SPONTANEOUS REDUCTION OF A DISLOCATION OF THE CERVICAL VERTEBRAE.

BY

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On April 25th, 1912, I was called to Ulverston to see a patient who was under the care of Dr. Anderson of that place. As the call was by telephone, I learnt that there was a possible fracture of the spine, that Dr. Thurstan Holland had been to Ulverston the previous day and taken a skiagram of the injured spine, and I was to go prepared to operate if necessary to relieve any pressure on the cord. I therefore went first to Liverpool to see the x-ray plate, in which it could be seen that there was an increased interval between the third and fourth cervical vertebrae and that the lower edge of the body of the third was pushed forward over the upper edge of the body of the fourth; this edge was less sharp than below.

On reaching Ulverston I learnt that on April 21st the patient, aged about 65, fell from a tree. As he was standing on a horizontal part of the trunk his feet slipped from under him, and he fell on his back and slipped down; possibly while thus falling a projecting piece of wood struck his spine. As he lay upon the ground he was perfectly conscious and had no pain, but had no power in his arms and legs; breathing was gasping, and he was conscious of having to force it. After a while there was some pain across the back, passing from the shoulder blade up to the head. There was no vomiting and no irregularity of the organic reflexes.

That same night there was a slight movement of the legs which the following morning was increased. On April 24th an enema was given, and the sphincter control was perfect. There was no spontaneous pain, but on movement of the body there was pain at the back of the neck, and he was conscious of a creaking sensation, but this was not detected by others or by the doctor who examined him. There was an inability to turn in bed, and there was a "feeling of a band" felt across the liver on the evening of April 21st. This disappeared and occurred higher up, and became, in the words of the patient, "like a cane stretched round the chest obliquely, passing below the left armpit and over the right shoulder." On April 25th the band felt a little lower and wider, passing over the heart, and seeming to cause embarrassment on breathing.

I found the patient sitting in a chair, apparently not suffering, and ready to converse intelligently about the situation. As he sat he was able to move his legs slightly, but he could not move his arms. Movements of the head and back seemed a little restricted; being utterly helpless to rise or help himself, he was lifted on to the bed.

1. LEGS.

(a) *Sensory Functions.*—Babinski's sign was absent from both feet. The right foot was hypersensitive, and pin-pricks were felt more on the right foot than on the left. He described the same prick on each foot as "sharp on the right foot and blunt on the left." A scratch or a pinch showed the same from the knee to the ankle. The right leg was rather duller than the left to the various forms of sensibility.

(b) *Motor Functions.*—The power to move the right leg was delayed and sluggish, though only very slightly limited in extent, while the left seemed normal. The knee-jerks were normal on both.

2. ARMS.

(a) *Sensory Functions.*—The hands appeared a little swollen, and in both arms there was a greater sensation on the radial than on the ulnar side, while the median area was indefinite. There were no patches of lost sensation.

(b) *Motor Functions.*—Flexion and extension, feeble in the fingers and wrist, were absent from the arm and forearm. In the attempt to lift the forearm the pectorals and trapezii contracted; supination and pronation were feebly present on both forearms. The grip and motor power of the hand was less on the left than on the right, and reflexes were present.

3. THE TRUNK.

Nothing obvious was to be noticed. The superficial reflexes were absent on the left, present on the right. Inspiration was full and painless. Sensibility was present all over, but was rather less on the right side; the region of the band above referred to, just below the left clavicle, showed an area of markedly lessened sensibility. The neck behind was red from local application, the skin was coarse, and when pinched between the fingers, slightly nodular. There was no abrasion, but there was slight tenderness over the cervical vertebrae, while the rest of the spine might be handled with impunity. No crepitus or abnormal formation could be detected.

The pupils were active to both light and accommodation, but the right was rather sluggish. The heart sounds were normal, the mental temperament was vigorous. The respiratory system appeared normal.

The important locating fact was that the arms were hypersensitive on their radial aspects, which is the area supplied from the fifth cervical root.

Amongst the literature on the subject which I read up in the train *en route*, Horsley's dictum from the *Clinical Journal* guided my action. "If the lesion is acute and in the cervical region, then certainly wait. As regards the dorsal region, better to wait a little. As regards the lumbar region, I do not think you want to wait to operate."

