CONSTIPATION AND RIGHT-SIDED PTOSIS *

BY

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There are few subjects on which medical views have changed more radically during the present century than on constipation. The haggard faces and emaciated frames of the victims of Arbutnot Lane's "kinks" are now recognized as the stigmata of chronic cascara poisoning, and we spend our days combating the precepts of our medical forebears, and in persuading people to leave their harassed bowels alone. Among those who have contributed to the establishment of the modern view two names stand out, Hurst and Alvarez.

Hurst was the first to describe the gastro-colic reflex, by the operation of which the entry of food into the stomach is followed by mass peristalsis in the colon. This peristalsis, or mass movement, as it is better called, is a remarkable phenomenon of the large intestine, unlike any of the movements of other parts of the alimentary canal. It occurs only three or four times a day, and results in the sudden transference of large blocks of colon contents from one part of the colon to the next, or even from one end of the colon to the other. First observed radioscopically by Holznecht and later studied by Hurst and by Barclay, its exact mechanism is still not clearly understood.

It has never been observed by the naked eye in man, but Alvarez, having filled the colon of a cat with a solution of soap, and then ligatured the rectum, saw "the whole colon shorten and straighten." The manner of entry of the small intestine into the large, and the presence of the ileo-colic valve and sphincter, confer a closed end on the proximal portion of the colon. When the colon shortens by the action of its longitudinal fibres, the blind proximal end, acting like the piston of a syringe, propels part of the contents of the ascending colon round the hepatic flexure into the transverse colon. On the subsequent relaxation, the hepatic flexure breaks the column of faeces and prevents the displaced portion of it from slipping back. When mass movement occurs in the distal half of the colon the natural result is defaecation, but the capacious rectums of dyschezic individuals receive the addition to their contents without response.

Hurst's second great contribution to our knowledge of constipation was his division of the condition into dyschezia and colonic stasis.

DYSCHEZIA

Dyschezia is simply the imperfect functioning of the rectal reflex. It is not so much a disease as an adaptation to civilized conditions of life. Even domestic animals suffer from it; the process of house-training of a dog is merely the painstaking abolition of its rectal reflex. Hurst found that the rectal reflex is excited by sudden increase of pressure in the rectum, normally produced by the entry of faecal material from the pelvic colon. By inserting a balloon into the rectum, and inflating it slightly, he was able to produce a brisk rectal reflex. If the balloon was allowed to remain inflated, it ceased in a short while to excite the reflex, and a further inflation was required to excite it anew. By successive stages of inflation he could induce the rectum to tolerate a

pressure enormously greater than that which originally excited the reflex. This is exactly what happens in dyschezia. The rectum becomes tolerant, and finally acts as a collecting tank, much as the bladder does for the kidneys. Unfortunately the evacuation of the rectum is not, in the present state of our evolution, under voluntary control, so the parallel breaks down.

Probably all civilized humans, those who live in cities at any rate, have some degree of dyschezia. It would be highly inconvenient otherwise. It is quite compatible with perfect health; at the worst it is responsible only for such troubles as anal fissure and haemorrhoids. Absorption of toxic material does not occur from the rectum, and in any case the faeces by the time they reach the rectum are comparatively detoxicated. The literature of constipation abounds with instances of people whose bowels did not move for weeks and even months at a time, and yet whose health did not materially suffer.

The vast majority of patients who come complaining of constipation are suffering from dyschezia. When a purgative is given to a dyschezic, all the intestinal movements are accelerated, and the dormant rectal reflex is at length excited by rapid addition to the rectal contents. In other words, the whole complex business of intestinal digestion and absorption is disordered in order to fill the rectum to the threshold of stimulation. The terminal portion of the small intestine contains highly toxic material. Nearly all the valuable products of digestion have been absorbed and the residue abounds in chemical and bacterial poisons. This toxic fluid is normally dealt with in the caecum and ascending colon, where it is detoxicated by dehydration.

This reabsorption of water is also a valuable element in the fluid economy of the body. Purgatives interfere with this process, and insufficiently dehydrated material is carried through parts of the colon which have not the caecum's power of selective absorption. Toxins may be absorbed beyond the power of the liver to detoxicate; foul tongue, headache, and disordered digestion may result. The most logical method of dealing with dyschezia is the periodical simple enema, but it is not very reasonable to train the rectum to act as a tank and then knock it about for so doing.

