ON
PETIT'S OPERATION
FOR THE RELIEF OF
STRANGULATED HERNIA.

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It has been remarked that the comparative value of the operation for the relief of strangulated hernia, as recommended by Petit, without opening the hernial sac, must be determined ultimately by an appeal to experience. However true the remark, and however desirable it may be to arrive at just conclusions, many difficulties arise in the course of inquiry, which do not present themselves upon a first view of the subject. Of these, the impossibility of obtaining parallel cases for comparison appears to present an almost insurmountable obstacle to a perfectly satisfactory result.

This difficulty, however, may in great measure be overcome by the comparison of large numbers of cases. But by this mode of proceeding, difficulties of another kind are created, which time and numerous opportunities alone can fully obviate. Cases collected in publications from the separate experience of many surgeons seem wholly insufficient, and are almost worthless unless they embrace the entire of such experience. It must be evident that the selection of cases from amongst others of the same kind, which for various reasons are withheld from publication, must necessarily yield

a false colouring to the experience it is intended they shall represent; and although they may in themselves be true, they do not represent the whole truth, and consequently are extremely unsafe for the purposes of just comparison.

The experience of Petit's operation hitherto published seems wholly to be of this character. The few cases already collected have been culled from many sources, whence it is highly probable that more extensive details might have been furnished, with conclusions more worthy to be considered as the fruits of experience.

In offering the present paper to the Society, I have endeavoured as much as possible to avoid this source of fallacy, by rendering up for its consideration the whole of the experience which I possess upon the subject of which it treats. It will, however, be proper to mention that I have not deemed it necessary to state the result of my experience of the operation for the relief of strangulated hernia as ordinarily performed by opening the hernial sac. Indeed, were I so disposed, I have not at hand the means necessary for the purpose, as some years have elapsed since I abandoned the ordinary operation as an ordinary practice. It will perhaps be sufficient for the purposes of comparison to call attention to a few details of the ordinary operation which have been published from the experience of others, but not open to the objections above stated. From these we learn the serious results and high rates of mortality which have usually followed this common course of proceeding, and are powerfully impressed with an idea of the necessity of seeking means for its diminution.

M. Textor states that, of fifty-six cases of strangulated hernia subjected to operation at Wurtzburg, between 1816 and 1842, twenty-four died, or nearly one-half.

M. Malgaigne states that of 220 cases subjected to operation in the Parisian Hospitals, between 1836 and 1840, 133 died, or considerably more than one-half.

Of fifteen cases of operation published by Mr. South, six died, or one in two-and-a-half.

Of cases published in the British Journals, I some time since ascertained that one-half died.

Of sixty-five cases subjected to the operation of opening the hernial sac, in the London Hospital, twenty-two died, or rather more than one-third of the whole number.

The obvious tendency of such details is to disincline surgeons from undertaking an operation so apparently fatal, until every effort likely to render it unnecessary by a successful taxis has been exhausted. Procrastination and delay is the too common effect. The results of the taxis also favour protracted efforts; and thus, the mortality of the operation, by deterring from its performance, on the one hand,—and successful taxis, by inviting protracted trials, on the other,—lead equally to delay and the loss of much valuable time.

Mr. King states that, of forty patients relieved by taxis, four died.

M. Textor states that, of 114 patients relieved by taxis, nine died.

Of 293 patients admitted into the London Hospital for strangulated hernia, between 1842 and 1847, 206 were relieved by taxis: amongst these patients there is not any death recorded.

We may, therefore, conclude, that when the taxis is performed successfully, the attendant danger to the patient is not very great, and persevering efforts for the attainment of so desirable a result appear to be a natural consequence. Conclusive and legitimate as the inferences appear from the foregoing statement, there are fallacies beneath them which it is desirable should be corrected, lest they encourage a practice more fatal even than that which I have stated as following the ordinary operation when ultimately appealed to.

