

## PREGNANCY AND PELVIC TUBERCULOSIS

WILLIAM E. STUDDIFORD, M.D., NEW YORK, N. Y.

*(From the Obstetrical and Gynecological Service [Third Surgical Division], Bellevue Hospital, and the Department of Obstetrics and Gynecology, New York University College of Medicine)*

MUCH has been written concerning the woman with pulmonary tuberculosis who becomes pregnant. Relatively few observations have been made on the occurrence of pregnancy in the presence of secondary pelvic tuberculosis, possibly because of the rarity of this association. While there is a growing recognition at the present time of the importance of this disease as a factor in sterility, pregnancy has been regarded as impossible<sup>1</sup> or very uncommon<sup>2, 3</sup> in the presence of pelvic tuberculosis.

It is generally agreed by all students of tuberculosis that the involvement of the pelvic organs in this disease is secondary to a primary focus, usually situated in the lungs. There are probably few exceptions to this sequence of events.<sup>4, 5</sup> The present concept of the dissemination of pulmonary tuberculosis holds that the hematogenous spread of the disease and the subsequent development of secondary foci take place as a rule during the active development of the initial pulmonary lesion, known as the primary complex. *This concept is important to hold in mind since it predicates the initiation of secondary foci in most patients within one year of occurrence of the primary complex and not as a late manifestation. Such secondary lesions may give rise to immediate clinical manifestations. Frequently they remain latent for long periods of time to terminate by healing or by giving rise to a subsequent tuberculous process.* This concept readily explains the common experience that a primary pulmonary lesion cannot be demonstrated by x-ray or clinical studies in many patients with proved tuberculous salpingitis. On the other hand, historical evidence can frequently be obtained of antecedent pulmonary disease or other primary tuberculous infections in such patients. Winkler and Wegemer<sup>6</sup> obtained a history of a preceding attack of pleurisy, generally within five years, in 41 per cent of their cases of pelvic tuberculosis, whereas only 3 of their 95 cases showed positive pulmonary findings on x-ray of the chest. In 125 cases of genital tuberculosis, Jedberg<sup>5</sup> obtained a previous history of one or more earlier tuberculous lesions outside the pelvis in 67 per cent. It is evident from both clinical and pathological studies that the primary complex in the lung frequently heals, leaving secondary foci in the pelvic organs which may give rise to clinical evidence of disease several years later.

This paper is not concerned with the patient suffering from advanced pelvic tuberculosis. Here the marked pathological changes have led to destruction of tubal function so complete that one can readily grant that preg-

nancy is impossible.<sup>7-10</sup> It is concerned with the considerable number of women, recorded during the past thirty years, who have been discovered to have what has been termed latent or subclinical pelvic tuberculosis.<sup>2, 11-14</sup> These women uniformly have the presenting complaint of sterility, often primary with or without associated symptoms such as alteration of the menses, vaginal discharge, etc. Pelvic examination usually results in normal physical findings. The discovery of tuberculosis of the pelvic organs is made ordinarily on the examination of curettings or an endometrial biopsy and comes as a complete surprise to the physician. Absolute confirmation of the nature of the endometrial infection can be made by culture of menstrual blood or endometrium; in addition, the latter tissue can be implanted into animals.<sup>5, 10, 15-17</sup> Such studies have resulted in the recovery of tubercle bacilli in a varying proportion of patients in whom the endometrium appears histologically tuberculous. The organism in over 90 per cent of instances has been of the human type.<sup>5, 10</sup> The presence of tuberculous endometritis predicates almost certainly an associated bilateral tubal infection, although the physical alteration of the oviduct cannot be detected on examination; in such cases definite stigmas may be present at laparotomy. As will be shown, however, the tubal lesion may escape detection even under inspection and palpation at the time of operation (Cases 4 and 5). This has also been noted at autopsy.<sup>18</sup> This assumption must be made in view of the well-known distribution of this disease in the pelvic organs, i.e., solitary endometrial tuberculosis is very rare; almost 100 per cent of cases of endometrial tuberculosis will show an accompanying tuberculous salpingitis. The former lesion is found only in 60 to 70 per cent of patients with tubal involvement.<sup>7-10</sup>