COLONIC STASIS

Various types of stasis in the colon have been described, but most of them are very rare. Barclay, from long experience of radiology, declared that, apart from mechanical obstructions, there are two, and only two, sites where stasis occurs—the caecum and the rectum. Caecal stasis deserves serious consideration. It is not nearly so common as dyschezia, but is nevertheless fairly prevalent. How can it be diagnosed? Hurst studied the rate of passage of the intestinal contents in normal individuals, and laid down certain criteria. One of these was that caecal stasis was probable, if twenty-four hours after a barium meal most of the barium was still in the caecum. He also observed that the caecum in a normal individual was empty in the morning. Chyme only begins to pass the ileo-caecal valve three or four hours after the morning meal. If a patient at the morning surgery has a distended caecum, caecal stasis can be diagnosed. During three years I examined in this way every panel patient who came to me complaining of constipation or abdominal symptoms of any kind. I found 23 men and 72 women suffering from caecal stasis; this amounted to 4.2 per cent. of the men and 14.1 per cent. of the women on my panel.

Caecal stasis, then, is fairly prevalent, and is three times more common in women than in men. There is reason to believe that it is much more common even than

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these figures would indicate, for they represent only those with caecal stasis and some abdominal complaint. It is noteworthy that persons with caecal stasis do not complain of constipation unless they have dyschezia as well. They will aver that their bowels move normally, though the matutinal examination reveals a boggy distended caecum.

Dyschezia is relatively harmless; can the same be said of caecal stasis? There are not wanting physicians of eminence who hold that view. Geoffrey Evans, in a recent paper, quoted the experiments of Alvarez, and asserted that the normal condition of the bowel is to be full and not empty. Alvarez administered barium to a number of normal individuals, and recovered it quantitatively from their faeces. He found that only 50 per cent. was recoverable in the first three days, and that the excretion of the remainder occupied several more days. The same results were obtained when glass beads were used instead of barium. It appears that the complete passage of the intestinal canal is a more protracted process than was formerly believed. Nevertheless, other abdominal conditions are so frequently found in association with caecal stasis that some causal relation seems an irresistible conclusion. Kantor, Schector, and Marks, three American radiologists, found on examining their records that caecal stasis in a normally disposed caecum was not usually associated with symptoms of marked clinical importance, but, when present in a low caecum, it was much more frequently productive of symptoms. I approached the subject the other way round, but arrived at the same result, for I found that in thirty-seven persons who clinically had caecal stasis and abdominal symptoms, every one, when examined radiographically or subjected to operation proved to have an abnormally low caecum.

The question of the position of the caecum and ascending colon has been gradually assuming importance during the past quarter of a century, since Wilms in 1908 pointed out that removal of the appendix failed to cure many cases of right-sided pain, and that these cases all appeared to have undue mobility of the caecum. Many writers have since given the subject attention, but the outstanding British contributions have been from Waugh and Carslaw. Waugh in 1920 reported on a series of 180 cases of operation for the relief of right-sided ptosis, and Carslaw in 1928 described a series of 248 cases treated by Waugh's method, and discussed the whole subject very thoroughly.

The colon in quadrupedal animals is suspended in its whole length from the dorsal abdominal parietes by a mesocolon. Undue tension on this mesocolon is prevented by the support of the anterior abdominal wall. Man, in assuming the erect attitude, incurred certain disabilities unknown in the animal world, such as varicose veins, haemorrhoids, and femoral and inguinal hernia. The intestines also were assailed by the pull of gravity in a direction at right angles to that which they were designed to face, and it is not surprising that certain modifications in peritoneal arrangements have appeared in the course of the further evolution of the human race. That must surely be the explanation of the fixation of the human colon to the parietes at various points. The process can be followed in the human embryo from the wholly free to the partially fixed condition.

Just as the rotation of the colon is sometimes incomplete, so that the caecum lies in the mid-line or even to the left, in the same way (but much more frequently) the fixation of the colon falls short of the usual adult condition. So far as the descending colon is concerned, its fixation, by fusion of its mesentery with the posterior parietal peritoneum, is practically constant. But the ascending colon is only securely fixed to the parietes in 75 per cent. of cases; mobility of the right colon is there-

fore a congenital condition. Treves found it in 26 per cent. of bodies examined, and Pirie in 20 per cent. of the bodies of children. Recently Larrimore in America has made radiological studies of babies 1 day old, and found that the incidence of mobility of the right colon was identical with that of any other age group. It would appear, therefore, that man's adaptation to the erect attitude is not yet complete.

