Rules to be Followed in the Effort to Prevent Mural Abscesses, Abdominal Sinuses, and Ventral Herniæ after Laparotomy.

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HORACE TRACY HANKS, M.D.,
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HORACE TRACY HANKS, M. D.,

PROFESSOR OF DISEASES OF WOMEN, NEW YORK POST-GRADUATE SCHOOL AND HOSPITAL; SURGEON TO THE WOMAN'S HOSPITAL IN THE STATE OF NEW YORK; CONSULTING GYNECOLOGIST NORTHEASTERN DISPENSARY; LATE PRESIDENT NEW YORK OBSTETRICAL SOCIETY; LATE VICE-PRESIDENT NEW YORK ACADEMY OF MEDICINE; AND MEMBER AMERICAN AND BRITISH GYNECOLOGICAL SOCIETIES, ETC. ETC.

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RULES TO BE FOLLOWED IN THE EFFORT TO PREVENT MURAL ABSCESSES, ABDOMINAL SINUSES, AND VENTRAL HERNIÆ AFTER LAPAROTOMY.

By Horace Tracy Hanks, M.D.,
New York.

Mural Abscesses.—Abscesses in the line of the abdominal incision, as we all know, are not necessarily dangerous, but they are attended with fever and pain on the part of the patient, and are a source of great anxiety to the young surgeon. And they help to make the track for a later ventral hernia as is well known to the more experienced surgeon.

Can they be avoided? To answer this question we must remember that an abscess, in the vast majority of cases, is due to a disturbance of the blood- and nerve-supply, either directly or indirectly, or to a deposit of sepsis, in the wound. The disturbance of blood- and nerve-supply as a cause of abscess, may require a word of explanation. A wound that is lacerated does not heal as quickly and as kindly as a smooth-cut wound. The lips of the wound that are pulled apart by the fingers, and pressed hard upon with retractors, are injured much deeper. The bloodvessels and nerves are possibly wounded for a full half-inch beneath the edge of the tissues. Consequently the vitality is low, and there is a disposition to form abscesses from direct death of a part of the wound; and in many cases this part of the wound is badly strangulated by deep sutures, which have been tied unnecessarily tight.

It is not safe or good surgery to tear up the tissue with the finger, separating the layers of the abdominal wall, making

large or small pockets for the deposit of sepsis or blood clots. Other things being equal, make a clean-cut wound through the abdominal wall, and retract the edges of the wound with a proper, safe retractor, using care in this also; never hold the retractor too firmly, as I have often seen done, for ten or fifteen minutes, without once loosening the instrument, to allow a return of circulation in the lips of the wound.

Make a larger wound *at first* rather than do any injury by too great pressure.

Sometimes, undoubtedly, the lips of the wound are severely injured by too much sponging with too hot water, or by using too strong germicide fluid. Avoid both sources of injury. Sometimes, too, the lips of the wound are seriously injured by the hand, in the vain effort to pass it into the abdomen through a too small incision, and later in an effort to deliver the tumor *through* this small opening. Because Mr. Tait has taught us to work through a small incision *when we can*, we must not suppose that he does not believe in a *large* incision *when necessary*. We have often erred in applying his rule for *special* cases, to *all* of our cases.

Make the incision large enough to enable you to work intelligently and without difficulty *in* the pelvis, and without injury to the lips of the wound while the hand is in the pelvis.

The question of *sepsis* at the time of the operation is one, however, not to be overlooked. Undoubtedly many an abscess is caused by the direct deposit of sepsis in the edge of the wound.

Make sure that the hands, instruments, sponges, towels, and all outer garments which can possibly be touched during the operation, are absolutely aseptic.

