DUDLEY (A. P.)

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With a Report of Five Cases.

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NEW YORK CITY.

REPRINT FROM VOL. XVII.
Gynecological Transactions.
1892.

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A. PALMER DUDLEY, M.D.,

NEW YORK CITY.

INSTRUCTOR IN GYNECOLOGY IN THE POST-GRADUATE MEDICAL SCHOOL; GYNECOLOGIST TO RANDALL'S ISLAND HOSPITAL, ETC.

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DORNAN, PRINTER,
PHILADELPHIA.

UMBILICAL HERNIA IN THE FEMALE.

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By A. Palmer Dudley, M.D.,
New York.

Hernia and its treatment has been so thoroughly discussed in the medical societies of New York during the past two or three years by such able men as McBurney, Bull, DeGarmo, Marcy and others, that any attempt on my part to add to the literature of the subject would simply be an effort to accomplish a difficult task, which when completed would, I am afraid, only have taxed your patience. I shall, therefore, confine my remarks to the treatment of one or two varieties, although I am safe in saying that the method I shall advocate is one readily adaptable to the treatment of all forms of hernia with which we meet.

It is a noticeable fact, brought vividly to one's mind in looking over the statistics of operations for hernia, and especially those compiled by general surgeons, that one of the most important, and surely not an infrequent form, has been lightly passed by or honored only with a passing remark. I refer to ventral or umbilical hernia, most frequently met with in women during the childbearing period, and also of late years as an after-result of cœliotomy.

Why such an important condition should have been so lightly treated I am unable to say, except that it may be because the custom for half a century has been to look lightly upon umbilical hernia, to prescribe some method of support, and to

allow the poor woman to carry her affliction until some unfortunate occurrence strangulates the hernia, which, in the great majority of cases, does not occur until years after it makes its first appearance, when she is made to suffer the torture of treatment by taxis until the time has passed when operation for radical cure can be safely done; hence the mortality in these operations. I do not mean to contend that we should therefore advocate radical operation in every case of umbilical hernia which we meet, for in adopting treatment we must constantly bear in mind the clinical history of each individual case, the sex and age of the patient, and the causes and conditions which favor or retard its cure. In the infant male, if properly treated by support, herniæ disappear and seldom return, while in the adult male they are rare; in the infant female they often again make their appearance in later life, and not infrequently give rise to distressing symptoms, especially during the childbearing period, and as it is a purely mechanical difficulty when once well established in a woman of mature years, it is a permanency until relieved by radical treatment. DeGarmo, in his able paper, says: "The sooner the entire profession realizes this, the sooner will prompt relief be afforded those afflicted."

In my judgment, one of the influences that has served to bring about a change of opinion with respect to the treatment of umbilical and ventral hernia, has been its frequent occurrence after cœliotomy, as ventral hernia from such a cause is not only a more distressing, but a much more dangerous condition, owing to the difficulty of restraining it within bounds, for I have yet to see the invention that can be worn by a woman with ease and comfort that will retard the gradual increase of a ventral or umbilical hernia when once the linea alba has given way.

My object in this brief paper will be, therefore, not to discuss methods of mechanical support, but to describe and offer for your approval or disapproval a method of operation which I have employed in my last three cases, and which has seemed

to me to attain the object for which we are all seeking in the radical operation, viz., firm reunion of the parts that have given way. I believe that the method has some advantages over those which have been in general use up to the present time, inasmuch as it does away with any form of buried stitch that is non-absorbent, while at the same time it allows of free drainage in case of failure to secure union of the cellular tissue by first intention. I have studied the subject with care for the past four years, for my first operation for the radical cure of hernia was made in October, 1888, and I well remember the trouble it gave me to secure firm union of the severed parts. Holding the opinion, as I do, that Nature never has been and never will be able to produce scar tissue equal in strength and elasticity to her first production, the normal linea alba, I believe that in adopting a method of radical treatment, especially for the relief of herniæ, subject to so much direct pressure as either ventral or umbilical hernia necessarily is, we should, if possible, operate in such a manner as to secure good union by first intention rather than by granulation and scar tissue; hence, although the operation as performed by McBurney may be all-sufficient for an inguinal or femoral hernia, I would hesitate to adopt it for the relief of either umbilical hernia or that which follows cœliotomy. I am also opposed to the use of catgut as the supporting suture in this operation, owing to the uncertainty of its resistance to absorption, for I believe that I can trace two of the cases of ventral hernia that have occurred in my cœliotomy work directly to the use of catgut that was absorbed before firm union was secured between the cut surfaces of the linea alba.

