AN INQUIRY INTO THE NATURE OF THOSE CASES
OF
STRANGULATED OBLIQUE INGUINAL
HERNIA,

TERMED

“RÉDUCTION EN BLOC, OU EN MASSE;”

WITH SPECIAL RELATION TO THE
ANATOMY OF THE ACTUAL LESION,
AND PRACTICAL DEDUCTIONS DERIVED FROM AN EXAMINATION
OF THE CASES.

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“Il ne faut jamais travailler dans le but de soutenir une théorie, parce qu'alors l'esprit se prévient.”

“Notre seul but doit être la découverte de la vérité.” — CUVIER
 (“Opinion sur les théories”).

MODERN writers on the subject of strangulated hernia have recognised the occurrence of cases, in which the hernial tumour has been pushed into the abdominal cavity by the forcible efforts of the patient, or of the surgeon.

This mode of reducing a hernia has received the name of “réduction en bloc,” or “en masse.”

The perplexing nature of these cases, their urgency, the fatal results attending them if they are not at once recognised, and the impediment to the reduction of the hernia immediately removed, may plead as an excuse for intruding the following observations on the members of this Society.

From the time of Le Dran to the present day, the practicability of returning a hernial protrusion into the abdominal cavity, *together with its investing sac*, whilst constricted or strangulated by the orifice of the sac, has been admitted. This doctrine is now indiscriminately applied to inguinal, inguino-scrotal, and femoral herniæ. The principle was first, however, enunciated by Le Dran in consequence of having met with a case of strangulated *femoral* hernia, in which, although the tumour had been reduced, the patient died with all the symptoms of strangulated bowel persistent. *Post-mortem* examination demonstrated that the orifice of the hernial sac strangulated the bowel, and that *the sac with its contents* had been pushed within the abdominal walls. ('Obs. de Chir.,' 2 vols. 12mo., Paris, 1731.)

The purport of this inquiry is to ascertain—

1st. The applicability of the terms "réduction en bloc," or "en masse," to cases of *inguinal* and *inguino-scrotal* herniæ *exclusively*; whether the lesion stated to take place does ever happen; in point of fact, is it practicable to detach the hernial sac from its connexions in the scrotum, push it through the abdominal rings and inguinal canal, and lodge it within the abdominal walls?

2dly. To endeavour to demonstrate the actual morbid anatomy of the lesion, by giving a description of the dissection of cases, in which this accident is said to have occurred.

3dly. To show in which varieties of inguino-scrotal hernia this accident most frequently happens.

4thly. To point out the practical inferences deducible from the examination of these cases.

PART I.

After a critical examination of the cases on record termed "*réduction en masse*," we may arrange them in two classes.

CLASS I.—The cases in which the patient died with the strangulated bowel unrelieved.

CLASS II.—The cases in which a cutting operation was performed for the purpose of relieving the strangulated bowel.

CLASS I.—Upon reference to the cases recorded by MM. Saviard,¹ Ricot,² Arnaud,³ Scarpa,⁴ Sir Charles Bell,⁵ M. Laugier,⁶ and some others, the nature of the lesion described may be classified under three heads.

1. Those in which *the hernia* is pushed out of sight, and is found, *post mortem*, between the peritoneum and the abdominal walls.

2. Those in which *the hernia* is supposed to be reduced, but is found, *post mortem*, to be *in a pouch* within the abdomen.

3. Those in which *the orifice of the hernial sac has been torn off*, which circumstance permits the hernia to be pushed within the abdominal walls, but not into the peritoneal cavity.

In some of the cases the hernial sac is mentioned, but I cannot find an instance in which the description might lead to the belief, that the sac had been detached from the scrotum; and in the case described by Sir C. Bell, the illustrative woodcut shows clearly that no such lesion could have taken place.

¹ 'Obs. de Chir.,' Paris, 1702.

² Arnaud, 'Diss.,' &c., p. 382, obs. vi.

³ Op. cit., p. 389.

⁴ 'Sull. 'ernie,' 2d edit., p. 49.

⁵ 'The Lond. Med. Gaz.,' vol. i, p. 485.

⁶ 'Bull. de l'Acad. Roy. de Méd.,' Juin, 1840.

CLASS II.—Let us now examine the nature of the operation performed for the relief of the strangulated bowel, and especially as regards the situation, or region, in which the hernial sac was opened. Be it remembered, that it is an essential characteristic of this variety of hernia that *the sac* has been pushed into the abdominal cavity, and must, therefore, in the event of the protrusion having descended into the scrotum, have been detached from its scrotal connexions.

I would ask, is it possible that so much injury could be inflicted on the tissues of the scrotum without some very marked indications of its existence?

In a majority of instances, the hernia seems to have descended into a scrotal sac of larger or smaller size, yet it cannot escape observation that there is not, in one of these cases, a single remark made upon the state of the scrotum. Would not this region have exhibited signs of contusion? Would not ecchymosis have been developed, or, after a few hours, inflammatory effusion poured into the scrotum? Indeed, in many cases several hours elapsed between the supposed reduction of the sac with its contents and the operation, and yet the condition of the scrotum is not alluded to in a single instance.

The only cases in which the slightest allusion is made to any injury which might be presumed to result from the forcible tearing asunder the connexions between the hernial sac and its investing textures are related by Mr. Luke and Mr. Curling.

Mr. Luke writes—"A local indication had also now arisen by the formation of a tumefaction along the course of the inguinal canal." This was on *the eighth day* after the commencement of the attack. Continuing the narrative, "an incision was made over the seat of tumefaction, from which a quantity of highly offensive, sanious fluid exuded, and by the infiltration of which into the cellular texture of the part the tumefaction had been caused." ('Med.-Chir. Trans.,' xxvi, p. 165.)

Mr. Curling writes—"An incision having been made

into the spermatic cord, it was found to be swollen, chiefly from œdematous effusion." ('Lancet,' 1850, vol. ii, p. 81.)

But one inference can be drawn from the omission of all mention of any morbid condition of the scrotum in the cases, in which this injury is supposed to have been inflicted.

But, assuming that a morbid condition of the scrotum and inguinal canal did exist, and that, through neglecting to observe it, the circumstance had not been stated, we are relieved from all doubt upon the matter by Mr. Luke, who regards the absence of all such indications of injury as one of the most prominent features by which to form a diagnosis of the accident. He writes, when describing the operation, and after stating that the tendon of the external oblique muscle, the abdominal ring, and spermatic cord were exposed, "a finger was then introduced into the ring to feel for some indication of the presence of a tumour within the inguinal canal, but there was not any discovered. The canal was next laid open by a division of the tendon of the external oblique muscle. It was observed that the spermatic cord *was clear and unobscured* by any superjacent structure, except by a small lobule of fat which overlaid its upper part. While pursuing the examination towards the internal ring, some cellular membrane lying on the inner aspect of the cord, appeared more condensed than usual in that situation; which, upon closer investigation, proved to be a condensed capsule, containing an empty cavity within it, sufficiently large to contain a small egg. It was thought probable that this capsule had formed an investment to the hernial sac, and was now left empty by the reason of the reduction, that at this time was strongly suspected to have been effected." ('Med.-Chir. Trans.,' xxvi, p. 170.) Surely, if this had taken place, the "capsule" would have afforded some, if but slight, evidence of the laceration?

In another paragraph of the same paper Mr. Luke writes, (p. 175)—"The presence of sac, even without hernial contents, causes an abnormal fulness in the part, easily ascertainable by examination. The absence of such fulness in a part, when hernia is known to have previously

descended, necessarily leads to the conclusion that the sac upon which it depended, has been *displaced*, and probably returned together with the hernia."

