Lettsomian Lectures

ON

THE SURGICAL DISEASES OF CHILDREN.

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BY

THOMAS BRYANT, F.R.C.S.,

ASSISTANT-SURGEON TO GUY'S HOSPITAL.

LECTURE II.

MR. PRESIDENT AND GENTLEMEN,—In my former lecture, I briefly brought before your notice the chief points of difference between the physiological and pathological processes as witnessed in early and in adult life; and then passed on to the consideration of some of the congenital defects which are to be observed in the oral and anal regions. The abnormal developments of the nervous, genito-urinary, and osseous systems, would next claim our attention; and had time allowed, I should have been glad to have brought these subjects under your notice. In the limits of three lectures, however, it is absolutely impossible to include every point which may be worthy of attention in the surgical diseases of children; and I am, therefore, compelled to pass over these, with many others of equal interest.

I must confess that it is with much regret that I am obliged to dismiss from our consideration the interesting subject of *Maldevelopment of the Head and Spine*, as exhibited in cases of meningocele, encephalocoele, and spina bifida; but, as we are able to refer to the labours of such an accurate and scientific investigator as Mr. Prescott Hewett, who so exhausted these subjects in his admirable lectures delivered at the College of Surgeons some few years since, these regrets are materially modified; for I feel that I do not possess much new material to add to our stock of knowledge, or any new views which might throw additional light upon the nature and treatment of this important class of cases.

Hermaphroditism is another subject which invites investigation; but, as it would require the three lectures to do it justice, it must be set aside, with the malformations of the penis and urethra.

I must quote, however, a singular case of arrest of development of the osseous system, which manifested itself by the absence of certain bones; and it is to be remarked that the left side of the body was the part affected.

Absence of Fibula, Os Calcis, Cuboid, and Three outer Metatarsal Bones, with the Toes. Robert F., aged 15 months, was brought to me at Guy's Hospital on Feb. 21, 1859, with the following deformity. The child was apparently quite healthy and in good general condition. The left leg and foot were, however, much wasted, and had been so from birth; but the extremity was of its normal length.

A careful examination detected the following conditions. The thigh appeared to be quite natural; but in the leg there was no evidence of the presence of any fibula; neither its head nor external malleo-

lus could be observed, and there was little soft tissue to obscure the observation. The foot was curiously ill-formed; it had but two toes, corresponding to the great and second toes. The four outer were absent, with their metatarsal bones, the cuboid, and os calcis; the astragalus, scaphoid, and cuneiform bones, with the metatarsal and phalangeal bones belonging to the two toes, being alone present. It was difficult to make out what muscles existed. The calf of the leg was very flabby, and the tendo Achillis was apparently absent. The toes could be moved by muscles and were well developed. The anus was situated somewhat towards the left side, and the left testis had not descended, but its distinct scrotal pouch was very visible.

Orthopædic surgery is another subject which might claim a passing attention, as a large number of cases come under our care during each twelve months; but it has been so ably written upon by many specialists, that I feel it would be presumption on my part to take up your time by its consideration. I will, however, make one observation upon the treatment of these cases, which experience has taught me; and that is, that by far the larger proportion of cases may be successfully treated by mechanical means alone, and without operation—that is, without the division of the contracted tendons.

The rule which I apply to these cases is as follows: that if the foot can be restored with but little force to its normal position, a cure will, in all probability, be secured by simple means—that is, by extension; and that the operation of tenotomy may be set aside; but if much force is called for to bring about this result, the division of the contracted tendons should be performed.

The mechanical means which I have been in the habit of employing are very simple; a good firm linen strapping being all that is required by way of material. The method of its application is also very simple, and may be thus described. If the case be one of varus or equino-varus, a piece of strapping about one inch wide, broad enough to cover the body of the foot, and about nine inches long, should be selected, and fastened by at least one circular turn round the foot, leaving the end on its outer side; the foot is then to be brought to the required position, and fixed there by forcibly bringing the extremity of the plaster to the upper and outer part of the leg, using it as a side splint. This upper extremity is then to be firmly held in position by an assistant, whilst a second piece is applied round the foot and ankle as a figure of 8. By this turn, the external upright plaster splint is firmly compressed towards the leg, and, thus drawing upon the ankle, turns the deformed foot firmly outwards, and fixes it in the required position. A third or circular piece may then be applied round the leg to fix the upper portion of the vertical plaster splint, and the thing will be complete.

If these strappings be well applied, it will not be necessary to readjust them for at least three or four days; by such means a large proportion of cases will be readily and permanently cured.

The principle of its application rests in the extending force which is employed by the external or vertical portion: the second or figure-of-8 binding this vertical splint firmly to the leg, increasing its extending force and making it permanent.

I have carried out this practice extensively at Guy's Hospital with great success; and, as the material is inexpensive, and its application is easy when once learnt, I have thought it worthy of bringing before your notice.