Dr. Marcy, of Boston, whose experience with the use of kangaroo tendon has extended over some years, speaks in the highest terms of this material for suture in hernia. I have great faith in his judgment and experience, but I cannot speak from my own personal knowledge of the use of the tendon as a suture. The majority of the operators who have reported cases seem to prefer the use of catgut as a buried suture. Dr.

A. P. Clark, of Cambridge, Mass., claims that it is far the best material for such purpose. He dwells at length on the proper preparation of the chromicized suture, notes the danger of having the catgut too hard or too soft, and contends that the use of wire sutures is not necessary, and should not be encouraged, claiming that wires sooner or later become a source of irritation and ulceration, conditions which necessitate their early removal.

Although I am a firm believer in the use of catgut in all cases where pressure or tension does not play an important rôle, I cannot coincide with the Doctor's opinion with respect to its use in hernia, for my experience with the use of silver wire has been so diametrically opposite to his.

Several unique methods of operation have been reported. Among others, I note one by Dr. J. Edwin Michael, of Baltimore, who sutured the linea alba with silver wire carefully twisted, covered with perforated shot, cut short, and left in position, closing the cellular tissue and skin over the stitches with interrupted sutures, and the patient made a good recovery. Also one by Dr. H. Marion Sims (*Am. Journ. Obstet.*, 1886, p. 272), who reports a case where he was obliged to make second cœliotomy for hernia of enormous size, the circumference of the umbilical ring being ten inches; the intestines were matted within the sac, and the operation lasted four hours and seventeen minutes. One hundred and fifty bleeding-points were tied; this patient recovered, and the result was a perfect one.

The method advocated by another operator, Lawson Tait, is so unique, and at the same time so difficult to understand without having seen it done, that I refrain from attempting to describe it here, and refer my hearers to the description of the operation published in the *British Medical Journal* of September 6, 1891. His method is one that seems complicated, and subjects the patient to unnecessary danger.

In March, 1891, before the New York Obstetrical Society, the subject of ventral hernia was thoroughly discussed in a

paper by Dr. George M. Edebohls, in which he strongly advocates the flap operation for the radical cure, and advises doing it, if possible, without opening the peritoneal sac. My experience has led me to believe that this is a dangerous method to pursue, owing to the fact that in the majority of herniæ, not only ventral but umbilical, especially if of long standing, the protruding contents of the sac will be found quite firmly glued to the latter, and it is my belief that if we return the hernia to the abdominal cavity without opening the sac and freeing all adhesions, we subject the patient to an extra risk from peritonitis or intestinal obstruction. My experience has been limited to five cases, in all of which firm union had taken place between the sac and its contents, necessitating not only the performance of a complete cœliotomy, but the removal of most of the omentum in all but one case. Especially will this be found to be the condition in cases of ventral hernia following cœliotomy, which the following report of my first case, operated upon October 10, 1888, will demonstrate.

Case I.—Mrs. R. D., German; married; two children. Second cœliotomy (my forty-first); the first was made one year previous, Hegar's operation being performed for uterine fibroid. Three weeks after returning home, while lifting a dumb-waiter loaded with coal, she ruptured the scar, and a large ventral hernia followed; an abdominal supporter was adjusted and she was kept under observation during the following year. The abdominal bandage gave but little support to the hernia and did not prevent it from increasing, while the removal of the appendages proved a failure as far as stopping the growth of the fibroid or preventing hemorrhage were concerned; although both tubes and ovaries were completely removed, the patient had periodical hemorrhages which depleted her as much as formerly. After the lapse of one year, careful examination showed that the tumor had actually increased in size, that her general condition had not improved, and that her former trouble was complicated by hernia; she was tired of such an existence and begged for relief. I readmitted her to the hospital, performed hysterectomy, and dissected out

the linea alba from either side of the old scar, sewed the peritoneum together with a continuous catgut suture and the linea alba with buried interrupted silk sutures; the cellular tissue and skin were united by a third row of sutures, silk being used. The patient did well after the operation, but convalescence was delayed by suppuration of two or three of the buried silk sutures, which caused cellular abscess, making it necessary to reopen the lower portion of the abdominal incision. The result, however, was a good one, and examinations at intervals of three months since that time, show this patient to be in good health and the abdominal wall firm, although thin over the former incision.

