the tongue. The edges were raised and everted and the centres deeply excavated; the bases were very hard, and the hardness extended downwards into the floor of the mouth on the right side, backwards to within half an inch of the epiglottis, and upwards to the right tonsil and the right half of the soft