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# ORIGINAL ARTICLES.

## MEMOIRS.

### AN ANALYTICAL STUDY OF TWO HUNDRED CASES OF PELVIC INFLAMMATORY DISEASE.*


HOWARD H. CUMMINGS, M. D.

INSTRUCTOR IN OBSTETRICS AND GYNECOLOGY IN THE UNIVERSITY OF MICHIGAN.

ANN ARBOR, MICHIGAN.


(From the Obstetric and Gynecologic Clinic.)

PELVIC inflammatory disease is one of the conditions which the general practitioner, as well as the gynecologist, is frequently called upon to treat. Because of this fact a discussion of the subject is always of interest and value.

As a basis for this paper, I have studied the histories of the last two hundred patients who have been treated surgically during the last four years in the gynecologic department of the University Hospital for inflammation of the pelvic structures.

Pelvic inflammatory disease, broadly speaking, is any infection of the uterus, tubes, ovaries, pelvic peritoneum, or pelvic cellular tissues. So commonly are the Fallopian tubes the seat of the active process that salpingitis, in the acute or chronic stages, is often spoken of as pelvic inflammatory disease, but involvement of the tubes alone is very uncommon.

*Etiology.*—The bacteriology of pelvic infections has been well worked out. Of the organisms causing this disease, the gonococcus is most often the offender and is followed closely by the streptococcus. Other organisms, as the staphylococcus, colon bacillus, bacillus of tuberculosis and pneumococcus do produce pathologic conditions in the pelvis. The following table gives the results obtained from a series of two hundred cases.

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TABLE I.

*Etiologic Factors.*

| CAUSE OF INFECTION. | NUMBER OF PATIENTS. | PERCENTAGE. |
|---|---|---|
| Gonorrhea | 76 | 38. % |
| Sepsis following abortion | 36 | 18. % |
| Sepsis following confinement | 51 | 25.5% |
| Tuberculosis | 21 | 10.5% |
| Questionable origin | 16 | 8. % |
| Total | 200 | 100. % |

It is evident that gonorrhea leads the list of etiologic factors, showing thirty-eight per cent. If it is true that fully one-quarter of the cases of sepsis following abortion and full-term labors, can be traced to a former gonorrheal infection, the percentage in this table would be raised to forty-eight per cent. If to this we add the greater part of the eight per cent of questionable origin, gonorrhea would probably be properly credited.

Sepsis following criminal and accidental abortion, also after confinement accounts for many of the most virulent and fatal cases of pelvic inflammatory disease.

It is remarkable that so many cases of pelvic tuberculosis appear in this series and probably ten and five-tenths per cent would be relatively too high if the cases had not been collected from an institutional clinic.

*Pathology.*—Acute pelvic inflammation gives various pathologic pictures. Following an endometritis, if the virulency of the invading organism is slight, the tubes may show congestion and some thickening of their walls which are infiltrated with leukocytes. Some of the fimbriæ may be bound together. More often the fimbriated extremities of the tube become closed off due to a greater inflammatory reaction. The tube curves itself about the ovary or attaches itself to the broad ligament. There may or may not be exudate poured out. Where a purulent collection forms in the tubes, these structures are soon fastened to adjacent organs by plastic exudate. Nature kindly sends down the omentum and intestines to wall off the pelvis from the general peritoneal cavity. In this way the posterior culdesac comes to contain one or two large abscesses. At times the ovaries contain purulent collections. In highly virulent streptococcus cases a general peritonitis sometimes develops, or the organism, traveling out through the lymphatics from the uterus, involves the cellular structures.

Some pathologists attempt to describe various forms of chronic pelvic inflammatory disease, but the truth of the matter is that chronic inflammatory disease is a residual condition following an acute one. An exception to this is found in the tuberculous type where the onset is usually insidious. However, because the process is old it must not be thought that the pathology is harmless. Very often chronic pustubes, fibroid, nodular tubes, chronic ovarian abscess, et cetera, are

harboring virulent germs and when these are liberated at operation, peritonitis rapidly develops. Dense bands of adhesions are the most common signs of chronic inflammatory infection.