It is hardly necessary to quote examples in which this treatment has proved of value. My note-books contain many such; but the fact of its proved usefulness amply suffices for my present purpose.

In cases of talipes equinus and valgus these plaster splints are equally applicable; the surgeon having only to modify the application of the principle to each form.

With these short observations upon as many of the special surgical affections of early life as the period allotted to these lectures will allow me to make, I must now pass on to the consideration of other portions of my subject, and to point out the differences which are found in practice between the injuries and diseases which are common to adult and infant life, and the modifications of their treatment which are consequently required. I propose to bring this subject before your notice by taking the different systems in rotation, commencing with the injuries and diseases of the nervous system.

THE DIFFERENCE BETWEEN THE DISEASES OF THE NERVOUS SYSTEM IN THE CHILD AND IN THE ADULT.

The marked anatomical differences which are to be observed between the crania of the adult and infant during the first few years of extrauterine life; and the equally important and palpable differences between the nervous centres of the human species at these two periods of existence; are of themselves amply sufficient to lead any reflective mind to the conclusion that there must be some important difference between the diseases of such structures at these opposite ages; and the results of experience prove the positive correctness of such an inference.

The anatomical purposes which are embodied in the development of the *adult* cranium are, without question, essentially *conservative*. They are perfected slowly, and with marvellous precision, and are adapted with admirable accuracy for the security and preservation from external injury of the all-important and wondrous structure, man's brain.

The anatomical purposes of the *child's* cranium are also conservative, but conservative only to a degree; for this high purpose is evidently completely subservient to the higher and more important conditions which appertain to the growth and development of the cerebral structure. In the adult cranium the anatomical purposes are solely adapted for the protection of the *perfect* brain. In the infant or child cranium the anatomical purposes are mainly adapted for the growth and development of the *perfecting* brain.

Respecting the structure of the brain, the firm and consistent nature of the adult organ stands also in bold contrast to the soft and pulpy nature of the child's; and the established functions which appertain to the perfect organ, form an equal contrast to the apparently uncertain and growing functions of the imperfect.

This activity in the growth and development of the child's nervous centres is associated also with an increase of sensibility, and a degree of sensitive-

ness to centric or eccentric impressions, which are not to be met with in the adult brain; and it is due to this fact that we are enabled to explain the differences which are to be observed between the symptoms which follow injuries to the head in childhood and in manhood.

It must not, however, be for one moment thought that this excessive irritability of the brain is manifested after every slight injury; for experience tells us that this is not the case, and that children can bear blows and falls upon the cranium with perfect impunity; the anatomical disposition of the bony centres being such that they invariably receive the first impression of the fall, and their membranous margins or fontanelles, taking up the impulse, retard and stop the force of the onward vibrations. The brain is not, therefore, as a rule, so materially shaken by a slight injury as, in surgical language, to become the subject of a concussion. But if this condition be experienced, the symptoms denoting cerebral irritation are generally severe and most marked. When once originated also, the disposition to excessive reaction or to inflammatory complications is very great; and in the following case the truth of these remarks is well illustrated.

CASE. Arthur B., aged 3, was admitted into Guy's Hospital in July 1860, under the care of Mr. Birkett; but the treatment of the case fell into my hands. Shortly before admission, the child had fallen from a window eight or ten feet high, pitching upon his head. He was taken up hastily, and brought to Guy's, when he was conscious, and presented no external signs of injury; and no symptom of cerebral mischief could be detected. He was placed in bed, and ordered to be kept quiet, as a precautionary measure; and everything went on well till the third day, when fever appeared, accompanied with vomiting, unconsciousness, and the peculiar shrill scream so characteristic of cerebral irritation. The head was tilted back upon the spine, and the pupils were dilated. A spirit lotion was prescribed, for the purpose of keeping the head cool; and a mild mercurial of grey powder, in three grain doses, with half a grain of Dover's powder, given every six hours; and in three days these symptoms had subsided. From that date everything went on well, and convalescence was established.

Many cases somewhat similar to the above might be selected from my notebook, although perhaps none could be more typical of the class of injuries. The necessity of preserving absolute rest in even the slightest injury to the skull is a rule which it is hardly necessary for me now to dwell upon, although it is difficult to make the inexperienced understand this necessity when no symptoms of brain-mischief exist. In children, this rule is as absolute (if not more so) as it is in adult life, although there may be some difficulty in carrying it out. For it must be remembered that, as there is in childhood a greater activity of the vital functions in the cerebral centres for the purposes of their growth and development, so is there a greater tendency to cerebral irritation and inflammation; and in proportion as the organ is more delicate in its structure than it is in adult life, so is the result of morbid action more important, as well as more rapid and destructive. As a consequence, therefore, injuries to the cranium in young life are followed by symptoms of concussion more frequently

than they are in adult life; and, when once manifested, these are liable to become more severe. The child-brain, from its softness and want of consistence, is also more liable than the adult brain to become the subject of ecchymosis from slight causes; and it is due to this fact that cerebral symptoms from secondary inflammatory action are so frequently observed.