The first discovery of the subclinical type of pelvic tuberculosis in any large number of women must be credited to Steinsiek,<sup>11</sup> who first employed routine curettage in the investigation of sterile women. In 1922, among 212 patients, he discovered 7.2 per cent with tuberculous endometritis. Subsequent observers report an incidence ranging as high as 5 and 10 per cent in sterile women.<sup>2, 12-14</sup> These are all reported from areas outside the continental United States. The greater prevalence of pelvic tuberculosis in these areas has been laid to environmental factors, but it is to be suspected that careful search will reveal a considerable number in our own population. This is borne out by the report of Rock and Bartlett,<sup>19</sup> who stated that it was discovered in 8 of 437 sterile women (1.8 per cent). In 7 of them it was quite unsuspected. Further investigation of such patients has demonstrated the fact that tubal patency may still be present in one-fourth to one-third.<sup>2, 12-14</sup> Prolonged follow-up has shown that many remain in this subclinical phase for extended periods of time.<sup>2, 12</sup> In some cases the disease heals, while in a minority progression to clinically recognizable pelvic tuberculosis occurs and eventually demands surgical therapy.<sup>2, 12</sup> Some of the latter group develop general dissemination of the disease so that this type of lesion cannot be regarded as entirely without risk to the patient.<sup>3</sup> It can be estimated that cases of subclinical pelvic tuberculosis far exceed the group showing definite pelvic findings and symptomatology.



The following 3 cases are illustrative of the latent or subclinical variety of pelvic tuberculosis:

CASE 1.\*—(Sloane Hospital No. 258,259) Mrs. I. S., aged 33 years, white, married seven years, para 0, gravida 0, was subjected to study in 1935 because of sterility. Her only previous illness had occurred at the age of 21 when she was suspected of having tuberculosis of the cervical spine and had suffered from a dry pleurisy for several months. Careful follow-up had revealed no evidence of a pulmonary lesion and recent chest x-rays showed negative findings.

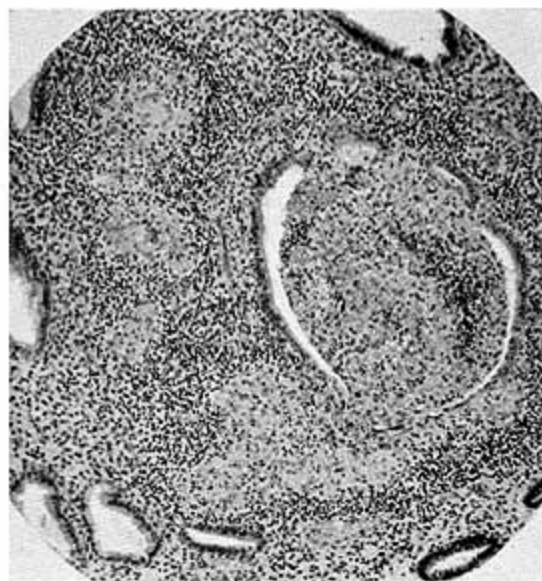


Fig. 1.—Tuberculous endometritis discovered in curettings from Case 1.

Her menstrual history was normal. Bimanual and speculum examination revealed nothing abnormal. Her husband was not a factor. Transuterine insufflation showed patent tubes. A basal metabolism rate of minus 11 was discovered and she was put on thyroid. Since no pregnancy occurred as a result of this investigation, she consulted another doctor in 1937, who reviewed the previous procedures and, noticing the omission of a curettage, carried out this procedure on Dec. 14, 1938. The curettings showed abundant tubercles (Fig. 1), a finding that was confirmed at a second curettage performed several months later. This patient was followed over the next ten years. She never became pregnant and palpable abnormalities could never be found in the pelvic organs. She stopped menstruating at the age of 42. She was last seen in 1947, at which time no evidence of progression of the disease could be found on pelvic examination. An attempt has been made to find this patient but contact could not be made.