I am not aware that at present any data exist adequate to remove those fallacies in a perfectly satisfactory manner. To do so, it is necessary that the general mortality of all cases treated by taxis and by operation should be stated conjointly, and a comparison instituted between the practice of protracted attempts to secure a successful taxis, and of

securing an early relief by any means to constricted parts, either by taxis or by operation. It is possible (although I think not probable) that the augmentation of the mortality of the operation, when deferred, is neutralized in the general results by the increased security which a successful taxis yields to the patient, even when protracted, and that what is lost on the one hand is gained on the other in the general average of mortality. There can be little doubt, however, that the mortality succeeding the operation alone is greatly increased by delay in its performance. Thus of sixty-nine patients operated on at the London Hospital or by myself, *before* the expiration of forty-eight hours from the commencement of strangulation, twelve died. Of thirty-eight patients operated on *after* the expiration of forty-eight hours, fifteen died. Of thirteen patients in whom the strangulation was of doubtful duration, six died.

That the operation itself as ordinarily performed, abstractedly from all considerations of visceral lesion by constriction, is in some degree dangerous, must be admitted. That the danger is also increased by the necessary exposure and immediate manipulation of parts so important to life, (especially when already the subject of inflammation,) is likewise true. Thence might partly arise the reluctance to have recourse to operation; and it appears likely that if the taxis could be accomplished even by an operation, without such exposure and manipulation, the reluctance would be in some measure, if not wholly, removed, and an earlier appeal to such operation might generally be expected as the result, provided no new dangers arise from the proceeding.

Such is indeed the scope of Petit's operation, which, by leaving the hernial sac unopened, causes a very close assimilation to the taxis as ordinarily performed; and this has already been shown to be attended by a very moderate amount of danger. The arguments, *à priori*, in favour of Petit's operation have already been stated by Mr. Key, in an excellent memoir on the subject, published some time since. It will consequently be unnecessary to repeat them in a paper in-

tended to embrace merely the results of experience. I am not aware that any series of results have hitherto been placed before the profession which will enable it to compare satisfactorily the value of Petit's operation with that ordinarily pursued by opening the hernial sac. In attempting to supply this deficiency to a limited extent, I do so with the hope that, if the comparison shall prove favourable to the method of operating without opening the sac, the more general adoption of it will follow as a consequence, and that there will be less reluctance to appeal to it at an early period of strangulation.

The materials from which the statements in this paper are drawn have been collected principally since the year 1841, although during the preceding ten years I have occasionally selected cases on which to perform Petit's operation from amongst many others which have fallen under my observation.

Since 1841 I have (with four exceptions) invariably attempted to perform the operation for hernia without opening the sac, a circumstance worthy of notice in this place, because to a certain extent we may conclude from it what will be the general results, both as regards the successful performance and mortality of the operation, provided it be adopted by the profession generally, as it has been by myself, as an ordinary rule of practice.

Inclusive of cases occurring between 1831 and 1841, (which were selected,) I have attempted the performance of Petit's operation in eighty-four cases. Of this number the operation was completed successfully, without opening the sac, in fifty-nine. In twenty-five it was necessary to open the sac to effect a reduction of the hernial contents, the opening generally varying in extent from one-half to one-quarter inch. With respect to the mortality amongst these patients, —of the fifty-nine in whom the sac remained unopened, seven died; of the twenty-five in whom the sac was opened, eight died.

Although it may be expedient thus to state in a general summary the results of all cases subjected to an attempt to perform Petit's operation, yet, for the purpose of satisfactory comparison, those cases which were selected from numerous

others (and which, therefore, may be presumed to yield results more satisfactory than ordinary) should be excluded; as also should those cases be, which from their nature could not be expected to be benefited by an operation of any description, or even by the taxis, could it have been successfully performed. The endeavour which the surgeon makes in such cases is like a forlorn hope, from which little but death is to be anticipated. For the above reasons I propose to exclude the twenty-six selected cases occurring between 1831 and 1841, and also four other cases, three of which were considered moribund at the time of the operation, and two of which died within three hours of its performance. The fourth case is excluded because the patient had recovered from the operation. Death, however, took place about six weeks from the period of its performance, in consequence of effusion into the peritoneal cavity, caused by stricture of the bowel and ulceration of the part which had been previously the subject of strangulation.

