

INTUSSUSCEPTION OF THE BOWEL IN CHILDREN.

ProQuest Number: 13915816

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



ProQuest 13915816

Published by ProQuest LLC (2019). Copyright of the Dissertation is held by the Author.

All rights reserved.

This work is protected against unauthorized copying under Title 17, United States Code
Microform Edition © ProQuest LLC.

ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 – 1346

INTUSSUSCEPTION OF THE BOWEL IN CHILDREN.

By intussusception of the bowel is meant the invagination of one portion of the bowel into another. Almost invariably it is the upper segment of bowel that is invaginated or intussuscepted into the lower. Irregular peristalsis of the intestine is universally recognised as the cause of this condition

The mechanism of intussusception is believed to be explained by the contraction of the longitudinal fibres of the bowel wall pulling the lower portion of the bowel over the upper. Along with this a local exaggerated contraction of the circular fibres of the bowel would seem to bring about a state of matters that would facilitate the occurrence of the form of intestinal obstruction known as intussusception.

Nothnagel who was one of the pioneers in the study of this subject by stimulating the longitudinal intestinal muscle fibres with the faradic current, was able to produce post-mortem an intussusception. Once the upper portion of the bowel becomes intussuscepted within the lower, it acts as a foreign body stimulating peristalsis until more and more bowel is dragged in and so a large tumour may be formed. In children at post mortems intussusceptions frequently multiple, are oftentimes found,
and/

and from the fact that they gave rise to no symptoms in life and showed no pathological changes, they are believed to have been formed in the act of dying. Intussusception is an affection that is almost peculiar to children. As a form of intestinal obstruction, it is uncommon to meet with it in adults. In children also more cases take place during the first year of life than at any other period. The proneness of infants to intestinal derangement often without appreciable cause, may in part explain their liability to disordered peristalsis. Intussusception is the commonest cause of intestinal obstruction in babies, although cases of obstruction by strangulated hernia, a Meckel's diverticulum, or bands of lymph, are occasionally met with. It is said to have been recognised from the earliest times, and inflation of the bowel as a method of treatment dates from the time of Hippocrates. Inflation of the bowel which fell into desuetude during the course of the centuries has only been revived in comparatively recent times. The first successful case of abdominal section for intussusception in a child in Britain, was performed by Hutchinson in 1871. Since then attention on the part of medical men has become more directed to the subject with the result that the number of cases recorded became greater each year. This is not due to the fact that this morbid intestinal condition has become more common, but rather that with more accurate diagnosis, the abdominal/

abdominal abnormality became more exactly identified. Cases formerly classed under the categories of dysentery, colitis and such like diseases are now arranged under their proper nomenclature.

An intussusception consists of three layers of the bowel - an outer layer called the intussusciens, or receiving layer, a middle or returning layer, and an inner or entering layer. The intussusceptum which is composed of the entering and returning layers, grows at the expense of the intussusciens or outer layer. The intussusception varies in size. The further its starting point may be from the rectum, the larger its dimensions may become. It may attain comparatively speaking, great proportions - involving part of the small intestine, the whole of the colon and may protrude beyond the anus. Any part of the alimentary tract from the duodenum downwards may be the seat of the affection, but by far the most usual site as a starting point, is at the caecum or in the very lowest part of the ileum. This is borne out by the cases which I shall adduce to illustrate this subject. The great difference in calibre which exists in some babies from birth, betwixt the lower end of the ileum and the commencement of the colon - although at birth there/

there is not much difference in width betwixt these portions of the bowel - is held by Mr D'Arcy Power^{*} to partly explain the predominance of the ileocaecal varieties of intussusception. The etiology of intussusception is still not perfectly clear. The marked mobility of the bowel in young children may also be reckoned as a predisposing cause. Amongst other conditions conducing to the production of an intussusception may be mentioned diarrhoea, annular stricture of the bowel and polypoid growths projecting into the lumen of the bowel. Nothnagel[⊖] considers that an exaggerated form of ordinary peristaltic movements explains the formation of an intussusception. He says that whilst the bowels are performing ordinary peristaltic movements "an annular and strictly local constriction of "the bowel happens to occur. This constriction may be "greater than normal and so pronounced that the limit of "physiological invagination is exceeded and the first degree of pathological intussusception develops. It is "quite unnecessary to invoke any primary causative factor, "all that is needed is a simple increase in the intensity "of the normal movement of the bowel which of itself is "sufficient/

* See his Hunterian Lectures on the Pathology and Surgery of Intussusception 1897.