The operation was a most difficult one, owing to the fact that the entire omentum, together with several coils of the small intestine, had become firmly attached to the anterior abdominal wall after the accident which ruptured the scar. This was the first case of ventral hernia that occurred in my cœliotomy work, and although I was in no way responsible for the accident, it was one that I have since attempted to avoid by every means possible, but in spite of great care, I have notes of two more cases that have occurred since and still exist.

CASE II.—(Operated upon in January, 1890; my seventy-fourth cœliotomy.) Mrs. D., English, aged ninety, married seventy years; the mother of ten children. When I was called to see her she was suffering from strangulated umbilical hernia, which was the size of a quart bowl. I would not pretend to say how many years this patient had suffered from the hernia, but am sure that it was a great many. It had been strangulated a number of times before, but her physician had succeeded in returning it by taxis; however, as usually occurs in such cases, the hernia eventually became irreducible. Such was the condition when I was first called to see this patient, at midnight; many efforts had been made to reduce the hernia by taxis, but all had failed, and as the patient was very aged—more than ninety years old—with heart trouble in consequence of which every third beat intermitted, it was evident that unless some relief could be given her, she would not last more than a few hours. Her family physician, Dr. Schoonover, urged operation at once, although the danger of

death upon the table from heart disease was very probable; under such circumstances the prospects of success were almost hopeless, but I concluded to make the effort. Ether was administered and the operation was performed by candle-light; she stood it fairly well and was put to bed in a much better condition than we expected. Upon opening the sac it was found to contain all of the omentum and fifteen inches of the small intestine; the omentum was adherent to the sac throughout, and so thick and abnormal in appearance that it was considered best to remove it all, which I did. The intestines had been so long strangulated that they presented almost a mottled appearance; they were packed in towels wrung out in very hot water and kept there until the congestion was so much relieved that I considered it safe to return them to the abdominal cavity; the wound was then treated as in the previous case, the linea alba being sewed up with interrupted buried silk sutures. It is surprising to me that this patient lived through the operation; however, as I have stated, she was put to bed in good condition. As is my custom, Seidlitz powders were administered as soon as she came out of the anæsthetic, and a good movement of the bowels was secured during the first twenty-four hours; after that I confidently expected her recovery, as she had no rise of temperature or evidence of peritonitis. The heart still continued to intermit, and her family physician, hoping to stimulate it, administered ammonia carbonate; the stomach did not receive the remedy well; she at once sat up in bed, called for a bowl, ejected the medicine, and fell back dead. We could only account for such a sudden termination of life by deeming it heart rupture, as otherwise she was doing well.

Case III.—Mrs. C. C., Newton, Mass., aged twenty-nine; married, and mother of two children; family history good She had never suffered from any acute or constitutional disease, but while giving birth to her last child, two years ago, a hernia occurred at the navel; it was not a large one, but sufficiently so to cause her some uneasiness and pain. When convalescent from her accouchement she consulted her family physician, who adjusted an ordinary belt and button supporter, such as is in general use for this form of hernia. Her abdomen was quite fleshy, and the supporter only sufficed to steady the abdominal

walls and prevent the hernia from spreading out beneath the cellular tissue; at various times she had some pain over the navel. In February of this year she consulted me concerning it, and I advised her to have the radical operation for its relief, feeling quite certain that in operating that it would not be necessary to open the peritoneum, but only to go down and reunite the linea alba. She returned to her home and some two months later wrote, saying she wished the operation to be performed.

Having had trouble with buried sutures in the first case of umbilical hernia upon which I operated, that experience, coupled with the knowledge I have since gathered in my cœliotomy work of the different methods of closing an abdominal wound, determined me to use, if possible, some method of suturing which would bring the walls of the abdomen into close apposition, maintain them so as long as I desired, and would allow of removal. To this end I had been for some months previous waiting for such a case as this, that I might put into practice the following method of suturing, which, it seemed to me, would accomplish the object which I had in view; so that when this patient was ready for operation, I went to her home prepared to do it and suture the parts by the method to be described.