Lest it should be considered that these four cases have been improperly excluded, I have deemed it expedient to detail so much of the particulars of each as will enable the reader to restore them to their proper places in the details which are subjoined. They are as follows:—

No.	Sex.	Age.	Species of hernia.	Duration of strangulation.	Sac opened or not.	Result.	Remarks.
1	F.	70	Right femoral	48 hours	not opened	died	{ Effusion into peritoneum. Wound healed. Died 6 weeks after operation. Moribund. { Moribund; lived 3 hrs. Moribund; lived about 14 hours, under the use of strong stimulants.
2	F.	56	Right femoral	62 hours	not opened	died	
3	F.	40	Right femoral	40 hours	not opened	died	
4	F.	81	Left femoral	72 hours	not opened	died	

After subtracting these thirty cases, fifty-four remain, which may be considered as affording satisfactory data upon a limited scale, for comparison with the results of the ordinary operation as previously stated, as well as for showing the amount of success which has attended the attempts made to carry Petit's operation into effect generally, and in each kind of hernia which has been the subject of operation. Of the fifty-four cases, the sac was opened in twenty-one, of which three died; and not opened in thirty-three, of which two died. Thus in upwards of three-fifths of the whole number, Petit's operation was successfully completed. Of the cases in which the sac was opened, in ten the strangulation of the contents had continued before the operation was performed under twenty-four hours, of which one died; in three, under forty-eight hours, of which one died; in eight, above forty-eight hours, of which one died. Of the unopened cases, the strangulation had continued in thirteen under twenty-four hours, of which none died; in twelve under forty-eight hours, of which one died; in eight, above forty-eight hours, of which one died. It should be recollected, whilst comparing these results with each other, as well as with the results of the ordinary operation in which the sac is opened extensively, that in opening the sac in cases of failure, it has not usually been divided beyond a very limited extent, (varying from one-quarter of an inch to one inch and a quarter,) and that consequently the irritation, from exposure of the hernial contents, and from the rough and immediate handling which they too often undergo when already in a condition of high inflammation, is almost wholly avoided. For this reason it may be expected that the results of these cases of limited section of the sac will approximate to the results of Petit's operation, to which they bear a certain resemblance, and that they will bear no very unfavourable contrast to it, although its principle is not so perfectly carried out. It should not be considered that the necessity to open the sac implies either a greater degree of constriction of the hernial contents or a consequently greater severity of case from organic lesion, than

in instances in which no such necessity occurs. It appears that the nature of the structure which causes the constriction, rather than the degree of constriction, however great, is the ordinary source of failure.

Thus, a stricture may be caused either by the neck of a hernial sac, or by the margins of the abdominal aperture, wholly independently of the sac. The degrees of constriction arising from these causes may be equal, and the consequent organic lesion may be in no respect different. Yet, in the former case, the surgeon will most frequently fail in his attempts, and be obliged to open the sac to enable him to return the contents into the abdomen; while in the latter, success will almost invariably attend his endeavours, unless adhesions have occurred within the sac.

Cases, as respect the hernial contents and the degree of constriction which they have suffered, may therefore be quite parallel, but differ widely in the amount of difficulty to be encountered in the performance of Petit's operation; and although failure of success involves a partial exposure of the contents, it does not necessarily imply a greater amount of danger, except that which arises from the opening itself. It is also to be expected that the results of these cases will be more favourable than the results of the ordinary operation, provided exposure and irritation are elements which generally militate against success, for these are (as already stated) almost wholly avoided.

With respect to the causes for opening of the sac in these twenty-one cases, it appears that in three Petit's operation was successfully completed, but the sac was opened after the reduction of the strangulated parts into the abdomen, to remove some doubts as to their perfect liberation. The proceeding in each case, however, was ascertained to have been wholly unnecessary.

In ten the stricture was caused by the neck of the sac.

In one the stricture was at the inner ring.

In one the hernia (femoral) extended to the umbilicus and into the scrotum, the intestine being very greatly dis-

tended by flatus, and having its peritoneal tunic rent by the distention.

In two the opening was accidental.

In four the cause of the sac being opened is not stated.

When an analysis is made of the different kinds of hernia, a great disproportion is found in the amount of success attending the attempts to complete the operation; from which we may infer the difficulties that have been encountered in each respectively, and also what are probable in other cases. Amongst the fifty-four cases, there were thirty-one of femoral, twenty of inguinal, and three of umbilical hernia.

Of the thirty-one cases of femoral hernia, the sac was opened in seven, of which one died; and not opened in twenty-four, of which one died.

