CASE OF ACUTE INTESTINAL OBSTRUCTION IN A HAEMOPHILIC.

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WORKING.

An ileal variety of intussusception (which according to Leichenstern occurs in only 8 per cent. of cases) complicated by containing a Meckel's diverticulum, and occurring in a haemophilic, forms a combination sufficiently rare to merit recording:

At 8 p.m., November 24th, 1905, I was called to see a boy, aged 10, who had been ill since the previous day, with what was thought to be a "bilious attack," to which he was said to be subject.

Family History.

His maternal great-grandmother was healthy, but both her sisters died from haemorrhage in confinements, and both her brothers died from haemorrhage. She had five children—four daughters, one of whom died from haemorrhage in her sixth confinement, and another died from "change of life"; and one son (patient's grandfather), who, during the first thirty years of life, was a "bleeder." He had one son and three daughters (one of whom was patient's mother), none of whom suffered from haemophilia. The patient had one brother, a marked haemophilic, and one sister, healthy.

Personal History.

Apart from haemophilia, he had had good health. He was subject to haemorrhagic joints, had bled for days after tooth extraction, and nearly died from haemorrhage after circumcision.

Present Illness.

The bowels were moved early on the previous day, but for more than twenty-four hours there had been absolute constipation, some slight abdominal pain, and frequent vomiting.

Condition on Examination.

The temperature was 99° F., and pulse 84. The tongue was furred. There was some bleeding from the gums, due to tooth eruption. The abdomen moved fairly well during respiration, but movement was restricted over lower part; there was no distension. Beneath the right rectus muscle, just above its insertion into the pubes, there was some resistance to palpitation, and on deep pressure a fullness could be detected, and some tenderness elicited. Over the same area there was slight impairment of resonance. Rectum empty; in the right anterior quadrant there was a smooth, elastic bulging, apparently part of a mass, the size of a hen's egg. Micturition was frequent, but not painful; urine acid, no albumen or sugar.

Progress.

On the following day the temperature was 99° F. and the pulse 96. Vomiting continued at variable intervals, but much less frequently, though more copiously, than on previous day; the bowels had not moved; enemata returned unchanged. During the night there was passed a copious chocolate-coloured evacuation consisting of altered blood. Physical signs unchanged, but more pronounced. The bulging per rectum had increased. Dr. A. E. Garrod saw the case in consultation with me. During the early part of November 26th there was nausea, but no vomiting. In the afternoon vomiting returned, and in the evening became frequent and pain became more severe. The pulse, in the morning 108, rose during the day to over 120. The temperature rose half a degree. On November 27th, about 4 a.m., he suddenly collapsed and died.

Post-mortem Examination Sixteen Hours after Death.

Beneath the right rectus and lying mainly in the pelvis was a large irreducible ileal intussusception about 5 in. long and involving more than 1 ft. of bowel; the distal extremity was about 3 in. from the caecum. Lying in contact with its posterior surface

was a long vermiform appendix dipping into the pelvis. Protruding from the intussusception was the blind end of a long Meckel's diverticulum. On laying open the intussusception this diverticulum was found to open into the inner tube of the ileum a short distance from the apex.

The family history presents the following noteworthy points:

1. At least three female members of the family died from haemorrhage.

2. The hereditary taint was transmitted through a male haemophilic of the second generation, though in a weakened form, as his immediate offspring (third generation) were exempt, but reappeared in the fourth generation through the female.

The exact diagnosis of the abdominal condition was beset with difficulties. At first the signs suggested inflammation of a long appendix dipping into the pelvis, and it is interesting to note the position of the appendix as found *post mortem*. The personal history suggested paralysis of bowel due to a haemorrhage into the intestinal wall or mesentery.

The absence of tenesmus and of severe spasmodic pain so characteristic of intussusception, and the difficulty of determining the outline of the tumour, owing to its lying in the pelvis behind the pubes, made it impossible to diagnose an intussusception with certainty. The blood passed by the rectum was of the character of chronic rather than acute intussusception, and in this patient was of doubtful diagnostic value.