An explanation of the circumstances might be brought forward by stating that the sac is not supposed to be wholly and entirely returned into the abdomen, but only a portion of it, and that in some cases but a partial reduction is effected, leaving the lowermost part of the body and fundus of the sac behind. But I contend that, if any part of the sac be detached from its scrotal connexions, some traces, however small, would remain to indicate the laceration.

Again, admitting that the hernial sac had been detached and pushed into the abdomen, and that it had been again brought down before the operation, or at the time of its performance, would not the operator find its body and fundus lying loose in the inguinal canal or scrotum, and but slightly attached at its neck? But in the relation of the cases such an observation does not occur, and, with the exception of a few instances, the hernial sac has been always opened before the sac enclosing the hernia has been reached. Nay, further, the operator, in many instances, states particularly that he experienced the greatest difficulty in bringing down the sac, when he had at last reached it. Does not this statement militate against the fact of the sac having been detached from its connexions? But we may be told that it has formed new adhesions in its novel position. Has there been time for these to be developed?

From such statements as the above, we may conclude that surgeons have not observed any appearances, either before the operation or at the time of its performance, leading to the inference that the hernial sac had been torn from its connexions in the scrotum and inguinal canal; but that, because the hernial sac was not clearly seen, it has been assumed that it was pushed into the abdomen. Mr. Luke is perfectly correct in stating that the sac is "*displaced*," but I hope to be able to demonstrate that it is not pushed bodily into the abdomen by being torn away from its connexions in the scrotum and inguinal canal.

Having examined the nature of the operation performed in these cases, and stated that in the majority of instances the hernial sac was opened in the inguinal canal, we may take advantage of the fatal cases to ascertain the local injury resulting from the supposed reduction of the hernial sac with its contents into the abdomen.

I have collected the record of eight cases, in which it is said that the hernial sac was found in the abdomen and opened within its cavity, or pulled out for the purpose of liberating the strangulated bowel. Of these cases only one terminated fatally, and this fatal result is entirely attributable to the long period the bowel had been strangulated before the patient came under the treatment of the operator. That period was six days. In the relation of the case ('Lancet,' 1850, vol. ii, p. 81) it is stated, that the inguinal canal was exposed, but no hernial sac could be made out. An empty sac was found at the back of the cord. Something like a tense sac was felt in the abdomen at the situation of the internal ring. "An opening was next made into what seemed the peritoneum, and intestine escaped." From this sac a small aperture was felt, which was divided. *Necropsy*.—General peritonitis. "In the right iliac fossa, between the peritoneum and fascia transversalis, there was a large hernial sac, which contained a coil, about five inches, of intestine The neck of the sac appeared to correspond with the internal ring, but to have become displaced . . . and the dilated pouch of peritoneum which formed the sac, instead of descending along the inguinal canal, had passed into the iliac fossa, and remained within the boundary of the abdominal walls."

In the case related by Mr. Luke, to which allusion has been made before, he states—"The large hernial sac discovered during the operation was brought more fully into view," (this sac having been incised by the operator in the inguinal canal.) "It was found to occupy a considerable space just within the abdominal parietes, in the vicinity of the internal ring. The fundus of the sac lay a little below its level towards the cavity of the pelvis, while the

neck (still contracted so as obviously to have been the original seat of stricture) lay in an upward direction towards the umbilicus, and between three and four inches distant from the situation of the internal ring." ('Med.-Chir. Trans.,' xxvi, p. 162.)

In the relation of the cases by Mr. Cock, he distinctly states that the hernial sac was opened in the inguinal canal, and in the detail of the necropsy he writes—"It was not until the omentum and some folds of bowel had been turned aside that the adventitious pouch was brought into view, and then the ring of peritoneum constituting the entrance into it was clearly seen, as depicted in the drawings." (2d case, R. E—, p. 59.) The drawings made from a dissection of the parts, show very clearly, especially Plate III, that the hernial sac still maintains its relations to the surrounding parts, and that, in the efforts to reduce the hernia, *the protrusion only, and not the sac*, was reduced within the abdominal walls, but not within the peritoneal cavity. In an appendix to this paper (p. 66) Mr. Cock relates a case, of which I made the *post-mortem* examination, and in conjunction with Mr. Cock. It was demonstrated that the intestine which had formed the hernia, had been pushed through *a lacerated opening* in the neck of the hernial sac, and was lying *outside the peritoneum* upon the fascia iliaca. ('Guy's Hospital Reports,' 1847, pp. 55, 56.)

This, so far as I can discover, is the first recorded statement of this injury, the laceration of the hernial sac, through which aperture the hernia makes its escape, to become lodged between the peritoneum and the abdominal walls. Some authors have stated, as before described, that the protrusion or hernia is pushed outside the peritoneum, but they have not accurately explained how such an accident may occur, nor has one of them spoken of this laceration of the peritoneal sac.

A very interesting and well-described case is recorded by Mr. Reid, of Canterbury, who laid open the right inguinal canal of a man, aged seventy-five years, and exposed a tumour in its upper part, in which, when opened, intestine

was found. This formed, however, but a small part of the sac; the remainder extended so far within the abdomen that it required the full length of the index-finger to reach the stricture. The man died from acute general peritonitis, and the post-mortem examination afforded the following results. "The sac was of the form of a double pouch, with a common neck and opening. A smaller pouch, about one fifth of the whole, partly within the abdomen and partly protruding through the internal ring; a second and larger pouch, placed nearly at right angles to the former, and extending from the inner side of the internal ring *between the peritoneum and abdominal parietes*. . . . The sac was readily drawn out from its double position, and then formed a simple bag. The outer side of the neck of the sac was only slightly separated from its connexion with the abdominal parietes." ('Prov. Med. and Surg. Journal,' 1849, vol. xiii, p. 41.)

This description of the double pouch accords precisely with the appearances in the case to be related directly; and a hasty perusal of the post-mortem examination might lead to the belief that the hernial sac was pushed into the abdomen. But what are the facts pointing to such a conclusion? No morbid condition of the scrotum or inguinal canal is stated to have been observed before the operation, or during its performance, to lead to the inference that the sac had been detached from its connexions, and in consequence of that separation pushed into the abdomen. The author terms the case one of "incomplete réduction en masse," thus intimating an impression on his mind that it did not fully accord with the circumstances of the accident. The statement that the second and larger pouch was placed *between the peritoneum and abdominal parietes*, is to be explained in two ways only. Either the hernial sac was dilated into this second pouch, and thus a duplicature of peritoneum formed; or, the neck of the hernial sac was torn, and the hernia escaped through it outside the peritoneum, and thus was lodged in a region where there seemed to be a newly formed pouch, although in reality there was not.

From the foregoing facts the following conclusions may be deduced :

1. That although the hernial sac is *displaced*, it is not detached from its scrotal envelopes.

2. That the practicability of opening the hernial sac in the inguinal canal is good evidence that it was not pushed into the abdomen.

3. That the difficulty in bringing out the sac containing the hernia from the abdomen, when it is said to be therein, is evidence that its connexions must be more firm in that region than would result from the mere pushing it there.

4. That the situation of the hernia has been pointed out, in some cases, although the exact nature of the lesion has not been fully described.

5. That the details of the cases are not in accordance with the presumed or accepted conditions of the accident.

6. That the evidence of the practicability of the patient or a surgeon reducing, into the abdomen, a *scrotal hernia*, together *with the sac* still strangulating its contents, is, at the present moment, equivocal.

7. And, therefore, that the term "*réduction en bloc*, or *en masse*" is not so applicable to cases of oblique inguino-scrotal hernia as to other species.

PART II.

The next point in this inquiry is to demonstrate the actual morbid anatomy of the lesion, and I shall briefly describe the cases which I have carefully examined. I do not pretend that the opportunity has occurred to me to observe every variety that may possibly occur, but, after the facts I shall immediately describe, future observers will have the opportunity of either corroborating or adding to those which I adduce.

