On some points in the surgery of hernia, with illustrative cases : (read before the London Hospital Collegiate Society, and re-printed from the Lancet) / by Nathaniel Ward.

with the author's compts

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SURGERY OF HERNIA,

With Illustrative Cases.

(READ BEFORE THE LONDON HOSPITAL COLLEGIATE SOCIETY, AND RE-PRINTED FROM THE "LANCET.")

By NATHANIEL WARD, F.R.C.S.,
Assistant-Surgeon to the London Hospital, &c.

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ON

SOME POINTS IN THE SURGERY OF HERNIA.

The advantage to be obtained at a large public hospital appears to me to be valuable in proportion to the opportunity afforded for acquiring sound knowledge on different cases, the counterpart of which are likely to be met with in the experience of an ordinary professional life.

Rare and remarkable instances of disease and injury, requiring medical or surgical interference, excite admiration and interest, either on account of their abstract peculiarities, or the judgment and dexterity that may have been elicited in their treatment, but can scarcely be said to leave that well-defined impression on the mind, that should be the result of a careful, observant, and assiduous study of more ordinary cases, which possess in themselves but few individual claims to attention. When, however, these ordinary cases are grouped and classified, and class and division analysed as to variety, constitutional and local treatment, symptoms during life, and phenomena after death, an amount of reliable information is gained, which will necessarily inspire confidence in diagnosis and decision in treatment, and render the practitioner more independent of the assistance of others, than if his opinion and mode of action had been merely framed from printed essays and the text-books of the schools. The great facility offered in the present day for gaining information from elegantly illustrated manuals in every department of medicine and science generally has, I fear, a tendency remote from that intended by their authors, and, by cutting out a too ready path to knowledge, is calculated rather to repress than encourage personal investigation, and to do away with that amount of

trouble and persevering inquiry inherent to patient observation and the careful record of cases.

I have no hesitation in saying that I consider that many an obscure point in surgery, both as to opinion and practice, would have been settled ere this, had a more careful registry been kept throughout the hospitals of England, than at present exists; and to no class of affections does this remark apply more forcibly, than to that I have selected for consideration.

Hernia, in its multiform characters, is a subject amongst many others that requires the close attention of the careful observer; and whatever be the student's line of practice in after life, he will never regret having rendered himself as far as possible master of it, inasmuch as an error of diagnosis or of treatment may make all the difference between the life and death of a patient, and between an increase and decrease in his own reputation.

I shall draw the remarks I have to make on this subject principally from cases of strangulated hernia that have occurred in the London Hospital during the last four years and three-quarters. During this time there have been many patients who have been operated on, and under careful observation by my different colleagues and myself; and to the former I am indebted for much of the material on which my remarks will be based. Sixty-nine of these cases I have already grouped together and commented on in a small pamphlet* published a short time ago. Thirty-one have occurred from the middle of May, 1854, to October, 1855. Taking these numbers together, we have a total of a hundred cases that have been operated on, an operation having occurred on the average about once in every seventeenth day. I am not aware that this number exceeds in amount that operated on in some other hospitals of London; so that if a calculation were made as to the aggregate of cases of strangulated hernia that are constantly under treatment in the public institutions of the metropolis, we should be much astonished at the extent to which life is jeopardized amongst the labouring population from the existence of rupture, and the negligent

* Memoir on Strangulated Hernia, &c. Second Edition. Churchill.

treatment of it by patients themselves. This negligent treatment is mainly comprised in the neglect of the truss, irregularity, or abuse in its application; and there is hardly a man or woman operated on, who, to the question on the subject, will not be found to have replied that the truss was out of repair at the time of the irreducible descent of the bowel, was temporarily laid aside, did not fit properly, or had never been had recourse to at all. The experience of large manufacturing districts is, I believe, the reverse of all this, and my friend, Mr. Jackson, of Sheffield, informs me that in his neighbourhood cases of operation are comparatively rare, although there is a large amount of hernia in the town, and he attributes this rarity of operation to the fact, that the work of the trades being uniformly heavy, the people are compelled, as a matter of necessity, to pay greater attention to the wearing and proper fitting of trusses than in those places where the work is of a lighter and less uniform nature.

Of the hundred cases alluded to, four were umbilical, sixty-three femoral, and thirty-three inguinal. The aggregate mortality amounted to thirty-three. Three deaths occurred amongst the umbilical, nineteen amongst the femoral, and eleven amongst the inguinal class. The peritoneal sac was opened in all the cases of umbilical hernia. Of the sixty-three femoral it was *not* opened in forty-two, and opened in twenty-one; the average period of strangulation in the former amounting to thirty-seven hours and a fraction, and of age to fifty-two years; in the latter, that of strangulation to fifty-seven hours, and of age to fifty-six years. Amongst the forty-two cases of *unopened* sac, of the thirty-two that recovered, the average age was forty-seven; and of the ten that died, the average age was sixty-six. Of the twenty-one cases of *opened* sac, twelve recovered, the average age being fifty-four, and nine died, the average age being fifty-nine. Of the sixty-three collectively, nine occurred in the male, and fifty-four in the female; forty-three were on the right, and twenty on the left side. Of the thirty-three cases of inguinal hernia, the sac was not opened in ten, and opened in twenty-three. The average period of strangulation in the

former was twenty-eight hours and-a-half; in eighteen of the latter, thirty hours. Of the cases collectively, twenty-five occurred on the right, eight on the left side; all took place in the male subject.