Laparotomy as a means of diagnosis or of treatment was considered unjustifiable.

Whether the presence of a Meckel's diverticulum was the cause of the lesion or a coincidence is not quite clear.

I incline to the view that it was indirectly the cause.

One would expect the diverticulum to be at the apex of the intussusception instead of a short distance from it. But this is analogous to an intestinal polypus which is an acknowledged cause of the lesion. Though usually found at the apex, occasionally a polypus is some distance from it owing to shifting of the entering and returning layers.

Treves¹ mentions two specimens in which a small and short Meckel's diverticulum had become inverted so as to project into the lumen of the bowel and so cause intussusception. Dobson² describes a similar case and has collected thirteen cases of this nature. Carwardine³ describes a triple telescopic intussusception with an inverted diverticulum. Golding-Bird⁴ relates a case of intussusception into a diverticulum, and two similar cases have been described by Parker and Southall.⁵

In my case there was no inversion of the diverticulum.

But it seems reasonable to suppose that irritation in a Meckel's diverticulum or in the portion of bowel from which it springs is more likely to set up irregular peristalsis than in a normal bowel; and the cases quoted above, I think, tend to support this view.

The position and irreducibility of the obstruction proves that treatment by injection or inflation would have been useless.

REFERENCES.

¹ Treves, *Intestinal Obstruction*. ² *Lancet*, April 25th, 1903. ³ *Ibid.*, February 20th, 1904. ⁴ *Trans. Clin. Soc.*, 1896. ⁵ *Lancet*, November 12th, 1904.

SOME POINTS IN THE ANATOMY AND PATHOLOGY OF THE HERNIAL SAC.

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It is the purpose of this paper to record certain observations on the hernial sac, gained by an experience of a large number of cases examined before operation, and from the anatomical and pathological conditions found in over 300 operations of radical cure for hernia, chiefly in children. The observations were made in the out-patient department of the hospital and in the operating theatre, as well as on surgically healthy children in the medical wards. A routine examination was made of children admitted to the hospital for medical ailments, and not subjected to surgical treatment afterwards.

The etiology of the hernial sac has of late been much under discussion, and attention has been drawn to the

frequency of its congenital origin by Russell, Stiles, Murray, and many others.

In the majority of patients brought to hospital with a history of hernia, the hernial protrusion is absent when the child is presented for examination. Can one always rely upon the history of a swelling in the inguinal region, even though it is said to come and go, as evidence of the presence of a hernia? To this one can most emphatically answer, No.

In fat babies, in which there is a marked development of adipose tissue in the pubic region, there is frequently a somewhat sessile scrotum. When the child cries or strains the testicles are drawn up and present the appearances of a swelling in the region of the external abdominal ring, which is interpreted by the mother, and not infrequently by the doctor, as caused by a hernial protrusion.

The surgeon must be guarded in expressing his opinion as to the presence or absence of a hernia in these cases. If he relies entirely on the history, operation often reveals absence of any trace of a hernial sac.

In children after the age of one year, however, this is less likely to occur. The scrotum becomes more pendulous, the spermatic cord longer, so that one is able to palpate it and distinguish its constituents more readily.

Examination of the Spermatic Cord.

If the surgeon grasps the spermatic cord between the forefinger and thumb immediately below the external abdominal ring and rolls the contents upon one another, he is able to distinguish the vas deferens, its vessels and coverings distinctly the one from the other. Furthermore, in comparing the one side with the other, he is able to detect any general thickening of the whole cord as compared with the opposite side.

It is interesting to note that, if one compares the thickness of the spermatic cord in normal individuals, there is a difference and often a marked difference on the two sides. I recently examined eighty-six children in the medical wards of the hospital, who had been admitted for treatment for other than an affection of the inguinal region. In sixty-eight of these there was an appreciable or a marked difference on the two sides. Increased thickening was noticeable in forty cases on the right side and in twenty-eight upon the left. It must be due either to some thickening in the normal constituents themselves—that is to say, in the vas deferens or in the blood vessels, or to the presence of some additional structure within the cord.