The first case seems to represent only one stage of the

mechanical results arising from pressure upon a hernial tumour. In this instance the hernia, a knuckle of ileum, was strangulated by the orifice of the peritoneal or hernial sac, and so tightly as to prevent the return of it into the peritoneal cavity. The result of pressure upon the scrotal tumour seems to have been—first, to push the orifice of the hernial sac away from the internal abdominal ring; secondly, to dilate that part of the hernial sac between its orifice and the internal abdominal ring into a pouch; and, thirdly, to push the hernia out of the scrotum and inguinal canal into this pouch, where it became fixed behind the internal abdominal fascia.

The hernial sac was not detached from the inguinal canal or scrotum.

CASE 1.—In November, 1834, a man was admitted into Guy's Hospital, under the late Mr. B. B. Cooper, suffering under urgent symptoms of strangulated bowel. When placed in a warm bath he became faint, and whilst in this state the taxis was employed, which proved, apparently, effectual, as the hernia was displaced from the scrotum, and seemed to enter the abdominal cavity. He even expressed himself relieved. However, after recovering from the faintness, all the symptoms of strangulation of intestine returned, and with greater severity. Not the slightest indication of a hernial protrusion could be discovered by a close examination of the inguinal region, and, suffering, as was supposed, from some internal obstruction, the man died.

Necropsy.—The results of general peritonitis were seen. A knuckle of intestine, in length about two inches, was found strangulated in a distinct sac, and it was lying between the right linea ilio-pectinea and the urinary bladder. The sac, as seen within the abdomen, seemed about equal in size to a large walnut; its aperture, which formed the stricture around the intestine, was pretty firm.¹

A preparation of the parts concerned with the hernia is

¹ 'Guy's Hospital Reports,' 1839, vol. iv, p. 331.

preserved in the museum at Guy's, and I have carefully examined it after removal from the bottle. The attachments of the hernial sac to the upper part of the scrotal region seem to be unaffected, but the neck of the hernial sac appears to have undergone a process of dilatation, just within the internal abdominal ring, and thus to have formed a pouch or secondary sac, into which the hernia was forced from the scrotum. The constricted orifice of the hernial sac, which formed the impediment to the reduction of the hernia into the peritoneal cavity, was pushed away from its connexions with the internal abdominal ring, but *there was not*, in this case, any laceration of the hernial sac.

The cases which ensue, illustrate the further progress of events, and they are, I believe, of the kind which most commonly happens. After the continued pressure exerted upon the neck of the hernial sac has dilated it into a pouch, the tissues of which it is composed, being no longer capable of resisting the force from without, gently yield under its influence. The result is the laceration of the hernial sac at that part where it is the least strengthened by the contiguous structures, which permits the escape of any serum it may contain into the subperitoneal connective tissue, and after that the hernia, escaping likewise through the same rent, is lodged outside the peritoneum, between this serous membrane and the internal abdominal fascia, not in a well-developed pouch, but in the connective tissue of the region.

In none of the cases was the hernial sac detached from the inguinal canal or scrotum.

CASE 2.—*Open inguinal portion of the vaginal process of the peritoneum from birth; hydrocele of the tunica vaginalis injected and cured. Irreducible omental hernia, serum in hernial sac; strangulated hernia, operation, death, necropsy.*

In November, 1854, I was asked to see a little delicate boy, æt. 13, whom I found suffering with right inguino-scrotal hernia.

I learned that on the 20th he had been taking violent exercise, by jumping over forms and benches; that on the 21st he had been in bed all day, and some castor oil was administered by his friends, and the next morning he vomited. A surgeon saw him, and discovered the hernia, and the boy stated that the swelling became larger early in the morning of the 21st, which was the first time it had given him any pain or trouble. He was known to have been the subject of a hernia into the inguinal portion of the peritoneum for about a year, but, as was subsequently proved, he must have had an epiplocele for a longer time.

I found him suffering great pain from a large tumour in the right side of the scrotum, which projected forwards; the neck of the tumour being remarkably small and well defined, and terminating sharply at the external abdominal ring. As there could be no doubt of the existence of a hernia, chloroform was administered, and by gradual and continued compression of the swelling, *certainly without force*, it was reduced *in size*. The margins of the external abdominal ring became distinct, and I hoped I had returned a part of the protrusion. A portion, however, remained behind in the inguinal canal, and from the manner in which the hernia diminished in size, I had some misgivings as to its complete reduction within the peritoneal cavity.

Nausea and vomiting continued; the swelling became again large, and I returned to the patient at noon on the 24th. He had been greatly depressed by the chloroform, and was long recovering from its influence. It was now necessary to explore the tumour, and this was done whilst the patient was again under the influence of chloroform.

I found an old hernial sac in the scrotum, to which omentum was adherent, and a coil of intestine (ileum), which was deeply congested and inflamed. I passed my finger upwards along the lower border of the bowel, and felt what I supposed to be the neck of the hernial sac, which seemed sufficiently large to permit the replacement of the intestine; but, in doing this, I discovered that the protrusion passed behind the peritoneum through a rent in

the hernial sac. I then gently drew the bowel back, and, by tracing the omentum upwards, I felt the neck of the sac at a great depth, and then slightly enlarged it. Another attempt was made to reduce the protrusion, but it eluded my efforts to pass it through the orifice of the hernial sac into the peritoneal cavity, and glided behind the peritoneum into a space formed in the subperitoneal connective tissue of the iliac fossa, as was demonstrated after death.

The contents of the sac, except the adherent omentum, having disappeared, the wound was dressed as usual. Vomiting continued, exhaustion followed, and the boy died about ninety-five hours from the commencement of the attack.

Necropsy.—General peritonitis existed. By making the examination from the inguinal region I found that a portion of the bowel had never been returned into the peritoneal cavity, but was lying in the iliac fossa outside the serous membrane. The posterior wall of the peritoneal or hernial sac had been torn about half an inch below its orifice, and through this rent the finger passed on to the fascia iliaca. Looking towards the iliac fossa from within, the anterior abdominal walls being reflected, the intestinal protrusion was girt by the orifice or mouth of the hernial sac, and the hernia seemed to occupy a newly formed pouch in this fossa, where it was covered by the peritoneal membrane of the region.

The hernial sac still maintained its connexions with the tissues of the scrotum, and was not in the slightest degree displaced in that region.

The explanation of the perplexing circumstances attending this case is as follows. In the attempts to reduce the hernia, the mouth of the sac had been pushed upwards and away from its connexions with the internal abdominal ring and fascia. The posterior wall of the neck of the hernial sac had been torn, and through this rent the bowel escaped into the iliac fossa. Probably, also, the serum which the sac contained, oozed through it into the connective tissue of

the same fossa, which explains the gradually diminished size of the swelling by the pressure exerted upon it. At the operation, my finger at first passed through this lacerated opening, instead of into the peritoneal cavity, through the orifice of the neck of the sac, with greater facility than it did at the necropsy, although I discovered the orifice by tracing the omentum upwards, and returned part of the bowel through it. The two apertures could not be distinctly made out during life, and from their proximity, their depth, and the attachments of the neck of the sac being destroyed, the protruded bowel passed partly through the true orifice of the hernial sac, and partly through the abnormal opening in its posterior wall.

CASE 3.—Of this case I made the examination, when demonstrator of morbid anatomy at Guy's Hospital, in 1847. The patient was admitted under the care of Mr. Cock, and the case is published in the 'Guy's Hospital Reports' (series ii, vol. v, p. 66).