The result of masterly inactivity was that in two months the patient walked into my consulting-room unaided and shook hands, but the finer movements were wanting, and he could not dress himself. On October 13th he was back at his office in Liverpool, could write well, but still was unable to button his collar.

Now, in June, 1913, fifteen months after the accident, he is able to carry on his work, but still has numbness in his finger-tips which hinders the finer movements being performed, and occasional twinges in the muscles of the neck.

A NOTE ON LOCAL ANAESTHESIA.

BY

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THE application of local anaesthetics is taking a very important place in the surgery of the present day, and is likely to replace the use of general anaesthesia in all minor and in many major operations. A field of outpatient surgery has thus been opened up which English hospitals have been somewhat slow to recognize, whilst in private practice the opportunities of the general practitioner have been greatly increased. The latter can now carry out in his consulting-room operations which have hitherto involved all the paraphernalia of general narcosis, and the only assistance required may be given by the patient himself.

The equipment required consists of a first-class syringe with fine needles of varying length. A Record syringe of 5 or 10 c.cm. capacity will answer all requirements. A few long blunt-pointed needles are useful for extensive infiltration.

The drugs chiefly used are cocaine, eucaine, novocain, and adrenalin. These all oxidize rapidly if exposed to the air in solution. All solutions should therefore be made up immediately before use, and when this is done it is possible to be certain that the solution is both active and sterile.

Local anaesthesia may be produced by four distinct methods: (1) Local application; (2) local infiltration; (3) nerve blocking—"regional" anaesthesia; (4) venous infiltration.

1. Local Application.

This is only used in relation to certain mucous membranes and raw surfaces. Its chief applications are in the nose, eye, and urethra. The nose may be plugged with strips of gauze soaked in a 20 per cent. solution of cocaine to which a few drops of 1 in 1,000 adrenalin have been added. In the eye 1 per cent. to 4 per cent. solutions may be used. In the urethra cocaine should only be used in 1 per cent. solution, as absorption is rapid, and toxic symptoms may be marked. This is the great disadvantage

of cocaine, and yet there is no drug to equal it in potency as a local application.

2. Local Infiltration.

This is the most generally useful method for minor surgical procedures. The nerve endings are paralysed by injections in their neighbourhood. The best solutions to use are 0.2 per cent. eucaine or 1 per cent. novocain, preferably in normal saline to which a few drops of 1 in 1,000 adrenalin are added. A very convenient method is to have gelatine capsules made up containing β eucaine 0.2 grams, and sodium chloride 0.8 grams. One of these is thrown into 100 c.cm. of boiling tap water when required, and, on cooling, 10 drops of 1 in 1,000 adrenalin chloride are added. The solution is then always fresh, always active, and always sterile. This amount will be sufficient for any ordinary operation, but, if necessary, twice or thrice as much may be used with perfect safety. The addition of adrenalin to these solutions is a very important advance. By constricting the vessels it not only prevents bleeding but limits the anaesthetic to the region required, increases its effect, and prevents its rapid absorption into the circulation and the resulting toxic symptoms.

In making the injection we adopt one of two methods: We may inject into the dermis or into the deep tissues. The former is essential along the line of incision, and should result in the raising of small swellings as the injection is made. Each swelling is itself anaesthetic, and may be used as the starting point for further injections. But if the deep tissues are to be entered, these too must be infiltrated, and in an extensive operation it will be better to carry this out as the various structures are exposed. In this way any superficial tumour can be removed, and even very extensive procedures carried out, with no shock and little or no haemorrhage. An important application of this method is to fractures and dislocations. Deep injections are made around the displaced ends of bone, the tissues around both surfaces being thoroughly infiltrated. In a few minutes all pain will have ceased, the reflex spasm of muscles will have disappeared, and the bones may be reduced to their normal relations with great ease.

3. Nerve Blocking.

By this means the whole region of distribution of the blocked nerve is rendered anaesthetic. The injection may be made into the nerve trunk or around it. In the former case the solutions already mentioned for infiltration may be used with very fine needles. In the latter case the solutions should be twice as strong and only small nerves should be dealt with. For large trunks endoneural injection is essential.

As an example of perineural injection we may take resection of a rib for empyema. Several cubic centimetres of solution are injected around the heads of the rib in question and of that above and below. The skin, the rib, and all the tissues to be divided will thus be rendered anaesthetic. Similarly, perineural injections around the median and ulnar nerves at the wrist will enable many operations on the hand to be performed. Endoneural injections of the brachial plexus have been extensively used by Krause for operations on the arms. An essential point of this method is that paraesthesia which should be felt in the nerve distribution after the needle is inserted and before any injection is made.

