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AFTER ABDOMINAL SECTION
AND ITS TREATMENT.

BY

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VENTRAL HERNIA RESULTING AFTER ABDOMINAL SECTION, AND ITS TREATMENT.*

ANDREW F. CURRIER, M.D.

THE great number of cases of ventral hernia which were observed a few years ago as the sequel of abdominal section, happily led to a careful revision of the *technique* of closure of the abdominal incision and to various modifications of the same.

The substitution of the vaginal for the ventral avenue of approach in the surgery of the abdomen and pelvis, on the part of many surgeons, has still further tended to limit the number of accidents of a hernial character. There are still many surgeons, with more or less experience in the vaginal method of operating, who are unwilling to abandon the tried and satisfactory incision through the abdominal parietes. Into the merits of this controversy, however, I do not propose to enter at this time. There will probably remain a **large number** of cases, in any event, in which it will always be deemed preferable to use the abdominal incision, either central or lateral, no matter what our

prejudices or preference may be, and hence the possibility of future hernias. Especially will those cases be exposed to this risk in which an incision in the loin is requisite, the muscle and fascia often affording less protection in this locality than in the central portion of the abdomen. This subject, therefore, cannot be dismissed as one which is deficient in practical utility.

The cause of ventral hernia is by no means identical in all cases. It may be due to imperfect apposition of homologous structures, to an insufficient number of supporting sutures, or to too large a number, to premature removal of the sutures, to insufficient protection of the abdominal wall after the patient has left her bed, to undue strain and tension upon the tissues involved in the wound, or to defective vitality in these tissues. It does not follow that hernia implies imperfect *technique* on the part of the surgeon, for it may occur when no flaw of such a character is demonstrable. It is well to recall, in this

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connection also, that with the occurrence of the menopause which follows many of the operations in which the abdominal parietes are divided, there is a tendency to unusual development of adipose tissue in that por-

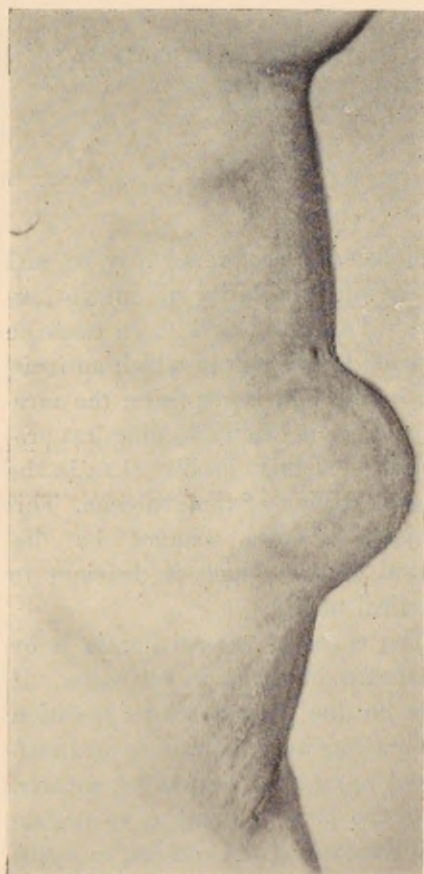


FIG. 1. (Profile.) Variety 1, simple.

tion of the body, and sometimes to fatty degeneration of structure as well.

When such a condition occurs in women who are obliged to work hard and continuously to earn their living, especially if they work in an elevated

temperature, and are addicted to the excessive use of alcohol, hernia may be expected to result in no small percentage of cases. Such hernias are not directly attributable to faulty operations, and cooks, laundresses, and scrub-women have occupations which render them very susceptible to the accident.

A tendency to hernia is present in the tuberculous, the syphilitic, and all others whose tissues are essentially depraved and deficient in resisting power, and the same is true of those with whom the line of union has been weakened by the use of the drainage tube, or the gauze packing, or with whom the union has been by granulation after more or less extensive suppuration.

