

FOREIGN BODIES LEFT IN THE ABDOMEN AFTER
OPERATION*

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DURING the last three decades, there has been a remarkable improvement in the technic associated with abdominal operations. This applies not only to the increase in skill and dexterity of surgeons but also to the advancement made in the problems of operating room facilities, lighting equipment, instruments, anesthesia, and other factors. Because of the dangers to the patient of leaving foreign bodies within the abdomen and also because of the direful consequences to the surgeon of a lawsuit as a result of this, efforts have always been made to prevent such occurrences. During the last twenty-five years many recommendations have been made on how to check up the loose armamentarium used during an operation. At present most hospitals have rather elaborate systems for this purpose and the common belief is that it is an extremely rare occurrence for an instrument or a sponge to be left in the abdominal cavity after an operation. Yet a high official in a large insurance company which protects physicians and dentists against malpractice suits informed me that his company takes care of approximately one hundred suits dealing with foreign bodies each year. Also that about one in every fifteen suits for malpractice against physicians and surgeons is for a foreign body. Since there are many insurance companies which insure physicians against malpractice suits, we can only conjecture the appalling number of foreign bodies left in patients after operations.

As far as I know only three of all these hundreds of malpractice suits have been reported in medical literature, although more of them may have been recorded in the medicolegal section of the *Journal of the American Medical Association*.

The large majority of malpractice suits for foreign bodies never reach the courts because for obvious reasons they are settled out of court. In spite of this however, I found records of 68 cases of foreign bodies carried to the courts of the various states in this country from 1897, when the first case was apparently recorded, to 1925. These 68 cases represent only those cases which were taken to court and on which a verdict was rendered. Where a case was not taken to court and even where it was taken to court but no verdict was rendered, either because the suit was dropped or for some other reasons, it was not included in these 68 cases. In many of the cases where verdicts were rendered, they were in favor of the patient. Even in the cases where the surgeons were absolved from responsibility,

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most of them suffered incalculable harm as a result of the odious notoriety usually associated with such lawsuits.

The question of guilt has not been answered by all courts in the same way. In answer to a query in the *Journal of the American Medical Association* the following information was given :

“Responsibility for allowing a surgical instrument or other foreign body to remain in the abdomen after an abdominal operation rests on the party through whose default, or through the default of whose agents, it was allowed so to remain. To locate that default on the proper party, it is necessary first, to ascertain the respective duties assumed by each of the several participants in the operation, personally and through his agent. Then it must be ascertained which of such participants defaulted in the discharge of the obligations that they had assumed with respect to the patient, and by whose default the patient was as a proximate result injured. The duties assumed by each of the several participants in the operation must be determined according to their respective relations to the patient, arising out of contracts, expressed or implied, or out of the relations between the parties independent of contracts. Such relations, so far as they are not fixed by contracts, are determinable from a study of the general customs relating to such operations, and of local and special customs a knowledge of which, prior to the operation, is brought home to the patient. No hard and fast rule can be laid down for determining the division of responsibility between the operating surgeon and the hospital. Charitable hospitals, however, are in many jurisdictions held to be free from liability to their patients, except for such injuries as may result from a failure on the part of the hospital to exercise due care and skill in selection of its agents and employees.”

In certain states including Illinois, Indiana, New York, Massachusetts and others, the courts hold the following point of view. Every modern hospital has nurses who count sponges and instruments before and after operations. At the request of the surgeon they report that all the sponges and instruments are accounted for at the end of an operation. If there is a mistake in counting, it is due to negligence of the nurse who is in the employ of the hospital. The surgeon is not responsible in such a case. Unlike charitable hospitals private hospitals are not immune in any state.