On April 13, 1892, the patient was put under ether and an incision about four inches long, extending two inches above and two below the navel, was made down to the sac of the hernia. It was then found that the pad-supporter had been a useless appliance which allowed not the intestine, but the omentum to extrude through the breach and dissect its way down under the cellular tissue for some two inches below the navel, where it had become adherent to the entire surface of the sac, a condition which I could not recognize before operation, owing to the amount of fat over the hernia. I was obliged to open the peritoneal cavity and break up the adhesions between the hernial sac and omentum before I could return the latter to the abdominal cavity and properly close the hernia. The sac wall was dissected free from the cellular tissue, cut away, and the peritoneum proper was then closed with a continuous catgut suture; the two halves of the linea alba were then dissected out from the cellular tissue and brought into close apposition with a second row of continuous

Showing hernia with patient erect.

Showing shotted sutures after operation.

catgut sutures. When this had been accomplished, four silver-wire sutures were introduced through the linea alba, taking care to include at least one third of an inch of the muscle within the suture; each suture was then shouldered over the cut surface, after the method of Dr. Emmet in his perineal operation, so that the two halves of the linea alba were held in close apposition without traction; over each suture a short canula, such as I show, was adjusted, pressed down firmly upon the suture, and held in position by a perforated shot upon the wire suture at the upper end of the canula (as shown in the cut); cellular tissue and skin were then closed with interrupted silkworm-gut sutures, allowing the four canulæ with their enclosed wire sutures to protrude between the cut surfaces about half an inch above the skin. The wound was then dressed by packing iodoform gauze about the four canulæ, building it sufficiently high to prevent pressure upon the latter by the abdominal bandage. The patient was put to bed and allowed to turn from side to side as she pleased; the bowels were moved the following day by the aid of salines; on the third or fourth day she was allowed ordinary diet; she had no intra-abdominal disturbance whatever, and never a rise of temperature. When the dressings were removed, at the end of two weeks, it was found that the wound had healed throughout and was perfectly dry; the canulæ had not irritated the skin sufficiently to produce suppuration about them. On May 4th, just three weeks after the operation, I visited the patient, removed the canulæ, and withdrew the four wire sutures; a properly fitting abdominal supporter was adjusted, and she was allowed to sit up and move about her room. She has had no trouble since; I saw and examined her August 7th, and found her in perfect condition.

Case IV.—Mrs. R., widow, aged forty-six years, the mother of twelve children; family history good. Three years ago she first noticed an enlargement of the abdomen, which gradually increased, and she then commenced to wear a bandage for support; she gives no history of injury, though she vaguely remembers having fallen, striking upon the abdomen; however, this was several years before she noticed the enlargement.

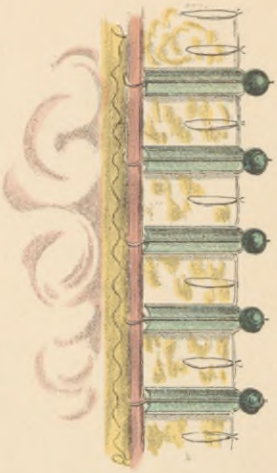
When seen by me she had an enormous ventral hernia, also

involving the right linea semilunaris; the accompanying cut will show more clearly than I can describe the size and shape of the hernia; it was the largest one I had ever seen. The cellular tissue about the navel had become so atrophied that the vermicular action of the intestines could be distinctly seen through the transparent skin. The woman was laboring with a burden that was more than she could bear, and she craved any method of treatment that would give her relief. It was considered hazardous to attempt a radical operation, but such was the only treatment which I could recommend for the patient; she gladly accepted it, and on May 8th of the present year she was put under an anæsthetic, and an incision nine inches long, extending from two inches above the pubes to five inches above the umbilicus, was made; the omentum was adherent along the entire line of incision, and I was obliged to remove a large portion of it before the walls could be brought into apposition. After cutting out an elliptical piece, about two inches wide and six inches long, from either side, the walls were drawn as closely together as possible and quilted by a continuous catgut suture; they were so much atrophied that it was almost impossible to get enough sound muscular tissue to cover in the hernia. In addition to the two rows of catgut sutures, seven deep wire sutures were adjusted after the manner described in the previous case; the wound was then closed with interrupted silk sutures and dressed antiseptically. Although I did not expect this patient to live more than a few hours (for the operation was certainly a terrible one), she rallied well and went on to convalescence without any trouble, except a slight suppuration around two of the canulæ over the wire sutures; this I considered to be caused by the friction produced by the movements of the patient. At the present time, four months after the operation, the woman is in perfect health, with good union of the long incision, and, with the exception of a slight bulging over the linea semilunaris on the right side, she is relieved entirely of her hernia.