There are three varieties of hernia which I have observed as the sequels of abdominal operations which may be denominated (1) the simple, Fig. 1; (2), the multiple, Fig. 2, and (3), the massive, Fig. 3. This distinction becomes necessary for the treatment, at least in my experience, differs for each. The order in which the tissues separate in the development of hernia is immaterial, indeed I do not know that any observations upon this point have been recorded. What has been observed is that the muscles and the firm sheath of fascia split apart when the *vis a tergo* becomes sufficient, and the peritoneum, usually, but not always intact, with the abdominal contents which are behind it, are projected forward into the opening. The peritoneum, if un-

ruptured, soon becomes adherent to the skin, while the omentum and intestines may or may not adhere to the peritoneum. The danger of strangulation with this form of hernia is not great, the danger is rather that the rent in the abdominal wall will increase in length and the volume of the hernial sac increase proportionately. In the simple variety of ventral hernia (Fig. 1), the lateral retraction and stretching of the muscles and fascia progress, there is a decided development of connective tissue binding the structures firmly together, and very often the formation upon the abdominal wall of a thick overlying mass of fat, so that the muscles are entirely buried from sight until the fat is dissected away. The muscles, as a rule, do not lose their function, and except for the weakening of the abdominal wall and the sense of insufficient support at the seat of the hernia, the patients may not be conscious of any great inconvenience or pain. Indeed, the discomfort is sometimes so inconsiderable that it is frequently difficult to persuade them to submit to an operation to restore the structures to their normal anatomical relations.

In the second variety of ventral hernia (Figs. 2 and 4), the conditions are more complicated. It occurs in women with weak and flabby tissues, and with general tendency to the development of adipose. There is great retraction of the muscles and fascia, with fatty degeneration, the muscles being pale and poorly nour-

ished and the fascia thin and yielding. The hernia is not only in the central line, but in more or fewer locations in other portions of the abdominal wall. The reduction of these various herniæ and the dissection and

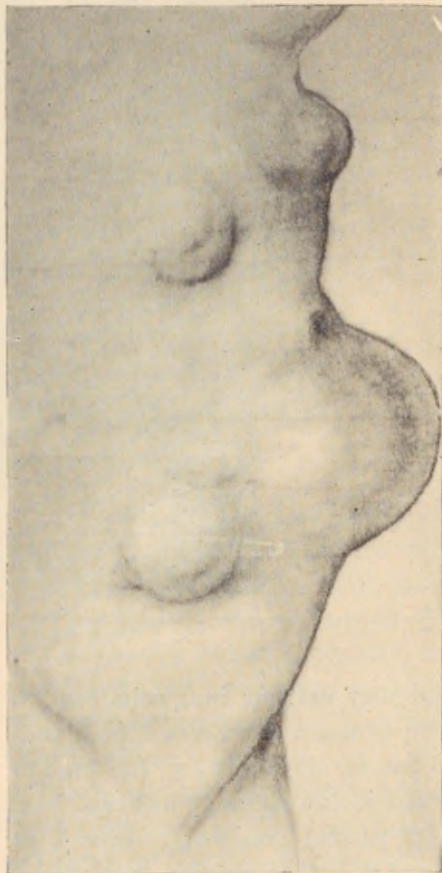


FIG. 2. (Profile.) Variety 2, multiple.

resection of the redundant and unnecessary tissues is a task which consumes much time and patience. Fortunately, this variety is the least frequent of the three. It gives rise to a very decided sense of weakness and insufficiency in the abdominal wall,

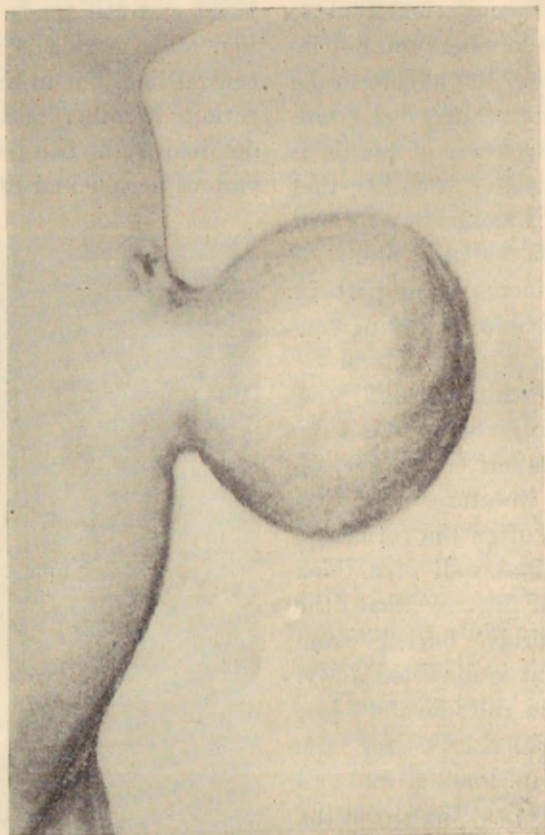


FIG. 3. (Profile.) Variety 3, massive.