On glancing over this analysis, we are struck in the first place with the fact of the operation without opening the sac, having been performed much more frequently in cases of femoral than of inguinal hernia. The greater applicability of Petit's operation to the one class than to the other, appears to be attributable to the fact of the neck of a femoral sac not undergoing hypertrophy so frequently as the neck of an inguinal sac. In the inguinal class, the pad of the truss bears directly on the narrowest portion of the sac, which is usually situated at or near the immediate neighbourhood of the outer ring, and this narrow portion receives a counter pressure from the pubis. In femoral, the pad bears mainly on the body of the sac, and not on the neck; we consequently find more thickening in the structure of the neck of an inguinal than of a femoral sac, a less amount of capability of yielding, and a smaller calibre. The neck of an inguinal sac offers therefore a greater impediment to the reduction of a strangulated bowel than the neck of a femoral, and necessitates the more frequent opening of the sac. I of course exclude from this remark quite recent cases of inguinal hernia, and also those cases of large, irreducible inguinal hernia, in which the pressure from within has ultimately gained the better of the resistance from without, and in which a recent additional protrusion has been followed by symptoms of strangulation; for, both to the one set and to the other, the operation without opening the sac is peculiarly appropriate. I limit the remark to those cases of inguinal protrusion of intermediate duration, which most frequently demand surgical attention, and in which the contents have been reduced, and retained in the abdomen by a truss, which temporarily occludes or diminishes the calibre of the neck of the sac, and by the irregular and inconstant pressure it exerts, leads to the thickening of its walls. In the second place, we observe, *that in the forty-two cases of femoral hernia in which the sac was unopened*, the period during which symp-

toms of strangulation had lasted prior to the operation, was less *by twenty hours*, than the period of strangulation *in the cases in which the sac was opened*, and that the age was less by four years. I should have also mentioned in the analysis, that the average day of recovery in the *unopened series* was the twenty-third, the average age also being less by nineteen years, than in the unopened cases that died; in the *opened series*, the thirty-first day. In two of the *former* class, the wound had healed on the fifth day; in one case the recovery had taken place on the sixth, eighth, ninth, tenth, and twelfth days respectively. The shortest period in which a case of opened sac had recovered was the tenth day; and after this, the twenty-first day was the next earliest period. Now, it is admitted on all hands, that the chances and rapidity of recovery after operation, both in cases in which the sac has been opened, and in those in which it has not, materially depends on the length of time the bowel has been subjected to mechanical obstruction and its consequences. Post-mortem evidence also proves, that the amount of intestinal lesion, and the risks of abdominal inflammation, bear a direct proportion to the period and intensity of strangulation. Based on this conclusion, the propriety of an early operation has become prominent to the mind of every thoughtful surgeon of the present day, and his great anxiety is to relieve a strangulated rupture before its organic capabilities have been seriously interfered with, well knowing that procrastination, even for a few hours, will now and then lead to a fatal result, in consequence of gangrene of the gut, collapse, peritonitis, or other fatal complication.

For the formation consequently of an unbiased estimate of the causes that determined the relative result after the peritoneal and extra-peritoneal operations, in this collection of cases, the period of strangulation should of necessity constitute a primary feature in the calculation. Considering, then, the short period in which the gut had been strangulated in those cases in which Petit's operation had been had recourse to, the less advanced age of the patients, and the comparatively healthy state of the bowel, it becomes a

question of interest to determine, whether in *these very cases of unopened sac*, the addition of a peritoneal incision, the exposure and manipulation of the gut would have influenced injuriously, to any great extent, the ultimate event. The expression of opinion on this matter cannot be considered decisive. It is quite clear, however, that had the sac been opened, something would have been done not required by the exigencies of the cases; and to repair that additional something, which could be looked on in no other light than as the infliction of an injury, a prolonged effort at restoration would have been required on the part of the system. The progress to recovery would in consequence, no doubt, have been retarded, without, however, the certain addition of enteritic or peritonitic symptoms, which I think no one could deny would be more likely to ensue from prolonged interference with the intestinal circulation, than from an exposure of the bowel and incision of the serous membrane. My own opinion is, that the risk of leaving the bowel unrelieved *for a long period—say thirty hours*—and then *operating without opening the sac*, would be greater than relieving *the bowel at a comparatively early period of strangulation—say twenty hours—and opening the sac.* I should even not be surprised to find that if ten cases of strangulated hernia, in which the symptoms of obstruction had been of short duration, and exactly similar in every respect, were operated on without opening the sac, and ten of a like nature by opening it, all the operations being performed by the same surgeon, in a similar manner, and with an equal amount of skill, that the results as to recoveries and deaths would be alike. I should think, however, that the period of recovery would be longer, and the attendant casualties during and after the operation would be greater in those instances in which the sac had been opened, than in those in which it had not been opened. I would refer, therefore, the more favourable termination, as established by this analysis, in cases of unopened sac, mainly to the early period of operation, and the less advanced age of the patients, without in any way denying that the limited nature of the operation, contributed essentially to safety and the rapidity of the cure. We have direct evidence on the

very point of early herniotomy, in which the sac was opened, in a very interesting *résumé* of a series of cases that have occurred at St. George's Hospital, published by Mr. Prescott Hewett in the *Medical Times and Gazette* of September 23rd, in last year.

Mr. Hewett states, that the rule at St. George's Hospital is the reverse of that adopted at the London Hospital, being, in fact, to open the sac freely. The mortality amongst seventy-five cases, in which this plan was adopted, amounted to only nineteen; the operation having been performed, as we glean from the context, as early as practicable, with every amount of attention to a previous cautious use of the taxis, and a subsequent non-purgative treatment. This result, I think, a very good proof, as far as it goes, that opening the sac, although it may retard the progress to recovery, is by no means of that serious or fatal character entertained by many of the advocates of the extra-peritoneal operation. Mr. Hewett considers, however, that, "if cases of hernia were seen at a much earlier period than they commonly are at our hospitals, and if protracted efforts at reduction were more generally given up, that the rule of not opening the sac would find many more advocates than at present." In this remark I perfectly agree; and for the sake of surgery, and the relief of suffering, should be glad to see it practically acted up to.