Controversy has raged on the question as to whether the possession of a ptosed right colon is a disadvantage. Hurst declared that a ptosed right colon is found as frequently in healthy people, with perfect digestion and no constipation, as in the constipated. It is certain that numbers of persons with mobile right colons make no complaint of abdominal symptoms. There must be 325 prolapsed colons on my panel. During three years only 95 persons made complaint which led to the diagnosis of caecal stasis, and only 37 of these cases were sufficiently serious to merit *x*-ray examination or operation. The striking fact is, and this is my contribution to the study of this question, that all those 37 persons were found on investigation to have prolapse of the caecum and ascending colon. Out of 975 individuals with a normally fixed colon during three years no case arose requiring operation for an abdominal complaint; out of 325 with prolapsed colons in the same period there were 37 whose pains and disabilities, I will not say "demanded" operation, but were sufficiently severe to lead them to consent to it.

A surgical colleague recently declared that every woman had a mobile ascending colon; he meant, of course, that every female abdomen he opened showed this condition, and he was right. It is the custom now, when operating for duodenal ulcer or gall-stones, to remove the appendix. How often does a separate incision have to be made? Only once have I had to make it. If the appendix can be removed through an incision, the lower limit of which is at about the level of the umbilicus, there must be some abnormal mobility of the caecum. Carslaw has pointed out the steps by which the drag of a loaded colon lacking support from the parietes produces effects in turn on the right kidney, the gall-bladder, and the duodenum, with all of which it is closely connected. Both Waugh and Carslaw described types of cases with symptoms simulating those of other abdominal diseases, which at operation were found to have nothing but right-sided ptosis. The failure of many abdominal operations to relieve the symptoms they were intended to relieve has been due to failure to recognize this fact.

Confusion is particularly liable to arise with appendicitis. In a series of 21 cases of right-sided ptosis I had operated on three years ago, five had had the appendix previously removed without relief, and in five others a definitely pathological appendix was found at my operation. The only thing that can be said with certainty in this connexion is that right-sided ptosis is frequently associated with appendicitis, and that, when it is, failure to fix the colon may lead to a relative failure of the operation to relieve the condition for which it was performed.

If a prolapsed right colon is so disadvantageous, how is it that only 10 per cent. of persons so afflicted complain of symptoms? It has to be remembered that about a third of each twenty-four hours is spent in a recumbent position, so that the lack of support for the colon is only operating for sixteen hours out of the twenty-four. Further, in muscular individuals, with firm abdominal walls and high intra-abdominal pressure, the abdominal viscera are packed like prunes in a bottle with little or no tendency to change their relative positions. Those who do complain of symptoms are typically females with certain physical charac-

teristics which constitute the well-known "faulty development of the infantile type." They are often undersized and thin, with poorly developed mammae, a long thorax, and an acute subcostal angle. Another fairly common type is the maternal—women whose abdominal walls have never recovered from the stretching of pregnancy.

It is the conjunction of caecal stasis with inadequate support for the caecum which apparently determines the onset of symptoms. The sympathetic nerve supply to the bowel is carried to it in the walls of the blood vessels. The sympathetic, it will be remembered, inhibits bowel movements and closes the ileo-colic sphincter. The theory of Tyrrell Gray and Carslaw is that, when the loaded caecum descends into the pelvis, traction is made on the vascular pedicle, which is the most resistant constituent of the mesocolon. The sympathetic nerves are stimulated by the traction, and the bowel movements are inhibited; stasis increases, the drag and the stimulation are augmented, and so the process continues in a vicious circle. In some of my own cases I have seen the bundle of vessels which run to the ileo-caecal angle standing out like a rope, and obviously supporting the weight of the colon.

The operation of colopexy, as devised by Waugh, seeks to imitate nature, and to confer on the subject of right-sided ptosis the same degree of fixation of the colon as his more fortunate fellow humans have at birth. After the appendix has been removed, an incision is made into the peritoneum in the angle between the ascending colon and the flank. A pocket is made by stripping up the peritoneum from the flank; the colon is rolled into this, and made secure by sewing the peritoneal flap over it. The bowel is thus in contact over a broad area with retroperitoneal tissues, and the adhesions which it there forms are the important element in its fixation. There is no technical difficulty in the operation, provided that a sufficient incision is made. I always use a paramedian incision to avoid weakening the abdominal wall, though the wide retraction entailed is responsible in some cases for a fair amount of after-pain. I have performed the operation fifty-three times, and have had no untoward complications and no deaths.