The patient himself, after repeated efforts, had pushed into the abdomen the contents of a large hernial sac, which occupied the scrotum. This region had been empty, but when admitted it was occupied by an enterocele, which was reducible, and marked indications of strangulation of intestine continued. Mr. Cock operated upon the patient, divided the narrow orifice of the sac, and replaced the bowel within the peritoneal cavity. The man died of acute peritonitis, and, *post mortem*, a coil of small intestine was found in the right iliac fossa, lying outside the peritoneum upon the iliacus muscle. It had reached this situation by escaping from the hernial sac through a laceration in its neck, and although the coil which formed the original hernia had been returned by Mr. Cock at the time of the operation, another coil had descended subsequently, and now occupied this abnormal position. The secondary hernia was the consequence of violent muscular movements made by the patient after the operation. The appearance of that part of the small intestine which had recently es-

caped through the lacerated hernial sac was clearly indicative of the fact, for it had not undergone any morbid change, whilst that which had been subjected to protracted strangulation was lying in the abdomen, and its morbid condition clearly indicated the constriction which had been exerted around it.

The hernial sac was situated in the inguinal canal and the upper part of the scrotum, and there were no indications, either before the operation, during its performance, or afterwards, that its connexions with the scrotum had been torn. The hernia was developed when the patient was about eighteen or nineteen years old, and although it was not in contact with the testis, it doubtless descended into a canal dependent upon the non-closure of the inguinal portion of the vaginal process of the peritoneum.

CASE 4.—The details of this case are reported by Mr. Aston Key, in the second edition of Sir Astley Cooper's work on hernia.¹

The man was admitted under the care of the late Mr. Morgan, in June, 1825. H—, æt. 58, had been the subject of right, oblique, inguino-scrotal hernia for several years. It had been sometimes irreducible for many hours. Before admission a surgeon had endeavoured to reduce the protrusion, but he did not succeed. Mr. Morgan reduced it, with great ease, by gentle taxis. All the symptoms of strangulation of the intestine remaining unabated, Mr. Morgan examined the inguinal canal, and thought he felt a small tumour therein. He next cut through the integuments over the external ring and inguinal region, exposed the inguinal canal, and found a serous sac, which he opened, but he could not find the intestine. The patient died—about four days and a half from the commencement of the attack.

Necropsy.—The tumour which had been felt in the inguinal canal was a hernial sac, and it contained a loop of

¹ 'The Anatomy and Surgical Treatment of Abdominal Hernia,' folio, 2d edit., 1827, p. 83.

strangulated bowel. The impediment to the reduction of the hernia was the orifice of the sac. Immediately below this orifice was situated the opening of an abnormal pouch, which descended, downwards and inwards, behind the fascia transversalis, in the direction of the crural ring. It was into this pouch that a portion of the strangulated ileum had descended. The communication between the tunica vaginalis and the abdominal cavity was not completely closed, but the finger could not pass from the cavity of the tunica vaginalis into the peritoneal cavity because of the pressure exerted by the hernia.

Here is sufficient evidence that in this case the hernia had descended into the vaginal process of the peritoneum.

A preparation from this case is preserved in the museum of Guy's Hospital, and to make a careful examination it was removed from the bottle. The hernia, as before described, is situated between the fascia transversalis and peritoneum, and it has reached this situation through a rent in the neck of the hernial sac, which rent is the "opening of the abnormal pouch" already mentioned. The mouth of the hernial sac has been pushed away from the internal abdominal ring, and the laceration of the sac has taken place between these two points. The rent is on the posterior surface of the neck of the sac, and corresponds with the posterior and internal borders of the internal abdominal ring. I cannot discover a trace of those appearances which would result from "the hernial sac together with its contents" being pushed into the abdominal cavity. It maintains the same relations with the surrounding parts as it always had.

CASE 5.—In June, 1851, a man was admitted under the care of Mr. Hilton, æt. 49. He was strong, healthy, and the subject of right, oblique inguino-scrotal rupture. He had been suffering with strangulated hernia some hours, when a surgeon succeeded, as he supposed, in effecting its reduction by the taxis. All the indications of strangulated

intestine existed on admission, although there was no tumour distinguishable in the scrotum, inguinal canal, or at the site of the internal abdominal ring. Mr. Hilton explored the inguinal region by a cutting operation, and, having opened the hernial sac in the inguinal canal, he discovered the strangulated bowel, divided the narrow mouth of the sac, and returned the intestine into the peritoneal cavity. The patient survived some hours, but succumbed under acute peritonitis.

Necropsy.—Visible results of acute and general peritonitis. The hernia had been pushed out of the scrotum and inguinal canal through a lacerated opening in the neck of the hernial sac. It had been placed between the peritoneum and the internal abdominal fascia, the mouth of the hernial sac, whilst strangulating the bowel, having been likewise pushed away from its attachments to the internal surface of the internal abdominal ring. The body and fundus of the hernial sac still maintained their relations with the scrotum and inguinal canal.

Let me now explain my views of the mechanism of this accident.

Of the formation of the hernial sac.

In every observation or discussion concerning the varieties of oblique inguinal hernia, or of the accidents occurring in the treatment of such cases, it is imperative that a marked distinction be drawn between those cases in which the hernia descends into the vaginal process of the peritoneum, and those in which the sac is formed by a slow and gradual process of extension of the serous membrane from above downwards.

The shape, length, and relations of the several portions of the hernial sac are quite different in these two classes of cases, and the importance of always bearing in mind the marked differences between them will appear very prominently in some of the subsequent remarks I have to make.

IV.

III.

II.

I.

However, I would here state that, in many of the cases in which a hernia descends into the vaginal process of the peritoneum, it only occupies at first the upper or inguinal portion of that sheath, and that contact with the testis and infantile development are not essential characteristics of this variety of oblique inguinal hernia.

Explanation of the Diagrams.

By the aid of diagrams I will now explain the mechanism of this accident, the so-called "*réduction en bloc*."

DIAGRAM I.—Describes a section of the abdominal cavity and scrotum; the broad, outside, crossed-surface, indicates the abdominal walls: within this the narrow, black line, represents the internal abdominal fascia, which constitutes the internal abdominal ring at A. The inner fine line indicates the relations of the peritoneal lining membrane passing into the scrotum through the internal abdominal ring.

This diagram represents the normal relations of a hernial sac to the abdominal walls and scrotum.

DIAGRAM II.—This represents the relations of the peritoneal hernial sac, in accordance with the description which defines "*réduction en bloc or en masse*" to be "the reduction of the sac, together with its contents, within the abdominal walls."

The peritoneal sac only is represented.

The same parts are indicated as in the first diagram, and by similar lines.

DIAGRAM III.—Illustrates the morbid anatomy of the parts in the first case I have described. The knuckle of ileum is shown in the secondary sac or pouch, which has been formed by a dilatation of the neck of the hernial sac, after its orifice has been pushed away from the internal abdominal ring. A portion of the sac, which is empty, remains in the scrotum. The secondary sac, or pouch, is placed behind the internal abdominal fascia.

DIAGRAM IV.—In this diagram the orifice of the hernial sac is represented to be pushed away from the internal abdominal ring, the neck of the sac lacerated, and the hernia outside the peritoneum, between it and the internal abdominal fascia. In this variety of the accident the hernia is lodged in the loose subperitoneal connective tissue, and it has no serous sac investing it, as in the last variety.

The mechanism of the injury.

The mechanism of the injury, which seems then to be very simple, is as follows. By the pressure employed to reduce the hernia, the contracted orifice of the hernial sac, tightly embracing it, is pushed away from the internal abdominal ring; and, by the continuance of the pressure, the neck of the hernial sac becomes dilated into a pouch within the abdomen, which receives a part of the hernia. Now, if the pressure on the hernial tumour be continued, the neck of the sac becomes torn, and then the hernia escapes through the laceration, and is outside the peritoneum altogether.