Independently of the 100 cases that have been operated on during the last four years and three quarters, 254 other cases of hernia have been admitted, the patients suffering more or less from symptoms of strangulation, but who have been relieved by general or local measures—the use of the warm bath, chloroform and opium; the taxis, and application of cold. The taxis has been found, with few exceptions, of eminent service, and has frequently done away with the necessity for an operation, which, prior to its application, seemed imperatively called for; and I can call to mind several cases in which it succeeded when no impulse could be detected in the body of the tense tumour. This reduction of bowel into the abdomen by manipulation requires, of course, in its use care, delicacy, and tact, and will frequently succeed in the hands of one understanding the principle of the pro-

ceeding, whereas it will fail over and over again, and may be the cause of considerable mischief, when applied by one either ignorant of or indifferent to it. I think it may be serviceable to append the following description of the professional way of applying the taxis; for to attempt to define or put in practice the frequently successful method adopted by patients themselves would be almost impossible, inasmuch as the proceeding they have recourse to appears peculiar, and at times complicated and ridiculous, and is followed by most serious consequences. My friend, Mr. Hovell, gave me an opportunity, a short time ago, of seeing an elderly woman, who had had a right femoral hernia for many years, and on being seized, as she frequently had been on former occasions, with symptoms of strangulated bowel, applied the taxis herself during the night. It was successful as far as referred to the reduction of the gut, but so much force had been used, that when I visited the patient, she had great prostration with marked mitigation of the symptoms of strangulation. Concluding that she would probably sink during an operation, and that the bowel had been ruptured, we decided on not interfering. In a few hours, an after-death inspection confirmed the qualified diagnosis that we had made. The following is the plan to be recommended in the use of the taxis:—Draw the body of the tumour gently down with one hand, and with the thumb and two or three fingers of the other steadily compress the neck of the hernia, with the view of causing the contained fluid to pass into the intestine above the swelling. When gurgling is heard, or when, from the sensible diminution in the size and tension of the hernia, there is reason to infer that the passage of fluid has commenced, then, at the same time, keep up gentle pressure on the body of the tumour without pressing it upwards, and the possibility is that the contents of, and then the hernia itself will be reduced. If the body of the tumour is not drawn somewhat downwards and kept so, the part of the gut (and the neck around it) just below the lower orifice of protrusion will be forced up, and doubled a little on itself against the borders of the opening, and injury to the intestine and a failure in reduction be the probable consequence. If this plan be found not to succeed

after one carefully-conducted trial, it will rarely be found to answer after many, and an indication is then given for the performance of an operation, as delay will but complicate the case, and further endanger the life of the patient. It may seem absurd to assert or insist on so obvious a truism, but the gloomy part of the records of surgery bears such painful testimony to the neglect of this precept, that the propriety of operating early, without persisting in the taxis, cannot be too strongly enforced and too clearly illustrated. Even at the risk, therefore, of being tedious, I submit a few examples of the result of the taxis when it has been frequently, carelessly, or forcibly applied.

A washerwoman, aged fifty-two, came under treatment for a left strangulated femoral hernia, which had been so for two days. Attempts at reduction had been made on the day following its descent, and persisted in for about half an hour, and also on the subsequent day for about a quarter of an hour. The operation was performed almost immediately after admission, without any further attempt at the taxis having been made. The hernia was reduced without the sac having been opened, and during the operation an ounce of opalescent fluid escaped from between the sac and its immediate investment, the former presenting a polished, smooth surface, and, from being black in consequence of extensive congestion, had the appearance of gut itself. The patient went on favourably till the afternoon of the third day, when intermittent pulse, clammy skin, and general prostration of the powers, ushered in a fatal end in the evening. After death there was no appreciable evidence of peritoneal inflammation; the sac of the hernia had not in any way been interfered with during the steps of the operation; and the fold of intestine that had been protruded was near the mouth of the femoral canal. A whitish, indented band passing round its neck, pointed out the tightness of the stricture, and was more obvious internally than elsewhere. Running along the middle of the convex border of the gut, in a line with the long axis, existed a rent of the serous coat, about an inch long, and in the middle of the rent the mucous and muscular tunics had become perforated by a rounded aperture, about one-fifth of an inch in

diameter; extravasation of the contents of the intestine having taken place into the serous cavity. That the rupture of the peritoneal coat had taken place during the attempts made at reduction was evident from its extent compared to that of the perforated opening of the mucous and muscular tunics, which had not given way until the third day after the operation. The effusion of fluid between the sac and its immediate coverings was also no doubt the result of the previous handiwork.

A coal-whipper, aged forty-four, was operated on for a large right oblique inguinal hernia, which had been strangulated for about three days. The taxis had been used with a considerable degree of force on three distinct occasions. Shortly before the operation, the vomiting had become intense, and the other strangulation symptoms aggravated. The scrotum was inflamed, and, on grasping it, a distinct sense of crepitation was felt. Nine or ten inches of intestine were found in the sac, dark, and highly congested, but not deprived of lustre. At one part, the serous membrane of the gut had been rent, and was covered with blood. Varied-sized coagula, mixed up with bloody serum, were in the sac, and there was bloody extravasation beneath the proper serous covering of the gut. The folds of the bowel were held together by soft fibrin; this was detached by the fingers, and the intestine carefully replaced in the abdominal cavity. The abdomen became, shortly before death, which occurred on the fourth day, tense and tympanitic.