CASE 2.—(Bellevue Hospital No. 34732-43) Mrs. S. F., aged 26 years, white, para 0, gravida 0, was admitted to the gynecological service of Bellevue Hospital on July 23, 1943, because of a uterine hemorrhage following an attempt at transuterine insufflation by her private physician. She had been subjected to this procedure every two weeks for the past four months following the discovery that the tubes were not patent and on one occasion had been told that positive results had been attained. She gave no history of any illness. Her menstrual history was normal. General physical examination proved negative. Pelvic examination revealed normal findings except for a bloody vaginal discharge.

\*Reported through the courtesy of Dr. D. A. D'Esopo.

Examination under anesthesia revealed no abnormal findings. A curettage secured endometrial fragments which, on microscopic examination, revealed a secretory pattern and which contained many typical tubercles (Fig. 2).

An attempt was made to get this patient back for follow-up examination in 1948. She stated that she was quite well, was under the care of a private physician, and was about to undergo an operation to re-establish tubal patency. It was suggested to her that it would be wise for her doctor to get in touch with the Bellevue Service. Nothing further was heard, either from her or from her physician.

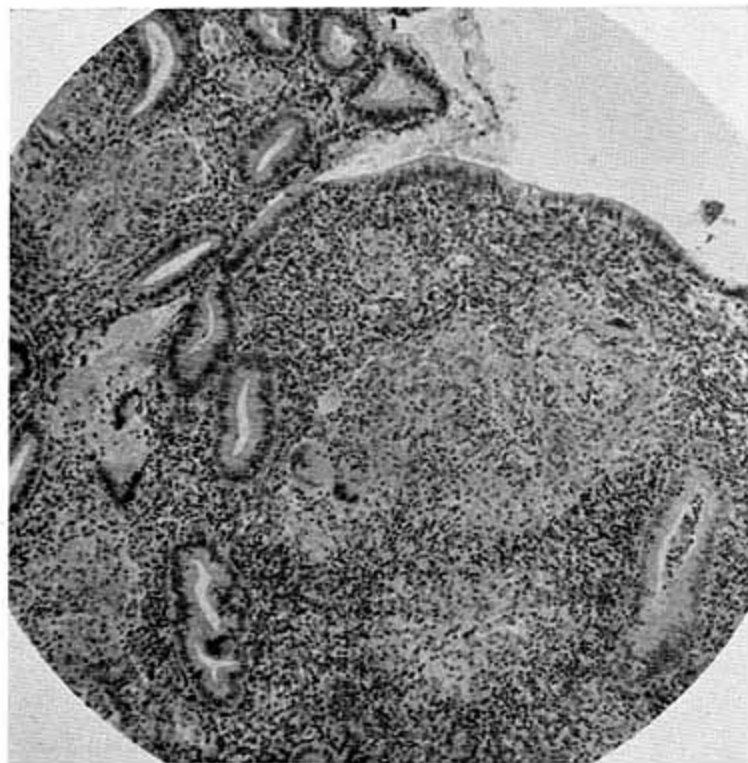


Fig. 2.—Tuberculous endometritis discovered in curettings from Case 2.

CASE 3.—(Doctors Hospital No. 53-955) Mrs. G. M., aged 40 years, white, para 0, gravida 0, was admitted to the Doctors Hospital on Feb. 1, 1953, for the removal of a left ovarian tumor about 10 cm. in diameter. She had been married 15 years and had never been pregnant. Transuterine insufflation and hystero-grams early in this period had revealed occluded tubes. She was told that otherwise the pelvic organs were normal. She gave no antecedent history of tuberculosis or of abdominal symptoms. Her menses were normal until the age of 38 when they abruptly ceased. She had been on estrogen therapy and recently had two periods accompanied by severe crampy pain.

General physical examination was negative. Bimanual examination revealed a movable 10 cm. mass in the region of the left ovary. Otherwise the pelvic organs seemed normal.