The dilatation of the neck of the sac and its subsequent laceration are, I believe, very much favoured by the presence of fluid in the hernial sac, which then exerts an equal pressure on all sides, and that part which is the least strengthened by the surrounding structures is least able to resist it. With forcible pressure from the outside upon a sac containing fluid, if that fluid does not escape into the peritoneal cavity, through the mouth of the sac, the coats of the sac itself must at last give way, and, by this bursting of the investing sac, the fluid is allowed to extravasate into the neighbouring connective tissue. This gives rise to the delusive feeling that, as the hernial tumour is slowly diminishing in size, its contents must be passing into the peritoneal cavity; but such is not the fact.

Judging from the circumstance of the laceration being usually in the posterior wall of the neck of the sac, we may assume this part to be the weakest, and, examining it anatomically, it is certainly that part which derives the least strength from the surrounding structures.

At this point it becomes necessary to inquire how the secondary intra-abdominal pouch is formed. After a critical examination of all the recorded cases of reduction en masse, the fact is elicited that the accident has occurred in two distinct classes of cases, as follows, viz.:

1st. Those cases in which the reduction has been effected without much pressure; and—

2d. Those in which considerable force has been employed to push the hernia out of the scrotum.

In the cases of the first class, it is difficult to suppose that the gentle pressure employed could dilate the neck of the hernial sac into a pouch sufficiently large to contain the hernia, and therefore we must search in the history of these cases for an explanation of this phenomenon. The instances in which we may assume the gradual formation of such an intra-abdominal pouch are very few, and the patients had been the subjects of hernia for some years, and had worn trusses. I purposely employ the expression "assume," because there is no demonstration of the existence of such a pouch in any cases but those in which the "taxis" has been employed, and we well know that the pressure which one surgeon would call "gentle taxis," another would not describe by such a mild term.

Mr. Cock has offered an explanation of the formation of the intra-abdominal pouch in the paper to which reference has been already made.¹ After stating that there are two remaining forms to be described, he writes: "The first consists of the prolongation of the hernial sac beyond the internal ring into the abdominal cavity, where it becomes dilated into a pouch of greater or less size, lying on the fascia iliaca, between the internal ring and spinous process of the ilium, and contained between the fascia transversalis and the peritoneum. On the inner aspect of this pouch, at a distance of between one and two inches from the internal ring, is the opening of communication with the peritoneal cavity, and the circle of this opening forms the seat of stricture. This pouch is no doubt of slow and gradual

¹ 'Guy's Hospital Reports,' 1847, p. 54.

formation, and appears to be the result of frequent and protracted manipulation to reduce an old hernia, which has been in the habit of constantly descending through a lengthened period of time. The repeated application of the taxis, and the means constantly used by the patient to return the intestine, as often as it protruded, appear at length to have had the effect of separating the circle of peritoneum constituting the mouth of the sac from its connexion with the margin of the internal ring; a portion of the sac becomes pushed upwards from the inguinal canal through the opening in the fascia transversalis, and gradually dilates into the cavity, or pouch, which I have already described."

To this I will add another explanation. The pouch is situated between the mouth of the sac and the internal abdominal ring and inguinal canal. Now, the pad of the truss is commonly placed over the inguinal canal, and its pressure is successfully exerted to prevent the rupture from passing through the external abdominal ring. But, supposing the rupture to descend through the mouth of the sac, a double pressure will be exerted upon it, *below* by the pad of the truss, *above* by those forces which are continually pressing upon it from that region, and thus the constant influence of these forces would be upon a point of the hernial sac between the extremes, namely, its orifice and fundus. The point upon which the pressure would fall, will correspond to the neck of the hernial sac; it might then become dilated, and the intra-abdominal pouch would be developed.

However, the slow and gradual formation of such a pouch is purely conjectural, for its existence, independent of some complication which might be referred to the immediate application of the taxis, has not yet been recorded, to my knowledge.

The cases which might be quoted in support of the opinion that the intra-abdominal pouch is sometimes formed slowly and gradually, are as follows:

Arnaud, 'Diss,' p. 387, obs. ix, anno 1740.

Luke, 'Med.-Chir. Trans.,' xxvi, p. 162.

Cock, 'Guy's Hospital Reports,' 1847, p. 55.

But after a careful perusal of these cases it will be, I think, admitted that they scarcely uphold the theory.

PART III.

[In this Part an Analysis of the tabulated cases of Réduction en bloc is given.]

Ages at which the herniæ were developed.

Inguinal herniæ are developed in infancy, youth, and adult life.

Those occurring during the first and second periods usually descend into the vaginal process of the peritoneum, whilst those of the third period sometimes descend into the above-named peritoneal process, and are also formed as the result of a slow and gradual extension of the peritoneum.

Of the 37 cases, I am unable to state the age at which the hernia was developed in 15, but of the remainder it was formed at the respective ages as follows :

In infancy . . .	in 4 cases.
In youth . . .	in 2 „
After puberty—	
Before 20 years . .	1 case.
From 20 to 30 years .	8 cases.
„ 30 to 40 „ .	5 „
„ 40 to 50 „ .	2 „
	—
	22
Not stated in . . .	15
	—
Total . . .	37

From this table it should be observed how large a proportion of the cases of hernia, in which this accident (réduction en bloc) has resulted, was developed before thirty years of age, the proportion of the 22 cases being 15 before thirty years of age, and 7 after. This circumstance is significant of the precise nature of the hernia, which will be more fully developed immediately.

Of the variety of hernia.

All the cases were of the kind described as *oblique* inguinal, a very large majority being *scrotal*, that is, the hernia had passed through the external abdominal ring. A large majority was in the right side of the scrotum.

In the <i>right</i> side . . .	20 cases.
In the <i>left</i> side . . .	9 „
Not stated in which side . . .	8 „
	—
	37

Some of the patients were afflicted with rupture on both sides, but the above table includes that side only, on which the hernia was reduced.

Numerical comparison between the cases of hernia into the vaginal process of the peritoneum and the variety of oblique inguinal hernia of slow development.—In a majority of cases the hernia descended into the vaginal process of the peritoneum, and of this fact the evidence is conclusive. The following table shows the numerical proportion :

Certainly into the vaginal process in 14 cases.	
Probably into the vaginal process in 8 „	
	—
	22 „
Not sufficient evidence of being into	
vaginal process	15 „
	—
Total	37 „

But even among the cases in the last category there are indications leading to the supposition, that even in a few of them the hernia may have been in this process of the peritoneum.

This circumstance is very important in regard to the mechanism of the accident. Bearing in view the anatomical differences, which exist between the cases in which the hernia descends along a canal already formed to permit its

descent into the scrotum, and those in which the hernia forms for itself a covering by pushing the peritoneum before it, we can readily understand why the laceration of the neck of the hernial sac takes place more frequently in the first class of cases than in the second.

Anatomical comparison between hernia into the vaginal process of the peritoneum and the variety of oblique inguinal hernia of slow development.—In cases of the first class, the orifice of the hernial sac is small, the situation in which it is originally formed is not influenced by the descent of the hernia, and the relations of the internal abdominal ring are maintained throughout, uninfluenced by the protrusion. Consequently, the length of that portion of the hernial sac lying in the inguinal canal, or between the internal and external abdominal rings, exceeds, very greatly, that of all other varieties of inguinal hernia. To this anatomical conformation the difficulty in reducing the hernia must be mainly attributed, for the orifice of the sac cannot either be felt or fixed, and any pressure from the scrotal region has a tendency to push the orifice of the sac away from the internal abdominal ring, especially too when the orifice so tightly constricts the hernia as to prevent it passing into the peritoneal cavity. This great length of the inguinal portion of the hernial sac would also favour its dilatation into a pouch within the internal abdominal ring, and the laceration of this, from prolonged pressure, would permit the escape of the hernia outside the peritoneum.