A milkman, aged twenty-eight, who had been subject to rupture ever since he was five years old, after having had a heavy day in carrying milk about, and immediately after a violent fit of laughing, found that his rupture had come down, and that he could not push it back as he had been in the habit of doing. He went to a surgeon, who reduced it, "after having worked at it for half an hour." He had pain in the stomach before and after reduction. The symptoms of strangulation were rather aggravated than relieved, and continued so for forty-four hours, when he was admitted. There was no evident tumour in the inguinal canal, the cord, on the contrary, being very distinctly felt, and having no sac either

in front or behind it, below the level of the outer ring. As some obscurity existed about the case, the operation was deferred for twenty hours to give trial to palliative treatment, which, however, was of no advantage. The inguinal canal was laid open in the direction of its long axis, and when fully exposed, there was remarked at the upper part, the cord thrown forwards, and spread over a tumour below and behind it, on a level with the inner ring. The cord was covered by a rather dense fascia, and after having been drawn aside, the sac was opened. It contained about six inches of dark intestine. The neck of the sac was behind the level of the inner ring, which was nearer than usual to the outer. Although in this case the taxis had brought about the nearly complete reduction of the hernia *en bloc*, the temporary disappearance of the gut from the grasp of one surgeon prevented any further manipulation and mischief, and probably saved the life of the patient, who, fortunately, recovered on the fifteenth day, under the treatment of another.

These three cases are sufficient for the object I have in view, which is, to show how fatal and pernicious it is to attempt to accomplish, by a rough manipulation, (which belies the very meaning of the word taxis), that which could be done easily by a delicate operation, without any great chance of compromising life. I can here hardly resist relating the plan adopted by a student of the London Hospital some years back, in order to return a somewhat large hernia into the abdomen. The anecdote is related by Mr. Headington, formerly a surgeon of the hospital. He was sent for one evening to see a case of strangulated hernia; he arrived at the hospital with all due speed, and on entering the ward was much struck by the attention of the patients being riveted on an object walking rapidly up and down the ward. This object was no other than a tall muscular pupil from the North, who had slung the female over his back and shoulders, and was rapidly strutting up and down the room, proud and conscious of his own ingenuity, and of the probability of relieving his patient. Even, however, such an inverted down-hill position, and such a jumbling movement, though no doubt astounding and uncomfortable to the patient, was

nothing in point of injury compared with the coarse handling too frequently resorted to, even in the present day.

Chloroform, as an adjuvant to the taxis, is of great value, and in several cases of this series, a reduction was effected in consequence of its employment, in which cases the taxis had been previously used without it. Chloroform appears to act by the temporary palsy that it induces of the abdominal muscles, whereby the struggles of the patient, and the compressing action of these muscles on the abdominal cavity are for a time suspended, the capacity of the cavity becomes enlarged, and less resistance therefore is offered, by the pressure of the viscera, to the return of a fluid in a hernia, and of the tumour itself. The following is an illustration of the efficacy of this agent:—A Jew child, aged ten months, was admitted with a strangulated non-congenital right oblique inguinal hernia. It was of three days' duration, and came down after coughing and crying. The symptoms of strangulation had existed for fifty-eight hours. There was no impulse on coughing, and the seat of strangulation test showed the impediment to reduction to be about the level of the outer ring. The taxis was ineffectually applied, after a warm bath. When the child was fully under the influence of chloroform, the taxis was again had recourse to, and the swelling retired within the abdomen without any difficulty. The bowels acted fifteen hours after the reduction of the gut, and the usual symptoms subsided. A similar case to this came under my notice some short time after the occurrence of the above, in the practice of my friend, Mr. Hutchinson, of the Metropolitan Free Hospital. A child was admitted, suffering severely from a strangulated inguinal hernia. He was placed under chloroform, and the gut easily went back. Of the benefit of freezing mixtures and the topical application of ice, the London Hospital does not offer any extensive amount of evidence, inasmuch as the strong surgical conviction is, that in cases of unqualified strangulation, much precious time would be lost in trusting to the chance efficiency of any local application. The last case in which ice was applied to a hernial tumour, was in the instance of a man aged sixty, who was admitted with an enormous left inguinal protrusion.

The symptoms were urgent, and from the tympanitic resonance of the swelling, it was inferred that the protruded bowel was much distended with flatus. A large bag of ice was applied for half an hour, when the contents of the hernial sac suddenly went back into the abdomen without manipulation having been needed. The symptoms of strangulation went off, and the patient shortly afterwards passed three copious motions, apparently nearly all blood. From this time he gradually got weaker and weaker, and died on the sixth day. On post-mortem examination, the mouth of the inguinal sac was found to admit of the easy introduction of two fingers. The bowel that had been down was represented by nine feet of the small intestine, which was black from congestion. It was not ulcerated in any part, nor did its cavity contain blood. This patient, three weeks before his admission, had suffered from the descent of the rupture, but the symptoms of strangulation had not been so severe as on the last occasion, and the taxis, without the use of cold, had proved successful. On the first occasion he also vomited, and passed blood by the rectum. He, however, rallied afterwards. Without saying positively that the topical application of cold to so large a surface as to nine feet of bowel was the unfortunate cause of this patient's death, it still appeared to have produced an amount of shock on the organic nervous system, under which the patient sank. Had the hernia been one-half or two-thirds the size, a different event might have taken place. Regarding this as an exceptional case, and in reference to its fatal termination, as open to a different interpretation, I think highly of the topical application of cold in incarcerated hernia, and in conjunction with the previous or subsequent exhibition of enemata. It may be asked what is meant by an incarcerated hernia, for in systematic works on rupture and its complications, there is a vagueness of explanation of this expression, which puzzles the student wonderfully. If I may venture on the difficult ground of definition, I would observe, that in incarcerated hernia, the obstruction, and possible ultimate strangulation, are *slowly* brought about by changes occurring in the gut itself; in strangulated hernia, properly so called, the ob-