⊖ Diseases of the Intestines and Peritoneum.

"sufficient to produce this dangerous condition."

Different forms of intussusception are distinguished according to the part of the alimentary canal that may be the seat of the trouble. There is the ileocaecal which starts at the ileocaecal valve. This form is oftentimes made to include intussusceptions starting at the caput caeci and if this classification is allowable, ileocaecal varieties amount to 70 per cent of all intussusceptions. In the ileocaecal varieties the appendix frequently forms a part of the intussusceptum. In the true ileocolic class, the ileum passes through the ileocaecal valve and along with the ileum there may also be included in the intussusceptum, the appendix, caecum and upper portion of the colon. Enteric and colic forms are described, in which the small intestine or the large are respectively the parts of the bowel affected. In enteric intussusceptions the ileum is usually the part that is most often involved. Occasionally in the same subject more than one intussusception may be found to be present at the same time. A double form of intussusception is mentioned in which one intussusception is driven inside the other and in this event five layers of bowel would be involved. Triple intussusceptions which would affect seven layers of bowel have also been reported.

The diagnosis of intussusception once one has seen a case, is as a very general rule not difficult. It is important as with other kinds of intestinal obstruction, that an early diagnosis should be made and that therefore a most careful examination of the child should take place. If one is watchful and observant, it is unlikely that a case would be overlooked. The history commonly is, that a previously healthy child is suddenly seized with severe abdominal pain, cries piteously and becomes very pale. Sometimes, however, as in Case VI to be described in this paper, intussusception makes its appearance during the course of another illness. After a time - usually an hour or so subsequent to the attack of pain - vomiting and straining begin. At first the vomited matters consist of the normal contents of the stomach and later of mucus and bile. The vomiting is seldom faecal possibly due to the fact that the lumen of the bowel is usually not entirely occluded. Straining is a marked feature of intussusception cases. At first the voided material is composed of faeces but after that they have been expelled, with each act of straining, mucus and blood are passed per anum. Straining and the passage of mucus and blood were present in all my cases and they rank amongst the chief symptoms of this affection and their presence ought to make one at once suspicious. In about 90 per cent of intussusceptions, straining/
ing/

straining and the passage of mucus and blood are found. In making a rectal examination after the symptoms have existed for a time, frequently the apex of the tumour can be felt by the examining finger, which on withdrawal is found to be blood stained usually. In a purely enteric form, an examination per rectum, would be negative in so far as the identification of the apex of the intussusception with the examining finger is concerned. With a finger in the rectum, however, and the other hand on the surface of the abdomen after the manner of a bimanual uterine examination, sometimes the tumour can be recognised. Usually, however, by palpation of the abdomen with the hand pressing backwards towards the posterior abdominal wall, it can be felt. Sometimes the tumour can be seen with the eye to cause a bulging forward of a portion of the anterior abdominal wall as in Case III, which I shall describe. It is possible that a small intussusception might be concealed under the liver. In the event of doubt, an anaesthetic should be given and the abdomen examined systematically, particular attention being directed to the region of the caecum which often gives to the hand a sensation of emptiness. This feeling of emptiness in the right iliac fossa to the examining hand, is called the sign de Dance and is explained by the fact that an intussusception starting in that locality, passes along the ascending colon and the/

the caecum is displaced from its usual position. The tumour is usually of a fair size - three or four inches long - sometimes longer, of a distinctly bulky feeling and of curved outline. The Text Book speaks of it as 'sausage shaped' and when it is large the description is accurate enough. The curved shape is due to the pull of the mesentery of the intussusception. The position of the tumour varies. It may be situated in any of the abdominal regions. Obviously the site will depend upon the part of the bowel that is affected. In all my cases the tumour, although in one instance very small, was quite readily recognised by palpation and without an anaesthetic having to be administered for the purpose of diagnosis. The recognition of the tumour may be called the cardinal sign of intussusception and the failure to locate it, renders the diagnosis uncertain. Sometimes - as in Case VI - an intussusception takes place during the course of an attack of diarrhoea. The mother fortunately drew the attention of the medical attendant to the presence of blood in the motions and straining and a typical intussusception tumour was discovered.