Case V.—Mrs. McC., age unknown; is a widow, the mother of several children; had suffered for a number of years from an umbilical hernia of large size. I was called to see her at eleven o'clock, Saturday evening, June 18, 1892, and found the hernia

CASE IV.

Ventral Hernia.



Method of Suturing.

CASE V.

Umbilical Hernia.

irreducible and strangulated; the intestine had been imprisoned since the Wednesday previous. She was a very fleshy woman, weighing more than two hundred pounds, and the size of the protrusion equalled that of a large cocoanut. Various efforts had been made by the woman herself to reduce the hernia; among others, a large blister had been applied over the entire surface. Her physician, Dr. Schoonover, had been called in early in the day and had exhausted every means to reduce the hernia; taxis made by myself failed to accomplish the purpose. Pain was intense over the site of the stricture, the patient vomited constantly, and her nervous system was exhausted. It was plainly evident to me that I could not relieve her by taxis; the intestine had been too long imprisoned, the parts were swollen, and the tenderness produced by the blister was very marked. I proposed cœliotomy for its relief, and the patient acquiesced. Preparations were at once made, under great difficulties, as the patient lived in a tenement-house, where there was little or nothing with which to undertake such an operation. Her heart was not in good condition, but we deemed its irregular action to be sympathetic.

A cœliotomy by gas-light is not a pleasant undertaking. The patient was brought into the kitchen, put upon a table, and made as comfortable as possible under the circumstances; old sheets and pillow-cases were drafted into service as towels. The abdomen, denuded of its epithelium by the blister, was carefully cleansed, and an incision six inches long made over the hernia, extending three inches above and three inches below the navel. The tissues covering the intestine had been stretched to such an extent that but little remained over the gut. Incision into the sac showed that the entire omentum protruded through the umbilicus, and was firmly bound to the sac by old inflammatory adhesions, which it was necessary to sever before the stricture could be reached or the intestine exposed. This was a difficult matter, owing to the fact that the contents of the sac were much congested by the obstructed circulation, and bled profusely when disturbed. When this had been accomplished and the intestine exposed, it was found that the entire transverse colon occupied the hernial sac. Never before has it been my fortune to meet with that portion of the intestine in an umbilical hernia. The stricture

was relieved by incision upward through the abdominal wall and the intestine released. It was then found that the strangulation was caused by the mesentery, the latter having developed a tumor in its folds, the size of a hen's egg, and composed principally of fat. This had made its way through the breach with the intestine, caught the latter in one of its folds, and prevented its return by any method of taxis. Before the intestine could be returned to the abdominal cavity, it was necessary to ligate the vessels feeding the tumor, and to remove it. The transverse colon was much congested, but there was no evidence of gangrene, so it was thoroughly cleansed and returned to the abdominal cavity. Great care was taken to prevent any blood or water making its way into the abdominal cavity, and I did not deem it necessary to irrigate the latter. After the intestine had been replaced, an attempt was made to restore the omentum to its proper position, but it was at once manifest that this could not be done without great danger of peritonitis, owing to the fact that it was exceedingly fat and thick, and bleeding freely from numerous points upon its surface where it had been broken away from the sac. Rather than return the omentum in such a condition, I deemed it wiser and less hazardous to amputate it entirely, which I did, quilting it off in sections close to the transverse colon, using fine chromicized catgut. Each stump above the ligature was then thoroughly cleansed and touched with pure carbolic acid, wiped dry, and returned. The portion of omentum removed was larger than my two hands spread out, and fully an inch thick. The abdominal cavity about the site of operation was cleansed with dry sponges, but no water or sponges were introduced within the pelvic cavity. The peritoneum was closed with a continuous catgut suture. The abdominal walls were then taken in hand, and all that portion containing the hernial sac was taken away by removing a section of skin on either side, elliptical in shape, two inches wide and about six inches long, including the navel and the cord down to the peritoneum. The two lateral halves of the linea alba were then dissected out from the fat and brought into apposition. For the purpose of retaining this tissue until firm union should take place, silver-wire sutures were introduced after the method which I have described.