I have never seen any condition of the vas deferens or pampiniform plexus in a child which could give rise to such thickening, with the exception of torsion of the testicle. What conditions outside these can produce this thickening? It must either be due to the presence of the peritoneal funicular process in its more or less congenital form or to a marked development of fat in the extraperitoneal connective tissue.

In two cases operated upon, children under 1 year of age, in which there had been a history of "rupture," on examination of the cord there was marked thickening. On separating the tissues of the cord no hernial sac was present, but a cord of extraperitoneal fat extended downwards towards the tunica vaginalis testis, and on dissecting more carefully I was able to identify a connective tissue strand, the remains of the funicular process. I think that one may say with all probability that when there is a marked development of extraperitoneal fat, in the cord, especially when associated with the presence of remains of the funicular process, that process has only recently become obliterated.

Further, these observations would seem to show that in more than 50 per cent. of cases the funicular process is not completely obliterated at birth. This in itself is a marked predisposing cause to hernia, and when hernia does occur under these conditions, its purely congenital origin seems to be probable.

The observations of Murray support this view. In adults he found that in 100 consecutive *post-mortem* examinations 21 presented potential sacs.

Anatomical Relations of the Sac.

The anatomist in describing the coverings of the vas deferens and its accompanying vessels, names three definite structures as forming the true "coverings of the cord." These are the internal spermatic fascia, the cremaster

muscle, and the external spermatic fascia. In the dissecting room it is possible with care to distinguish these coverings. On the operating table it is still more easy to differentiate them. In this latter statement I believe that I am not in agreement with many surgeons, but I have no doubt that in nearly all cases it is possible to demonstrate these three coverings in the living subject. Most are agreed that the two outer coverings can be easily distinguished, but it is in the separation of the internal spermatic fascia that some difficulty is experienced. After dividing the cremaster muscle and separating it freely from the cord, the veins are exposed on the anterior and outer aspect, and the vas deferens on the posterior aspect of the cord. These appear quite distinct, and would seem to be easily separated from the underlying sac. That this is not so is well known to any surgeon who has had much experience in operating in hernia. It is difficult to isolate these structures at this stage, and this has given rise to the belief that the cord and its vessels are firmly adherent to the hernial sac. If one examines carefully one will see that there is a thin fascial covering enveloping these structures and binding them down to the sac. This is the internal spermatic fascia. Incision with a sharp knife along the line of the vessels shows strikingly with what ease these along with the vas deferens can be stripped off the sac. The identification of this innermost covering is of the highest importance for the easy and successful separation of the sac from the constituents of the cord. I believe that this simple fact is frequently overlooked, and that the difficulty experienced in isolating the sac without tearing is due to this neglect.

The reason emphasis is laid on this anatomical relationship is that all these coverings are distinct and can be separated easily from one another and from the sac. There is no evidence in children or in many adults of any pathological connexion between the sac and its coverings. There is no adhesion such as one might expect from any traumatism resulting from the protrusion of an acquired sac into its new surroundings. There is no intimate connexion between the sac and its coverings such as is seen in acquired ventral hernia after abdominal operations.

It is not to be supposed that an acquired sac cannot be present, without evidence of injury or traumatism, but one would expect that in these cases of "sudden rupture" occurring in adult life and in children, that the rapid descent of a new sac would lead to considerable bruising, and subsequent pathological adhesion between the sac and its coverings.

I had occasion recently in private practice to operate on a child aged 18 months, one month after the "sudden onset" of a hernia. The sac was easily separated from its coverings and presented all the appearances of a congenital sac present from birth. There was no sign of any pathological adhesions such as one might expect from the protrusion of a foreign body into new surroundings.

From studying, therefore, the anatomical relation of the sac to its coverings, one is led to believe that in most cases, at any rate, we have to deal with a congenital structure rather than one acquired since birth.

The Macroscopic and Microscopic Characters of the Hernial Sac.

