PYELITIS COMPLICATING PREGNANCY.[1]

BY

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PYELITIS complicating pregnancy does not differ materially from pyelitis which occurs under other conditions. When it occurs as a complication of pregnancy it does, however, decidedly modify the condition of the patient, the fetus, and the course of gestation. It may occur in early pregnancy, although it is rarely found before the fifth month. In the very large majority of cases it makes its first appearance in first pregnancies and may reoccur in succeeding

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pregnancies. Not all women who have long slender waists and short anteroposterior depth of abdomen are victims of pyelitis when pregnant, but pregnant women who suffer from pyelitis quite generally conform to this type. The danger to the mother is the severe infection, permament damage to one or both kidneys with, occasionally, extension of the infection to other regions. The danger to the fetus is death *in utero*, premature delivery before viability, or, in a condition so weakened that life is continued, if at all, only under many difficulties.

With rare exceptions, the offending agent is the bacillus coli communis.

The clinical picture as we have observed it, and substantially as others have reported, is that the patient is early in the fifth month of her first pregnancy. She has suffered for several days from general malaise, abdominal discomfort and a sense of heaviness, with a dull pain over the region of the affected kidney. Then there is a feeling of chilliness, or a decided chill and a rise of temperature to 102° or 103° F., or even higher. The pulse range is in the neighborhood of 100. Constipation is an invariable complication. Not infrequently there will be a definite history of daily evacuation. A vaginal examination will disclose the rectum full of fecal masses as far up as the examining finger can reach. Urinalysis shows acid urine, excess of indican, a considerable quantity of pus and hyaline casts. Distinct tenderness is found on palpation of the affected kidney region. In a few cases we have found liver tenderness, a muddy pallor of the skin with easily recognizable jaundice of the sclerotics. Beyond a moderate vesical congestion, cystitis is not found early in the attack. The urologist, in catheterizing the ureters, usually reports the obstruction at the point where the ureter crosses the pelvic brim and is compressed by the gravid uterus; ordinarily on the right side, less often on the left. Rarely both ureters are compressed. In the cases in which both ureters are involved, one is decidedly infected and obstructed and the other to a much less degree. We do not expect to find both ureters markedly obstructed and the kidney pelvis infected in the same patient. It is common to see the urine flow from the ureteral catheter on the affected side in a well-defined stream until the ureter and kidney pelvis is empty; while from the other catheter it comes in the characteristic drop.

Several factors enter into the make-up of the causes which finally result in pyelitis complicating pregnancy. By the fifth month the pregnant uterus has become a tumor mass of considerable size,

which in the roomy abdomen tends toward anteversion against the anterior abdominal wall, which in turn stretches and yields to this pressure. In some primiparæ with abdomen of small capacity and well-developed abdominal muscles, this anteversion is not allowed; the uterus is forced back toward the spinal column, being crowded somewhat downward, so that it tends to occlude the pelvic brim, impeding the passage of the intestinal contents and resulting in intestinal stasis and constipation. With this stasis and accompanying fermentation there is an overproduction of colon bacilli. At the same time, there is compression of one or both ureters, partly occluding the ureter affected, distending it and the kidney pelvis and thus forming a reservoir of stagnant urine which by back pressure congests the kidney and impedes its normal activity. Through the lymphatics and probably through the blood stream, the overflow of colon bacilli find their way into this accumulation of stagnant urine which proves a favorable soil for their further development. Inflammation of the pelvis of the kidney appears with the formation of increased mucus and pus.

In Cesarean operations we are able to note the position of the uterus. More often than not it is turned on its long axis toward the right side, occasionally its anterior wall faces directly forward, rarely we have found it decidedly turned toward the left side. This usual dextrotorsion of the uterus, whatever its cause, by its pressure upon the right ureter as it crosses the brim of the pelvis, probably helps to account for the more general occurrence of pyelitis on the right side. The somewhat lower position of the right kidney and the fact that the prolapsed or floating kidney is more often found on the right side may have some bearing upon this condition. It is conceivable that malformations or kinks in a ureter may retard the flow of urine through it and either by itself or in conjunction with pressure upon it by the gravid uterus prove to be a causal factor in the pyelitis of pregnancy although no such malformations, strictures nor kinks have been reported to us in the cases which have come under our observation. Tubercular processes may extend from neighboring regions. We recall the case of an elderly primipara who in childhood had tubercular hip-joint disease from which she recovered with an anchylosis of the hip. She regained sound and vigorous health and for many years was a very active and hardworking saleswoman. She married rather late in life and became pregnant. During late pregnancy tuberculosis of the bladder developed, later extending to both kidneys, terminating fatally in about five months after the birth of her full-term child. The autopsy showed much