In this case three were used. They were then shouldered after the method of Dr. Emmet, and a canula placed over each suture and shotted in position. Between the wire sutures interrupted catgut sutures were placed, so that the entire linea alba was brought into close apposition, and a row of silkworm-gut sutures was then introduced through skin and cellular tissue down to the linea alba, but not including the latter. When the catgut sutures had been tied, the wire sutures with their canulæ protruded through the centre of the wound. The parts were cleansed and dressed with iodoform gauze and the patient put to bed. She bore the operation fairly well. As soon as she had recovered from the anæsthetic sufficiently to swallow, she was given half a Seidlitz powder in hot water. This was repeated every hour until she had taken four, for the purpose of keeping up vermicular action of the intestines, thereby preventing adhesions, and also relieving congestion about the bowel by producing a watery stool as soon as possible, which was accomplished the next morning. From that time on the patient's recovery was an uninterrupted one, although she was a most unruly woman. The wound healed by first intention. Her temperature never went above 100°, and her pulse soon steadied down and became better than before the operation. Tympanites at no time was present. On the twelfth day, while the nurse was absent, the patient got out of bed and walked around the room. The silkworm-gut sutures were removed at the end of two weeks, but the silver-wire sutures in the linea alba were allowed to remain until July 15th, two days short of a month. During the last week of this time the patient was up and about the house, caring for herself almost entirely.

The result is a perfect one, no complication whatever having followed the cœliotomy and the removal of the entire omentum.

It will be noticed that accident following cœliotomy was the direct cause of hernia in the first of these cases, and so far I have purposely refrained from consideration of causes influencing ventral hernia, but it is a well-known fact that since the advent of cœliotomy for intra-peritoneal disease, ventral hernia has been much more frequently met with, and I wish, if possi-

ble, to place the cause where it belongs—to the credit of the surgeon. It is due to the careless closure of the abdominal wound, to the unnecessary and prolonged use of the drainage-tube, the making of an unnecessarily large incision, the too early removal of sutures, also to allowing the intestines to become tympanitic, instead of early using saline cathartics, to allowing the patient to pass out of the surgeon's care too soon, without proper support from a well-fitting bandage, and especially when mural abscess has followed his work.

Wylie reports sixty-seven consecutive cœliotomies, eight of which were for ventral hernia; the eight operations were performed upon six women, two having to be repeated (*Am. Journ. Obstet.*, 1887, p. 25). In five of the six women, the hernia followed a previous cœliotomy, and in all the drainage-tube had been used, evidence sufficient to convince me that the drainage-tube is not a harmless instrument.

In closing this paper, I wish to draw attention to the following conclusions:

1. That in the female the treatment of umbilical or ventral hernia by mechanical support rather than by radical operation is unwise.

2. That the radical operation, if properly done, is not more dangerous than cœliotomy for any other purpose.

3. That the use of a buried non-absorbable suture is attended with more or less risk.

4. That to secure a good result it is necessary to have perfect apposition of the cut edges of the linea alba.

5. That in using any form of suture which includes skin, cellular tissue, and peritoneum with the linea alba, we cannot be sure of proper apposition of the latter.

6. That the silver-wire suture, if adjusted as I have described, can be worn from three to five weeks without causing irritation.

7. That the small sinuses leading down to the linea alba from the use of the silver canulæ over the wire sutures, are an advantage rather than otherwise in fleshy women.

8. That if operators who have this accident follow in the wake of their work, would only report their cases, the profession at large would profit by it, and greater efforts would be made to prevent the occurrence.

DISCUSSION.

Dr. H. J. Boldt, of New York.—This of all subjects has been of unusual interest to me, for the reason that I have had occasion to operate on a number of cases of ventral and umbilical herniæ in women during the past few years. I would make a great distinction between hernia resulting from abdominal section and ordinary umbilical hernia, since in the latter, especially where there is much fat, the operation is a much more difficult one.