The patient should be made clean, the pubis shaved, and a moist bichloride dressing should be kept over the abdomen for twelve hours before the operation. This last suggestion is too often overlooked. I believe it to be important. No iodoform or aristol collodion dressing is needed to cover the wound when a *sterilized* cotton dressing is used. Another source of sepsis is

the dressing, which is often allowed to remain too long over the wound before it is changed. We have not yet found a perfect dressing—one which we can safely trust on a wound of the abdomen for six days without removal. Even a bin-iodide of mercury dressing, which we all had hoped would be perfect in this respect, is far from an ideal dressing. We have often removed it after three days, and found underneath an abundant crop of pustules—some quite deep and large. I know of no germicide dressing which it is safe to keep *in situ* over the wound for six or eight days without inspection. We must not practise and teach that a dressing can remain for six days without changing. It is far better, if we wish to avoid mural abscesses, to remove the dressing, of whatever sterilized material is used, on the third day, and wash the wound with a warm germicide fluid and apply another sterilized dressing, doing this every second day, until the time to cut some of the sutures has arrived. And, furthermore, we should apply a moist bichloride dressing to the wound for full two hours *before cutting* the sutures. In other words, under no circumstances *introduce* sepsis as you withdraw a suture which is not absolutely asseptic. Sutures *must* be made aseptic before cutting and removing. Our abscesses which appear after the eighth day have almost always been caused by this carelessness.

The selection of needles and suture material, and the manner of introducing the needle may also, undoubtedly, be a cause of abscess.

Use a needle which will pass *easily* through the abdominal wall. I do not think in abdominal surgery, that the shape of the wound which the needle makes is of great advantage. The rules to follow are to have a sharp needle in all cases, a long and strong needle in thick-walled cases, and not a large needle in any case. A few Keith or Skene fine trocar-pointed needles, each carrying a sterilized suture of silk, or silkworm-gut, will be the ideal needle to use in passing sutures through the abdominal wall, when the edges can be

easily raised and everted. But if the wall is *tense* and the wound small, a *stronger, slightly-curved Hanks-Peaslee* needle will serve *best*, or a slightly curved *Hagedorn* needle may be used. I have found silkworm-gut easy to use with this handled needle, and my assistant threads the needle instantly after its passage through the wall on his side. Silkworm-gut or silver is best for holding the different layers together. I have found the sharp two-inch, round-pointed, slightly curved needle best for the peritoneum. For the fascia a sharper, stronger needle should be selected. I make these suggestions because I believe that unnecessary punctures are often made with poor needles, needles not adapted to the work in hand, and I believe every puncture, especially with a large needle, is an additional source of irritation. Too many surgeons are not good mechanics, and they expect to do all the work in the different abdominal wounds with needles of the same length and size. In very stout patients, when the adipose tissue is two and a half inches or more in thickness, it may be well to close only the peritoneum, muscle, and fascia, and leave the adipose tissue and integument to heal slowly by granulation, as recommended by Dr. Pryor.[1] By this way Dr. Pryor seeks to avoid the mural abscesses which are so liable to occur in every *stout* woman. I have never tried this plan primarily, but I have always practised a similar procedure in closing the sinuses caused by drainage-tubes and mural abscesses. I believe it a wise suggestion to follow in stout women and shall certainly follow it in the future.

To recapitulate: In trying to avoid mural abscess—

1. Make a *clean-cut* wound and not a *lacerated* wound.
2. Do not *separate* the *different layers* unnecessarily.
3. Do not *retract* the lips with *too much force* or for *too long* a *period.*
4. Do not use *too hot* water, nor *too strong germicide* on lips of wound.

[1] Medical Record, September 19, 1891.

5. Have the abdomen *aseptic* by keeping a *germicide dressing* on abdomen for twelve hours before operating.

6. Do an *aseptic operation.*

7. Make no unnecessary *punctures with needles.*

8. Do not *strangulate wound* with *too tight sutures.*

9. Under proper aseptic precautions remove the *sterilized dressing every two days,* wash with *warm germicide fluid,* and *re-dress as before.*

10. Before cutting sutures have the patient wear a moist bichloride dressing for two or more hours. Be sure no sepsis is on any suture before removing it.

SINUSES IN TRACK OF DRAINAGE-TUBES.—These accidents, like mural abscesses, are not dangerous, but they trouble our patients longer and humiliate the surgeon beyond expression. I believe they can be avoided.