Table II shows the number of acute and chronic cases and the amount of involvement of the pelvic structures.

TABLE II.

*Involvement of Structures.*

| ORGANS. | NUMBER OF CASES. |
|---|---|
| Uterus | 3 |
| Uterus, tubes and ovaries | 153 |
| Both tubes and ovaries | 10 |
| Right tube and ovary | 10 |
| Left tube and ovary | 19 |
| Left tube | 1 |
| Left ovary | 2 |
| Both ovaries | 1 |
| Pelvic cellulitis | 1 |
| Total | 200 |

Tables III, IV and V show the structures involved in the various types of infection.

TABLE III.

*Involvement in Gonorrheal Cases.*

| ORGANS. | NUMBER OF CASES. |
|---|---|
| Uterus | 2 |
| Uterus, tubes and ovaries | 58 |
| Both tubes and ovaries | 4 |
| Right tube and ovary | 6 |
| Left tube and ovary | 6 |
| Total | 76 |

TABLE IV.

*Involvement in Puerperal and Abortion Cases.*

| ORGANS. | NUMBER OF CASES. |
|---|---|
| Uterus, tubes and ovaries | 59 |
| Both tubes and ovaries | 6 |
| Right tube and ovary | 4 |
| Left tube and ovary | 13 |
| Left tube | 1 |
| Left ovary | 2 |
| Both ovaries | 1 |
| Pelvic cellulitis | 1 |
| Total | 87 |

TABLE V.

*Involvement in Tuberculous Cases.*

| ORGANS. | NUMBER OF CASES. |
|---|---|
| Uterus, tubes and ovaries | 21 |

*Involvement in Cases of Questionable Origin.*

| ORGANS. | NUMBER OF CASES. |
|---|---|
| Uterus | 1 |
| Uterus, tubes and ovaries | 15 |
| Total | 16 |

In seventy-six and five-tenths per cent of the cases all of the generative organs were involved. The left appendages were oftener involved than the right.

Pelvic inflammatory disease shows a definite relation to the periods of greatest sexual activity and child-bearing. This is emphasized in Table VI.

TABLE VI.

*Age.*

| YEARS. | NUMBER. |
|---|---|
| 10-15 | 1 |
| 15-20 | 5 |
| 20-25 | 39 |
| 25-30 | 25 |
| 30-35 | 42 |
| 35-40 | 37 |
| 40-45 | 26 |
| 45-50 | 18 |
| 50-55 | 6 |
| 55-60 | 1 |
| Total | 200 |

A study of the type of infection in relation to the ages of the patients gives the following figures:

TABLE VII.

*Age and Type of Infection.*

| AGE. | GONORRHEA. | ABORTION. | PUERPERAL SEPSIS. | TUBERCULOSIS. |
|---|---|---|---|---|
| 10-15 | 0 | 0 | 0 | 1 |
| 15-20 | 8 | 2 | 5 | 2 |
| 20-25 | 28 | 18 | 14 | 7 |
| 25-30 | 12 | 14 | 13 | 3 |
| 30-35 | 8 | 7 | 7 | 4 |
| 35-40 | 11 | 4 | 7 | 2 |
| 40-45 | 3 | 1 | 5 | 1 |
| 45-50 | 5 | 1 | 0 | 1 |
| 50-55 | 1 | 0 | 0 | 0 |

All types of pelvic inflammatory disease are most frequent between the ages of twenty and thirty years, while after forty years the disease is relatively infrequent. The youngest patient was thirteen years of age and had a tuberculous infection. The oldest patient was fifty years of age and had an acute gonorrheal infection of one month's duration.

In the cases studied, one hundred eighty-two of the patients were married and suffered from gonorrhea, sepsis or tuberculosis. The majority of these patients contracted gonorrhea from their husbands, many of the abortions were criminal and were performed by the patients. Tuberculous infections followed abortion or child-bearing in several cases.

There were eighteen single patients. Of this number eleven had gonorrhea and four had tuberculosis.

The question of sterility following a pelvic infection is most interesting. It is well known that gonorrhea and tuberculosis usually involve the tubes, causing them to be sealed off, while a streptococcus infection involves the parametrium and peritoneum. The number of children and some of the causes of sterility are shown in the table which follows:

TABLE VIII.