At laparotomy an obvious dermoid cyst of the left ovary was discovered. Both tubes were densely adherent to the posterior aspect of the broad ligaments and showed occlusion of the fimbriated extremities. A total hysterectomy and bilateral salpingo-oophorectomy were performed. Pathological examination showed a bilateral healed salpingitis. The right tube



showed areas of calcification. The left tube, after further sections were cut, showed a small area containing typical tubercles. The endometrium was normal and failed to show these lesions (Figs. 3 and 4).

Fig. 3.

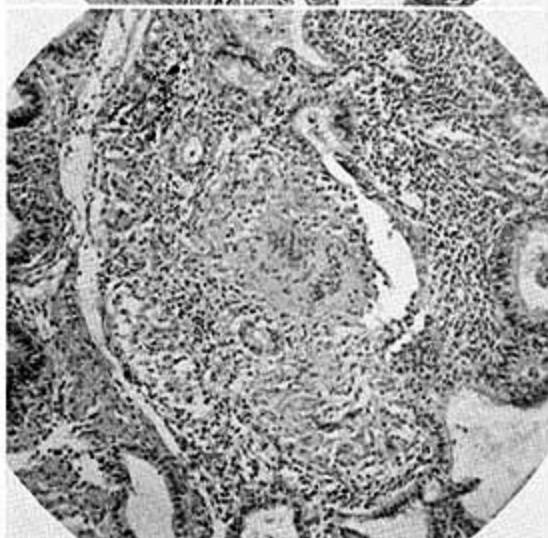


Fig. 4.

Fig. 3.—Chronic healed salpingitis with calcification in right tube of Case 3.

Fig. 4.—Tubercles discovered in chronic healed salpingitis of left tube after search in many sections (Case 3).

These three examples of subclinical pelvic tuberculosis illustrate various characteristics of this disease. The absence of symptoms and abnormal pelvic findings and the uniformity of the presenting complaint of sterility are noteworthy. All of them emphasize the fact that such cases do not always progress

but remain static over long periods of time.<sup>2, 20</sup> In fact, some observers feel that this is the rule rather than the exception. Case 3 points to the possibility of such a lesion healing spontaneously. Case 1 represents the variety with which this paper is concerned. In this patient tubal patency was repeatedly demonstrated, and here the possibility of pregnancy exists yet it rarely occurs. Sharman<sup>2</sup> states that he has followed 127 such individuals from one to fifteen years and pregnancy occurred in only one case. Others have had a similar experience.<sup>5, 12</sup> What is the factor which prevents the occurrence of pregnancy? It is most difficult to believe that the endometrial lesions, often few in number, and readily missed in single microscopic sections, would prevent