The above discussion deals with foreign bodies, the presence of which sooner or later becomes known to the patient or to the patient's relatives. In addition to these cases there is a very large number in which foreign bodies are accidentally found by surgeons who usually make no mention of their discovery to the patient or to his or her relatives. In fact very few of these cases are made known to anyone except those in the operating room, because of the desire to protect the surgeon who performed the first operation. Many surgeons in conversation will reveal having removed one or more foreign bodies which they or others have left behind, but they seldom report these facts in medical literature. In support of this contention I should like to cite the report of White. This author sent inquiries to surgeons in all parts of Great Britain asking for *unpublished* cases of instruments left in the peritoneal cavity after operation. He specifically requested that forgotten laparotomy pads and gauze sponges be omitted and in spite of this he received details of 39 instrument cases. White him-

self had two cases and there were three additional specimens in the Museum of the British College of Surgeons. In this series of 44 cases, eleven patients died (25 per cent). Likewise Schachner sent letters to many surgeons in the United States and all but four reported that they themselves had left one or more foreign bodies in the abdomen.

There is still a third group of forgotten foreign bodies, namely, those in which the mishap remains unrecognized. Undoubtedly there are patients in whom foreign bodies have been left and who die of peritonitis or other causes. There is no suspicion of the true cause of the peritonitis because an autopsy is not performed. That such cases are not infrequent is proved by the relatively large number of foreign bodies which were discovered accidentally at postmortem examinations.

In the literature a relatively large number of articles devoted to this subject have appeared, especially in the first decade of the present century. The most extensive papers with a compilation of cases are those by Neugebauer (1900), Schachner (1901), Goerlich (1908), Crossen (1909), and Albitzky (1917). In reviewing the literature from 1859 to 1908 Crossen found reports of 172 sponges and 51 forceps and other articles left as foreign bodies after abdominal operations. In addition he found 18 cases of foreign body left after vaginal operations. Among the 172 sponge cases, the end-results were as follows: 83 patients (48.3 per cent) recovered, 53 patients (30.8 per cent) died, and in 36 cases (20.9 per cent), the outcome was not mentioned. Among the 50 patients with forceps or other instruments (in one patient two forceps had been left, hence the 51 instruments in 50 patients) the results were as follows: 17 patients (34 per cent) recovered, 14 patients (28 per cent) died, and in 19 cases (38 per cent), the results were not stated. Hence among the entire 222 patients with foreign bodies, 100 patients (45 per cent) recovered, 67 patients (30.2 per cent) died, and in 55 cases (24.8 per cent), the end-result was not stated. In this series of 222 cases, the original operation during which the foreign body was accidentally left, was an abdominal one in 30 cases (13.5 per cent), a pelvic one in 86 cases (38.7 per cent), and in 106 (48.7 per cent) cases, the type of operation was not listed. In 52 of the 222 cases (23.4 per cent), the foreign body was discovered at autopsy.

In Albitzky's series 56.8 per cent of the patients were females, 3.2 per cent were males, and in 40 per cent, the sex was not stated. In 80.4 per cent the foreign bodies were left during gynecologic operations, and in 19.6 per cent during other types of surgical operations. In this series 48.5 per cent recovered, 23.5 per cent died, and in 28 per cent, the outcome was unknown. In 38 per cent the foreign body was removed during a second operation, in 20 per cent it was expelled spontaneously, in 2.1 per cent it was found at autopsy and in the remaining 21 per cent there was no report as to how the foreign body was discovered.

I had the unusual experience of finding three foreign bodies within eleven months. Brief abstracts of these cases are as follows:

CASE REPORTS

CASE 1.—Mrs. I. B. (No. 1,043,841), aged thirty was admitted to the Cook County Hospital on January 4, 1928 because she had a persistent, purulent discharge from an abdominal wound, chills, fever, nausea and vomiting and had lost 25 pounds in the last five weeks. The family history was negative. The past history was unimportant except for two operations performed at another local hospital ten weeks and five weeks respectively before admission to the Cook County Hospital. A posterior colpotomy had