In operating upon a large number of herniae one is struck with various appearances of the sac.

(a) As regards its shape and size.

(b) As regards its thickness.

The typical sac may be described as pyriform in shape. One sees this form of the sac where it projects just beyond the external abdominal ring and when the inguinal canal is narrow. Any variation in the shape depends on a wide inguinal canal and external abdominal ring, and on the length and size of the sac. It becomes more sac-like in shape the wider the canal and the larger it becomes. This is seen most marked in those large sacs which contain the caecum and ascending colon, and in which the internal abdominal ring comes to lie almost immediately behind the external ring.

What, perhaps, is more worthy of notice than the size of the sac is the actual thickness of its walls. I have heard it stated that the use of the truss in treatment of hernia frequently causes a thickening of the sac. I am very sceptical of this being so in many cases, as a truss, if at all efficient, can only exert pressure on the neck of the sac, and will not in any way affect its fundus.

One may say without doubt, that without any truss treatment whatever, the thickness of the hernial sac varies to a remarkable degree. It presents a varying degree of thickness from that of the tunica vaginalis testis to that of the parietal peritoneum lining the abdominal wall.

A microscopical examination of these two structures shows that their minute anatomy is identical. They present a thin endothelial lining, the substance of the sac wall being formed of a more or less condensed layer of connective tissue.

I have examined over 100 sacs removed at operation. The varying degree of thickness depends on the development of this connective tissue or fibrous layer. The thickness of the sac does not depend on its size or extent. It is not common to find a sac presenting equal thickness with the tunica vaginalis testis, it being easy to compare them as one dissects the one off the other.

The tunica vaginalis testis shows up as a white thick non-translucent covering to the testicle, especially in young subjects. I have seen a small pyriform sac on more than one occasion identical in thickness and appearance with the tunica vaginalis testis, and a large sac, such as is seen in caecal herniae, may be also of considerable thickness. The development of the connective tissue of the sac wall does not apparently depend on the size of the sac, though as a rule thin sacs are large sacs.

Can we make any deductions from the histological characters of the sac as to its probable congenital or acquired origin? One would expect that the acquired sac would resemble more nearly the parietal peritoneum, and the congenital sac more closely the tunica vaginalis testis.

A small thick sac is often associated with a narrow inguinal canal and a small external abdominal ring, so much so that apart from removing the sac, it is unnecessary to attempt to narrow the canal or the ring. In these cases the bowel rarely descends into the sac, and there seems very little doubt that it is part of the funicular process and congenital in origin.

It seems probable that the varying degrees of thickness of the hernial sac represent stages in its natural obliterative process. Microscopic examination does not seem to me to afford any aid in distinguishing the acquired from the congenital hernial sac, although I am inclined to view the small thick sac as always congenital in origin. It is only natural to suppose that a small acquired sac will resemble more nearly the parietal peritoneum than the tunica vaginalis testis.

If the funicular process which has almost become obliterated be examined, it will be found that the endothelial lining disappears before its increasing fibrous wall.

Conclusions.

As a result of these observations, it is perhaps justifiable to suggest the following conclusions.

1. That in early childhood clinical evidence, by examining the spermatic cords of apparently normal children, shows that between 50 and 75 per cent. present thickening due to incomplete closure of the funicular process.

2. That the anatomical conditions present in operated cases support the view of a congenital origin, as shown by the relation of the sac to its coverings, and its presence in spite of a narrow canal and a small external abdominal ring.

3. That the histological and naked-eye appearances of the sac in most cases do not afford reliable evidence of its congenital origin or otherwise, although a markedly thickened sac, if small, is suggestive of the embryonic condition.

THE TREATMENT OF CHRONIC EMPYEMA BY HYPERAEMIA AND HYPERTRANSUDATION.

By J. STAVELEY DICK, M.B., B.Ch.R.U.I.

MR. R. J. GODLEE in his classical lectures¹ on Empyema, delivered more than twenty years ago, said that

A very grave prognosis must always be given in cases of empyema which will not heal, and the question arises as to what, if anything, can be done for their relief.