*Married Women.*

| CHILDREN. | NUMBER. |
|---|---|
| 0 para | 45 |
| 1 para | 45 |
| 2 para | 38 |
| 3 para | 26 |
| 4 para | 17 |
| 5 para | 4 |
| 6 | 3 |
| 7 | 3 |
| 8 | 1 |
| Total | 182 |
| Sterility due to gonorrhea | 36 cases |
| Sterility due to tuberculosis | 7 cases |
| Sterility due to questionable infection | 2 cases |
| Total | 45 cases |

The general condition of patients suffering from pelvic inflammatory disease is of great importance because the greatest good comes from operative procedures and surgical risks are of two kinds, good and bad. Certainly the majority of the patients who suffer from either acute or chronic pelvic infection, are poor risks unless handled properly.

Nine patients out of one hundred showed a normal blood picture; the remaining eighty-one patients had secondary anemia. The most

common conditions found were, anemia, hemic heart murmurs, heart lesions, myocarditis, nephritis and gastrointestinal disturbances.

*Symptoms.*—The symptoms and signs of acute pelvic inflammatory disease are as follows: Pain in one or both lower quadrants of the abdomen, fever ranging from 100° to 105°, profuse leucorrheal discharge in the gonorrheal cases but sometimes in septic cases the discharge is only moderate or absent, leukocytosis, abdominal tenderness and muscle rigidity, pains increased by movement; on vaginal examination, marked tenderness of the pelvic structures; inability to outline the organs because of spasm or exudate; at times distinct masses in the lateral pelvic regions or culdesac; fluctuation of large abscesses.

In chronic conditions the patient has exacerbations of the old trouble from time to time. Often these attacks precede the menses and dysmenorrhea is common. Often the symptoms of retrodisplacement are given as frontal headache, lumbar backache, leucorrhea, constipation, et cetera. Examination often reveals a retroverted, tender, adherent uterus, but when the uterus is forward, there is thickening in the tubal regions and the ovaries are unusually sensitive and immobile. This last sign is by far the most important.

*Diagnosis.*—The diagnosis of pelvic inflammatory disease is usually easy to make because the history is helpful. If a young woman marries and a few weeks or months later comes for treatment of a profuse leucorrhea, smarting and burning upon urination, vulvovaginal abscess, abdominal pain and tenderness, gonorrhea is usually a good diagnosis. If following an abortion or confinement the patient has chills, fever, prolonged flow of bloody lochia, a large tender uterus, feeble pulse, marked anemia, she probably has a mild sepsis. Virulent streptococcus infection is not difficult to diagnose, because of the intense symptoms. Beside a family history and pulmonary involvement the following points outlined by Kelly are useful in the diagnosis of tuberculous disease of the pelvis:

First, extensive pulmonary disease associated with pelvic inflammatory masses.

Second, where a persistent uterine discharge or uterine curettings are found to contain tubercle bacilli.

Third, where there is pelvic inflammatory disease associated with irregular ill-defined masses with fluctuation in the lower abdomen, and the latter are noted at subsequent examinations to have changed their relation.

The examination of smears from the cervix and a diagnostic curettage are very useful measures. I wish to emphasize the importance of ether examinations where the patient is too tender to allow a careful bimanual examination. Many supposed inflammatory cases have been found to be cases of hysteria and neurasthenia.

*Treatment.*—Pelvic infection, like other infections, requires general measures, such as absolute rest, stimulation of the emunctories; locally cold applications give relief. In the acute stages, hot, long continued vaginal douches hasten the softening of exudate, lessen congestion and

relieve pain. When a definite mass can be outlined and pus is undoubtedly present, a posterior colpotomy gives the best results. The operation is simple and has only a few dangers attending. These are: tears of the rectum, damage to the uterine arteries or the ureters. These can be avoided by stripping back the posterior vaginal mucosa from the cervix and with it any rectocele which may be present. Always work in the median line and against the cervix. In this way the vessels and ureters can be passed without harm. After the finger or blunt scissors is past the danger zone, the masses can be punctured laterally. The value of this operation is great. Some patients return for a radical removal of the involved organs several months after the posterior colpotomy has been done. By that time the inflammation has lost its virulency and the abdominal operation is without incident. However, many women are so greatly relieved that the laparotomy is never performed.