been done the first time. Five weeks later a laparotomy was performed and both tubes and ovaries were removed. (Inquiry at the hospital where the operations were performed elicited the information that both tubes and ovaries had been removed but not the uterus.) Immediately following the laparotomy, a purulent discharge escaped both from the abdominal incision and from colpotomy wound. Then the patient had chills, fever, and anorexia, and she vomited most of her food. She left the hospital in this condition. The general physical examination on admission to the Cook County Hospital revealed no abnormalities other than extensive emaciation, marked pallor, and a foul odor. The temperature was 102.6° F., the pulse was 108 per minute and respirations were 26 to the minute. The blood pressure was 110/70. The red blood cell count was 1,180,000, the hemoglobin was 30 per cent, the white blood cell count was 4,400 of which 62 per cent were polymorphonuclear leucocytes, 24 per cent were large lymphocytes, 10 per cent were small lymphocytes, and 4 per cent were myelocytes.

Abdominal examination revealed a low midline scar, well-healed, except at the lower end where there was a sinus. From this sinus foul-smelling pus escaped. Vaginal examination was made with difficulty because the introitus and the vagina were very tight. The cervix was small and hard. Behind the cervix, the colpotomy opening could be felt and through it, the same type of pus escaped as came out of the abdominal sinus. The body of the uterus could not be outlined but the entire pelvis was found to be indurated. The diagnosis made was pelvic abscess due to a foreign body or tuberculosis with secondary infection. The Wassermann reaction was negative. An x-ray picture was taken and a shadow of a straight pin was found anterior to the right half of the sacrum. Roentgen ray pictures were repeated twice on different days and the straight pin was found in the same position each time. A lateral projection picture showed the pin to be at the level of the sacral promontory.

The patient refused to be operated upon and left the hospital. We could not trace her.

The straight pin had probably been accidentally enclosed in a package of gauze pads or sponges when these were wrapped or the pin was dropped when a package of gauze pads was opened during the operation.

CASE 2.—Mrs. L. H., aged thirty, was admitted to the Cook County Hospital on May 24, 1928 because of pain in the lower abdomen. She had been married ten years but had never been pregnant. The family and past histories were unessential except for an appendectomy performed in Ohio three years before admission. The patient felt entirely well until six weeks before the present admission to the hospital. From that time on she experienced a constant, dull pain in the lower abdomen. This became progressively more severe. The pain was frequently associated with nausea but vomiting never occurred. During all this time there was a profuse foul vaginal discharge and constipation.

The general physical examination was entirely negative, except for a temperature of 99.8° F. The red blood cell count was 3,950,000, the hemoglobin 80 per cent and the white blood cell count was 8,900. On abdominal examination tenderness was elicited suprapubically and in the left iliac fossa. No masses were palpable. Vaginal examination revealed hypertrophied labia minora. There was no cystocele or rectocele. The anterior lip of the cervix was hypertrophied, smooth and not lacerated. The fundus of the uterus was enlarged, very hard, anteflexed and moderately movable. When the uterus was pushed backward the patient complained of great pain. The right tube was enlarged and tender. The left adnexa were converted into a very tender cystic, adherent mass. In addition to these masses there was a round, exquisitely tender, slightly irregular mass in the culdesac. The diagnosis made was fibrosis uteri; left tuboovarian abscess, right salpingitis and prolapse of the cystic right ovary. After the patient's temperature dropped to normal and remained so for a few days a laparotomy was per-

formed. Both tubes were enlarged and inflamed. A defundation of the uterus was performed and both tubes and the left ovary were removed. The right ovary was found to be in its normal position and in good condition. The very tender cystic mass which had been felt in the culdesac was easily shelled out and when opened proved to be a gauze sponge surrounded by a thick capsule of fibrous tissue. Convalescence was uneventful and the patient left the hospital on the eleventh postoperative day. The sponge had been left in the abdomen three years previously and had not given rise to any symptoms until perhaps six weeks before I saw her. Even these symptoms were most likely due to the salpingitis rather than to the gauze sponge which was well encapsulated and fairly clean.

