CLINICAL LECTURE ON SPINAL CARIES; AND ON IMPROVE- MENTS IN ITS TREATMENT.

Delivered January 23rd, 1885.

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GENTLEMEN,—Since 1877, when the practical genius of Professor Sayre expressed itself in his manual, *Spinal Disease and Spinal Curvature*, British surgeons have paid much attention to the plaster-of-Paris jacket treatment; and my object to-day is to bring under your notice modifications of this treatment, as practised by myself and others at the Westminster Hospital; to specially direct your attention to a case of cervical caries, lately in Mark ward; and to conclude with some remarks on spinal caries, the outcome of practical experience during the past nine years.

In 1876, I utilised hammock-suspension of patients in applying the plaster-of-Paris jacket; and published my experiences, with illustrations, in *Surgical Lectures* (Smith, Elder, and Co., 1880). As you all know, I have never forsaken this plan, but can recommend it highly in private and hospital-practice; notably, in the cases of young children. Experience has shown, however, many improvements in this method of hammock-suspension. Allow me to demonstrate the steps of our present operation, and to introduce a case of curvature for plaster jacket application.

First Stage.—In Fig. 1, you will see the patient and hammock, placed ready for suspension, on an ordinary table. The hammock is really nothing more or less than a long piece of towelling (exactly of the width of the patient's chest, from armpit to armpit), sewn at one end around a split ash rod or broom-stick (2); and tied firmly by a slip-knot to the hook of a set of compound pulleys at the other. Two leathern bands receive the split rod, and are hooked up to a fixed iron rod. The cross-band of leather (1) slides up and down the two leathern bands, so as to neatly and comfortably support the patient's forehead. The iron rod and pulley hook receiver are securely fixed in wood, according to circumstances, and the ingenuity of the surgeon. The cords of the pulley-blocks are slack, and the patient is placed either on the back or side, or front, according to discretion and variety of curvature.

One word on vests: I am much pleased with the vests knitted in this hospital by one of the sisters, or by patients under her charge; they are made of thick fleecy (Leviathan) wool, and cost about half-a-crown each; they are reliable against pressure (*vide* Fig. 3). The only dinner-pad I have ever used is the dinner itself.

Second Stage.—The cord is drawn on the blocks, and thus the patient's body is lifted off the table. Having fixed the cord firmly, let an assistant remove the table aside. The bandages having been adjusted without any undue hurry, matters have reached the point illustrated in Fig. 2. The application of wet plaster bandages is not a clean process at any time. Let me advise you to have a big waterproof sheet on the floor to catch the splash; also to wear an apron with suitable sleeves. Rub your plaster in well; do not be above your trade. Your trouble will show itself in a strong and durable corset; and whatever is worth doing is worth doing well. From 12 to 20 bandages will be required; and, according to the temperature of the surrounding air and quality of plaster (always use the best), your patient will remain suspended from half an hour to one or two hours. The table may be placed underneath the patient's body, so soon as the surgeon has finished fixing the bandages; it gives a feeling of security to those who think it would be a long distance to fall from the hammock to the floor. The table does not touch the hammock. I may say with satisfaction that I have never encountered any accident or mishap in the many hundreds of cases which have been treated by this method. In weight, we have swung examples from one to 15 score pounds.

Third Stage.—An ordinary stretcher on poles, or the same hammock, may be used for conveying the patient to his bed, after the drying of the plaster. The knot tied in the pulley-cord is loosened, and the patient drops gently on the stretcher on the table. The hammock itself is then drawn through from between the vest and the plaster-bandages, and the patient's condition is well shown in Fig. 3.

According to the set of the plaster, the withdrawal of the hammock is effected either on the same day, or on the morning following the operation. A spatula (18 inches long) is sometimes useful to separate any adhesion between the hammock and bandages; but, as a rule, the withdrawal of the hammock is very easy; once, as a demonstration only, I drew the hammock away by means of the pulleys. The towel-hammock now before you has been already used for over twenty cases of suspension. The shifting of the soiled vest for a clean one is easily effected; and frequently the plaster corset has been worn for twelve months with great advantage to the patient.

Let me next draw your attention to an interesting case of cervical spinal caries, lately under my care in Mark Ward. I will read an abstract of the clinical report.