Most people with practical experience will agree with Mr. Godlee's reply to his own question, that adequate

drainage—adequate, that is to say, not merely in regard to the size of the opening but also in regard to its position and the length of time it is maintained—is the first condition of cure.

It happens, however, now and again, that though efficient drainage has been secured and maintained, a cavity remains which Nature's unaided efforts fail to obliterate. Can anything of value besides drainage, short of Estlander's, Schede's, or similar radical operation, be done in such circumstances? Mr. Godlee tried sponge-grafting,² but the results were not encouraging.

Sir James Barr has suggested the use of an appropriate vaccine,³ but he does not offer any positive evidence of its suitability or necessity; and there seem to be certain considerations which militate against the general adoption of this suggestion in this particular type of case. In really old-standing empyemata we know that the walls of the cavity consist of dense fibrous tissue of considerable thickness and poorly supplied with blood. Hitherto it has not been proved that in such cases the continuation of the infective process is due to a deficiency of antibacterial substances in the blood; and when we reflect that spontaneous auto-inoculations have probably been in progress for months, or at all events whether this be so or not, that the patient's general health has greatly improved as a result of drainage, tonics and fresh air, it appears not unlikely that the persistence of the infective process is due rather to the limitation of the blood supply to the infected area than to an abnormally low opsonic index. Further, if "a mixed infection" be assumed to exist in chronic cavities of this kind, and the assumption is more than probable, then the technical difficulties incident to the preparation of an appropriate vaccine appear to be at present so considerable as seriously to depreciate the value of the suggestion, as a routine mode of treatment.

Apart altogether, however, from the doubt as to the actual necessity for a vaccine, and apart from the technical difficulties in the way of procuring an appropriate vaccine, is not the first and most rational step in this line of treatment rather to try the effect of such means as are available in order to increase the transudation of blood to the infected area? A vaccine may subsequently be required to supplement the effect, if a freer transudation of the blood with its existing opsonic content should fail to bring about a cure.

The following case of chronic empyema is submitted as evidence that measures to promote a freer transudation of blood to the infected area may in some cases of the kind be followed by the most gratifying results:

J.B., aged 8½ years, contracted pneumonia; six weeks later he "vomited" a large quantity of pus (?); cough and copious offensive expectoration followed; six months later he was operated on in Manchester Northern Hospital for Women and Children, a portion of rib being resected in the mid-axillary line of the right side. He then weighed three stones; he remained in hospital subsequently about four months, and then weighed almost four stones. He was sent to a convalescent home at St. Anne's, wearing a drainage tube; after a failure to reinsert the drainage tube, signs of reaccumulation of pus occurred. He first came under the writer's observation three weeks later; he then had anorexia, headache, nausea, dyspnoea, and a temperature varying from subnormal in the morning to 102° in the evening. A portion of rib was resected in the posterior axillary line, and about ten ounces of thick, jelly-like, slightly offensive pus evacuated. This was followed for four months by satisfactory improvement, when failure to maintain adequate drainage was followed by recurrence of very acute symptoms of septic absorption. Four days after the return of fever, two inches of the next higher rib was resected in the line of the angle of the scapula, the corresponding periosteum and parietal pleura cut away, and the opening still further enlarged by dividing the structures between it and the second sinus. A surprisingly large quantity, about twenty ounces, of thin, odourless pus was evacuated. Two large drainage tubes were inserted; one was discontinued in six weeks and the other packed tightly with gauze, carried to the bottom of the cavity, and tubular drainage was maintained for nine months without difficulty. Six months after the final operation the capacity of the cavity was a little over two drachms; three months later it was practically the same. During these last three months it was possible to aspirate one-half to one drachm of pus each morning from the bottom of the cavity; the usual breathing exercises and antiseptic irrigations had been resorted to daily during this period.

The position, therefore, was that two years from the onset of pneumonia, and nine months from the final operation, there was still a cavity having a capacity of over two drachms, and secreting over one drachm pus daily;