In the chronic cases a laparotomy is necessary to obtain a cure. The objects of the abdominal operations are: first, to release adhesions; second, to remove diseased organs; third, to restore the organs which can be saved to as near normal condition as possible. No one branch of operative gynecology is so difficult as radical operations in inflammatory cases. A surgeon who intends to do a hysterectomy at the beginning of an operation, may find himself anastomosing intestines, repairing the bladder, transplanting the ureter and various other things before the operation is completed. Not only this but foci containing virulent organisms may be hidden in the pelvic debris and a splendid operation may be followed by peritonitis and death.

The nature of the operations performed on the two hundred cases studied is recorded in the following:

TABLE IX.

*Operative Procedures.*

| OPERATION. | NUMBER. |
|---|---|
| Panhysterectomy and bilateral salpingo-oöphorectomy | 38 |
| Supravaginal hysterectomy and bilateral salpingo-oöphorectomy | 54 |
| Posterior colpotomy | 38 |
| Laparotomy, freeing adhesions | 22 |
| Bilateral salpingo-oöphorectomy | 4 |
| Right salpingo-oöphorectomy | 17 |
| Left salpingo-oöphorectomy | 19 |
| Left salpingectomy | 2 |
| Right oöphorectomy | 1 |
| Left oöphorectomy | 5 |
| Total | 200 |

It was possible to save all of the pelvic organs in sixty cases. In forty-eight cases some of the organs were saved, in most instances the ovaries. Ninety-two patients had all the internal generative organs removed.

*Complications.*—Suppuration of the abdominal wound is a frequent complication and is due to contamination in removing septic organs and to the poor resistance of chronic septic patients. Tears in the intestines occur in freeing adhesions and are especially liable to occur in tuberculous infections. Phlebitis sometimes occurs in panhysterectomies without infection but is more likely to occur in septic cases. Fistulæ are formed in separating adherent structures and in sloughing following trauma. Cases have been reported where adherent gauze used for drainage caused fistulæ. I have listed the complications found.

TABLE X.

*Complications.*

| | |
|---|---|
| Suppurating abdominal wound | 19 |
| Tears in the intestines | 3 |
| Infected hematoma | 1 |
| Phlebitis | 1 |
| Urinary fistula | 1 |
| Rectovaginal fistula | 1 |

*Results.*—The results of operative treatment for pelvic inflammatory disease are on the whole gratifying, if it be considered that the operations were not performed by the head of the department alone, but by his three assistants as well.

Tabulation of the results in the series shows:

| | | |
|---|---|---|
| Patients cured | 149 or | 74. 5% |
| Patients improved | 38 or | 19. % |
| Patients not improved | 2 or | 1. % |
| Patients died | 11 or | 5. 5% |
| Total | | 100.00% |

The causes of death were:

| | |
|---|---|
| Peritonitis | 5 patients |
| Shock | 2 patients |
| Miliary tuberculosis | 1 patient |
| Postoperative hemorrhage | 1 patient |
| Acidosis | 1 patient |
| Acute intestinal obstruction | 1 patient |
| Total | 11 patients |

The results of this analytical study would warrant the following brief conclusions:

First, pelvic inflammatory disease is most frequently caused by a gonorrheal infection. Sepsis following abortion and confinement is an important causal factor. Tuberculosis is not an uncommon agent in pelvic infections.

Second, pelvic inflammatory disease is greatly increased during the years of greatest sexual activity.

Third, gonorrhea is a most important factor in producing sterility.

Fourth, pelvic inflammatory disease is often the cause of secondary anemias in women.

Fifth, streptococcus infections often localize in the parametrial tissues. Gonococcus infections select the tubes.

Sixth, posterior colpotomy gives excellent results in acute cases.

Seventh, laparotomy, months after a colpotomy or when the condition is chronic, holds out the greatest hope of a cure.

723 Church Street.