W. S., aged 18, schoolboy, was admitted into Westminster Hospital on May 24th, 1884, and died on June 8th, 1884, collapsed and exhausted. He was a palestrumous boy; his parents were both dead; had five healthy brothers alive; had enjoyed good health until two months ago. Then he complained of sore throat, and was treated for quinsy. At the same time, he had a so-called attack of pleurisy, which got better, leaving, however, his neck stiff. A fortnight before admission, a swelling came on the left side of his neck, extending for four inches from the occipital spine to his left ear; this abscess-sac was hard, resisting, and tender. Another abscess burst into his pharynx on the left side, and a probe, carefully introduced through his mouth, came down on exposed bone. He walked into the hospital, and was at once placed absolutely in the recumbent posture, and there maintained, with his head supported comfortably by the aid of sand-bags, ordered a generous fluid diet, and *ol. morrhue*, ʒij; *syr. ferri phosph.*, ʒj, three times a day; all discharge to be carefully cleaned from mouth. No improvement, beyond the freedom from pain, resulted, and he died exhausted on June 8th, 1884. There was no suddenness or exacerbation of symptoms immediately preceding death to lead me to suppose any pressure of the odontoid process on the spinal marrow.

Post Mortem Examination, Monday, June 9th, 1884, at 2 p.m.—Speaking generally, the viscera were healthy; and I shall confine my observations to the pathological appearances of the cervical spine and its surroundings. The occiput and upper five cervical vertebrae are now mounted on wire, ready for examination. The eroded articulations are the left occipito-atloid, the atlo-axoid, and the left joint between the axis and third cervical vertebra. All the bones below are healthy. A large abscess-sac enveloped these diseased articulations, spreading itself forward to the pharynx, where a small ragged aperture was found on the left side, and laterally and behind towards the left ear and occipital crest, where inflammatory processes were in progress. No skin-opening was present. This abscess was *extra duram matrem*; although no opening had taken place through the dura mater, yet the membrane was pouched on the left side, large enough to admit an olive-stone; the spinal arachnoid and a film of dura mater spinalis forming the wall of this oval dilatation. On looking down the spinal tunnel (after removal of the brain), the odontoid process of the axis was seen bulging, pushing the dura mater backwards, which acted as an intact ligament, preventing compression of the spinal cord. The spinal dura mater was firmly attached to the occiput (margin of foramen), to the posterior aspect of the axis, and to the third intervertebral disc of cartilage; and was hypertrophied by inflammatory organisation. The dura mater was blended with the occipito-axoid ligament. On turning this back, after division, the vertical part of the cruciform ligament (occipito-odontoid), that is, through medium of the transverse ligament (ligamentum suspensorium of Gray) was broken through, unattached below, but above was firmly united to the occipito-atloid and axoid ligaments and the dura mater spinalis. The two check ligaments were intact, but the left occipito-odontoid ligament was weakened by abscess-pressure or commencing softening. The transverse portion of the cruciform ligament was completely severed by the diseased process; its right portion was seen attached to the lateral mass of the atlas, but its left attachment was gone, and exposed bone was seen covered with pus of a soapy curd character. The basilar groove and process below were eroded by the pus, but the cranial contents were all healthy to the naked eye. All the synovial membranes in contiguity with the diseased portions of bone and ligaments were destroyed and unrecognisable. The skull-cap and brain were removed with my skull-tractor and saw—a plan I have advocated for rapidity in operating, absence of hammering, and conservation of the surgeon's fingers. The brain-section by the saw (after washing) was an extremely definite demonstration. There was nothing abnormal in the brain from without or on section; but the membranes and nerve-sheaths were thickened and vascular.

Now this is a very typical case of cervical caries, unilateral, with

Fig. 1.

Fig. 2.

active joint-mischief going on; but its only distortion is a thick stiff neck (mistaken for quinsy). The exposed body of the second vertebra was detected by a silver probe in the pharynx. This examination was made while the boy was recumbent. Rest was rigidly maintained, but no benefit gained beyond freedom from pain. The boy died worn out by an exhaustive disease.

Use every endeavour, in similar cases, to arrive at an early and correct diagnosis. Much may be done in the way of prevention by anticipation; nothing in the way of cure after delay.