Now, the converse of all the anatomical relations pertaining to hernia into the vaginal process of the peritoneum is manifested in those varieties of inguinal hernia developed late in adult life, and preceded by a gradual extension of the peritoneal membrane to form the hernial sac. The orifice of the sac is large; the abdominal rings are approximated; the inguinal portion of the hernial sac is short; the orifice of the sac can be easily felt and fixed, and there is not the same facility offered to push the mouth of the

sac away from the internal abdominal ring, and lacerate its neck.

Situation of the testicle.

In three of the cases of hernia into the vaginal process of the peritoneum, the testis of the same side as that in which the hernia was formed, was lodged in the inguinal canal. In two of these, the organ had never descended into the scrotum, but in one it is stated that, upon an occasion when the rupture had been reduced by much force, the testicle, together with the hernia, had been pushed back into the abdomen.

By whom, and by what local means the hernia was pushed out of the scrotum, and the nature of the constitutional measures employed to assist in the reduction.

In some of the cases a surgeon, and in others the sufferer, effected the removal of the hernia from the scrotum. The force employed is variously described, thus: "by moderate pressure," "with great difficulty," "avec beaucoup de peine."

The constitutional means have been those usually adopted in cases of strangulated hernia—hot baths, venesection, opium, and chloroform. I believe that it is during the influence of this anæsthetic agent that great mischief may be done, and that the sac may be very easily torn at the time when all muscular tonicity is removed.

Local indications that the hernia is not reduced into the peritoneal cavity.

In the majority of the cases there has been usually some local indication that the hernia was not entirely reduced into the peritoneal cavity. These were repeated descents of the protrusion, slight fulness at the internal ring, and pain on pressure over this region. Even a small

persistent tumour has, in a few cases, indicated the necessity for exploration.

PART IV.

Practical deductions.

Very important practical deductions are involved in the preceding analysis of the cases, and I shall now endeavour to extract those facts which must exert important influences in the formation of a correct diagnostication of these complicated cases, as well as on their successful treatment.

I. *Diagnosis.*

1. The analysis shows that cases of this nature may occur in patients varying between the ages of thirteen years and seventy-nine. Therefore, at any age after puberty, and during adult life, the surgeon may be prepared to meet with this accident.

2. Complications arising from the lesion described seem to affect the herniæ developed in early life more frequently than those which are formed after forty years of age. And thus the diagnostication may be assisted by ascertaining what was the age of the individual under observation at the time when the rupture was first developed.

3. All the observations on record were of *oblique* inguinal herniæ, a majority of them being scrotal, and on the right side. When there is a rupture on both sides of the scrotum, the diagnostication of the strangulated bowel is rendered extremely difficult. But, acting upon the experience of the successful issue of a case in which Dupuytren opened both the inguinal regions, the surgeon would be justified in following the example.¹ In one case,

¹ Dupuytren, 'Leç. Orales,' edit. 1832, t. i, p. 583.

a correct diagnostication was formed of the side upon which the strangulated bowel existed, by observing that on one side the rupture readily descended, whilst on the other it seemed to be reduced, and could not be made to come down, which it had always previously done upon exertion. This was the side upon which the bowel was strangulated, and an operation saved the life of the patient.¹

4. A large proportion of the cases of oblique inguinal hernia, to which this accident happened, was of that class in which the bowel descends into the vaginal process of the peritoneum. Accuracy in diagnostication might, therefore, be assisted by obtaining a correct history of the mode of development of the rupture; whether it appeared suddenly in the inguinal canal or scrotum, as the result of immediate exertion or violence, or was the production of slow and long-continued pressure from above, and relaxation of the tissues of the region.

5. The situation of the testis may be a cause of obscurity in the diagnostication of these cases of hernia. When congenitally absent from the scrotum, it is often in the neighbourhood of the abdominal rings, and forms a swelling, which, from the pain caused by pressure over it, might mislead the surgeon as to its precise nature. A careful examination of the region, when a deformity of this kind exists, can alone place the nature of the case clearly before the observer.

6. In the majority of these cases the hernia consisted of reducible intestine *only*, and therefore, when this was pushed outside the sac, and behind the peritoneum, nothing but the sac itself remained as an additional element to the tissues of the scrotum. Under these circumstances, until it can be proved that the hernial sac had been torn away from its scrotal attachments, it must maintain its relations with them. The assumption of the translation of the hernial sac from the scrotum into the abdomen is based upon very insufficient evidence, and, until ocular demonstra-

¹ Dupuytren, 'Leç. Orales,' edit. 1832, t. i, p. 587.

tion of the fact exists, we may expect to find, certainly in scrotal herniæ, some trace of the hernial sac at the upper part of the scrotum, or in the inguinal canal. A majority of the cases show this to be an indisputable fact. But in those cases of entero-epiplocele, in which the omentum is adherent to the hernial sac, it remains irreducible after the reduction of the bowel, and then more or less swelling is perceptible in the inguinal region. I dwell particularly upon these facts, because Mr. Luke, in his very practical paper, writes that "the absence of such fulness in a part, when hernia is known to have previously descended, necessarily leads to the conclusion, that the sac upon which it depended has been displaced, and probably returned, together with the hernia."¹ If, therefore, too much reliance be placed upon the absence of all local indications of a hernia having existed, an incorrect diagnosis might be formed of those instances in which adherent and irreducible omentum is present.

7. A disposition to the recurrence of the hernia may exist many years before the accident which is the subject of this paper happens to it. Or, in other words, herniæ of quite recent formation, as well as those of long standing, may be reduced "en bloc;" that is, the hernial sac may be ruptured in the application of the taxis, and its contents escape through the laceration.

8. The production of this injury must be the result of the application of more or less violence, in the majority of cases, if my interpretation of the nature of the local lesion be correct. When all the tissues of the part are relaxed, and all muscular tonicity and resistance overcome by the anæsthetic influence of chloroform, or any means giving rise to conditions closely approximating such results, it needs but very little pressure to be exerted in order to tear the peritoneal sac, especially when circumstances, before alluded to, favour such lesion. In the diagnostication, then, of this injury to the hernial sac, if too much reliance be placed

¹ 'Medico-Chirurg. Trans.,' vol. xxvi, p. 175.

upon the statements of the employment by the operator of "moderate pressure," "gentle taxis," "no force," and expressions of like tendency, the surgeon may be led astray.

9. Are there any local indications by which the surgeon may diagnosticate the nature of this lesion, and the situation of the hernia? In the majority of the recorded cases the writers describe local indications more or less marked.

They are as follows :

a. Repeated descents of the hernia after its reduction is supposed to have been accomplished.

b. Swelling in the iliac fossa.

c. A hard tumour *to be felt* in the inguinal region and canal.

d. Slight protrusion at the external ring after making efforts to produce the rupture.

e. Pain on pressure and fulness in the iliac fossa.

f. A tumour to be indistinctly felt at the internal abdominal ring.

10. In all the cases the constitutional indications of strangulated intestine were persistent.

II. Treatment.

A review of the cases on the tables very clearly establishes the rule to be followed in the treatment of these cases. If the strangulated bowel is not relieved from its constriction, and the impediment to its reduction into the peritoneal cavity removed, the death of the sufferer is imminent, nay, certain !

To avoid, in the first place, the risk of the occurrence of the complication, great care and circumspection are required on the part of the employer of the taxis, especially *if the patient be under the influence of chloroform*, and the case in hand should be of that variety of hernia which descends into the vaginal process of the peritoneum. This last fact must be ascertained by careful and minute inquiry into the *early* history of the case, the manner of the production of the

hernia, and the age of the patient at the time of its development.