7 - Acute cilitis sometimes simulates intussusception. In colitis the tumour is of a different shape, being usually much longer and it cannot be felt as a distinct body in the rectum, although through the abdominal parietes it/

it may be palpated low down on the left side. Enlarged mesenteric glands with tubercular ulceration of the intestine might also conceivably be a cause of error. The history of gradual onset of symptoms, the different shape of the mass and the presence of tubercular disease elsewhere, would make clear the diagnosis. Faecal impaction might possibly cause a mistaken opinion, giving a tumour like feel on palpation. The fact that the tumour in this case could be indented by firm pressure and the different history would enable one to make a satisfactory distinction. Some forms of purpura are described, which before shewing their presence in the skin, affect the mucous membrane of the bowel, causing severe haemorrhage into the intestine and the frequent passing of blood per anum. Sometimes also the blood collects in segments of the bowel, distending them and giving rise to tumour like masses. Commonly, however, the situation becomes clear by the subsequent appearance of haemorrhagic symptoms in the skin or other tracts. If the patient be examined with ordinary care giving adequate consideration to each of the symptoms, it is not likely, in my opinion, that a case of intussusception could be missed. The history in a child previously healthy, of sudden pain, followed by vomiting and straining with or without the passage of blood and mucous, ought to make one suspicious and no effort should be spared to make a sure diagnosis.

In/

In case of doubt an anaesthetic ought to be given and a thorough examination should be made.

I will now give notes of seven cases which I have extracted from the Journal, of which six were under my own care and the seventh was seen by me in consultation outside.

C A S E I.

W. J. McElroy, aged 11 months was admitted into the Cottage Hospital on February 18th 1905 with history of symptoms of intussusception of twelve hours duration. He was of healthy appearance. There was the story of sudden crying followed by pallor and after a time of vomiting and straining with frequent movements of the bowels, containing mucus and blood latterly. On palpation a small tumour lying transversely above the umbilicus was discovered. On examination per rectum, the apex of the tumour could be felt. Chloroform was administered and the child being inverted, irrigation with warm sterilized water was tried. Several attempts had to be made and the irrigating can had to be held about six feet above the child before the bowel was reduced. The shock sustained by the child by the irrigation was very severe and during the process it was at one time supposed to be moribund. It recovered however, and was dismissed well a few days later.

C A S E II.

Maggie Carson, aged 3 years was sent into the Cottage Hospital on November 3rd. 1905. Examination revealed a sausage shaped tumour lying transversely about two inches above the umbilicus. Vomiting and straining with passage of blood and mucus per anum were present. The symptoms had existed for three days previous to admission. Under chloroform an attempt was made to reduce the mass by irrigation. Many efforts were made, but without avail. The abdomen was then opened in the middle line. The tumour was brought out of the wound and was reduced with difficulty. It was an intussusception of the ileocaecal variety and contained the caecum, appendix, part of the ileum, and ascending colon. It was necessary to take the tumour outside of the abdomen before that reduction could be effected. The layers of the abdominal parietes were united with through and through sutures. Patient died on November 7th 1905, probably from shock. Had no preliminary irrigation been tried and shock thereby to some extent minimised, I think now that an immediate laparotomy might have saved the child.

C A S E I I I. Maggie Beveridge, aged 4 months, healthy looking was admitted to the Hospital on June 15th, 1907, with the history of probable intussusception of the bowel of a few hours' duration. It was stated that the child had been seized suddenly with colic, bilious vomiting and straining with frequent bloody evacuations. A tumour could be made out in the left iliac region and its apex could be felt with the finger in the rectum. It could also be seen distinctly causing a bulging forward of the portion of the anterior abdominal wall behind which it was situated. Treatment was by irrigation whilst the child was under the influence of chloroform and the intussusception was reduced. During the irrigation the child became very collapsed and caused some anxiety. In two or three days it was dismissed well.

C A S E I V.

John Smith, aged 8 months, previously healthy was sent into the Hospital on March 2nd 1908. He had been ill for about thirty hours with vomiting, straining and passage of blood per anum. By palpation an ill defined tumour could be made out in the upper part of the right side of the abdomen. Under chloroform, several efforts at reduction by irrigation were made, but without success. The child was very faint. The abdomen was opened in the middle line below the umbilicus. A colic intussusception was found which in order that it might be reduced had to be taken outside of the abdomen. The intussusceptum was gangrenous and was excised. The ends of the bowel were united with a continuous suture going through all the coats and then with Lambert's sutures going through the outer coats.