Professor Syme advocated the use of the actual cautery as a counter-stimulant in the early stages of cervical caries; and I can testify that the careful use of the hot iron relieves pain, and that a night's rest follows the use of this agent. The making of two short deep lines of cauterisation, one on each side of the cervical spinous processes, is the most direct way of gaining benefit.

It would be quite impossible to-day to enter on the question of steel spinal instruments. Amongst the poor, I have entirely given them up; amongst the rich, occasional benefit may result, at great expense and trouble; but the wearers thereof may be quoted as "fast bound in misery and in iron." In cervical caries, much head-support may be given and dead-weight relieved by the use of India-rubber air-collars. I have used these constantly in spinal caries of the cervical region since 1876, both in hospital and in private practice, and am amused to see the method advertised as new. The late Mr. James, of Exeter, ingeniously invented steel collars for throwing the dead-weight of the head on to the shoulders, and so permitting rational exercise. I have only used plain cylindrical collars, much like swimming-collars; they are easy, comfortable, and beneficial. In country practice, a dry piece of inflated gut answers very well; but in towns India-rubber is best, and is easily covered with fur, so as to imitate a victorine. At the seaside, I have repeatedly availed myself of these collars, so that sea-bathing may be indulged in, the head being strictly supported and balanced, while free movements and the most gentle form of extension are carried out in the act or pretence of swimming.

In cases of spinal caries (complicated with abscess), I have found it best to postpone opening the sac (whatever its contents may be) until pointing is so pronounced as to necessitate an outlet. You have lately

seen a boy in Mark Ward who has had a psoas abscess for three years, with pronounced fluctuation in Scarpa's triangle, and who has been wearing a spinal jacket with great advantage to his lumbar spine; and neither

Fig. 3.

retrogression nor advance in the amount of fluid in the sac has taken place. Surgical interference in these chronic abscess-cavities opens the first page of a large chapter of dangers; it must not be forgotten that

Some of these fluid collections solidify, or become absorbed, or remain quiescent. Yet in those cases where necrosed bone exists in conjunction with an abscess, and the dead bone is acting as an exciting factor of mischief, a dependent opening should be made in the loin or back, and the sequestra removed. I have frequently discussed this operation with the late Mr. C. F. Maunder, of the London Hospital, and have performed the operation so far back as May, 1879.

Permit me to draw your attention also to this girl's case, who is now quite well, and wearing a plaster-of-Paris jacket in Percy Ward (March, 1885).

A. R., aged 19, housemaid, has been under my care (off and on) for the last six years, and was readmitted this year, suffering from diseased lumbar spine and psoas abscess on the right side, discharging in the centre of Scarpa's triangle. She was compelled, in 1882, to have her right abscess opened; I removed, by open incision, 60 fluid ounces of pus, in March, and kept her at rest in bed for three months, washing out the abscess-cavity with weak iodine-solutions. The operation was demanded by reason of her right leg and thigh becoming greatly swollen, by pressure on the common, external, and internal iliac veins on that side. She made a complete recovery, and left for Brighton on July 11th, 1882, with the wound closed, and a spinal jacket put on by hammock-suspension. Early this year, 1885, she was readmitted, because the old wound had reopened; and was discharging a tablespoonful of pus daily. Again she was well nourished, well nursed, and well rested; and again, in March, 1885, she was discharged with the wound closed, and a new jacket on. She has had spinal jackets adjusted in 1880, 1881, 1882, 1883, 1884, and 1885; all have been very good ones, and the last two have been worn as ordinary clothing, by addition of eyelet-holes and lacing, after cutting open the cylinder.

While on the subject of psoas abscess, I will give you a sketch, showing the relationship of parts as they pass beneath Poupart's ligament, and an easy way of remembering the same.

Fig. 4.

You will notice that the initial letters of *In Parvo* give the initial key to the following structures: 1. I. Iliac muscle; 2. N. Nerve—anterior crural; 3. P. Psoas muscle; 4. Ar. Femoral artery; 5. V. Femoral vein; 6. O. Femoral opening.

This *memoria technica* carries *multum in parvo*; I generally mentioned it to my class, when lecturing on anatomy; some of you may find it worth remembering as surgeons.

There is an interesting clinical fact in this girl's case, corroborating Claude Bernard's experiments on the control exercised by the sympathetic in the neck over the corresponding pupil. At 2½ years' old, she had a cervical abscess on the left neck; this was opened at the Children's Hospital in Great Ormond Street, and a scar resulted, situate one inch over the left clavicle, and one inch and a half from the anterior border of the left sterno-mastoid tendon. The left pupil is permanently contracted (about size of No. 7 shot).