and may entirely incapacitate a woman from earning her living. It is also not devoid of danger, for strangulation in the accessory pouches is an ever present possibility. (See Figs. 2 and 4.) The massive variety of ventral hernia (Fig. 3) is sufficiently indicated by the name. It includes all cases in which the hernial pouch is of the size of a child's head or larger. It may occur from the sudden rending of the entire scar which results from the abdominal wound, or by gradual development

from the simple variety. When the process is gradual and the peritoneum has ruptured, a well-marked ring of fibrous tissue may be developed at the peritoneal border (Fig. 5). The contagious peritoneum may also undergo great thickening, and folds and pouches innumerable may make the situation a complicated and perplexing one. The intestinal mass may be reducible or irreducible; in the latter case the contour of the entire abdominal cavity undergoes change, and it is possible that the



FIG. 4. (En Face.) Variety 2, multiple.

function of the intestines may suffer modification. The development of a great mass of fat adds to the difficulty, and presents a very knotty problem for solution.

The question naturally arises whether it is proper in all cases of ventral hernia to advise the patient to submit to an operation for its relief. In my opinion this question should always be answered affirmatively. The discomfort from the hernia may be slight and the danger of strangulation small, but it is almost certain that the same or a similar force which produced the original rupture will enlarge and extend it.

Such a process may be gradual, but it is difficult to understand how

it could fail to take place if the patient occupied herself with the ordinary avocations of life. With hard-working women, the volume of the hernia usually increases rapidly, especially if they are careless as to the protection of the abdomen by a suitable bandage.

The symptoms of ventral hernia are so similar to the well-known symptoms of intestinal hernia in other locations, that it would be superfluous to say more than that they vary from absolutely no discomfort—in the simplest cases, to complete incapacity for ordinary muscular toil in the most severe.

The occurrence of this accident naturally excites the attention of the patient from its very conspicuous-

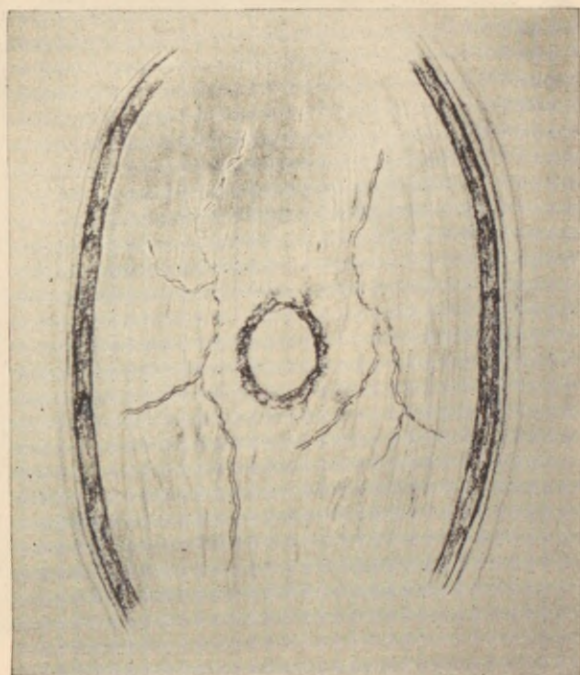


FIG. 5.

ness. Should she then consult a physician who is without surgical tendency or experience, he would probably recommend the use of a bandage or truss. Such advice, which might be entirely suitable for an ordinary inguinal or femoral hernia, would not be appropriate for the variety which is now under discussion. In the former case, the intestine has escaped through a natural passage, in the latter, through one which is artificial, and the line of rupture is prone to extend until the original wound is reopened, or a fissure of even greater extent produced. Hence prudence and common sense dictate the radical surgical treatment of the

injury at the earliest practicable moment.