The operation was protracted by reason of the preliminary irrigation efforts and the suturing of the divided intestine. The child died on the following day from shock.

C A S E V.

John Mitchell Baird, aged 9 months was admitted to Hospital on April 13th 1908. He had had the usual symptoms of intussusception for about 24 hours. A tumour was made out on the right side of the abdomen below the umbilicus. Chloroform having been given, attempts were made to effect reduction by irrigation. At first they were believed to be successful but upon returning to examine the child two hours later, the tumour could again be perceived. Chloroform was accordingly again administered and the abdomen was opened. The tumour was taken outside of the abdomen and reduced. It consisted of small intestine. The child promised well but died on the evening of the next day with symptoms of acute bronchitis.

C A S E V I.

Agnes English, aged 8 months, previously healthy, was sent into the Hospital on April 12th 1910 with history of probable intussusception of 12 hours duration. There had been vomiting, passing of blood and straining, a tumour could be felt in the left upper lumbar region. It was determined to waste no time in this case with preliminary irrigation. Under chloroform an incision was made through the left rectus, the abdomen opened and the tumour taken outside and reduced. It consisted of small bowel. The wound was closed with through and through sutures of silk worm gut. The child stood the operation well, and was dismissed well on April 30th, 1910.

C A S E V I I .

Mary Guibbin, was a case that I saw in consultation. She was aged 5 months, and was brought into the Hospital on August 3rd, 1910. She had been ill with diarrhoea for three days previously, when latterly blood became largely present in her frequent motions. A bulky tumour was easily discovered on left side of abdomen, lying parallel to the middle line. It was determined by my colleague to open the abdomen right away without making trial of irrigation. The incision was made in the middle line and the intussusception was reduced. There was much collapse and there was no little anxiety to get the child off the table alive. The collapse was probably predisposed to by the preceding illness. The baby rallied however, and was dismissed well.

Intussusception of the Bowel is said sometimes to undergo spontaneous reduction without the use of any external means. Cases again, well authenticated, are narrated in which the obstruction is relieved by the sloughing of the intussusceptum and its subsequent appearance in the stools. Osler, in the Principles and Practice of Medicine^{*} makes mention of a youth who in this way passed per rectum, 17 inches of small intestine and ultimately recovered. Acute intussusception may pass into a chronic form in which the symptoms pursue a milder course with exacerbations at times that, in the end, may compel treatment. Such terminations, however, occur so rarely, that one practically must not take them into serious consideration in so far as the prognosis of any particular case is concerned which is not relieved by operative procedures. There are three forms of treatment which are employed for the reduction of an intussusception of the bowel. They are:- Inflation, with air, Irrigation with water, and Laparotomy.

Inflation with air is a method that is not much in vogue. I have no experience of Inflation, and so cannot express a personal opinion upon it as a means of treatment. From the fact that one has no handy means of measuring the quantity of air to be injected and of thus/

thus forming an idea of the amount of pressure to be exerted on the bowel wall, it is not regarded with much favour. Cases of rupture of the bowel by inflation with air have been reported.* Another objection against inflation with air in the treatment of these cases is, that it cannot be so conveniently sterilized as water and it is conceivable that a germ laden atmosphere in contact with an area of bowel of lowered vitality, might be productive of harm.

Irrigation of the bowel as a means of reducing an intussusception, is spoken highly of by many surgeons. Certainly in some cases it is entirely efficacious but it is not absolutely reliable. Of the seven cases of intussusception which are described in this Thesis, Irrigation of the bowel with water, was employed in five. In two of these, namely, Cases I and III, reduction was accomplished and in each of them the apex of the intussusception could be felt per rectum before Irrigation. The fact that the apex of the intussusception could be made out per rectum, shews that the tumour was possibly colic and that might explain the feasibility of reduction.

On/

* Osler's Principles and Practice of
Medicine, page 525.

On the other hand in Case IV, Irrigation was employed unavailingly, although on abdominal section the intussusception was found to be colic. The manner of employing Irrigation was as follows:-

A douche can holding two pints of sterilized water was connected by a piece of rubber tubing with a glass nozzle which was inserted into the rectum, the child being under the influence of a general anaesthetic. The child was inverted and held by the legs and the douche can was usually held three or four feet higher. A very considerable amount of shock was caused in each case and so profound was the collapse in two instances, viz., in Cases I and IV that the patients seemed moribund.