Of the twenty cases of inguinal hernia, the sac was opened in thirteen, of which two died; and not opened in seven, amongst which number there was not any death.

Of the three cases of umbilical hernia, the sac was opened in one, followed by recovery; and not opened in two, of which one died.

The foregoing statement demonstrates, that the performance of Petit's operation has been by far most frequently successful in femoral, and that it has been most frequently necessary to open the sac in inguinal hernia, to effect the reduction of its contents into the abdomen. This result is quite in accordance with our expectations, and might have been anticipated from the difficulties to be encountered from the usual seat of stricture in such cases. All surgeons agree that the stricture is occasionally seated in the neck of the hernial sac, but a difference of opinion exists as to its supposed frequency. Those who deny its frequency suppose that the constriction, in many cases, is caused by the fascia which immediately invests the sac. I agree with those, however, who think that the constricting cause is most frequently seated in the neck of the sac, and results from a thickened condition of the peritoneum at that part, the breadth of which varies in different cases. Of the twenty cases of

inguinal hernia enumerated, I find by my register that the seat of stricture is stated to be in the neck of the hernial sac in no less than fifteen. When so seated, it has been mostly found, not at the abdominal apertures, but a little below the external ring, the distance varying from half an inch to an inch. I have, however, seen it as much as three inches, producing the hour-glass contraction of the hernial sac. It is generally supposed, that when the stricture is produced by a thickened state of the peritoneum at the sac's neck, Petit's operation cannot be by any means successfully performed. The supposition is not wholly correct. It is true, that the difficulties of performance are very greatly increased, but they are not insurmountable. In confirmation of which assertion, I find that of the seven cases of inguinal hernia in which Petit's operation was successfully completed, five are stated to have the seat of stricture in the neck of the sac. Before proceeding further, it may be advantageous to describe the mode of proceeding which I have usually adopted in such cases. The first step, before any incision is commenced, is to ascertain the exact spot at which the stricture is situated; for it must be evident that, without such information, the necessary incisions are liable to be directed to a point different from that in which they are really required. This information (as more fully stated in the Medical Gazette, vol. i. 1839-40) is attained through a general knowledge of the fact, that the stricture prevents the communication of impulse from one part of a tumour to another, beyond the stricture. Nothing more, therefore, is required in availing ourselves of that knowledge, than to press the tumour firmly between the fingers of one hand, with a view to cause impulse, while with the fingers of the other hand at the neck of the sac the precise point at which impulse ceases is carefully ascertained. At that point will be found the seat of stricture. Having obtained this information, the next step is, to incise the integuments, so that the centre of the incision shall be directly over the stricture, a proceeding easily accomplished by causing a transverse fold to be pinched up between the fingers, and

divided by transfixing it with a straight bistoury, in a direction parallel with the long axis of the tumour. The various fascias are subsequently divided, until the neck of the hernia is fairly exposed. If this be carefully and completely done, a depression will usually be observed at the seat of stricture, presenting a more contracted appearance at that part than at others. To the touch this contracted part feels thick, and often hard, while into it thin layers of fascia dip, which may be mistaken for the stricture itself, but which may be divided wholly independent of it, and no relief arise from the division. When these layers are turned back, the real stricture is exposed to view. In proceeding further than this point much caution is required. The remaining object to be attained is, to incise, or rather scarify, the exposed and thickened peritoneum (which forms the stricture at the sac's neck) in one, two, or three places, without completely dividing it. By these scarifications, the stricture becomes so weakened, that it is placed in a position most favourable for yielding to the pressure of the taxis, and, consequently, most favourable for its successful attainment, a circumstance which is much assisted by the removal of the support which it previously derived from the surrounding fascias in their entire state. It must be evident that, in thus dealing with a stricture so seated, it is somewhat difficult to limit the incisions so as to avoid its complete division. Should this division happen, an opening is necessarily made into the hernial sac, and the attempt to complete Petit's operation becomes a failure. Yet the opening thus made being of small extent, there is little consequent exposure of the hernial contents. It is often sufficient, however, without further enlargement, to admit the successful application of the taxis, in which case little less than a successful attempt has been attained in the performance.

It has occasionally occurred that the strictured part has been rendered so thin and weak by the scarifications, as to give way under the pressure of the taxis, even when moderate in amount, and the fluid contents of the sac have escaped by the opening, and on one occasion with a small portion of

intestine. In this case, the intestine was readily replaced within the sac, and afterwards reduced into the abdomen by the taxis, without any consequences worthy of note.