This method can be used wherever the nerves of the part are accessible—in the arms, the feet, the legs, the jaw, for example. It has the great advantage that it does not in any way interfere with the actual site of operation, and its only limits appear to be the anatomical knowledge and manipulative skill of the surgeon.

4. Venous Anaesthesia.

This most recent method of local anaesthesia we owe to Bier. It depends upon the extensive anastomosis between the superficial and deep veins. Some portion of a limb is emptied of blood by elevation, or an elastic bandage, and is cut off from the circulation by tourniquets above and below. Into one of the surface veins the anaesthetizing solution is injected under some pressure. The result is complete anaesthesia of the section of limb between the tourniquets by "infiltration" and complete

anaesthesia of the limb below by "blocking." Either of the infiltrating solutions may be used, but no adrenalin should be added (Bier). A vein may be dissected up under local anaesthesia, but it is easier to insert a short needle into the vein while it is full, and to empty the limb rapidly by elevation. The tourniquet above the field of injection should be slowly removed at the end of the operation, to avoid a sudden flooding of the circulation with alkaloid. The limb will then return to its normal state in seven or eight minutes.

This very powerful method has wide applications, and can be used for the gravest operations on the limbs, provided a tourniquet can be placed above the site of operation. Its application in lacerations of hands and feet, in amputations, and in osteomyelitis, is obvious.

By one or other of the above methods almost any operation of modern surgery can be satisfactorily carried out. For minor surgery and for operations on the limbs these methods are far superior to general narcosis, and in special circumstances they may have advantages even in graver operations. They form a very powerful weapon with whose uses every practitioner should be familiar and upon which the surgeon and anaesthetist of to-morrow may largely rely.

Those who wish for further information on the subject will do well to refer to the following papers:

Gwynne Williams: *Choyce's System of Surgery*, vol. i, p. 680.
Braun: *Deut. med. Woch.*, January 2nd, 1913, p. 17. *Medical Review*, May, 1913, p. 269.

Kulenkampff: *Deut. med. Woch.*, October 3rd, 1912, p. 1878.
Medical Review, January, 1913, p. 47.

Lenormant: *Presse méd.*, December 21st, p. 1066. *Medical Review*, May, 1913, p. 246.

ON DILATATION OF THE FALLOPIAN TUBES FOR STERILITY.

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MANY women seek advice as to the cause of their sterility, and the usual means employed, after one is satisfied that the fault lies with the female, have, up to the present, been the correction of malpositions and flexions, the dilatation of the cervix uteri, curettement of uterus and cervix, and the cure of endocervicitis.

Though in many cases this is done, still impregnation does not take place. I am quite satisfied that there are many cases where the fault lies in the Fallopian tubes. I will briefly cite two cases which bear out my contention.

The first case in which I dilated the Fallopian tubes deliberately for sterility occurred some eight years ago. I had occasion to open Mrs. A.'s abdomen for an appendical trouble—in the quiescent period; she was a nullipara, married some five or six years, and very anxious for a child. She requested me to ascertain, if possible, while I was doing the appendicectomy what was the cause of her sterility. I opened the abdomen in the middle line, and found her uterus and ovaries were normal, but she had stenosis of both Fallopian tubes. I dilated them both from the ostium to the uterus. She made an uneventful recovery from the laparotomy, and within eighteen months gave birth to a healthy child. When last I heard of her she had had a second child.

This case gave me considerable food for thought, but it was not till April 19th, 1911, that I came across a case that gave me sufficient grounds for advising a deliberate laparotomy and dilatation of tubes as a cure of sterility. Mrs. N., aged 30, married four years, had never been pregnant. The catamenia began at 15, were regular and normal, though a little delayed at first; since marriage they had been regular; there was no pain at the period, but much pain ten days after the flow, "sickening, deadly pain across the lower abdomen"; it lasted three days and went away as suddenly as it appeared. It seemed a distinct case of "middle pain." I found that in her anxiety to get pregnant she had had the cervix dilated and curetted, and also the cervix slit up about a year after she was married. This did not have the desired effect. On examination, the vagina was found to be capacious; the cervix was slit bilaterally; the uterus seemed small, its position was normal, and the sound passed normally. I