struction is *rapidly* caused by changes in the gut, effected in consequence of the presence of structures extrinsic to the gut. It therefore follows, that in incarcerated hernia the remedial measures should be applied directly and indirectly to the gut itself; in strangulated, to the parts extrinsic to the gut, supposing, of course, the taxis not to have succeeded. In the former group of cases, the treatment directed for their relief is usually successful, without it being found necessary to enlarge by the knife, the mouth or neck of the sac, or parts around it; whereas in the latter group, the parts around the neck of the gut usually require more or less surgical interference, in order to do away with the primary cause of obstruction. In other words, general and local treatment, without the operation, usually answer in cases of incarcerated hernia; but the operation, without local and constitutional treatment, is fundamentally efficacious in strangulated hernia. In the group of incarcerated hernia, we may reckon principally old reducible or irreducible ruptures, with enlarged aperture to sac, and in which deterioration, or arrest of function, has slowly ensued, in consequence of distension by fæces above or below, or in the protruded bowel, vascular congestion from too copious or too irritating meals; the consequences of injury short of actual inflammation and lesion; and other obscurer causes.

Before proceeding to extract a few very interesting cases from amongst the thirty-one not mentioned in my pamphlet, I would say a few words concerning the examination of a patient supposed to be affected with strangulation of the bowel, or with symptoms resembling it, and also would make one or two remarks in reference to the operation for the relief of femoral hernia.

Whenever a patient is siezed with pain in the umbilical region, accompanied with nausea or vomiting, the propriety of examining the abdominal apertures should be regarded as a cardinal rule. This rule, however, in consequence of the comparative rarity of rupture in private practice, is, I fear, apt to be somewhat slighted; and it now and then happens that a case is treated for many hours as one of dyspepsia, colic, or enteritis; leeches, counter-irritation, cataplasms,

fomentations, and drugs are ineffectually brought to bear, followed by an aggravation, instead of a diminution of the symptoms. An examination of the abdominal walls is subsequently instituted, and a hernial tumour probably detected. An operation is performed, and the chances of death will mainly depend on the time it has been deferred. I am personally acquainted with one or two cases of such fatal oversight. The ignorance and false modesty of patients frequently also aid the surgeon in the establishment of a faulty diagnosis, and it will be found, strange as it may appear, that patients suffering from strangulated hernia now and then are quite unconscious of the existence of any swelling, or if they know of it, are surprised on being informed that the severe symptoms under which they are suffering have anything to do with the swelling they have had for years, particularly as the pain that has accompanied these symptoms is usually referred to a part of the abdomen remote from the position of the tumour. My friend, Mr. Ray, of Sittingbourne, informs me that on one occasion an elderly female was operated on by him, who, he found on inquiry, had been suffering from symptoms of strangulation for thirteen days. During this period she had consulted no one, nor would her husband let her, but relied on his own medical powers, which consisted in the use of some simple medicines, and a recommendation to take exercise for her relief, so that the patient had accomplished several long walks during this interval. On Mr. Ray being eventually called to see her, and on his explanation of the nature of her affection, the astonishment and incredulity depicted on the countenance of the wife and husband was great, and the former remarked, before consenting to an operation, "Now, doctor dear, do you *really* think that this here (putting her hand on the groin) has anything to do with the sickness." The poor creature, I need hardly say, died, as on opening the sac, a false anus became soon established, and she sank rapidly.

When a tumour has been detected in, or protruding from, say, one femoral, or one inguinal canal, the examination should not even then be deemed sufficient, but all the abdominal apertures should be examined. However redundant such precaution

may appear in the majority of cases, experience forcibly dictates the necessity of attending to it, and the mere circumstance of one fatal case having taken place from such deficiency of supervision, fully warrants its adoption. A large, fat woman was admitted suffering from symptoms of strangulation of more than usual severity. Examination detected a large umbilical hernia. This was reduced without much difficulty, but the symptoms were not relieved. It came down again, and then could not be returned, and an operation was performed. Omentum only was found in the rupture. The symptoms of strangulation continued, and she died. On a post-mortem examination a knuckle of intestine was found in the femoral ring, perfectly sphacelated. There had been also considerable peritonitis.

Independently of a small hernia being overlooked, when the attention is concentrated on a large one somewhere else, two or three herniæ may be detected at the same time, and there being severe strangulation symptoms, it becomes a question, which of the protrusions, or whether more than one, should be selected for the operative proceedings of the surgeon. The late Mr. Robinson, in a valuable paper, "On the complications of Hernia," which was published in the *London Journal of Medicine*, quotes the following case:—"Mr. Luke was called to a female who was labouring under an inguinal and an umbilical hernia, with symptoms of strangulation. Both ruptures were very tense and painful, and both were irreducible. The former was small, and was apparently contained in the inguinal canal; of the two it was the more tense, and could be obscurely felt through a thick layer of fat." He was induced to operate on this one. He found, upon opening the sac, a portion of small intestine tightly strangulated. He divided the stricture, and returned the bowel. Relief followed; the symptoms subsided, and the woman recovered.

Before conducting an operation for femoral hernia without opening the sac, the surgeon should have obtained, by dissection, as clear and practical a knowledge as possible of the structures that may be involved in it. Without alluding to the remarkable but reconcilable diversity of opinion as to

which structure forms the impediment to reduction, I would merely remark that, one, more, or all the structures situated over the neck of the sac, or in its immediate vicinity, above or below, may prevent the return of the contents of the hernial sac, and consequently require relaxation or direct incision. These different structures have been and are recognised under so many names, that, for the sake of simplicity, and the convenience of memory, it may be as well to group them and their synonyms together. Thus Poupart's ligament, the femoral arch, and crural arch, are convertible terms; so are the following:—Gimbernat's ligament, and posterior edge of Poupart's ligament; upper fourth of falciform edge of Burns, Hey's ligament, and femoral ligament; sheath of femoral vessels, fascia transversalis, and fascia propria; deep femoral arch, deep femoral ligament, fibres above and behind Poupart's ligament, and Key's fibres; transverse fibres strengthening the sheath of the vessels, Cooper's anterior columns, and Luke's fibres.