CASE 3.—Mrs. A. K. (No. 68137), aged thirty-seven was admitted to the Chicago Lying-in Hospital on December 9, 1928. She had had two cesarean sections performed by two different obstetricians, one thirteen years and the other ten years before admission. She was sterilized at the time of the second operation. The menstrual history was negative and her last menses had begun November 27. Her complaint was pain in the abdomen. The general examination was negative. There were two incisions in the lower half of the abdomen which was distended by a hard, somewhat tender mass. The latter apparently rose out of the pelvis and was adherent to the abdominal scars. Vaginal examination revealed a nulliparous outlet. The cervix was long, hard, smooth and way up high behind the symphysis and on the left side of the vagina. The fundus of the uterus was enlarged to the size of a five months' pregnancy, hard, and adherent to the abdominal wall. To the left of the uterus was a soft, slightly irregular cystic mass approximately 8 by 10 cm. in diameter. This mass was very tender. The diagnosis made was fibroid uterus and left ovarian cyst. However, because the patient had not menstruated from March to November, I wished to rule out a pregnancy such as a missed abortion. A roentgen ray picture was taken and much to my amazement a shadow of a large curved needle was seen on the right side. There were no fetal structures to be seen. An operation was performed on December 14, 1928 and great difficulty was encountered because the large fibroid uterus was firmly attached to the abdominal wall, and there were very dense adhesions between the uterus and the adnexa. The fibroid uterus and the adnexa including the ovarian cyst on the left side were removed. A search was then made for the needle, and this was found entirely buried between the folds of the mesoappendix. The needle was removed and then the appendix was amputated. There appeared to be almost no reaction around the needle for it was perfectly clean. Convalescence was disturbed by a wound infection. The patient left the hospital on the seventeenth day following operation. The needle had almost certainly been left in the abdomen at the time of the first operation because the second operator informed me that he had never used such large curved needles at any time in his career.

REVIEW OF THE LITERATURE

I have reviewed the literature from 1908 (Crossen's comprehensive report) to January, 1932, and found that 109 cases of foreign bodies in the abdomen have been reported in American, British, German, French, Italian, Spanish, and Russian journals. There were a few cases however, which had to be omitted because I could not secure the original journals.

Only those foreign bodies are listed which were left in or gained access to the peritoneal cavity. With the exception of six cases all the original operations were laparotomies. The exceptions were two herniotomies, a colpotomy, a sacral operation, a vaginal pack for abortion and a plastic operation for fat in the abdominal wall.

An analysis of the tabulated cases reveals the following types of foreign bodies:

Gauze	58 (52.2 per cent)
Artery forceps	38 (34.9 per cent)
Needle	4
Rubber tube	2
Retractor	2
Towel clip	1
Glass tube	1
Glass rod	1
Straight pin	1
Thick thread	1

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The foreign body was recovered at a subsequent operation in 87 cases (80 per cent), it was expelled spontaneously fifteen times (13.8 per cent), it was discovered at autopsy in 5 cases (4.6 per cent), and two patients are still carrying around their foreign bodies (pin and glass tube respectively).

In the 87 cases where the foreign body was removed by operative procedures, the means of access were as follows:

Laparotomy	75
The bladder	4
The vagina	3
Bier's suction pump	3
A fistula in the wound	2

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In 15 cases the foreign body was expelled spontaneously as follows:

Through the rectum	7
Through the wound	5
Through the urethra	1
Through the vagina	1
Coughed up	1

15

The ultimate results in the 109 cases were as follows:

Recovered	76 (69.7 per cent)
Died	19 (17.4 per cent)
Unknown	12 (11.0 per cent)
Still in the patient	2 (1.9 per cent)

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Of the 75 patients who had subsequent abdominal operations for the removal of the foreign body, 14 or 18.7 per cent died. Among the entire 97 patients in whom the results are known, 19 or 19.6 per cent died as the result of the foreign body, hence these two death rates are almost identical. The length of time the foreign body remained in the abdominal cavity varied considerably. The longest interval recorded was twenty-four years. Likewise the size of the foreign body ranged within wide limits and in one case a laparotomy pad 72 cm. long had been overlooked during an operation for a twisted ovarian cyst during pregnancy.

