Surgical treatment of genital and peritoneal tuberculosis in the female

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MY PARTICULAR interest in this pathologic condition of the female genital organs was aroused by the case of a patient, aged 38 years, who consulted me in January, 1936, for a uterine hemorrhage of several months' duration that could not be arrested by conservative treatment. Gynecologic examination indicated a large uterus and apparently normal adnexa. On these findings, I performed a curettage and histologic examination of the specimen showed tuberculous endometritis.

The history of this patient is so characteristic of the syndrome of genital tuberculosis in the female that the case can be taken as a classic example of the course of this disease. She had pleurisy at the age of ten. At the age of 12, an appendectomy was to be performed, but it was discovered upon operation that the girl was suffering from tuberculous peritonitis and not from appendicitis. Consequently, she was sent to Davos, Switzerland, for 2 years and was apparently cured. At the age of 20, she married and did not become pregnant in the 18 years following. After the curettage, I recommended a stay of several months at a health resort situated at an altitude of 4,600 feet in the Austrian Alps, which brought about a condition of apparent well-being that lasted until the end of 1941. In January, 1942, 6 years later, the patient complained of increasing pain in the hypogastric region. On examination, large inflammatory tumors were detected in the adnexa on both sides. Laparotomy was immediately performed and resulted in the discovery of severe tuberculous lesions of the adnexa which were extirpated without interference with the uterus. This patient had therefore had latent tuberculosis of the Fallopian tubes for 32 years, suffering not the slightest discomfort for a large part of this time; only operation effected a permanent cure. The patient, who now lives in Munich, has never suffered a relapse.

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Case material

My interest in genital tuberculosis in the female was thus aroused during the period of my clinical activity in Prague. It was further stimulated in Vienna, where, in the course of the last 9 years, I have observed 121 patients with this disease and declined to operate in only one case, as the patient in question was in almost a terminal condition as a result of generalized tuberculosis. The ages of these patients are shown in Table I and their reproductive histories in Table II. None of these women contracted genital tuberculosis until after the birth of their children, and, as can be seen from Table III, all of them had either before or simultaneously shown in other organs symptoms that are very frequent concomitants of genital tuberculosis and facilitate its diagnosis. In 113 of these 120 cases I diagnosed genital tuberculosis solely on the basis of the typical history and clinical picture and on the histologic establishment of tuberculous endometritis. In 7 cases, in which the history and clinical picture gave no indication of tuberculosis, genital tuberculosis was revealed only through laparotomy and histologic

Table I. Age and genital tuberculosis

Years	*No. of cases*
11-20	6
21-30	59
31-40	35
41-50	15
51-60	4
61-70	1
Total	120

Table II. Incidence of sterility and infertility in women with genital tuberculosis

No. of cases	*No. of children per patient*
93	None
16	1
9	2
1	3
1	4
Total 120	41

Table III. Additional signs in women with genital tuberculosis

Localization of infection	*No. of cases*
Fallopian tubes	78
Peritoneum (seeming appendicitis, 21)	76
Pleurisy	67
Lungs	44
Endometrium	18
Without signs	7
Bones and joints	7
Lymph nodes	4
Kidney	3
Skin	3
Intestines	1

examination of the Fallopian tubes and, in 2 cases, of the uterus.

Therapeutic methods

In the eleven years between 1934 and 1945, when we had no streptomycin or other tuberculostatic drugs, I recognized the advantages and effectiveness of the surgical treatment of genital tuberculosis in the female. I have carefully studied the operative techniques necessary for such treatment so that, despite the variety of changes in the female genital organs caused by tuberculosis, I am now able to select the appropriate procedure in each case. I have always adopted as conservative a procedure as possible, that is, to extirpate only the diseased Fallopian tubes if the ovaries are not affected, and always to preserve the uterus, in order to avoid the unnecessary creation of large wound cavities, as these constitute a potential source of postoperative infection.

As the majority of these patients are girls or young women, they would be severely mutilated if one should remove the uterus and both the ovaries, because they respond most satisfactorily to tuberculostatic drugs as soon as the tuberculous tubes are eliminated. Moreover, these patients can be persuaded to be operated on if they are certain that the surgical intervention is restricted to the tubes only and that the vegetative functions of their sex organs are preserved. Under these conditions, I received permission to operate in many cases in which the radical operation had been positively refused.