The results in some cases have been dramatic. In one case the most careful preparation in the ward had failed to remove all solid faeces from the caecum. The day after the operation, for the first time that this patient could remember, her bowels moved naturally, and have continued to move without purgatives ever since. About thirty of my cases have been from my own panel, and the happy result has been that many who were formerly most troublesome cases now make infrequent appearances.

It must not be forgotten that dyschezia is as likely to be present after the operation as before. Caecal stasis also may occur, but it causes no pain. Some of my cases radiographed after the operation show only slight elevation of the colon compared with the previous condition, and moderate caecal stasis; yet they have been relieved of their symptoms. This observation harmonizes with the theory of Tyrrell Gray and Carslaw, for if it is the traction on the mesocolon which causes the pain and the stasis, then a very small lift and fixation is sufficient to relieve the trouble. If a man is hanging by the neck, a lift of an inch or so will save his life.

As the result of the study I have given to this subject I have formed the opinion which I have tried to justify in this short paper that the vast majority of pathological abdominal conditions occur in that quarter of the population who have congenitally ill-supported colons. A timely colopexy would relieve their early symptoms, and save them subsequent visits to the operating theatre for much more serious operations.

THE SOURCE OF INFECTION IN A MINOR OUTBREAK OF PUERPERAL FEVER

BY

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The two cases of puerperal pyrexia to be described occurred at close intervals of time at a nursing home in a town. The home had been until then singularly free from sepsis. Both patients were infected with haemolytic streptococci and, in addition to the rise in temperature, presented one unusual feature in common—namely, multiple suppurative arthritis. It was thought possible that the two organisms might be identical, and that there was present a common source of infection responsible for both cases.

King¹ showed that there is a well-marked correlation between the presence of haemolytic streptococci in the upper respiratory tracts of medical attendants and the incidence of cases of puerperal fever. Subsequently, Smith,² by means of agglutinin-absorption experiments, showed that, out of eighteen cases of haemolytic streptococcal infection during the puerperium, the source of infection could be traced in eleven to the throat or nose of the doctor, student, or nurse in attendance.

CASE I

Mrs. X was admitted at 3.30 a.m. on June 18th, 1931. Vaginal examination was made by Sister A on admission, and again at 6 p.m. on the same day. At 7 p.m. a vaginal examination was performed by Dr. B; the perineum, etc., was prepared by Sister A and Nurse C, and a low forceps delivery was made by Dr. B. During delivery the perineum was lacerated. The following evening the patient had a rigor, temperature rising to 104° F. on June 19th. Daily rigors followed; suppurative arthritis developed in the right shoulder and wrist, and in the right knee. The patient ran an intermittent temperature, and died at the end of three weeks.

No face masks were worn by any of the attendants either before or after delivery.

Bacteriological Findings.—Throat, negative for haemolytic streptococci; urine, sterile; cervix, coliforms and haemolytic streptococci; perineum, negative for haemolytic streptococci; blood, shoulder, and knee, positive for haemolytic streptococci.

CASE II

Mrs. Y was admitted at 3 a.m. on June 21st, 1931, and spontaneous normal delivery took place at 4 a.m. No vaginal examinations were made before delivery. Sister A only was present at delivery, and she wore a mask. Nurse C relieved Sister A at 6 a.m., and subsequently did all the nursing for this patient until June 27th, when Sister A attended her only. Rigors commenced twenty-four hours after delivery, and occurred daily, with high temperature between. Within one week the patient had developed suppurative arthritis in the left sterno-clavicular joint and in the right wrist-joint. After two weeks her condition slowly improved, and the temperature settled after about eight weeks.

No masks were worn by Nurse C up to the time the patient had developed a temperature.

Bacteriological Examinations.—Haemolytic streptococci found in throat, vagina, and blood; urine, sterile.

HISTORY OF CONTACTS

Dr. B delivered Mrs. X only. During the week before and the week after delivery of Mrs. X Nurse C had delivered, had been present at the delivery of, or had nursed during the puerperium, five other women. After Mrs. X's delivery masks were worn. All five had uneventful puerperia. Sister A also dealt with three patients, and wore a mask while attending each. They also had uneventful puerperia.