In the Cases I and III which recovered by Irrigation alone, it will be noted that the symptoms had not lasted more than twelve hours. In the other three cases which did not recover with Irrigation, viz., Cases II, IV, and V. laparotomy followed. One of these cases had shown symptoms of intussusception for three days the other two for twenty-four hours. In one of the cases when the abdomen was opened, considerable difficulty was experienced in the reduction of the tumour and the intussusceptum was found to be partly gangrenous, necessitating resection followed by end to end suturing of the Bowel. In Case VI. I decided to spend no time with Irrigation but to open the abdomen at once. I feel convinced that had Irrigation been previously tried without/

without success, that the additional shock would have proved fatal to the child. In Case II. had Irrigation been omitted and so additional shock avoided, it is my opinion that here too, laparotomy might have been attended with success. Case IV. was one of Colic intussusception a form that one would think to be the most amenable to treatment by Irrigation, yet Irrigation was useless.

Case VII. was treated by laparotomy without previous trial of other method of reduction. In this instance the child was in a feeble condition by reason of the antecedent diarrhoea and it was considered wisest to adopt the quickest and surest means, viz., laparotomy for its relief. The result justified the method employed.

It is evident then from what has been written that the only sure way to relieve the form of intestinal obstruction known as intussusception is that made use of in other forms of intestinal obstruction, viz., laparotomy. By immediate leparotomy, one saves the patient the shock of a preliminary irrigation if it happened to be unsuccessful. One also is enabled thereby to judge with the eye as to the viability of the intussusceptum and can also see that reduction actually takes place. If Laparotomy is rapidly performed, it is not the forlorn hope in a child that it used to be considered. Instead of making trial of Irrigation, I should in future in every case favour the opening/

opening of the abdomen and the relieving of the condition with the fingers. When resection of the bowel is found to be necessary with the subsequent tedious suturing, the results in children are usually unfortunate. For resecting the bowel in intussusception cases, Mr Barker, according to Treeves* practices an ingenious operation. "At the point where the sheath receives the entering layer, the two portions of bowel are united by a continuous suture of fine silk. This suture takes up the serous and muscular coats and is carried on to the mesentery. If there be any sign of gangrene about the neck, more gut is invaginated before the suture is inserted. A longitudinal incision is then made through all the coats of the intussusciens along its free margin on convex side. The intussusceptum is thus exposed and is drawn out through the incision made in the sheath and is entirely divided as near as possible to its upper end . . . Stout silk ligatures are passed through all the walls of the stump and are tightly tied. The stump is cleaned and dried and dusted with iodoform. It is then allowed to drop back through the incision into the lumen of the intussusciens. The longitudinal incision in the latter is now closed and the abdominal wound adjusted by sutures."

* A Manual of Operative Surgery. Vol II,
Page 372.

In the "Lancet"* of February 3rd, 1910, a case of successful resection of intestine for intussusception in a child aged 7 months with the help of spinal anaesthesia, is mentioned.

If the middle line is considered suitable for giving access to the tumour, then no better site for the incision could be chosen, there being less likelihood of a ventical hernia forming subsequently, in that situation. If for any reason the middle line is not deemed suitable, then the abdomen may be opened through either rectus or semi-lunar line or directly over the tumour. The incision should be large enough to permit the withdrawing of the tumour outside the abdomen if it be thought necessary. Rapidity of operation is what conduces most to success. The less time expended in the relieving of the obstruction and in the closing of the abdominal incision, the more likely is the result to be satisfactory.

The after treatment resolves itself into the combating of shock. The child should be put to bed with plenty of warm water bottles and symptoms treated as they arise. A saline or strychnia hypodermically may be indicated. The bowels usually operate of themselves.

When an intussusception is relieved by Laparotomy, it does not tend to recur, at least immediately after it has/

has been reduced. Rarely an intussusception may again form requiring a second Laparotomy, but this event takes place months afterwards. Immediate recurrence after treatment by Irrigation, is not unusual, but in this case it is probable that the tumour was not really at any time perfectly reduced.

-o-o-o-o-o-o-o-o-o-o-o-o-o-