A somewhat extended experience has led me to the conviction that the operation, without opening the sac, cannot be conducted in a simpler or safer manner than according to the method recommended by Mr. Luke, and described by him in the thirty-first volume of the "Medico-Chirurgical Transactions," and which I have quoted in the second edition of my memoir. Its general applicability is its particular recommendation; and I believe I am not overstating the case when I remark that, since the efficiency of this plan of operating has become generally recognised, the failures in contemplated operations for femoral hernia, without opening the sac, have been the exception to the rule; whereas such failures were not unfrequent before Mr. Luke gave the results of his operative experience to the profession, and described his method of proceeding.

From amongst the thirty-one cases before mentioned, I proceed to extract some that appear to me to have the most interesting points connected with them.

Case 1.—*Right femoral hernia; sac unopened; perforating ulcer of small intestine which had healed, and contracted adhesions by its circumference with the omentum.*—A man, aged eighty-four, was operated on for a hernia of twenty hours'

strangulation, and of three weeks' duration. He recovered from all the symptoms of strangulation; but it appeared that in consequence of his age, the shock of the strangulation, and the operation employed for its relief, had so depressed his condition, that he gradually sank, and died on the twenty-third day. On a post-mortem examination, the subcutaneous fasciæ were found infiltrated with the products of inflammation. Poupart's ligament had been divided, and about half an inch of the tendon of the outer oblique, in an upward direction. A small sac, capable of holding a cob-nut, occupied the femoral canal. About four feet from the large intestine, a loop of collapsed small intestine was found in the pelvis, of a mottled slate colour, having a portion of the free border of the omentum adherent to the upper part of its anterior surface. On making slight traction on this, the adhesion gave way, and part of the contents of the bowel escaped. A perforating ulcer, which had been prevented communicating with the abdominal cavity, in consequence of this organised adhesion of the omentum, occupied the anterior wall of this part of the gut, above its middle. It was the size of a three-penny piece; its borders were smooth and beveled off, and had quite cicatrised. It was evident, in this instance, that the bowel had been returned with a patch of mortification in its walls, and which had sloughed off into the cavity of the gut; and that extravasation into the serous cavity had been prevented by plastic union of the circumference, of the resulting ulcer with the omentum.

In the above case, it appears to me that if the sac had been opened, the gut would probably have given way in the process of reduction, inasmuch as the pressure exerted on the gut in order to effect a reduction would have been direct, instead of having been indirect, and exerted through the equalizing medium of the sac, and a liquid represented by the fluid products of congestion and inflammation in the sac. The following remarks by Mr. Luke are so pertinent to this, and cases similar to it, that I cannot do better than quote them:—"When the mortification of the bowel is extensive or general, the practice of opening it freely, and leaving the

part in the sac unreduced, is the most advisable course to be pursued; but when small portions are mortified, the practice of leaving it unopened and returning it into the abdomen appears preferable. In the latter case there is a very great probability that the continuity of the canal will remain undisturbed, by reason of the lateral aperture formed in it by the separation of the mortified part usually becoming closed by adhesions of its margins to the abdominal parieties or adjoining viscera. The mortified part is thus rendered capable of being discharged into the intestine itself, without the occurrence of effusion into the peritoneal cavity. Such cases do not therefore render Petit's operation improper, because, if fully ascertained, they would not receive any treatment beyond the usual taxis."*

Case 2.—*Right femoral hernia; sac not opened; strangulation of small portion of calibre of intestine; sloughing off of mucous membrane.* — A woman, aged seventy-three, was operated on, the strangulation symptoms having lasted fifty hours. No truss had ever been worn, and she had had palsy of the lower extremities for eight years. Death took place on the third day. On a post-mortem examination, it was found that only a small portion of the calibre of the small intestine had been strangulated, and this part was represented by a circular raised patch on its anterior surface, nearly equal to a florin in circumference. This was situated just outside the femoral ring, *and was adherent to this part of the abdominal wall.* It gave evidence of having been severely inflamed. The serous coat to this extent was covered with fibrin, and the surrounding serous membrane was very congested. The mucous membrane was to a similar extent covered over with reddish lymph, and about the centre of the deposit was a circular space, in which the tip of the finger could be placed, and in which the circular muscular fibres could be seen, the mucous membrane having been thrown off. This case points out in a satisfactory manner, in the first place, that under a given amount of inflammatory action, the mucous membrane is, of the three coats of the intestine, the most prone to be affected; and secondly, the

* Medico-Chirurgical Transactions, vol. xxxi.

process of adhesion, which glues a highly-inflamed portion of gut to the abdominal walls. Had this patient lived, it is possible that the muscular and serous, as well as the mucous, coats would have been thrown off into the cavity of the intestine, and an ulcer have resulted, the borders of which would have contracted an adhesion with the abdominal walls, and so the continuity of the canal have been restored, without the danger of peritoneal effusion. The case would then have resembled Case 1, which latter, no doubt, went through similar phases of change, the omentum, however, having taken the place of the parietal peritoneum.