Should there be even the slightest indications of the complication described in this paper, the operator must proceed to explore the inguinal region, for delay is inadmissible. In this operation he should first search for the hernial sac. Having opened this, upon passing the finger upwards to the internal ring, he will very probably pass it through the laceration in the sac, and, feeling intestine, he will suppose that he has reached the peritoneal cavity. This, however, he has not yet accomplished. He must next draw the bowel into the inguinal canal, and then, by passing the finger along the *anterior* surface of the mesentery, he will reach *the orifice* of the hernial sac, which firmly constricts the protrusion. The orifice of the sac must now be divided, and in the reduction of the hernia into the peritoneal cavity, great care is required to prevent it gliding through the laceration. The division of the constriction, or orifice, of the hernial sac is accomplished with greater facility, if an assistant steadily draws the sac downwards, whilst the operator introduces the bistoury on his index finger.

This communication having extended far beyond the limits which I contemplated at its commencement, an apology is due to the Society, and, in relying upon the forgiveness of its members, I trust they will not accuse me of endeavouring to support a theory, for my sole design has been the discovery of the truth, and therefore the advancement of practical surgery.

TABLE

Cases of Inguinal Hernia reduced

Case.	Sex.	Age of Patient.	Variety of Hernia. Usual size.	Right or Left.	Age of Hernia.	Age at development.	By whom reduced.	Means employed.
1	M.	50	Enterocoele	...	"Years"	—	A surgeon	—
2	M.	13	Enterocoele. Probably in vaginal process	—	—	—	—	—
3	M.	47	Enterocoele; scrotal. Probably in vaginal process	Right	20 years	27	A surgeon	—
4	M.	67	Enterocoele; scrotal	Right	30 years	37	Surgeon	Hot bath, which induced faintness
5	M.	30	Enterocoele; scrotal. Probably in vaginal process	Right	5 years	—	Surgeon	—
6	M	—	Enterocoele; congenital. In vaginal process	—	—	—	—	—
7	M.	42	Enterocoele; scrotal; size of hen's egg	—	"Years"	—	Surgeon	After venesection
8	M.	—	Enterocoele; scrotal; size of hen's egg	—	"Years"	—	Patient	—

I.

"en bloc." No operation. Death.

Local indications of Hernia after reduction.	Survived this attack.	Necropsy.	Anno.	Reference.
None	Reduction; six months. Last severe attack eight days	The intestine was not under strangulation from the ring. A bag about the bulk of a hand-ball, formed by peritoneum, contained three inches of mortified bowel (ileum)	1740	Arnaud; Diss., p. 387, obs. ix.
None	—	"The intestine, still strangulated by the neck of the hernial sac, had been pushed up along with the sac beyond the ring, where it was seen rolled up between the aponeurotic parietes of abdomen and peritoneum"	1818— 1819	Scarpa; Sull'ernie, 2d edit., p. 49.
Repeated descents	About 3 days	Hernia in scrotum; it had been pushed within the abdominal muscles, but not within the peritoneum; neck of sac torn from internal ring	1828	Sir C. Bell; Lond. Med. Gaz., 1828, vol. i, p. 484.
None	—	A knuckle of intestine was discovered in a sac, lying between right linea iliopectinea and bladder	1834	B. B. Cooper; Guy's Hosp. Reports, iv, p. 331.
—	6 to 7 days	Knuckle of jejunum confined in inner portion of abdominal ring, strictured by hernial sac	1836	Parish; Observations on Strangulated Hernia.
—	—	" <i>Arrachement du collet</i> " of the hernial sac, by which the bowel was strangulated within the abdomen	1840	Laugier; Bull. Chir., i, p. 363.
None	About 4 days	A small knuckle of intestine just inside the inner ring, strangulated by the sac, which had been returned with it.	1842	Banner; Prov. Med. and Surg. Jour., 1843.
None	About 4 days	—	1844-5	Blackman, p. 38.

TABLE

Cases of Inguinal Hernia reduced

Case.	Sex.	Age of Patient.	Variety of Hernia. Usual size.	Right or Left.	Age of Hernia.	Age at development.	By whom reduced.	Means employed.
1	M.	38—40	Enterocoele; scrotal. Seven or eight inches long. Probably in vaginal process	Right	15 years	23—25	Surgeon	—
2	M.	40	Entero - epiplocele; double hernia. Probably in vaginal process	Left	12 years	28	Surgeon	"Beaucoup de peine"
3	M.	—	Enterocoele, in contact with testis. In vaginal process	—	—	Infancy	Surgeon	—
4	M.	23	Enterocoele; <i>not</i> in scrotum; <i>first descent</i> . In vaginal process	Right	A few hours	23	Surgeon	—
5	M.	—	Enterocoele; double hernia	Right	11 years	—	Patient	—
6	M.	39	Enterocoele; testis in inguinal canal. In vaginal process	Right	"Years"	—	Surgeon	"Moderate pressure"

¹ Arnaud makes this observation (p. 375): "I tried again to bring out the rupture, but contiguous parts upon which it lay, confined it so much that it could not be moved."

II.

"en bloc." Operation. Recovery.

Local indications of Hernia after reduction.	Duration of strangulation.	Nature of Operation.	Anno.	Reference.
None perceptible to sight. Could feel a hard tumour in inguinal region and canal	Between 3 and 4 days	External ring incised; hernial sac opened in inguinal canal; orifice of sac very deep, but incised, and bowel relieved. ¹ The tumour ran along the rectus	1736	Arnaud; p. 371, obs. v.
None in <i>left</i> inguinal region. Tumour in <i>right</i>	Between 5 and 6 days	<i>Right</i> sac opened first, empty. <i>Left</i> next, sac opened in inguinal canal; contents, bloody serum, omentum, and bowel; orifice cut, bowel reduced	1814	Dupuytren; Lec. Orales, ed. 1832, t. i, p. 583.
A tumour could be felt in inguinal canal	—	Sac opened in inguinal canal ²	18—?	Sabatier; edit. 1824, t. iii, p. 520.
Swelling in iliac fossa	—	Inguinal canal exposed, and tumour appeared at internal ring; the hernial sac was opened, orifice cut, and bowel reduced	1824	Sabatier; edit. 1824, iii, p. 522.
Only "une espèce de cordon cylindrique"	About 2 days	Sac opened in inguinal canal, and a <i>cul-de-sac</i> felt higher up; orifice of sac cut, bowel reduced	1832	Dupuytren, p. 587.
"Slight fulness" in right inguinal region; small flaccid tumour at external ring when erect; tumour in site of internal ring which was testis	About 24 hours	Sac opened in inguinal canal, testis seen, and sac with contents drawn out from abdomen; orifice of sac incised, and bowel returned	1843	Luke; Med. Gaz., Nov., 1843.

with as little success as before; the adhesions which the sac had contracted with the

² I have doubts of this being a case in point.