The adoption of this principle, namely, of removing only those organs that are the actual source of genital tuberculosis in the female, has proved its value and has given most gratifying results in conjunction with the administration of the tuberculostatic drugs now available. The operation is fairly simple and quick to perform if there is pyosalpinx with a greater or lesser degree of swelling, for, in this case, the adhesions between the tubes and their environment usually consist of thin films of tissue from which the tubes can be easily detached and removed without interfering with the usually healthy ovaries. On the other hand, the operation may demand the utmost in skill and perfection of technique of the surgeon if it is necessary to separate adherent intestinal coils from one another, to expose and drain cold abscesses and wound cavities, and to mobilize and extirpate adnexal tumors firmly embedded in cartilaginous callosities. After such complicated operations involving the opening of large abscess and wound cavities, there arises the necessity of drainage, a process that I have always carried out by the Mikulicz method, which, though excellent, is now almost completely forgotten.

Mikulicz drainage proved necessary after operation in 18 cases and always produced good results.

Relationship of peritonitis to salpingitis

In the last nine years, my assistants and I have operated on 120 patients. Tuberculous salpingitis was histologically confirmed in the Fallopian tubes of all but 3, in 2 of whom the tubes were not extirpated at their expressed wish. In a 53-year-old woman an ulcerative lesion of the cervix turned out to be of tuberculous nature and was not surgically treated because of the bad general condition of the patient. In 76 of these 120 patients, tuberculous peritonitis had already been clinically established in the years preceding operation. In 17 patients, it was positively proved during operation that the peritoneum was also affected, a fact that had previously escaped observation. Of these 119 cases of tuberculous salpingitis (in one patient only tuberculous endometritis had been established) 93 also suffered from tuberculous peritonitis. In the remaining 27 patients, tuberculous peritonitis had probably been overlooked and had subsided by the time of the operation. This is an assumption that is corroborated by the fact that the Fallopian tubes were found to be occluded at their abdominal ends. In 39 cases, a diagnosis of tuberculous peritonitis was established by the internist, and was confirmed by the surgeon in 7 cases. In 37 cases, the surgeons, acting independently, performed laparotomy and discovered tuberculous peritonitis, whereupon the abdominal wall was again closed. Table IV lists the time which elapsed between diagnosis of tuberculous peritonitis in these 76 patients and operation in my hospital. These figures illustrate the characteristic latency of genital tuberculosis and are a very clear indication that tuberculous peritonitis is an initial concomitant of tuberculous salpingitis.

Of these cases in which tuberculous peritonitis was surgically established, 23 were diagnosed by exploratory laparotomy, 17 in the course of appendectomy, one during