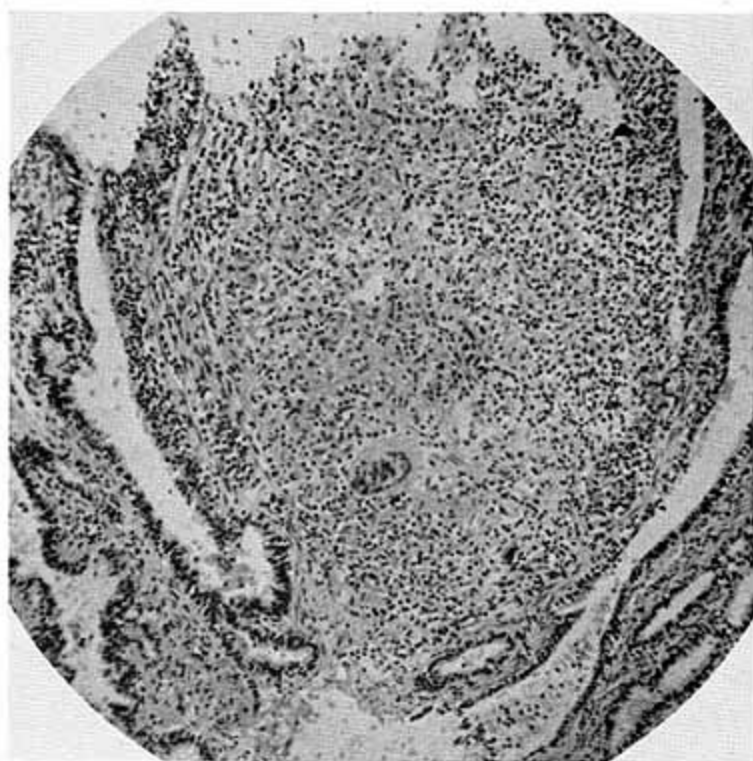


Fig. 5.—Tuberculous salpingitis discovered in section of left tube made at point remote from site of tubal gestation (Case 4).

nidation. The failure of pregnancy to take place can be ascribed in all probability to the profound alteration of the tubal mucosa, producing a very extensive follicular salpingitis, which has on occasion been misinterpreted as a tubal carcinoma until multiple sections revealed the true character of the lesion.<sup>8</sup> It may well produce a labyrinthine maze which traps and delays the sperm in its ascent, allowing degenerative changes to begin before it comes in contact with the ovum. In addition, the tubal infection may produce an en-

Fig. 6.—Very low power of left tube at point remote from site of ectopic gestation, showing marked fusion of secondary plica to form follicular salpingitis but main pathway through tube patent and free from exudate (Case 5). ( $\times 15$ ; reduced  $\frac{1}{4}$ .)

Fig. 7.—Higher magnification showing glandular pattern of follicular salpingitis characteristic of tubal tuberculosis. Tubercles may be absent in large areas (Case 5). ( $\times 90$ ; reduced  $\frac{1}{4}$ .)

Fig. 8.—Tubercles in mucosa in another area (Case 5). ( $\times 200$ ; reduced  $\frac{1}{4}$ .)



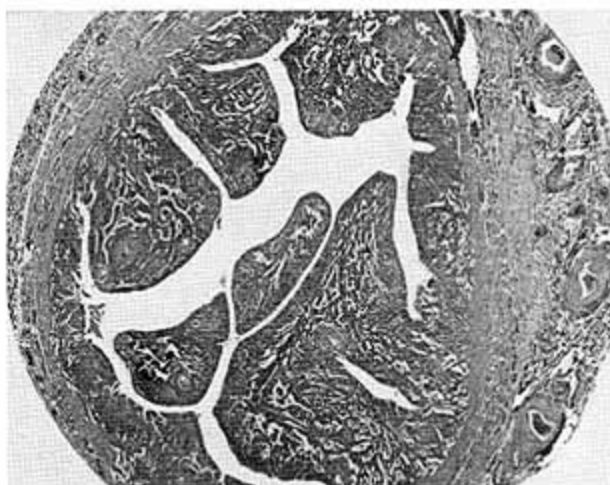


Fig. 6.

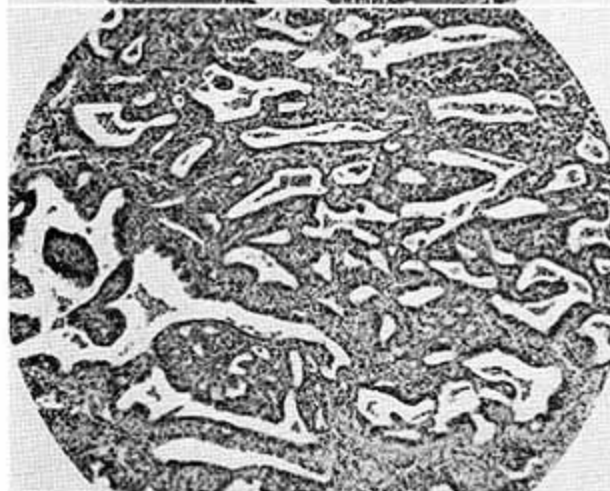


Fig. 7.