ETIOLOGY

One or more factors may be responsible for leaving a foreign body in the abdomen. Carelessness on the part of the operator and his assistants undoubtedly accounts for some cases. However unreliability of the nurses who are in charge of counting sponges and instruments before and after operations is the most important factor. Not infrequently the introduction of extra, uncounted sponges or instruments during an operation is the cause of this accident. In some cases the fault lies in a poorly administered anesthetic because of which there is considerable retching, expulsion of the intestines to the outside of the wound, rapid, forcible attempts to replace and hold the intestines back, undue bleeding, haste to complete the operation and other disconcerting occurrences. In a few cases the patient goes into shock and the operator hurries to close up the abdomen without proper inspection of the field of operation. Poor light and untrained assistants, poor exposure of the field of operation, the use of an unnecessarily large number of instruments especially small ones and failure to remove all excess fluids such as serum, blood, and pus are factors in some cases.

PATHOLOGY

In nearly all cases there is some evidence of old or recent peritonitis. The foreign body is surrounded by the omentum and nearby organs which attempt to encapsulate it. Sooner or later however, in most cases, the foreign body exerts pressure and forces an opening into a hollow organ with or without associated signs and symptoms. After this in some cases there is spontaneous expulsion of the foreign body to the exterior but in most cases operative interference is required to remove the offender.

SYMPTOMS

During the first few days after a foreign body has been left in the abdomen there are usually no symptoms by means of which attention would be drawn to this accident. Rarely a patient may describe the sensation of something moving around in the abdominal cavity. A clean smooth instrument is less likely to cause peritonitis than a gauze sponge or pad saturated with blood or pus. After a few days or weeks symptoms generally arise and they are usually the result of peritonitis. In most cases, the omentum rapidly demonstrates its protective mechanism by surrounding the foreign body and shutting it off from the organs in the peritoneal cavity. If this does not occur and sometimes also even when this does take place, serious disturbances arise such as intense pain somewhere in the abdomen, signs and symptoms of ileus, bladder disturbances, rectal tenesmus, abscess formation, the development of a tumor or a fistula, or the protrusion of part of the foreign body through the wound, the rectum or the bladder.

the rectum, the mass should be removed by incising these respective areas. If the foreign body is in the bladder it may sometimes be removed through the urethra, else the bladder will have to be incised. Foreign bodies discovered by roentgen ray pictures long after an operation was performed and which cannot be removed by a simple incision must be removed by a laparotomy as soon as the diagnosis is made. Even if a foreign body is accidentally discovered in a patient who has no abnormal symptoms, it should be removed because there is a great risk in leaving it in the abdomen.

CONCLUSIONS

In spite of the relatively few case reports in the literature of foreign bodies left in the abdomen after operation, an appalling number of such cases occur each year. While in an occasional case, the condition seems to be unavoidable, in the vast majority of cases it is due to negligence of either the surgeon or more particularly a nurse. The condition is serious because in the present series of 109 cases which I collected, including three cases which came under my own observation, there was a mortality of at least 17.4 per cent. Most of the foreign bodies left in the abdomen were gauze sponges or pads (52.2 per cent) and next in frequency were artery forceps (34.9 per cent). The foreign bodies were detected during a subsequent operation in 80 per cent of the cases, they were expelled spontaneously in 13.8 per cent, and they were discovered accidentally at autopsy in 4.6 per cent. In this paper the etiology, pathology, symptomatology, prognosis, prophylaxis and treatment of foreign bodies are discussed.

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ABSTRACT OF DISCUSSION

DR. JAMES W. KENNEDY, PHILADELPHIA, PA.—We give as a solution for the problem the simplest possible technic of which the surgeon may become the master. We work with three gauze towels and three gauze sponges and one assistant. This very small number of gauze towels and sponges is placed in two basins and it is easy for the surgeon to inspect the three gauze towels and sponges in each basin before and after the operation. No other piece of gauze is ever permitted to remain within the abdominal cavity.