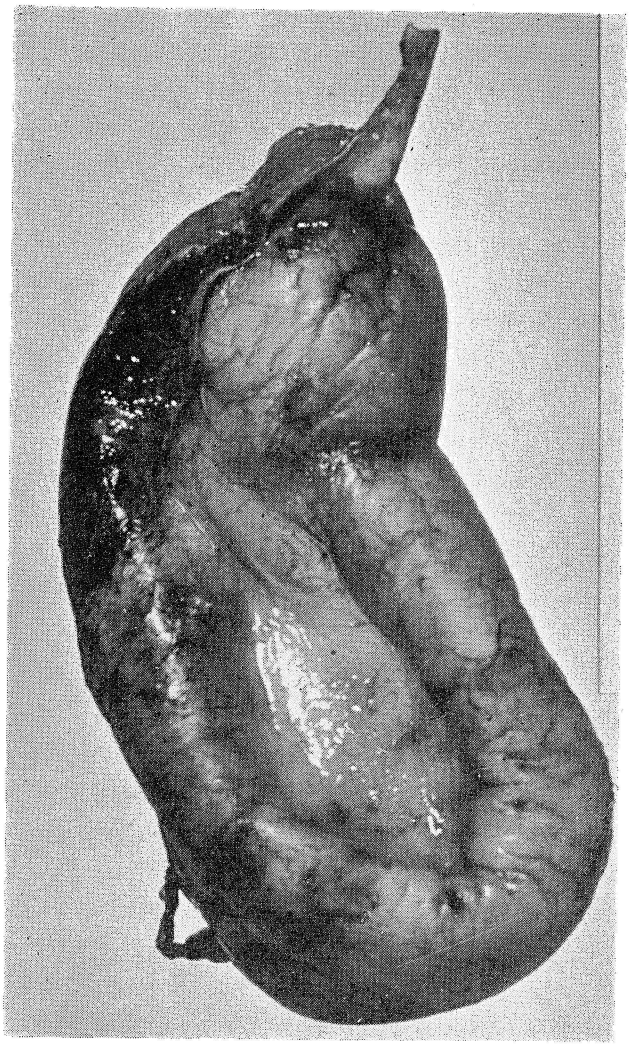

Fig. 1. The largest of these 117 tuberculous tubes, removed from a 31-year-old sterile woman who had never had any other symptom of tuberculous infection. The difference in thickness between the isthmic and the ampullary part of the tube is striking.

cholecystectomy, and one on the opening of an abscess in the pouch of Douglas. In one case, the left adnexa were removed after appendectomy and, in another, the right tube only.

In the cases in which I operated, I found 22 with miliary tuberculous peritonitis, 10 with more or less extensive cold abscesses around the tubes, and 24 with the residua of recently healed miliary tuberculous peritonitis. In 27 of these patients, tuberculous peritonitis had been detected by previous laparotomy. The intervals between the preceding laparotomy and the operation performed by me were 19 years in 2 cases, 10 years in 1 case, 9 years in 1 case, 7 years in 2 cases, 6 years in 2 cases, 5 years in 3 cases,

Table IV. Latency of genital tuberculosis

Interval (years)	*No. of cases*
35	1
27	1
21	2
19	3
17	2
16	1
14	3
12	1
10	1
9	2
8	2
7	4
6	3
5	12
4	5
3	3
2	4
1	26

1 year in 4 cases, 5 months in 1 case, 2 months in 3 cases, 6 weeks in 2 cases, 4 weeks in 1 case, and 3 weeks in 1 case. These facts show that tuberculous peritonitis can exist for years, if the necessary conditions are present. The causal relationship between tuberculous salpingitis and tuberculous peritonitis was clarified to the extent that it can now be taken as an established fact that miliary tuberculosis of the peritoneum arises and persists only if and as long as the abdominal ends of the tubes are open. It is very simple to verify the fact that, in every case of tuberculous peritonitis originating from the genitals, the fimbrial infundibula of the Fallopian tubes are open, thus permitting the entrance of the infectious secreta from the tubes into the abdominal cavity and resulting in tuberculous infection of the peritoneum. This observation, the result of clinical experience, is further confirmed by the observation that tuberculous peritonitis neither occurs nor persists if the tuberculous Fallopian tubes have closed at their abdominal ends. However, as it is a characteristic feature of tuberculous salpingitis that in a high percentage of cases the abdominal ends of the Fallopian tubes remain open for a long time, turned up in the form of a ruff, it is easy to understand why tuberculous peritonitis is most frequently evoked by infection from the specifically diseased tubes. At any rate, I could not discover any other cause for this disease of the peritoneum in any case.

Rationale for surgical therapy

In this connection it is worth emphasizing that other authors who have dealt with the etiology of tuberculous peritonitis have also observed that the disease is much more common in women than in men. Comparing the incidence of tuberculous peritonitis among males and females, Osler[6] reported 131 females and 60 males treated during the same period of time. Similarly, Faulkner and Everett[2] reported 350 females and 36 males, Olcott and Paccione[5] 70 females and 39 males, Auerbach[1] 76 females and 55 males, Kahrs[3] 99 females and 70 males, and von Schosserer[8] 237 females and 60 males. The preponderance of cases in women is certainly not accidental and clearly indicates that tuberculous salpingitis is by far the commonest cause of tuberculous peritonitis.

Since males can be affected by tuberculous peritonitis, it follows that the disease may result from etiological factors other than tuberculous salpingitis. This is most clearly demonstrated in the statistics given by Kahrs[3] in his etiological analysis of tuberculous peritonitis which reveals the strikingly high incidence not only of intestinal and genital foci but also of polyserositis. As pleurisy is a highly significant diagnostic factor in the anamnesis of tuberculous salpingitis, it therefore seems to be of equal importance in the etiology of tuberculous peritonitis in both sexes. The decisive difference, however, is that, in women, the tubes are affected as soon as the disease spreads to the serous membranes. As tuberculous salpingitis, in sharp contrast to tuberculous peritonitis, heals poorly, it persists as an intra-abdominal focus for tuberculous peritonitis in the female. In male patients, where the genital focus lies outside the abdominal cavity, tuberculous peritonitis is frequently very quick in healing and is thus often not recognized. This explains why tuberculous peritonitis persists much longer and may continually

recur over a period of years in the female, and also why the disease is much less frequently observed in males.