1. Never use a drainage-tube when not needed.

2. Never allow one to remain *in situ* for over twenty hours without drawing it upward a third or half an inch, and fastening it in its new position.

3. Entirely remove it on the *third* day, unless purulent matter is withdrawn on that day, or the case is one of tubercular peritonitis. A little serum will do no harm if it *is* allowed to remain in the cavity.

4. Insist upon much more care being exercised by the house surgeon or nurse, in clearing the tubes. They must be kept *sweet* and *aseptic.*[1]

5. Always have one loose suture untied in the track of the tube, which is to be tied as soon as the tube is removed and the parts thoroughly cleansed.

VENTRAL HERNIA.—This accident is far more frequent than many suppose.[2] They do not all occur alone in the practice of the inexperienced operators. Some of our most brilliant operators find that there is a large per cent. of patients with

[1] See the Johns Hopkins recent report on infection through drainage-tubes.

[2] See our Fellows' articles, Drs. Wylie and Chadwick, and Dr. Pryor's article in Med. Record, Sept. 19, 1891.

ventral hernia, if they examine them after two years. I have been called to operate for this distressing accident five times in three months during the last year. These patients had been operated upon by four different gynecologists. One patient only had been operated upon by myself. If I have seen five cases in three months, what must be the number seen by all the other gynecologists in New York City alone during the year. During the last few years in the Cripples' Hospital in New York, fifty patients, from among the *poor*, have applied for suitable trusses or supports for ventral hernia following laparotomy. The cause of ventral hernia is, of course, the giving way of the muscle and fascia in the line of the wound. I believe we can prevent the accident.

I know, and many of you know, how very infrequently the peritoneum, the muscle, and the fascia are brought into exact apposition during an operation. I have seen this done so slovenly that nothing short of a miracle could prevent a hernia. Many and many a time, when a deep wound is being closed, the peritoneum on one side is allowed to slip up between the fascia, thus paving the way for an early rupture. To avoid this accident, and for other reasons, Ségond favors vaginal hysterectomy, as in that case there is no abdominal cicatrix.[1]

Pozzi[2] and a host of others advocate suturing the wound in layers to reduce the possibility of hernia in the abdominal cicatrix to its minimum proportions. The drainage-tube is far less likely to be the cause of the hernia. When a large one is used, possibly it may be an exciting cause, but generally it is surrounded by plastic material, and no portion of the intestine can get in position to work through the artificial canal. The cause, therefore, is due to the inexact way in which the different layers are brought together, or to the weakness which has resulted from an abscess in the wound at the point of union of

[1] Abstracts in Am. Journ. Obstet., August, 1891, p. 1010.
[2] Am. Journ. Obstet., August, 1891, p. 1014.

the fascia. The rule to be adopted and followed in all cases, is to bring the peritoneum together with very fine continuous catgut sutures, then the muscle and fascia in like manner, making sure of the muscle as well as the fascia. No wound is safe unless the fascia is *strong*. Whatever plan you may adopt for the adipose tissue and integument, the peritoneum, and especially the *muscle* and *fascia*, *must* be treated as above described if the danger of hernia is to be reduced to a minimum. A good course to pursue is to keep the different layers together by inserting two deep sutures of silkworm-gut *first*, and allowing them to remain loose until the fine catgut, suturing in the peritoneum and fascia are each, in turn, completed; then by gently tightening these deeper sutures, bringing the different layers in apposition. Do not draw these deeper sutures too tightly, or there will be strangulation of the deeper tissues. If you are sure of your catgut you can do all the work with it. Certainly not more than two deeper silver or silk or silkworm-gut sutures are needed. I do not insist upon any one plan for closing the wound. I only insist upon *bringing each layer in exact* apposition with its fellow in regular order in the most exact and approved manner.

The annoyance and distress of some of these women suffering from a monstrous hernia cannot be exaggrerated. We ought to be willing to give five minutes extra time to a scientific suturing of the abdominal wound in order, if possible, to prevent an accident so serious to the patient and so humiliating to the surgeon.