I may say that in all cases when operating I enter the peritoneal cavity. After opening the former wound and freshening the edges of the fascia and muscles, I introduce silver wire, chiefly for the purpose of a splint, then use catgut sutures in continuous rows; the result is usually good union. But in cases of thick walls, adherent intestines, with sometimes great protrusion, the difficulties encountered are much enhanced, and I have not been so fortunate as the author in avoiding all suppuration in the line of union. I presume his better result in this respect has been due to the drainage which he secures by the tube through which the suture is passed. Usually I employ two rows of catgut in the fascia and muscles. The peritoneum, of course, is closed separately. The silver wire is finally drawn taut and holds the parts firmly. Often it is necessary to cut away the thickened, bulky omentum. The result of the treatment on the hernia has been satisfactory. One patient died of septicæmia.

Dr. Charles P. Noble, of Philadelphia.—I have recently adopted in my abdominal work a suture which I have seen Dr. Edebohls, of New York, use, and I think it might prove satisfactory in hernia. Silkworm gut is used; it is passed through the fascia, rectus muscle, and peritoneum on one side, and then in a corresponding way on the opposite side, is tied and cut short —in other words, is buried. At first sight one might think that

it would lead to mural abscess, but in practice the result is satisfactory, and gives, I think, permanent support to the weakened fascia and transverse muscles. In general, I quite agree with Dr. Dudley. I think that it is of the utmost importance to open the peritoneum, otherwise we might reduce a mass of adherent omentum and intestine in altered relations, which might afterward lead to obstruction, or form a pocket favorable to subsequent protrusion, etc.

I wish to call attention to the degree of *tension* present in fat women. I once operated on an umbilical hernia in a very fat woman who had suffered much and prevailed upon me to operate, rather against my judgment, as the abdominal walls were very tense. I succeeded in freeing the adhesions and in reducing the hernia, but found great difficulty in closing the hernial ring, as there was not enough room in the abdomen for its proper contents. We should, therefore, before operating on very fat women, consider whether we shall afterward, with the degree of tension present, be able to close the wound satisfactorily. In a doubtful case I should first try to reduce the fat by dieting and exercise before operating.

Dr. H. Marion Sims, of New York.—The subject of abdominal hernia is also of unusual interest to me. Unfortunately, I was not present at the reading of the paper, but I have some knowledge of its contents. One reason why the subject of ventral hernia is of interest to me is the fact that I believe that I operated upon the first case put on record in this country. Having never seen any such operation, it was slow and tedious. It was in that case, alluded to in the paper, that the hernial ring was ten inches in circumference and the intestines were adherent at every point, requiring two hours for their separation. Yet the operation proved entirely successful; it came up to all my expectations, with one exception, namely, that the peritoneum bulged inside and burst open the wound somewhat, so that it was slow in healing. This was due to the large size of the woman, the layer of adipose tissue being three inches and a half thick. After this experiment I was able to handle my next case much more skilfully. The hernia was due to a cœliotomy, which had been performed by a well-known gynecologist. In this case I used the little

tubes and secured drainage much as, I presume, Dr. Dudley has done. I have now operated upon six cases altogether, and I always use Lembert sutures in sewing up the peritoneum. These sutures, composed of heavy catgut, were buried. The fascia and muscles were brought together by a separate stitch, and drainage was secured by placing fine rubber tubes in the deep opening in the adipose walls. After two weeks they were taken out, and the wound healed perfectly.

At the time of my third case Dr. Pryor and I had thought of the idea of leaving the adipose tissue open entirely, that is, closing the peritoneum, bringing together the fascia and muscles by a second row of sutures, and then packing the remaining portion of the wound, and allowing it to heal by granulation. I found this treatment more successful than any I had tried previously, and have continued to use it. The packing with iodoform gauze is repeated as often as required, and the cavity gradually fills up. The result of this method has been very satisfactory.

My sixth case was one of large ventral hernia, operated upon about eight months ago. An enormous omentum completely filled the hernial sac, and after the adhesions were broken up a considerable part of it was removed. The patient made a good recovery, and has remained well to the present.

Where, as Dr. Noble says, it is difficult, owing to the extreme fatness of the patient, to bring the walls together, I have taken two or three preliminary deep sutures with wire, running outside the other row of sutures, thus holding the walls together or giving additional support. Whether it has had anything to do with the ultimate recovery of the patient I am unable to say; I simply resorted to it as a precaution.