If one remembers that tuberculous peritonitis almost invariably results from tuberculous salpingitis, it is easy to see the effect of the exploratory laparotomy. This was first observed by Wells,[9] in London, on a 22-year-old girl in December, 1862, and is still generally practiced by surgeons for the cure of tuberculous peritonitis, although it possesses only palliative value as therapy since it does not remove the cause of the disease. This also explains why medical literature reports that this almost century-old therapy is successful in only 25 to 69 per cent of cases, since success can be expected only if the Fallopian tubes become occluded after laparotomy. If they remain open, tuberculous peritonitis will persist or recur in spite of the airing of the peritoneum. However, to adopt a therapy directed at the cause of tuberculous peritonitis, the state of the tubes must be studied and they must be extirpated if pathologic lesions are present. This observation, made in the surgical treatment of tuberculous salpingitis, will convince surgeons that, in the treatment of tuberculous peritonitis, the extirpation of the tuberculous Fallopian tubes is the only certain method of achieving a cure.

Because of the paramount necessity of achieving a cure, the surgical treatment of tuberculous peritonitis requires the gynecologist who is familiar with the surgical treatment of the inflamed adnexa, because this is unknown or at least unfamiliar to the general surgeon. Therefore, in the future, every women in whom tuberculous peritonitis has been diagnosed or is suspected should be referred to the gynecologist. As these patients are usually young, the gynecologist should endeavor to preserve the uterus and ovaries and should remove only the tuberculous Fallopian tubes. This task will be relatively simple in all cases of the miliary form of tuberculous peritonitis. In my experience, the Fallopian tubes usually lie free in the abdominal cavity, not adhering to neighboring organs. I have treated 46 patients in this way and achieved a remarkably rapid cure of the miliary tuberculous peritonitis because I removed the focus of the disease. For this reason, all other methods of postlaparotomy treatment, such as ultraviolet light therapy, fresh air and x-ray exposure, dieting, and change of climate, are meaningless and of questionable outcome, unless the abdominal cavity is purified by extirpation of the Fallopian tubes, which are the source of the infection. One procedure that has proved outstandingly successful is to infuse isonicotinyl hydrazine,* one 250 mg. ampule, into the abdominal cavity at the end of the operation. The local action of this drug on the tuberculous granulation tissue is no less than amazing.

I agree with the clinical report of Wood and Elgueta[10] on 500 cases of genital tuberculosis and sterility and their view that, in these conditions, the task of the physician cannot lie in treating the sterility, but in achieving a speedy and certain cure of the genital tuberculosis. The physician should therefore not be guided by isolated successes in the treatment of sterility, but should rather follow the course shown to be most effective in all patients for the combating of this highly dangerous disease.

The fact that the extirpation of both tubes in genital tuberculosis and miliary tuberculous peritonitis is not only justified, but most decidedly indicated, is proved by the possibility of cold abscesses developing around the tubes, with all the attendant dangerous complications which I have observed in 10 patients I operated on. If this important prophylactic measure is not taken, the patient is exposed to the danger of the development of intra-abdominal conglomerate tumors and of abscesses around the tubes, a condition which can be healed only if the surgeon is prepared to accept the risk of performing these quite atypical and very difficult operations. At the moment, in Austria, the number of such surgeons is very small indeed. The patient is usually given conservative

*Supplied as Rimifon by Hoffman-La Roche, Nutley, New Jersey.

treatment and finally dies of tuberculous peritonitis. On the other hand, the 10 patients I operated on recovered and became fit to work in a few weeks; some of these patients had been ill and had undergone treatment without success for as much as 10 years. Such difficult operations, which many surgeons refuse to perform, will be successful only if, after opening of the abscess and extirpation of the pus-filled Fallopian tubes, the wound cavity, which may be of greater or smaller size, is drained by the Mikulicz method. By this method the abdominal wall is not completely closed, thus providing easy escape of the wound secretions.