Case.	Sex.	Age of Patient.	Variety of Hernia. Usual size.	Right or Left.	Age of Hernia.	Age at development.	By whom reduced.	Means employed.
7	M.	40	Enterocoele; scrotal; double. Ruptured on right side before 20. In vaginal process	Left	4 years	36	Patient	—
8	M.	74	Enterocoele, size of a good sized pear; double	Right	30 years	44	—	—
9	M.	77	Enterocoele	Left	"Years"	—	Patient	—
10	M.	50	Enterocoele; "in iliac region"	Right	11 years	39	Surgeon	—
11	M.	62	Entero - epiplocele; not in scrotum. In vaginal process	Right	62 years	From infancy.	Patient and surgeon	—
12	M.	—	Entero - epiplocele; scrotal	—	—	—	Patient	—
13	M.	14	Enterocoele; in vaginal process	Right	2 or 3 days	14	Surgeon	Chloroform

Local indications of Hernia after reduction.	Duration of strangulation.	Nature of Operation.	Anno.	Reference.
Not a trace at operation; there had been a little fullness before	44 to 45 hours	Inguinal canal laid open, sac found at internal ring, cut, stricture divided, and bowel reduced	1843	Luke; Med.-Chir. Transact., xxvi, p. 166.
Slight protrusion at external ring after efforts to produce the rupture	About 3 days	Sac opened in inguinal canal, and bowel exposed; orifice of sac cut, and bowel reduced	1845	Wade; Lancet, 1845, July.
None, except slight pain on pressure above left inguinal canal	Nearly 6 days	Inguinal canal opened, and cord exposed. Tumour felt at internal ring, opened; hernial sac traced to its orifice which was cut, and bowel reduced	1849	Luke; Med. Gaz., 1850, p. 236.
None	14 hours	Inguinal canal opened, and hernial sac found at internal ring, pulled down, cut, orifice of sac dilated, and bowel reduced	1849	Syme; Monthly Jour. of Med. Science, x, p. 1, Jan., 1850.
Pain in iliac fossa, which was fuller than <i>left</i> side	About 3 days	Inguinal canal laid open; hernial sac felt in abdomen, exposed, incised at fundus and orifice, bowel reduced	1849	Melchiori; Gazette Med. Lomb., Nov. 1849.
None	—	Inguinal canal laid open; hernial sac in abdomen, incised in body and orifice, bowel reduced	1849	Robert; L'Union Med., 1849.
Tumour indistinctly felt at internal ring	2 to 3 days	Inguinal canal opened; sac pulled down, its orifice and ring divided, bowel reduced	1854	Ward; Memoir on Strangulated Hernia, p. 20.

TABLE

Cases of Inguinal Hernia reduced

Case.	Sex.	Age of Patient.	Variety of Hernia. Usual size.	Right or Left.	Age of Hernia.	Age at development.	By whom reduced.	Means employed.
1	M.	—	Enterocoele	—	—	—	—	—
2	M.	40	Entero-epiplocele; scrotal. In vaginal process	Right	30 to 40 years	In youth	No account	—
3	M.	55	Enterocoele; congenital. Double hernia, scrotal, size of pigeon's egg. In vaginal process	Left	55 years	Infancy	Patient	—
4	M.	58	Enterocoele; scrotal	Right	"Years"	—	Surgeon	—
5	M.	30	Enterocoele; scrotal; "large." Probably in vaginal process	Left	"Years"	—	The patient, with very little force and not the slightest pain	—
6	M.	34	Enterocoele; scrotal. In vaginal process. Testis in inguinal canal	Right	A few hours	34	Surgeon	—
7	M.	64	Entero-epiplocele; scrotal. Probably in vaginal process	Left	36 years	28	Surgeon	Warm bath, opium, ice

III.

"en bloc." Operation. Death. Necropsy.

Local indications of Hernia after reduction.	Duration of strangulation.	Nature of Operation.	Necropsy.	Anno.	Reference.
—	—	Sac opened in inguinal canal; orifice not incised	Hernia strangulated by orifice of sac, which was on psoas magnus	1740	Vacher, Arnaud; Diss., p. 386, obs. viii.
A tumour	—	Sac opened in scrotum and inguinal canal; omentum in sac; no intestine seen	A sort of double sac, one external to the other, inside the abdomen, which contained ileum	1801	Hernu; Recueil périodique de la Soc. de Med., 7 Messidor, an IX (1801), t. xi, p. 291.
Pain and fulness in left inguinal region	5 days	Inguinal canal opened; sac opened in canal; the true sac in abdomen; incised; orifice cut; bowel reduced	No account of the parts	1817	Dupuytren; Jobert; Mal. Chir. du canal intestin, i, 492.
Small tumour in canal	4 days	Sac opened in canal; no bowel	A pouch extended downwards and inwards behind -fasc. trans. in direction of crural ring	1825	Astley Cooper on Hernia, 2d edit., p. 83.
Tumefaction in canal after eight days. None before	8 days	Sac opened in canal; orifice not incised	Large hernial sac just within abdominal walls, its orifice away from internal ring	1839	Luke; Med.-Chir., xxvi, p. 162.
Tendency to reproduction of tumour after taxis	8 days	Sac opened in scrotum and inguinal canal; no bowel; sero-albuminous fluid	Portion of ileum in iliac fossa, probably outside peritoneum	1839	Parise; Bérard; Mém. de la Soc. de Chir. de Paris, t. ii, p. 399.
Tumour from omentum	8 days	Sac opened in canal	Pouch in abdomen, constricting bowel	1847	Guy's Hos. Reports, 1847, p. 56.

Case.	Sex.	Age of Patient.	Variety of Hernia. Usual size.	Right or Left.	Age of Hernia.	Age at development.	By whom reduced.	Means employed.
8	M.	35	Enterio-epiplocele; congenital. In vaginal process. Testis in inguinal canal	Left	35 years	Infancy	Surgeon	—
9	M.	30	Enterocoele. In vaginal process	Right	10 or 12 years	18—20	Patient	—
10	M.	79	Enterio-epiplocele; scrotal	Right	30 years	49	Surgeon	—
11	M.	75	Enterocoele	Right	40 years	35	—	—
12	M.	35	Enterocoele. Probably in vaginal process	Right	"Years"	—	Surgeon	—
13	M.	49	Enterocoele	Right	—	—	Surgeon	—
14	M.	14	Enterio-epiplocele; congenital; scrotal. In vaginal process	Right	2 years	Childhood	Surgeon	—
15	M.	37	Enterocoele; scrotal; congenital; double. In vaginal process	Left	9 or 10 years	27	Surgeon	"With great difficulty"
16	M.	51	Enterocoele; scrotal; double	Left	—	—	Patient	—

Notes and observations.—CASE 1. The hernia seems

Local indications of Hernia after reduction.	Duration of strangulation.	Nature of Operation.	Necropsy.	Anno.	Reference.
Only an empty sac	—	Sac opened in canal	Pouch in abdomen, &c.	1847	Idem, p. 55.
Descent of hernia	4 or 5 days	Sac opened in canal; orifice of sac cut; hernia reduced	Laceration of neck of sac; hernia between peritoneum and internal abdominal fascia	1847	Idem, p. 66.
Small and soft tumour at ring	25 hours	Sac opened, and orifice cut	None	1848	Luke; Med. Gaz., 1849, p. 272.
—	—	—	Laceration of sac; hernia between peritoneum and internal abdominal fascia	1849	Reid; Prov. Med. and Surg. Journal, 1849.
No history of a hernia having descended	6 days	Inguinal canal opened; hernial sac at internal ring; incised; bowel escaped; stricture divided	Acute peritonitis; hernial sac and contents between peritoneum and fasc. trans.	1850	Curling; Lancet, 1850, ii, p. 81.
Fulness in inguinal canal	3 to 4 days	Sac opened in inguinal canal; hernia seen; stricture cut; hernia reduced	Acute peritonitis; neck of hernial sac torn, and bowel outside peritoneum between it and internal abdominal fascia	1851	Personal obs.
Fulness in inguinal canal	3 to 4 days	Hernial sac opened in inguinal canal; bowel thought to be reduced through its orifice	Neck of hernial sac torn; bowel lodged between peritoneum and internal abdominal fascia	1854	Personal obs.
—	—	Hernial sac opened in inguinal canal; stricture at orifice	Orifice of sac divided by operator a little above internal ring	1854	Ward; 1st Mem., p. 22.
Obscure swelling at upper part of inguinal canal	7 or 8 days	Hernial sac opened in inguinal canal; orifice cut	"Neck of sac" over border of inner and anterior part of true pelvis; body of sac in iliac fossa	1854	Ward; 1st Mem., p. 21.

to have been reduced through the *external* ring only.