The surgical treatment of ventral hernia in its earliest stage is simple enough; the old wound should be refreshed throughout its entire extent unless it is quite evident that the tissues are perfectly strong and secure—above and below the hernial opening. The retraction of muscles and fascia is then only moderate, and it is an easy matter to bring homologous tissues into apposition. It is quite possible to pass the ligatures through all the tissues, including the peritoneum, without opening the peritoneal cavity, until they have been passed. This implies, of course, the

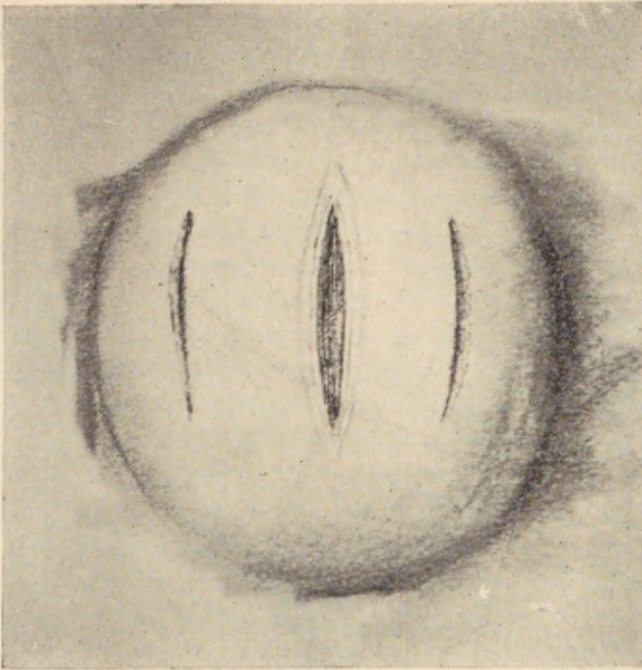


FIG. 6.

certain knowledge that none of the abdominal viscera are in immediate contact with the peritoneum and the peritoneal sac must be cut off before the ligatures are tied. In the more voluminous hernias which have been developing during months and years, and in which the retraction of muscle and fascia has been considerable, the task is more difficult. In these cases it is well to open the peritoneal cavity at once. It may not be possible to locate the retracted tissues by palpation from without, but they can be readily found by palpation from within. Once found, they must be dissected out, superfluous peritoneum, fat, and connective tissue removed

and homologous structures approximated. If after free dissection the tension upon the approximated tissues should be great, this tension must be relieved by appropriate longitudinal parallel incisions in the contiguous tissues (Fig. 6). In the massive variety of hernia, the liberation of the muscle and fascia with its attendant extensive dissection by no means completes the preparation of the tissues for reunion. The hypertrophy and redundancy of the peritoneum in such cases may be enormous.

As was observed in a previous portion of this paper, this variety furnishes us with a well-marked fibrous ring (Fig. 5), if the original rupture

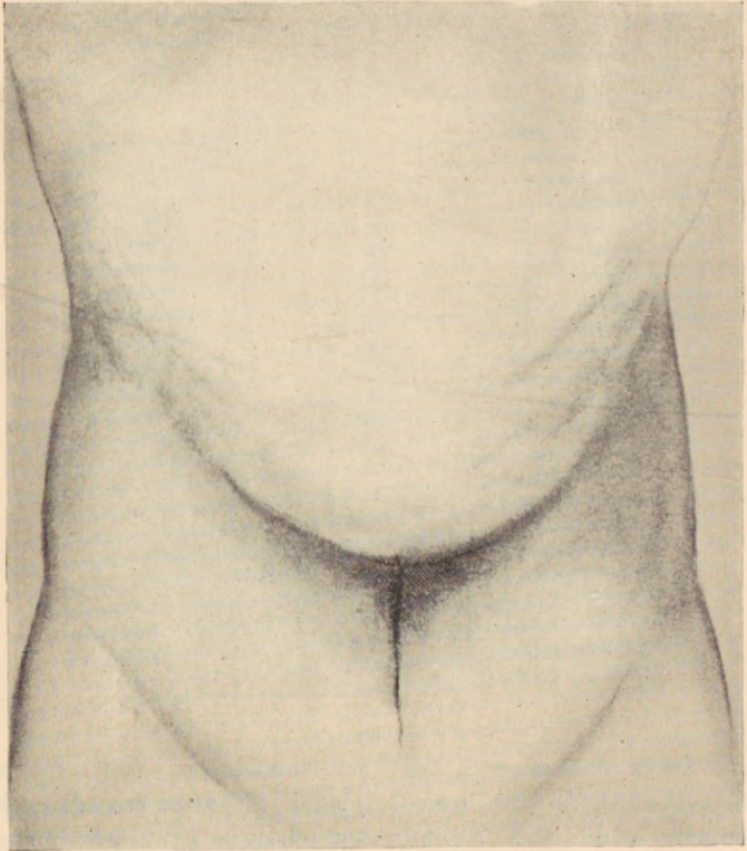


FIG. 7.