When the stricture is caused by the margins of the external ring, the division of it is of easy accomplishment, by introducing the hernia-director beneath, and dividing it with a bistoury. On the contrary, when the stricture is at the internal ring, the division is extremely difficult, in consequence of the depth of its situation. The attempt is to be made after the same manner by the introduction of a director, and by the use of a common bistoury.

For the relief of femoral hernia, Petit's operation has been much more frequently successful than for inguinal. Thus, of thirty-one cases of femoral hernia in which that operation was attempted, it was successfully performed in twenty-four, being more than three-fourths of the whole number.

The rate of mortality has been so low in these cases, that the confidence of surgeons in the mode of operating appears fully justified.

There is great variety in the forms of femoral hernia. In the more common forms the tumour rises over Poupart's ligament, to a greater or less extent, sometimes considerably overlaying the anterior surface of the tendon of the external oblique muscle. It sometimes obscures the external inguinal ring, in which case it becomes liable to be mistaken for inguinal hernia. In other cases it rises to the spine of the ilium or even to the umbilicus; of which I have seen one example. In all such cases the femoral ring is obscured by the tumour, and there is an apparent difficulty in reaching it for the purpose of dividing the stricture without opening the sac. The difficulty in most cases is not real, although it is possible that in some it may form a serious obstacle to the operator's proceedings, or even prove insurmountable.

The operation is generally one of easy performance, and may often be accomplished with a safety and a despatch by no

means commonly to be witnessed in the ordinary operations for hernia.

When the tumour thus rises over Poupart's ligament, there are not any certain means of ascertaining the precise seat of the stricture until the ligament itself is exposed by the operation. Yet it is so constantly within a very short distance of the femoral ring, that we may, for the purposes of the operation, assume the ring to be the part to which we may most advantageously direct the necessary incisions. It is, however, necessary to recollect that it not infrequently happens that the real seat of stricture is on the thigh, to the extent of half or three-quarters of an inch below the ring. In this case it is caused by bands of fascia, which immediately invest the sac at that part; they are probably derived from the transversalis fascia, and have been described as the fascia propria of the sac.

The femoral ring being the desideratum, it becomes the question how that aperture can be most readily reached. When the tumour rises as described, an incision upon it directly over the femoral ring manifestly involves a necessity of subsequently directing the incisions to its upper part, after which they must be directed downwards, between the tumour and tendon of the external oblique muscle, to the ring. In this manner a circuit would be made, in some instances of probably more than one half of the tumour, a very great part of which would in no way assist the surgeon in the attainment of his object; but, on the contrary, would delay his proceedings, prolong the pain, and increase the dangers of the operation. It is far preferable to avoid incisions over the tumour as much as possible. This may be accomplished to a very great extent by the plan of operating which I have usually adopted in such cases.

It will be recollected that there is almost always a groove or depression of the integuments, which defines the upper limits of the tumour upon the abdominal surface. Where no depression can be seen, the boundary of the tumour may be ascertained by the pressure of the finger in that situation.

A fold of integuments is to be pinched up at that part, and divided by transfixing it with a narrow knife, so that the incision, when the skin is replaced, shall fall perpendicularly to the body, with its centre opposite to the depression referred to. By a few strokes of the scalpel the tendinous expansion of the abdominal muscles is to be laid bare; after which a finger should be introduced as far as Poupart's ligament, between the tendinous expansion and the tumour, when the latter rises upon the former. The ligament being thus exposed, a hernia-director is guided under it by the finger into the femoral ring, the margin of which may be safely and easily divided in an upward direction with a common probed bistoury, and the taxis applied in the usual way. Should the margin of the ring have formed the stricture, the taxis for the most part succeeds very readily, and the operation is completed in a very short time. But should the stricture be caused by the bands of fascia propria referred to, the director will have passed over them as it entered the femoral ring, in which case any amount of division in an upward direction will be of no avail. When the taxis does not succeed readily, these bands of fascia may generally be suspected to be the cause of failure. The fact may be made sufficiently clear by introducing the finger upon the neck of the sac, under Poupart's ligament, while the body of the sac is pressed between the fingers and thumb of the other hand, when it will be discovered that no impulse is communicated to it by such pressure. By a little attention the bands may be detected crossing the neck of the sac from half to three-quarters of an inch below the ring, and may be divided by insinuating the nail of the fore-finger of the left hand under them from above, and by carrying the point of a probed bistoury along the nail, with its blunt edge towards the sac. The division is made by the surgeon drawing the bistoury away from the sac towards himself, a proceeding which, if properly performed, avoids all danger of wounding the sac or its contents. It is probable that to a want of knowledge of this frequent seat of stricture, so far below