Conservative methods of treatment, especially with the modern tuberculostatic drugs, may be very effective in combating tuberculous peritonitis in individual cases, provided the conditions are favorable, that is to say, that the tuberculous salpingitis is not accompanied by caseation and that the diseased Fallopian tubes become occluded at their abdominal ends at an early stage. Under such conditions, tuberculous peritonitis heals rapidly because the tubes eliminate themselves as a focus and miliary tuberculous peritonitis, as distinct from tubal tuberculosis, has an exceptionally strong tendency to heal spontaneously if there is no focus of infection inside the abdominal cavity.

While, under such favorable conditions, it is relatively easy to deal effectively with miliary tuberculous peritonitis by conservative methods, these almost invariably fail in the treatment of tuberculous salpingitis, which can be ameliorated by such methods, but only very seldom healed, if by healing one means the disappearance of the tuberculous stigmas in the histologic sections of the tubes. Although in at least 50 cases a full course of conservative treatment for genital tuberculosis was given, with the administration of sufficient quantities of tuberculostatic drugs, such as streptomycin, para-aminosalicylic acid, and isonicotinyl hydrazine, tuberculosis was histologically established in the extirpated tubes so that chemotherapy failed to effect a cure.

The fact that tuberculous endometritis, a concomitant of tuberculous salpingitis in at least 80 per cent of all cases, thus considerably facilitating diagnosis of the latter, almost invariably subsides spontaneously on extirpation of the tuberculous Fallopian tubes is proved by the following observations. In 43 cases curettage was performed one year after salpingectomy and in only 3 of them was tuberculous endometritis found. This condition was then completely cured in every case by intrauterine instillation of isonicotinyl hydrazine in doses of 150 mg. dissolved in 2 c.c. of water 3 times a week in the course of 2 cycles.

The phenomenon, characteristic of tuberculous salpingitis, namely that the mucosa of the isthmic section of the tube remains free from tuberculous lesions, even if the ampulla is considerably diseased, leads to so striking a difference in thickness between the isthmic and the ampullary sections of the tube, that the tuberculous character of the salpingitis can be detected with the naked eye. This typical sign of tuberculous salpingitis, which is perceptible immediately on opening the abdominal cavity and whose diagnostic value has been confirmed by Schaefer,[7] is illustrated by Fig. 1.

Results of therapy

Of these 120 patients suffering from genital tuberculosis and tuberculous peritonitis, 117 were cured by surgical intervention and recovered their fitness for work. One 24-year-old patient, in whom genital tuberculosis could not be detected, although laparotomy was performed, seemed to be suffering from malignant degeneration of the uterus. I removed a conglomerate tumor reaching as far up as the level of the umbilicus. On the eighth day after the operation, the patient died of severe enterocolitis as the result of overdosing with antibiotics, particularly terramycin administered intravenously, for which an overzealous assistant was to blame. Another patient, aged 64, was operated on by one of my assistants for a suspected ovarian carcinoma. During the removal of the chronically inflamed adnexa, carried out under extremely difficult conditions, the rec-

tum was injured. The patient developed an intestinal fistula and phlegmonous inflammation in the pelvis minor and died on the forty-fifth day after the operation. In both cases, the pathologist failed to recognize the genital tuberculosis until after histologic examination of the extirpated organs.

Summary

1. Of the genital organs, the Fallopian tubes are always the first to be affected by tuberculosis; the infection is invariably hematogenous and bilateral.

2. The affection of the peritoneum is always secondary, originating from the tubes, which are the seat of the primary infection. The reverse is never the case.

3. These observations provide incontrovertible proof that tuberculous peritonitis can persist only as long as the tuberculous Fallopian tubes are open. As soon as the tuberculous tubes become occluded at the abdominal ends, there can be no tuberculous peritonitis, just as this condition cannot exist after extirpation of the tuberculous Fallopian tubes.

4. The endometrium invariably becomes affected after the Fallopian tubes, which are a continual source of infection for it. The process of infection can easily be explained from the fact that the mucous membrane of the interstitial and isthmic sections of the Fallopian tubes is not affected, so that the tubes still remain open toward the uterus, permitting the infectious contents of the more or less seriously diseased ampullae to enter the uterine cavity, thus infecting the endometrium.

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