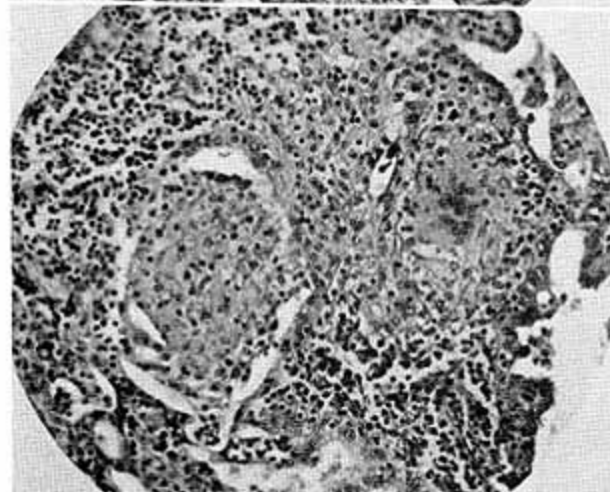


Fig. 8.

(For legends see opposite page.)

vironment inimical to both sperm and ovum. The possibility of this factor is favored by the fact that even ectopic pregnancy is rare, although large numbers of these patients are capable of becoming pregnant. Nevertheless, pregnancy can occur, as is witnessed by the growing numbers of ectopic gestations reported as occurring in tuberculous tubes.

In 1939, Stevenson and Wharton<sup>21</sup> reported the first such case in the American literature and collected 16 others from foreign sources, 7 of them of the abdominal type. By 1951, Kistner, Hertig, and Rock<sup>22</sup> were able to assemble 52 of these cases. Nothing remarkable was noted in the postoperative course of such patients. To these can be added 3 others, 2 of them occurring sequentially in the same patient.

CASE 4.\*—(Sloane Hospital No. 706680) Mrs. V. H., aged 32 years, white, married, para 0, gravida i, had her last normal period on Feb. 13, 1943, and sought medical care on April 21, 1943, because of bleeding and lower abdominal pain of eleven days' duration.

Her previous menstrual history was normal. She had been suspected of having pulmonary tuberculosis in 1937 but had been told in follow-up that the lesion was healed.

General physical examination was negative except for tenderness, muscle resistance to palpation, and rebound tenderness in the lower abdomen. Pelvic examination showed findings characteristic of a left tubal pregnancy. This was verified at laparotomy, a left tubal abortion being excised. The pelvic peritoneum and the right tube showed no evidence of pelvic tuberculosis, the latter being reported as quite normal. Pathological examination of the left tube showed typical chorionic villi and a tuberculous salpingitis (Fig. 5). A chest x-ray was taken before discharge and proved normal. She was last seen in 1944. No further pregnancies had taken place and pelvic examination revealed no abnormal findings.

CASE 5.—(Sloane Hospital No. 6704) Mrs. M. O., aged 33 years, para 0, gravida i, had her last normal period on July 29, 1924. She was admitted to the hospital on Jan. 8, 1925, complaining of irregular bleeding, cramps in the lower abdomen, and backache for three months. Her menstrual history was normal. Her previous medical and surgical histories were irrelevant and there could be elicited no suggestion of tuberculous infection. General examination was negative except for the presence of a tender mass in the left lower quadrant of the abdomen rising from the pelvis. This was confirmed on pelvic examination. At laparotomy a ruptured left tubal pregnancy was discovered and removed. The right tube appeared slightly swollen and congested but otherwise normal. Pathological examination of the specimen showed an ectopic pregnancy in a tuberculous tube.

Following discharge she was seen several times and then referred to the Presbyterian Hospital because of vague lower abdominal complaints which suggested tuberculous peritonitis. She received heliotherapy and small therapeutic doses of x-ray. The latter was discontinued because of the possible sterilizing effects. Her menses continued in a normal pattern and repeated pelvic examination showed no abnormal findings.