the femoral ring, caused by these bands of fascia, failure of success in the performance of Petit's operation in this kind of hernia is often to be attributed. With this knowledge I believe failure will be infrequent, unless from causes which exist within the sac, arising from changes in its contents, a circumstance by no means common in cases of recent descent.

Of umbilical hernia a sufficient number of cases have not fallen under my notice to justify my speaking confidently upon the subject. From what I have seen of these cases, when the sac has been opened by other surgeons, or by myself, I am disposed to the opinion, that Petit's operation is not so well suited to umbilical as to inguinal or femoral hernia, except when the hernia is of small dimensions. It is a well-known fact that, in the larger and older forms of the disease, a very large portion of the tumour is usually composed of masses of omentum, often rendered thick by the deposition of fat. In this mass the intestine is liable to become enveloped and even strangulated. Should either of these circumstances occur, Petit's operation may be uncertain or dangerous, and consequently is not to be trusted. When, however, the hernia is of recent date, previously reducible and of small dimensions, it appears to me that Petit's operation is equally suitable to such cases as to those of which I have already spoken.

Similar objections to those which I have just stated, have been urged against Petit's operation in all cases. Without insisting that the same objections may be generally raised to the ordinary application of the taxis, it may be observed that, in inguinal and femoral hernia, entanglement and strangulation of the contents amongst themselves are far less likely to occur than in the larger forms of umbilical hernia; and that this difference depends upon their greater distance from the sources of mischief, and their consequent comparative immunity from the protrusion of large masses of omentum, the frequency and magnitude of which must be taken as the measure of the danger under consideration. It is not intended

to assert that the danger does not exist even in inguinal and femoral hernia; but it may be asserted with truth (which experience confirms) that it exists in these forms in a very slight degree, and certainly not to an extent that should influence our proceedings with respect to Petit's operation. In large herniæ, where there is a greater probability of the protrusion of large masses of omentum, the danger is somewhat greater. Surgeons, however, have already agreed that it is desirable to avoid opening the hernial sac in large herniæ, justly concluding that the danger, arising from the exposure of a large mass of hernial contents to atmospheric and other baneful influences, is far greater than that arising from any liability to entanglement; the force of which conclusion increases with the magnitude of the hernia. If, therefore, surgeons are agreed (and I believe almost all are so) that Petit's operation is properly applicable when the danger of entanglement is great, it appears, *à fortiori*, that entanglement has little weight, as an argument against the performance of the same operation, in cases of small herniæ, in which the danger can scarcely be said to exist.

Embarrassments may occasionally arise from the existence of adhesions between the hernial contents and the sac. These may be either recent or old. With respect to the first, it is not probable that they will be frequent if the operation be performed at an early period of strangulation, nor likely to form any serious obstacle to the return of the hernia, while in a soft state; for then they may be broken down in the ordinary manipulations of the taxis. When of greater consistency, they form so serious an obstacle to the taxis as to render the opening of the sac necessary for the reduction. Old adhesions imply a previous irreducible condition of the hernia,—a state which the history of the case will make known to the operator. Should these exist, it rarely happens that the adherent parts become the subject of serious strangulation, but some new protrusion which seems to receive the whole influence of the stricture. If this part be liberated by an operation, surgery has done all that is

required in the case. In liberating and reducing so small a part of the hernia as these new protrusions frequently are, some doubt may exist in the mind of the surgeon whether the relief has been sufficient and effectual; for that part, which was previously irreducible, still remains so. The signs of liberation, however, are usually sufficiently clear and decisive, that little or no uncertainty need be apprehended. Should any remain, the sac should be opened; but to a limited extent. While operating in such a case the surgeon will be satisfied if, under the pressure of the taxis, he feels a portion of tumour slip from beneath his finger through the abdominal aperture, followed by a relief to the tension of the remainder. The signs of success become more marked as the taxis proceeds, until generally no reasonable doubt remains that effectual relief has been afforded. The successful performance of Petit's operation in such cases has this important advantage, that adherent parts which necessarily must remain in the sac unreduced, have not been exposed to any injurious influence, and are placed in a condition for the performance of functions very little, if at all, different from their accustomed state previous to the new descent.