Dr. J. M. Baldy, of Philadelphia.—In dealing with ventral hernia I have laid down for myself several principles. In the first place, the hernia is due to the lack of union of fascia and muscle; so these are the tissues to be dealt with primarily and principally. Further, if we want union of these parts we must have a broad surface brought into approximation, get a solid line of union, and take the precaution to have these surfaces held in position as long as possible.

In practice I have found it absolutely necessary to open the

peritoneal cavity in dealing with these cases. Ventral hernia is comparatively easy to handle, but umbilical hernia—not the result of an operation—is often extremely difficult to manage. It is the tension in the old cases which is often the cause of failure.

My last case illustrates the method which I use and which has always been successful. The patient had primarily been operated upon in the Homœopathic Hospital, the operation proving a failure, and leaving her worse than she was before. There was an opening in the walls between the muscles and fascia as large as two silver dollars. I denuded the split edges of the muscles and fascia, getting as broad a raw surface as possible, then whipped the muscles and fascia together with a continuous silk suture; then a second, and even a third row were placed, each burying the other. The other steps were like those in any abdominal section. The sutures, it will be seen, are buried. I had no suppuration whatever. To repeat, I carried out the principle of bringing together as broad a denuded surface as possible, and used three rows of buried silk, in order to keep the denuded surfaces together as long as possible, that is, as long as the silk would last. I do not believe that a month is sufficient, and in that respect I think Dr. Dudley's method is deficient. I have used buried silk a great deal in all sorts of abdominal and plastic operations, and have not had any trouble follow its use.

Dr. Boldt.—I had one case like that of Dr. Noble's. Owing to gangrene I was compelled to resect a large piece of the abdominal wall, and afterward found the walls separated several inches, so that they could not be brought together. I therefore made a number of vertical incisions on each side, extending down through the fatty tissues, which separated and permitted the edges of the wound to be brought together and sutured. The incisions healed by granulation. As to silkworm gut, if inserted through the entire thickness of the walls in a fat patient it will not be long enough.

Dr. Baldy asked Dr. Boldt whether this idea was German or not, and having received an affirmative reply, he said that Dr. Emmet had spoken of it in connection with vesico-vaginal fistula, and that he had himself employed it in operations on

other parts of the body, and recently in a case of fistula where tension would have prevented healing had he not made incisions into the adipose tissue to one side. It was a most valuable procedure, and the honor of its suggestion was due to Dr. Emmet.

Dr. Dudley.—It has been a great pleasure to me to hear this free discussion. I agree with Dr. Boldt as to the difference between umbilical hernia and ventral hernia in the matter of treatment, but I consider one as dangerous as the other so far as strangulation is concerned. The umbilical hernia may be even more dangerous because of the elasticity of the ring. I should have entitled my paper "Umbilical and Ventral Hernia," rather than "Umbilical Hernia" alone.

As to catgut, I use it wherever tension does not play an important role. As to Dr. Noble's criticism and advocacy of silkworm gut, I have stated in my paper that I use silver wire with the tube in order to avoid inserting a non-absorbable suture which would have to remain. I do not believe that it is desirable to have a foreign substance of any kind within the body, and silkworm gut is non-absorbable. We may be able to use it and not have suppuration, but what is the advantage of its presence when other material can be used and left sufficiently long and then removed? Not longer ago than July I had occasion to remove a silkworm suture from a woman who had had cœliotomy performed upon her by some one eighteen months before, and during that time had a sinus, due to the ligature, which would not heal until the latter was removed.

As to the necessity of opening the sac, I think that it is evident to all of us, especially if the patient is fat. As to intra-abdominal pressure preventing coaptation of the edges of the wound, I have in all cases but one removed the entire omentum, which overcame the difficulty.

I am much obliged to Dr. Sims for his remarks. It is to him that I am indebted for the idea of using canulæ.

Regarding Dr. Baldy's way of operating, it will be remembered that Dr. Marcy puts in not only three, but even four rows of sutures, one continuous tendon suture uniting the peritoneum, another uniting the lower half of the split surfaces of the linea alba, a third uniting the two upper halves, and a fourth uniting

the skin. I think that it is a most excellent method, and if I had the confidence in the tendon which Dr. Marcy has I would use it. At any rate, if the patient should prove an unruly one, like one of mine, the work would be undone.

I think that the linea alba should be united edge to edge, not side to side, if one would secure union and avoid separation.