destruction of the bladder. The right kidney was a sac of pus with no kidney structure to be found. About two-thirds of the left kidney was a tubercular abscess, the remaining third of the kidney was studded with small tubercular abscesses. It is worthy of note that the progress of this condition was somewhat gradual and that life continued for some time while there could have been only a small portion of functioning kidney tissue left.

A number of years ago a case of puerperal sepsis came under our care. The more acute stage had passed and a considerable exudate had formed to the right of the uterus and above the level of the fundus. To this condition the characteristic symptoms of right-sided pyelitis were added. It was found that the bladder had been drawn up to the right side and distorted so that the right ureter was catheterized only after great difficulty. A considerable quantity of urine containing pus was withdrawn. A weak solution of formalin was instilled into the pelvis of the kidney resulting in abrupt cessation of the symptoms of pyelitis. In this case the stagnation of urine in the ureter was due to partial stenosis of the lower end by its inclusion in an inflammatory exudate. By catheterizing this ureter drainage was reëstablished and a cure promptly followed.

From observation of patients and the study of histories of hospital and private cases it is evident to us that there is a rather large number of pregnant women who suffer from a mild form of pyelitis. We see these cases in our hospital service. They remain under treatment for a time, are cured and are dismissed into the care of their family physician from whom we not infrequently learn that pregnancy has continued to term without recurrence of the pyelitis. Other patients return to us with repeated attacks, sometimes of increased severity. From the fact that cases of pyelitis of pregnancy come to our service after having been treated for a previous attack in another hospital, shows that some of our so-called cured cases probably have subsequent attacks and find their way into other hospitals. We must, therefore, conclude that a woman who has had her pregnancy complicated by pyelitis, even though of mild degree and apparently cured, is liable to subsequent attacks or a continuous form of pyelitis. Such a patient should be under rather close observation throughout the remainder of her pregnancy and as long thereafter as symptoms are present and pus and kidney elements appear in the urine. A considerable number of such patients are in danger of permanent and extensive kidney injury and require the care of a skilled urologist if this is to be avoided.

One primipara had an attack of pyelitis during the fifth month of her pregnancy, recovered and insisted upon going home. She returned in a similar condition during the seventh month; after a time went home, returning again near full term with high fever, very ill and was delivered of a macerated fetus.

The course of a private patient may illustrate several points. A primipara, twenty-one years of age was threatened with abortion at the third month. By rest in bed, mild opiates, etc., the uterine contractions and bleeding ceased and this danger was successfully passed. Quite early in the fifth month she developed characteristic symptoms, dull pain over the upper part of the right side of the abdomen and back, moderate tenderness over the right kidney, slight enlargement and tenderness of the liver, decided pallor with jaundice of the sclerotics, with extreme prostration and anorexia. The urine was acid, of high specific gravity, concentrated, had excess of indican, much pus with hyaline casts and albumin. By culture the urine was shown to contain a large number of colon bacilli. Both ureters were catheterized. On the right side decided obstruction was found at the point where the ureter crossed the pelvic brim and was compressed by the pregnant uterus. A considerable quantity of retained urine was withdrawn, flowing from the catheter in a well-developed stream. To a much less degree a similar condition existed in the left ureter. The bladder showed moderate hyperemia. After this there was temporary improvement. The patient, however, remained very ill in bed requiring the continued attention of a nurse until her premature delivery September 8, 1916, at the end of seven months and one week of her gestation. The child weighed 4 pounds and 12 ounces a week after its birth and is still living and thriving. After a few days it nursed, securing plenty of nutrition from its mother and developed very satisfactorily until the last week in December, 1916, when it suddenly became cyanosed and stopped breathing. Respiration was established with difficulty by the nurse. An enlarged thymus was found and apparently cured by a few applications of the *x*-ray. Soon after this attack bottle feeding was resorted to. The mother after an uneventful puerperium had gained 20 pounds in weight. The urine showed a few pus cells, traces of albumin and an occasional hyaline cast. During the two months from the onset of pyelitis until premature delivery it was found necessary to catheterize the ureters 4 times and instil a weak solution of silver nitrate. Constipation was overcome by mild laxatives, occasional small doses of calomel and daily colonic irrigations. A daily hot