involved the peritoneum. The strength of this ring may be great and beautifully illustrates nature's conservative efforts to replace the normal protection to the abdominal viscera. This ring must be entirely removed, the folds and reduplications must be smoothed out and drawn towards the abdominal opening as a centre, and all excess must then be trimmed away in order to restore the normal anatomical relations. The peritoneal hypertrophy may be attended with the development of very

large veins which should be ligated before the tissue is excised (Fig. 5). By no means the simplest part of the operation consists in the removal of the excessive accumulation of fat which is present in many cases. Failure to excise it sufficiently in all directions from the wound will, by exerting too much tension or pressure upon the wound, endanger its permanent integrity. A great fold of fat constantly protruding is very unsightly and must also be a source of more or less discomfort (Fig. 7).

In the multiple variety of hernia the opportunity for effective work upon the weakened and degenerated tissues seldom exists. The tissues are all in a bad state of nutrition, the recti muscles may have disappeared to so great an extent that it would be well nigh impossible to bring them into apposition, and the fascia is so friable, that it is best to interfere very little with it. I have contented myself in such cases with laying bare the central hernial sac, removing it and the pouches which are contiguous to it, and then closing the wound, uniting such tissues as could be brought into apposition without great tension. Other hernial protrusions are then treated in a similar manner, the incisions being in lines parallel to the central incision.

One of the most important features in connection with this operation has to do with the suturing of the wound. The object in view is to bring the freshened tissues into contact so accurately and keep them in contact so long that when the supporting sutures are removed the union will be as firm as could ever be expected with the conditions which are inseparable from the individual.

Experimentation with the various substances which have been employed for suture material, has satisfied me that worm-gut in the greater number of cases, fills the requirements more completely than any other.

Numberless cases of infection with catgut, however prepared, render it

at least of doubtful safety for long sojourn in the tissues. Metallic sutures have the very desirable property which resides in a permanently aseptic material, but they are not sufficiently pliable for manipulation as other suture material may be manipulated.

Silk may become infected within the tissues though it may have been sterile when introduced. Worm-gut may also become infected and irritating, but this occurs less readily than with other sutures of animal material, and in my experience the number of cases has been very small. This has led me to repose greater confidence in its innocuousness than in any other animal suture. If too much of it is used in a given wound the nutrition of the tissues will be impaired, and I have seen troublesome dermatitis without suppuration, caused by four tiers of such sutures in a thin abdominal wall. The extreme limit of tolerance of this material by the tissues, in my experience has been three to four weeks. When retained for a longer period it becomes hard and irritating, and suppuration may ensue. Experience which demonstrated this fact long since convinced me that it was not adapted for permanent use as a buried suture. Soft tissues like the fat, the muscle and fascia which have undergone fatty degeneration, and the skin in alcoholics and others with whom the general physical condition is depraved do not sustain favorably the tension of tightly drawn sutures. For such cases the metallic sutures,

especially silver wire of rather coarse drawing, furnish a better and more enduring support than even the worm-gut. Necessarily they must be interrupted, rather than continuous, and if they can be retained two weeks or longer without cutting the tissues, the result will usually be favorable. Such su-

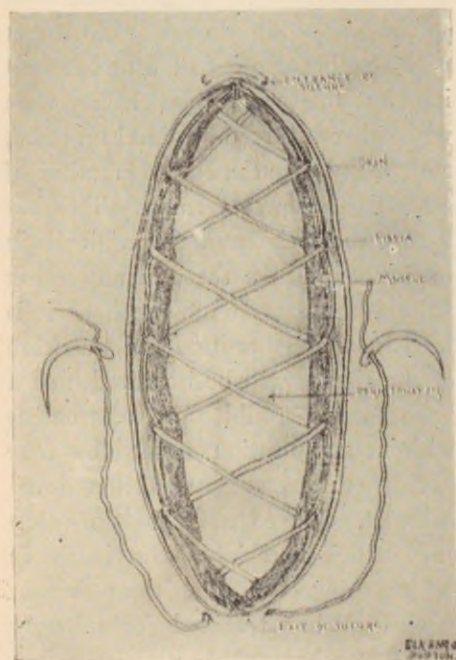


FIG. 8.