Case 3.—*Right femoral hernia; sac opened in consequence of fulness in femoral region, and continuation of symptoms; no intestine discovered. Death from giving way of gut, which had prior to operation been reduced by the taxis.*—A labourer, aged fifty-six. Symptoms of strangulation had lasted forty-seven hours, and about five hours before admission, the taxis had been used without any amount of force. The result was, the sensible diminution of the tumour, without relief to the symptoms. When admitted, fulness in the femoral region led to the performance of an exploratory operation. On opening the sac, a yellowish fluid, mixed with air-bubbles, escaped. The patient died forty-eight hours after admission, peritonitis having supervened on the symptoms of strangulation. On the post-mortem examination, evidences of acute serous inflammation were found. About an inch to the pubic side of the femoral ring, and not more than twelve or fourteen inches from the duodenum, was the portion of gut that had originally constituted the hernial protrusion. It represented about the lower two-thirds of the calibre of the intestine, and had the appearance of a prominent pouting excrescence, with an aperture through which a sixpenny-piece could have been passed into the interior of the intestine, and springing apparently from a constricted neck, which was the part that had evidently been girded by the femoral ring. The walls of the apparent excrescence stood firmly out, in consequence of the inflammatory exudation that had taken place in and between its coats. The borders of the aperture were thin, ragged, and sloughy and at its back part was

another thin, irregular aperture, with a sloughy border. In this instance we have an example of a recent rupture, with severe strangulation symptoms, a part of the gut only being involved. Of all forms of rupture, this I think possesses the most intense symptoms, and is fraught with the greatest danger to the patient, from the consequent rapid and irremediable lesion that frequently affects the bowel. Of all forms, it is that in which the operation should be performed without the previous use of the taxis. An immediate operation without it, might, in this instance, have saved the life of the patient.

Case 4.—*Right femoral hernia, sac opened; false anus; recovery.*—A married woman, aged forty-seven, was operated on for strangulated hernia of seven or eight years' duration, and forty-eight and a half hours' strangulation. On opening the sac, which contained a small knuckle of intestine, bloody fluid came out; the gut looked much inflamed, and here and there as if it had been bruised. No truss had ever been worn, and the patient not liking to say anything about the rupture from feelings of delicacy, no medical man had known of its existence, and the patient herself was unaware of its exact nature. The bowel descended after violent exertion in haymaking. The patient was sick every day until the eighth after the operation. On the ninth day, fæcal discharge came away from the wound, the discharge not however being complete, as the rectum acted slightly. This partial discharge continued until the twenty-eighth day, and a day or two after this the wound had healed. A good deal of benefit was in this case derived from the application of collodion to the parts surrounding the inguinal wound, and which by its protecting power much lessened the irritation which would have otherwise occurred from the contact of the fæces with the soft parts. Collodion was applied in a similar case by Mr Erichsen, the particulars of which are related in The Lancet of July 8th, 1854.

Case 5.—*Right femoral hernia; sac opened; false anus; recovery.*—A housemaid, aged thirty-one, was operated on for a hernia of two years' duration, and of twenty-one hours' strangulation, which came on at night-time, in consequence

she said, of vomiting from having eaten too much salmon for dinner. Her truss had been laid aside for a week This was one of the most acute cases I ever witnessed, and the vomiting at times took place almost every minute. The groin was exquisitely tender to the touch. The taxis had been freely applied before admission. The patient was placed under chloroform, and Mr. Gay's oblique internal line of incision made. It was found necessary to open the sac, and this was not accomplished so easily as if the incision of the parts over the neck of the sac had been made vertically. A small quantity of dark bloody fluid escaped on opening the sac. The loop of intestine that was in it was highly congested, and in consequence of having lost its resiliency, required to be gently pushed in an upward direction before it could be returned into the abdomen. The symptoms of strangulation gradually went off, but on the fourth day the patient complained of uneasiness and nausea, which depended apparently on a tympanitic state of the abdomen. An injection was administered, and was followed by a copious discharge from the bowels, and feculent discharge from the groin, a feculent odour having been detected from the discharge from the groin on the third day. All the fæces passed by the wound until the twenty-seventh day, when, with the exception of a very small quantity, all passed by the anus. During this interval collodion was applied to the groin, and a fluid nutritious diet was had recourse to, and when fæces began to pass by the rectum, the patient was allowed mutton, porter, and wine. The wound had quite healed on the fifty-fourth day.

These two cases may be looked on as illustrating the course of treatment that should be adopted under similar circumstances. The abstinence from solid food, and the administration of fluid, nutritious, and, if necessary, a somewhat stimulating diet, not in large, but very small quantities, at repeated intervals, was very carefully attended to, as, also, the frequent removal of fœtid discharges from the groin, which might possibly have set up inflammation around the wound of an erysipelatous character. In the first of the cases it will be remarked that the symptoms of strangulation did not subside until the eighth day after the operation. The persistence for

a variable time of the symptoms of strangulation after a hernial operation, and occasionally after the use of the taxis, cannot well be wondered at, considering the period that must necessarily elapse before the bowel can recover its characteristic contractile power, in consequence of the lesion of its coats, or their infiltration by inflammatory products. Some of the old physicians were much puzzled at the continuance of symptoms after an operation for strangulated hernia; and Travers mentions that on one occassion M. Parisot performed an operation at Lyons, and after the operation the symptoms that had existed before it still continued. The physicians who were in attendance taxed the surgeon with an imperfect operation, and insisted that he had not removed the stricture, because the young lady continued to vomit. They made her swallow shot, and afterwards quicksilver, in the quantity of three or four ounces. Dionis, who was associated with M. Parisot in the treatment of the case, remonstrated, and explained that the injured intestine was so debilitated by over distention, that these ponderous substances would lodge in it and burst it. He proposed the exhibition of purgatives, which were had recourse to. By two doses the bowels were emptied, the vomiting ceased, and the patient recovered.