bath was given. Urotropin was used freely; methylene blue was tried but each time promptly vomited. Bulgarian bacilli were given throughout this time and an occasional injection of autogenous vaccines. While good results may have followed the use of these two agents, they were not decidedly apparent. The diet at first was only milk in considerable quantity, with large quantities of plain water and Vichy. The knee-chest posture was resorted to for ten minutes several times each day thereby allowing the uterus to fall forward, removing pressure and favoring drainage through the ureters. Promptly after each catheterization of the ureters, which caused the patient very little pain and discomfort, quite decided uterine contractions began. These contractions while very evident were not painful to the patient. They were soon checked by the free use of opium. For about two weeks prior to delivery ureteral catheterization had not been resorted to. Uterine contractions began and increased in force and frequency. Suppositories, each containing a grain of opium were used every four hours until the maternal respiration was twelve per minute, without checking the contractions. An easy delivery followed after about fourteen hours and in spite of the use of 3 grains of opium during the first twelve hours, respirations in the baby were spontaneous. We believe that this child owes the continuance of its intrauterine life up to a very precarious viability to the skilful urological care of Dr. H. G. Bugbee, and no less important, its very unpromising start in extrauterine life and through its thymus crisis to the prompt and wise management of Dr. C. G. Kerley. The patient made an uneventful recovery and became completely well again. Her last menstruation appeared February 28, 1917. In the third month, after a rather long motor ride, an abortion threatened, with uterine contractions and moderate bleeding. With rest and care this condition subsided. Pregnancy thereafter was uneventful. There was no noteworthy abnormality in the urine. Quiet life in the country kept the general health in better condition than during the first pregnancy. During the first week in August, 1917, at approximately the fifth month of her second pregnancy, a pyelitis again appeared but not so severe as during the previous year and subsided in about a week. There was an interval of about two weeks of good health followed by a more severe attack with characteristic urine changes and evening temperature to 102° F. for several days. Ureteral catheterization was used once and with other treatment the condition promptly cleared up. The patient moved to another city late in September. Pregnancy continued uneventful until the completion of the eighth

month, when the easy delivery of a well-formed male child weighing between 6 and 7 pounds was reported.

During the past winter we have seen a considerable number of undoubted mild cases of pyelitis complicating first pregnancies which responded promptly to rest in bed, colonic irrigations, hot baths, forced fluids and urinary antiseptics, knee-chest posture, etc., without catheterizing the ureters. At one time we had in our Service four cases decidedly ill because of pyelitis complicating their first pregnancies. With other treatment all had ureteral catheterization, one was catheterized twice. All recovered and continued well. The patient who was twice catheterized gave a history of having been under treatment in another hospital. She left there and remained at home six weeks under the care of her family physician, and was very ill all of the time. We note that there may be wide variance between that which consultants say and what a patient is able to report that they have said. One consultant is reported as having advised drainage by incision over the kidneys. Such a course appears to us as very radical and unwarranted. Another advised emptying the uterus. If necessary, this would have been a much safer course to have followed. This patient although very ill when admitted, recovered under the treatment outlined, including catheterization of the ureters twice, and remained in the hospital without symptoms throughout the rest of her pregnancy and her puerperium. She was delivered at about the eighth month after normal labor, of a small child which lived and was gaining when discharged with its mother.

In the foregoing histories treatment has been fairly well indicated. In only a small proportion of cases of pyelitis of pregnancy is ureteral catheterization indicated. It is not advisable for any one to attempt this, however, unless specially skilled in the necessary maneuvers, otherwise traumatism and pain will surely result from the manipulation of passing the ureteral catheters. In the hands of a trained urologist, who by long experience and constant practice has acquired deftness and unerring skill, I have never noted harm to follow ureteral catheterization. I regard a partially occluded ureter distended with infected urine in the nature of an abscess and that the passage of a catheter results in free drainage of the same.

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