tures should include all the tissues in the abdominal parietes, should be passed at intervals of a third of an inch, and additional sutures between them should include the skin, subcutaneous fat and the sheath of the recti muscles if the latter can be liberated and brought to the central line. For hernias in which the wound is not more than four inches long, I have adopted a method of suturing which

has given satisfactory results in a number of cases. It is a continuous suture, a modification of the buried suture, and suggested itself in view of the advantages to be derived from prolonged support of the tissues and the disadvantages of the permanently buried suture. I have used it as a tier suture, that is with separate inclusion of the peritoneum, another separate inclusion of the skin and subcutaneous structures, endermical, and a third tier including the muscles and fascia. The peritoneal suture has been discarded as unnecessary and superfluous, and instead of the endermic suture, a continuous cutaneous one may be used if it is preferred except in cases in which the tissues to be united are very voluminous, when it will be better to use an interrupted one including the skin, muscle and fascia. The essential suture is therefore the one which enters the abdominal parietes just beyond the upper angle of the wound, traverses the tissues below the skin and subcutaneous fat from end to end of the wound, and emerges just below the lower angle. If the wound is not more than three inches long, only one suture, of this character, will be required (Fig. 8). If it is longer than three inches two sutures are preferable, one of them beginning beyond either angle, and both terminating near the center (Fig. 9). It is obvious that the longer the sutures the more difficult will it be to pull it out through the various tissues which it has engaged.

I first began to use this form of suture about a year and a half ago, and the method of introducing it is as follows: A strand of coarse worm-gut twelve inches or more in length is inserted at its ends into two strong, curved needles sufficiently long to penetrate all the tissues of the abdomen. Both needles are introduced into the abdomen just beyond the upper angle of the wound about half an inch apart, from without inward. The sides of the wound are then brought into apposition by successive stitches of continuous suture, including peritoneum, fascia and muscle, from below upward, and then from above downward, changing the needle to the opposite side with each successive stitch, precisely as one would lace a shoe. The suture must not be drawn too tightly, for that would pucker the tissues. If two sutures are to be used, *i. e.*, one for each half of the wound, the ends of each must penetrate all the tissues, including the skin, and emerge near the middle point of the wound. After these ends have been tied, each to its appropriate fellow, the gaping skin is to be closed by continuous or interrupted suture whichever seems the more suitable, as has already been remarked. A minor point which is not without practical importance consists in protecting the skin at the beginning and end of each suture by a thin strip of gauze which is passed under each loop. The wound may be sealed with iodoform collodion, or not, as preference may dictate; I have found

it useful. The dressings which cover the wound may remain unchanged, if the case proceeds normally, for two weeks. They are then removed and with them the superficial sutures. If the deep sutures are causing no trouble they may remain two weeks longer. By this time the tissues will

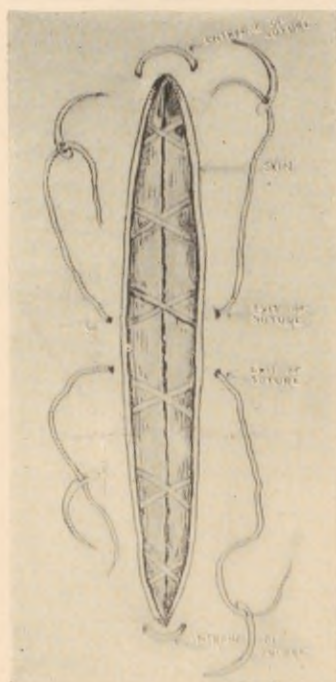


FIG. 9.

be as firmly united as they will ever be, and the sutures are not only no longer useful but act as foreign bodies which may cause trouble at any moment. To remove them the ends which were tied are cut, the loop at the initial points is gently pulled and with moderate traction each suture is removed. If the tissues offer great resistance to their removal, cutting

the loop and drawing on each end separately will facilitate the operation. An anæsthetic should be given if severe traction becomes necessary, but such an emergency is infrequent. I have usually removed them with very little trouble and without the infliction of severe pain. The patient is kept in bed while the sutures are

in situ and for a few days after their removal. As an additional safeguard I prescribe the wearing of a suitable number of straps of rubber plaster over the abdomen until the function of the tissues in their renewed conditions is fully established.

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