She again experienced amenorrhea dating from June 6, 1926, followed by the onset of severe lower abdominal pain for which she was readmitted to the hospital. Examination revealed clear-cut evidence of a right tubal pregnancy, and she was subjected to laparotomy. A ruptured right tubal pregnancy was removed, which on pathological examination revealed, in addition, tuberculous salpingitis. She was seen for the last time in September, 1926, at which time she had no complaints and revealed nothing abnormal on examination (Figs. 6, 7, and 8).

These cases illustrate the minimal alteration of the external characteristics of the oviduct which is present in some cases of subclinical pelvic tuberculosis. One can assume that both tubes were involved in these patients at the time of the initial operation and in one of them there is fairly positive evidence to this

\*Permission to report this case was given by Dr. Marion D. Laird.



ination just prior to this showed an 8 cm. mass in the right adnexa and a smaller mass on the left. Slight mobility was present. During the next nine months her chest lesion diminished and stabilized. Pelvic examination in December, 1948, after her return to New York City, showed slight thickening in the right adnexa and a 4 by 5 cm. mass on the left. Cultures from the cervix were negative for acid-fast organisms. Repeated examinations showed further improvement. At present slight thickening can be felt in the right adnexa. For the past year she has returned to active work at Bellevue Hospital. She is quite symptomless except that she has not become pregnant.

CASE 7.—(Bellevue Hospital No. 7943-35) Mrs. J. C., Negro, aged 24 years, married, para 0, gravida i, was admitted in the third month of pregnancy on March 27, 1935, complaining of pain the lower abdomen and vaginal bleeding for four days.

She had been admitted to Seaview Hospital in May, 1934, for pulmonary tuberculosis, where she was kept for six months and treated by right pneumothorax. She had been discharged in January, 1935, as an arrested case but had continued the same treatment up to the present. An appendectomy had been performed in 1929.

General physical examination on admission was negative except for a temperature of 99.4° F. and physical signs of pneumothorax on the right side of the chest. Bimanual examination showed the uterus enlarged to the size of a three months' pregnancy. Nothing abnormal was noted in the adnexa. On inspection the cervix was blue, showed a scant bloody discharge. A diagnosis of threatened abortion complicated by chronic pulmonary tuberculosis was made.

About twenty-four hours later she aborted completely, the fetus appearing to be about 14 weeks of age. Unfortunately, the placenta and membranes were not subjected to pathological examination.

Immediately following the abortion her temperature rose to 101° F. and within the next few days to 104° with a corresponding elevation of pulse rate. Examination on April 3, five days after the abortion, showed a uterus enlarged to twice normal size with marked adnexal tenderness but no definite masses. She was believed to be suffering from post-abortal sepsis, secondary to unadmitted interference or to gonorrhoeal cervicitis. Cultures showed a mixed flora of organisms; no hemolytic streptococci or gonococci could be recovered in special media.

This course persisted for four weeks, the temperature ranging between 101 and 104° F. Later pelvic examinations showed the uterus to be retroverted with a tender mass behind it in the cul-de-sac.

Early in May the temperature began to fall to lower levels but she began to develop evidence of intestinal obstruction. On May 10 an exploration was carried out. A large amount of fecal fluid and gas was encountered in the peritoneal cavity. The peritoneum was studded with tubercles and many adhesions were present. The perforation could not be located. She died two days later. An omental biopsy was reported as showing tuberculosis.

At autopsy the principal findings were: (1) caseous pulmonary tuberculosis in the right middle lobe, the right lower lobe, and the left lower lobe with hematogenous spread to the left lung; (2) tuberculous peritonitis; (3) tuberculous salpingitis (bilateral, the tubes not occluded); (4) tuberculous metritis and endometritis; (5) tuberculous cervicitis; and (6) perforation of the appendix stump.

CASE 8.—(Bellevue Hospital No. 27614-44) Mrs. A. K., aged 23 years, white, para 0, gravida i, was admitted on June 15, 1944, complaining of purulent vaginal discharge, pain in the lower abdomen, and fever, dating from spontaneous abortion which had occurred at about the twelfth week of pregnancy, eight weeks prior to admission. Her previous medical and surgical histories were irrelevant. Her menstrual history was normal. She had married in January and became pregnant almost immediately.