On February 27th, 1882, my colleague, Mr. George Cowell, examined her left eye, and kindly gave me the following note.

The left pupil was dilated under the influence of atropine; there was excessive hyperæmia of the left optic disc, not amounting to neuritis. Hypermetropia requires convex glasses of 20 inches focus. R.V. = $\frac{2}{3}$, L.V. $\frac{2}{3}$, Hm. = $\frac{2}{3}$, R.V. $\frac{2}{3}$ nearly, L.V. $\frac{2}{3}$. Possibly, the in-

trusion of cicatricial tissue on the middle cervical ganglion of the sympathetic, resting on the inferior thyroid artery, may explain the vaso-motor and nervous phenomena on the optic disc and iris respectively.

Let me conclude to-day by insisting on the importance of an early correct diagnosis of spinal caries, and the necessity for treating such on broad principles (both local and general), and, to avoid disappointment in treatment, to state how ridiculous it is for an educated surgeon to expect success when the disease is hereditary. The surgeon is called in far too late after the deformity is recognised; for the prevention of spinal caries opens out the wide field of inculcating amongst all the good of sanitation, temperance, regular living, and all such virtues that establish the sum total of well being.

Mechanically, those safeguards, under the direct control and manufacture of the surgeon, far excel any of the much vaunted instrument-maker; I must "praise the bridge that carries me over;" and, discarding cervical cases, and those complicated with abscess in other spinal regions (which, in my opinion, are best treated in the recumbent posture), I have not yet met with any case which cannot be well treated in the manner here described, and often used in our hospital. Spinal curvature is very rare amongst the lower animals, so far as I know, and is possibly one of the penalties we pay for walking in the upright position.

ON THE EMPLOYMENT OF DIGITALIS IN ACUTE FEBRILE DISEASE.

Read before the Bath and Bristol Branch.

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Two purposes have been sought to be accomplished by the administration of digitalis in acute fevers. One has been to reduce the febrile temperature. With this view Wunderlich used it in enteric fever; and many authorities, particularly on the continent, have followed his example. But the only doses which were found available in their hands were so large, that, having regard to the other physiological properties of the drug, they could hardly, in ordinary practice, be considered safe; while its advocates themselves claimed for it only a very moderate and ephemeral efficacy, looked upon its operation as rather indirect than direct, and, in short, had clearly no intention of placing it as an antipyretic on a par with quinine or its allies of more modern introduction. The other purpose for which digitalis has been used in acute fevers, is to give strength to the action of a weak heart, and to diminish the frequency of the pulse. The late Dr. Anstie, in an article, characterised by his wonted ability, which appeared in the *Practitioner* for September 1873, insisted upon the value of digitalis, given for this purpose in adynamic fevers, and particularly in enteric fever. He, however, adduced no cases in illustration.

There are, undoubtedly, two very common diseases in which, at certain stages of them, any remedy possessing the properties thus attributed to digitalis must be deemed most valuable. One is croupous pneumonia, where, along with high fever, we may have extensive consolidation of the lung, in perhaps a more or less damaged subject. We know that often the supreme question of prognosis in such a case is, whether the right ventricle will bear the overwork imposed upon it. If by any means we can succeed in enabling it to do this, and so tide over the crisis, we may save the patient; in the contrary event he will die. The other disease, and that which Anstie had more especially in view, is enteric fever. Here also we know what, in the third week (may be a little earlier or later), heart-failure means; what the short weak first sound and rapid diastolic pulse at this period denote;—hypostatic congestion of the lungs, that may prove fatal. Of course, the free use of alcoholic stimulants is imperatively required in this, just as it was also in the previous, instance. But if we possessed a real heart-tonic, which would at once retard the heart's action, and give greater force to the ventricular contraction, at the same time also raise the tension of the arterioles, in all adynamic fever known to be low, how much better would be our prospects of successful treatment! Now, perhaps there is no therapeutic agent the physiological action of which has been more diligently and more thoroughly studied than digitalis; and various animals, from the lowest to the highest in the scale, have been laid under contribution for experimental research. The results obtained have been occasionally discrepant, and questions, I need not say, still remain for