Case 6.—*Strangulated left femoral hernia; sac not opened; death on the fifth day.*—A man, aged fifty-three, a labourer, suffering from chronic bronchitis, was operated on for a small rupture of only two days' duration, and a few hours' strangulation. It was the most recent case I have seen; Gay's line of incision was made. The operation lasted about two or three minutes. On the second day erysipelas came on in the left groin, accompanied with great dyspnœa, blueness of lips, and abdominal respiration. The symptoms gradually increased, and he expired on the fifth day. The erysipelas was found, on the post-mortem examination, to have extended from the left femoral region to near the left axilla. Over the left side of the abdominal muscles, from the line of incision upwards to the extent of eight or nine inches, was a thick layer of fibrino-purulent effusion in the meshes of the superficial fascia. The sac which occupied the saphenous opening, was surrounded by several small glands in a state of inflammatory congestion; Gimbernat's ligament had been nicked about

one-eighth of an inch below Poupart's ligament, without either the sheath of the vessels or the falciform edge having been interfered with. There was no trace of peritonitis. About two inches and a half of the middle of the small intestine were intensely congested; part of this portion of the intestine must have been in the sac. There existed most extensive disease of the lungs.

This case is interesting as showing that in recent herniæ Gimbernat's ligament only may require incision; for in this instance it was divided superficially to the sheath of the vessels even, and the rupture, which had previously been tense, and without the slightest impulse on coughing, readily went back. It is to cases like this that Gay's line of incision is particularly applicable. This patient's powers were vitally much depressed, and accounted for the rapid access of erysipelas after so simple an operation, for the line of incision externally was barely an inch and a half in length. The man had been a great drinker, and hardly ever took meat.

Case 7.—*Strangulated right femoral hernia; sac opened; recovery on the tenth day.*—A woman, aged fourty-four, who had never used a truss, was operated on for a hernia of thirty-seven hours' strangulation, and five years' duration. A vertical incision was made over the neck of the tumour, and structures round the neck were divided, with a view of reducing the protrusion, without opening the sac. This could not be accomplished. The sac was opened, and was found to contain a large quantity of omentum, perfectly adherent to the neck of the sac, so that the latter was obliged to be dissected away from it before the bowel could be reduced. The gut was much congested. The omentum, which was healthy, was left in position. The wound had quite healed on the tenth day, the earliest period of recovery after the sac had been opened that has come under my observation.

Case 8.—*Strangulated right femoral hernia; sac unopened; second operation; hospital gangrene; recovery,*—A charwoman, aged forty-five, was operated on for a hernia of seven years' duration, and six hours' strangulation. This was the second operation, as she had undergone a previous one, on the same side, more than two years ago. On the first occasion, she had

slipped through the framework of a chair, the bottom of which had given way. Gay's operation was had recourse to, and she recovered on the sixth day. On the second occasion, the vertical incison was used, and (as on the first occasion) she suffered for several days with retention of urine after the operation. She recovered on the eleventh day, and went out cured on the nineteenth. She was re-admitted on the tenth day afterwards, with a circular, sloughing sore, with hard, raised edges, and dirty-brown coloured surface, exuding a thin, ichorous, and most fœtid discharge. The skin surrounding the edges of the sore was of a dusky-red colour, and the tissues were rather hard, and somewhat boggy. There was but little constitutional disturbance. She was ordered generous diet, bark, ammonia, and wine, and the strongest nitric acid was freely applied to the ulcer. After the separation of the slough, the wound was four inches long, and three wide, and the edges still not being clean, the acid was again applied. After a third application, the wound, which was ultimately four inches and a half long, and three and a half wide, and involving to some extent the abdominal muscles in the vicinity of the line of operation, gradually took on a healthy, healing action, and on the eighty-eighth day after the ulcer had commenced, cicatrization was complete. The occurrence of hospital gangrene in this case was apparently owing to the truss having been applied to the groin before the soft tissues involved in the operation, had become well consolidated, and to the circumstance that hospital gangrene was rife at the time, and after, the patient was operated on.

Case 9.—*Right oblique inguinal hernia; hour-glass contraction of the sac; further impediment to reduction at the inner ring; recovery.*—A sail-maker, aged eighteen, was operated on for a hernia of six hours' duration, and five of strangulation. The history of the case was involved in a good deal of obscurity, and the patient merely stated that a short time before admission, the right scrotum, without any particular cause, became fully distended, and was rather tense; symptoms of strangulation came on almost immediately afterwards. The testicle could not be felt, and the rupture was consequently looked on as one of congenital variety. On the application of the seat of strangulation test, the impulse

ceased about a quarter of an inch below the outer ring, and there the tumour was evidently much constricted. Above this circle of constriction, it again swelled out, and was lost in the inguinal canal. An incision was made over the tumour, so as to command its narrow constricted portion, and over this was seen a dense band of fibres, on the division of which the impulse became communicated from the lower to the upper part, but the bowel could not be reduced. The sac was then opened, a knuckle of intestine intensely congested, together with fluid, occupied it. The gut was passed back into the abdomen on the division of a further impediment to reduction, situated chiefly about an inch and a quarter from the outer ring, in the direction of the inner, and caused by the neck of the sac. Slight peritonitis, treated by leeches, calomel and opium, succeeded the operation, as also did orchitis on the left side, which subsided on the use of ice. In this curious case the seat of strangulation test was but of partial service, as it pointed out the locality of only one impediment to reduction. Coughing would have pointed out the whereabouts of the other, as the impulse would have stopped at the inner ring, and not have been communicated by it to the upper division of the swelling.

In concluding this communication, I would observe that I have endeavoured as far as possible to avoid any remarks or deductions not warranted by particulars, contained either in the illustrative cases I have brought forward as occurring in the London Hospital, or amongst other cases I have met with privately. Of the constitutional treatment after a hernial operation, I have not thought it necessary to say anything, inasmuch as the balance of authority is at present great, and is becoming gradually greater, in favour of a negative or narcotic, over a purgative plan of treatment.

1, Broad Street Buildings, 1856.

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