General physical examination revealed nothing except for a tender mass over the lower abdomen. Bimanual examination revealed a tender, fixed right adnexal mass. A diagnosis of postabortal salpingitis was made.

right tube appeared normal. Biopsies were taken from the peritoneum and the uterus. These were reported as characteristic of tuberculosis. Unfortunately, the placenta was not examined microscopically.

The patient ran a stormy postoperative course which continued after her return to the chest service. In February, 1947, she was transferred to a sanatorium. She was readmitted on May 20, 1947, with abdominal distention and a fecal fistula in the cesarean scar. The chest was negative on x-ray. She died on June 3, 1947. No autopsy was obtained.

This patient differed in several respects from those in the previous group. Her pregnancy was marked by the development of a primary tuberculous pulmonary infection during the second trimester. By the time that secondary tuberculosis of the peritoneum and tubes had taken place by hematogenous dissemination, the uterine cavity had become obliterated, thus preventing infection of the decidua by the usual method of spread. The secondary tuberculous lesion was completely unsuspected until the abdomen was opened at the time of cesarean section. Although the pulmonary lesion healed, a marked exacerbation of the secondary lesion occurred post partum to which the patient eventually succumbed. It must be concluded that the course of the disease in this patient differs from that in the preceding group in the development of the secondary lesion during and not prior to pregnancy. One can speculate whether the removal of the uterus and adnexa at the time of the cesarean section might not have influenced the subsequent course.

### Summary

The relationship of pelvic tuberculosis to pregnancy can be summarized briefly as follows: In the vast majority of instances this type of pelvic infection is associated with intractable sterility. This is not surprising in the clinically recognizable cases. There are, however, a large number of patients with subclinical or latent pelvic tuberculosis, in whom tubal patency can be demonstrated, and in whom pregnancy is potentially possible. Observation and follow-up of many such patients have resulted in only one proved case of uterine pregnancy which occurred soon after the recognition of an endometrial infection.<sup>5</sup>

That pregnancy can take place in such patients is borne out by the reports of a number of ectopic gestations discovered in tuberculous tubes. Even this type of gestation is much rarer than would be expected. The surgical interruption of such pregnancies gives rise to no postoperative complications. Three instances of such an association are described in this report.

There appears to be a strong probability that uterine pregnancy can also occur on rare occasions in the presence of such a tubal lesion. The evidence for this, except in one case, is largely indirect. Five such cases are described, all terminating in early abortion with an abrupt exacerbation of the pelvic infection. In 4 of the 5 there is presumptive evidence that the primary tuberculous infections preceded pregnancy by more than a year. A sixth patient is described in whom the evidence points to the development of tuberculous salpingitis and peritonitis during pregnancy. She also developed an acute exacerbation of the infection in the postpartum period. Unlike ectopic pregnancy, the occurrence of uterine pregnancy in association with a pelvic tuber-



eulous infection appears to be a very dangerous complication leading to an acute flare-up of pelvic peritoneal disease, sometimes to hematogenous spread of tuberculosis, and often to a fatal termination (3 of 6 cases).

### Conclusions

1. Pelvic tuberculosis in women almost always causes sterility and this may be the only symptom of its presence in the subclinical stage of the infection.

2. In many patients with pelvic tuberculosis the disease is subclinical in form and the oviducts are patent.

3. In such patients ectopic pregnancies have been reported and to these three instances are added. The surgical treatment of such patients is not marked by untoward complications.

4. Cases have been reported, and to these five are added, which suggest that uterine pregnancy is possible under these circumstances. They terminate in early abortion complicated by acute exacerbation of the pelvic infection, often with a fatal termination.

5. Uterine pregnancy can be regarded as a serious complicating factor if pelvic tuberculosis is present.

6. In the rare event that uterine pregnancy should occur in a recently recognized case of pelvic tuberculosis, radical removal of the pelvic organs prior to abortion might be seriously considered.

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