The occurrence of mortification in the hernial contents is supposed to demand imperatively the opening of the sac, for the purpose of applying a special treatment to meet those dangers which are thought likely to accrue in such cases. Forcible as the arguments are, which the occurrence of mortification furnish for opening the sac, they are not very cogent as militating against the general adoption of Petit's operation: for the negative information, which the occurrence of sixty-two cases in succession supplies, is important to the point under consideration, and shows, at least, that mortification is rare; and it is probable that it will become more so under the practice of an earlier operation. One case only of mortification occurred out of the above number: but in that case to so limited an extent, as not to require any special treatment; the hernial contents being returned into the abdomen in the ordinary manner, followed by recovery

of the patient without any local ill consequences from the proceeding.

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 of returning it into the abdomen, appears preferable. In this 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 parietes 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, therefore, do not render Petit's operation improper, because, if fully ascertained, they would not receive any treatment beyond the usual taxis. Nor does it appear that the liability to effusion into the general peritoneal cavity is in any degree increased by the sac remaining unopened. If effusion occur it will be equally disposed towards the sac, whether the sac be opened or not; while the evidence of effusion into the sac when unopened will be sufficiently marked to enable the surgeon to open it when the necessity arises, and before further ill consequences ensue. It must be evident that if the sac had been opened in any one of the above sixty-two cases from a dread of mortification, the proceeding, on that account, would have been wholly unnecessary; and, consequently, a positive danger would have been inflicted by the operation, which the circumstances of the case did not demand. Although the occurrence of extensive mortification is a contingency to be calculated on in the ordinary performance of Petit's operation,—yet, if the results of that operation shall inspire surgeons generally with a confidence of greater security than that which they derive from the ordinary operation, it is highly probable that they will appeal to it at an earlier period than they are now accus-

tomed to do, with the highly probable effect that those circumstances, which now are supposed to militate against it, will become much diminished in frequency. It is true that by adopting an early operation we do not avail ourselves of all the chances of a successful taxis by protracted efforts; and that occasionally operations may be performed, which protracted efforts might have rendered unnecessary. Admitting this with its fullest force, it weighs but little against the adoption of an early operation as a rule of practice. It seems far preferable that a few patients should be submitted, even unnecessarily, to an almost harmless proceeding, than that all should be submitted to the too often fatal consequences of procrastination; for the inconveniences of Petit's operation, when successfully completed, bear no proportion to the magnitude of the dangers removed by it. Should the attempt to perform this operation fail, the alternative remains of opening the sac in a manner that need not subject the hernial contents to exposure and irritation, except to a very limited extent. The circumstance, although a failure, argues the propriety of an early operation.

It will be recollected that the difficulties of the taxis, arising from the tumefaction of the hernial contents, increases with the duration of strangulation up to a certain point; and that, consequently, the taxis is most readily performed at an early period, before that tumefaction has taken place. It will be recollected also, that the attempt to perform Petit's operation creates facilities to the taxis, by the division and removal of parts which surround and support the immediately constricting cause. Should failure take place at an early period, under circumstances most favourable for success and with all the aids afforded by a limited operation, it seems wholly improbable that the taxis, without those aids, would have any chance of success, however long it may be protracted. A failure of the operation, when properly performed, may, indeed, be taken as a direct proof, that the taxis alone would not have succeeded; while a successful performance of it (even if unnecessary) will have entailed

upon the patient little more than an unimportant division of the integuments, without any unnecessary new danger legitimately attributable to the surgeon's proceeding. But infinitely more generally there will be a satisfaction, arising out of the supposition that relief to the patient has been afforded at an early period, by an operation which (if precipitation be avoided) there is very great reason for expecting would have become most urgently necessary at a later period, under circumstances of delay likely to produce a very great augmentation of danger.