It can be no matter of surprise, therefore, that a fatal result is by no means uncommon after a slight cerebral injury during child-life.

The delicacy of the brain and its wonderful irritability are well shown by the fact that every symptom of severe disease of its structure may make its appearance, and death follow, yet no pathological indication may be detected upon subsequent examination.

It is hardly consistent with received opinions or our own belief to acknowledge that altered function suffices by itself to destroy life; and yet, if the absence of positive evidence of cerebral disease, in cases in which every symptom of cerebral affection not only existed, but proved fatal, tends to prove the truth of such an opinion, it must be here ad-
 duced.

For a child may, without doubt, die off-hand from simple concussion, and no evidence of organic change be subsequently seen on *post mortem* examination; and a child may also die during a convulsion produced by a local injury or some reflected excentric cause, with the same subsequent absence of local pathological conditions.

Again: as another proof of this excessive irritability of the nervous centres, so predominant in early life, the effect of injuries to the extremities or integument may be brought forward; for it is, I think, certainly true that tetanus and convulsive diseases are by no means uncommon complications of these injuries; and it is this fact, if such it may be called, which must tend to modify our practice in the treatment of these cases. It has fallen to my lot to see several fatal cases of tetanus following upon laceration of the integuments and compound fractures in young subjects, in which conservative surgery was carried out, when perhaps a more energetic practice might have saved life, although with the loss of a limb; and I have it upon my conscience that I should in some few cases have been led into such an error, and have thus lost my patients.

It is almost an impossibility to bring forward positive proof of the accuracy of these views; but it is certainly within the limits of experience when I assert that it is a rare thing for tetanus to appear in an adult after a lacerated wound or compound fracture, and these injuries are not uncommon; but in young life, although such accidents are rare, death from tetanus is by no means infrequent.

It is, therefore, with some confidence that I now venture to assert my belief that tetanus is a more frequent result of a lacerated wound, or of a compound fracture, or of any other integumental injury, when these accidents occur in young subjects, than when they take place in the adult; and that, therefore, so-called conservative surgery in such cases must be more cautiously carried out in children than in adult life. As additional evidence of this opinion, it may be stated that, in Mr. Poland's able communication on Tetanus in the *Guy's Hospital Reports* for 1857, out of seventy-two cases which he brings

forward, fourteen were in children under fifteen years of age; this being one-fifth of the whole number of cases.

The following two cases will perhaps tend to illustrate the truth of this record.

CASE I. William E., aged 5 years, was admitted into Guy's Hospital, under my care, on September 8th, 1860, for a severe lacerated wound of the left elbow, exposing the joint, produced by the passage of a cart-wheel over the part. The vessels and nerves were, however, apparently uninjured. As the local injury was not believed to be beyond recovery, a splint was applied, and iced-water dressing employed. Everything went on well till the sixth day, when tetanus appeared, followed by death in ten hours.

CASE II. Eliza W., aged 5, was admitted under my care at Guy's on April 8th, 1861, with an extensive lacerated wound of the left leg and fracture of the tibia and fibula in their upper third, from the passage of a cart-wheel over the part. On the ninth day, tetanus appeared; amputation was performed without benefit, death taking place in sixty hours.

It is perfectly unnecessary for me to enlarge upon the treatment of the injuries to the skull and its contents in early life; for the same principles which are applicable to the adult are applicable to the child; my object being to dwell upon the peculiarities or differences which are to be found in practice, and not upon the points in which they agree.

The surgical diseases of the cranium need not also occupy our attention for long, as they differ but little in their nature at the two ages. Inflammations, however, of the cranial bones in children are not common; and the following case will probably be read with interest.

CASE. Martha J., aged 15 months, was brought to me at Guy's Hospital on March 7th, 1860. She had been ill two months, and, when seen, was suffering from extensive necrosis of the left half of the frontal bone, which had followed upon a wound received from a nail. There were no head-symptoms, nor any indications of a general mischief. The bone was readily removed by means of forceps; and the dura mater was exposed, covered with granulation. Everything went on well, and recovery rapidly took place.

In this case, the rapid progress of inflammatory disease of the bone was well illustrated; and its death and subsequent removal accomplished without giving rise to any cerebral symptoms. In this point of view alone the case is, therefore, worthy of record. In adult life, it is not a common thing to find necrosis of the whole thickness of a cranial bone; and when we do, it is not a common thing to find it progress without giving rise to cerebral symptoms. Syphilitic necrosis in adult life is the commonest form; and it is too true that, in these cases, epileptic seizures as a result are not infrequent; these seizures being palpably due to an extension of the inflammatory mischief to the dura mater and membranes beneath, and subsequent cerebral disease.

In childhood, these cases are unknown; the disease of the cranial bones being generally due to some accident similar to that noted in the previous case.

[To be continued.]