PYELITIS COMPLICATING PREGNANCY.*

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In looking about for something that would be of practical interest to each and every member of our association, I decided that the question of Pyelitis Complicating Pregnancy would probably meet the requirements better than any other matter I might choose, but in dealing with this subject in the paper I shall read this evening I would like to have it distinctly

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understood that I am not dealing with an acute manifestation of a pre-existing chronic inflammation of the pelvis of the kidney, which existed before the woman became pregnant, or one that has developed from calculus or some other cause entirely independent of pregnancy, but an acute inflammation which develops during pregnancy, and is dependent in some way on the pregnant condition for its causation, and in some cases partially subsides before completion of gestation, and where usually all signs of the inflammatory process pass off in a few weeks after delivery.

In a paper read before this association in January, 1891, I gave notes of a case of this kind which I had under my care, a short time previously, and in these notes pretty accurately described a condition, which was then new to me. This paper was not published, and as a consequence Reblaud, to-day, gets the credit of having first accurately described the condition, in a paper read by him at the Surgical Congress in 1892, or more than one year later than the date of my paper.

It is my purpose to-night to give extracts from my previous paper with notes of the case then reported, and the subsequent history of this patient. I will also give notes from two other cases, which have come under by personal observation since that time, together with the present views as to the frequency causation, prognosis and treatment of this disease.

I find that in my paper, January, 1891, I said that at that time (sixteen years ago), there was practically no literature on the subject. All the standard works on obstetrics, which I had consulted, Lusk, Playfair, and others, did not mention it. In letters received from several leading specialists, I was informed that practically nothing had been written on the subject. The notes of my case, then reported, were as follows:

Case I.—Mrs. B., farmer's wife, aged 22 years, married Christmas, 1889, became pregnant, in her first pregnancy, the following May, 1890. She had always enjoyed excellent health before marriage, and since, up to about two weeks previous to the time she consulted me, which was on October 21, 1890. She was then between five and six months pregnant. Her symptoms at this time were pain, *rather severe behind, over right kidney*. Chilly sensations. Temperature 103° F. Pulse over 100. Dry cough, constipation, some frequency in urination, no appetite. She appeared somewhat apathetic and dull.

She said that she had not been well for the preceding two weeks, but the symptoms had become markedly worse during the past two or three days. Examination of the pelvic organs showed an apparently normal uterine pregnancy. Examination of the chest revealed nothing to account for the cough and other symptoms. I did not get a sample of the urine for examination on this date.

As she came from a part of the country where there was some malaria, I thought that this might explain the symptoms. I advised her to go home and go to bed, and prescribed a calomel cathartic, to be followed by good doses of quinine. The next day, October 22, I saw her at her home in the country at 4 P.M. She was feeling somewhat better. Temperature was normal. She was slightly jaundiced and complained of some nausea. The pain was not so severe. The urine had not yet been examined, and the diagnosis still favored malaria.

On October 23, although taking quinine in good doses, she had another light chill early in the morning, with an accompanying rise of temperature, and some increase of pain and urinary irritation. An examination of the urine on this date showed it to be acid in reaction, with a trace of albumen, and showing under the microscope numerous pus cells.

From October 23 to November 21 she had occasional slight chills with fever and sweats. The pain in the right lumbar region continued, and she also felt pain running down in front, along the course of the right ureter. There was nausea and vomiting at times and pretty rapid emaciation.

Repeated examinations of the urine showed it to be acid in reaction, with a marked trace of albumen, and numerous pus and epithelial cells. I could not detect casts.

From November 21 to December 4 I had the temperature taken night and morning and found that it ranged from normal or subnormal in the morning to 100 degrees and 101 degrees F. in the evening. Pain in the side during this time was not severe. She emaciated rapidly and had night sweats so that she resembled a person in rapid decline. The quantity of pus in the urine increased, and from her general condition I began to think seriously of terminating the pregnancy, but as she was anxious, if possible, to have a viable child, I concluded to defer as long as possible. From December 4 she began to feel better. There was cessation of pain, disappearance of cough, and lessen-

ing of the quantity of pus in the urine. On December 7, about 220 days following her last menstrual period, labor pains came on about 5 A.M., with a discharge of liquor amnii, and after a moderately tedious labor, owing to an R. O. P. position of the head, a very well-nourished female child was born about 1 P.M. Convalescence was normal and free from any rise in temperature. For a few days there was slight pain in the right kidney region, and some pus in the urine, but an examination of the urine fourteen days after labor showed it to be free from pus.

The diagnosis of pyelitis complicating pregnancy in this case was made from the clinical history, and examination of the urine. The history of pain in the right kidney region, running down along course of ureter, coming on rather suddenly and accompanied with chills, fever, sweats, digestive disturbance, emaciation and urinary irritation, with examination of the urine, showing it to be acid, and containing pus and epithelial cells (apparently from kidney pelvis), was, I thought, sufficient to establish the diagnosis. There was at no time any diminution in the quantity of urine.

When I first saw the patient and before a careful examination of the urine was made, malaria was considered a probable cause of the symptoms. No other disease was considered in the differential diagnosis. Regarding the pathology in this case I could say very little at that time. I felt convinced that the inflammatory process started in the pelvis of the kidney and was not an extension upward from the bladder. I gave as the probable cause of the trouble *partial obstruction of the ureter from pressure of the enlarged gravid uterus*. I also gave "*constipation as a possible factor*," but I looked upon this as a pressure factor from the hardened feces in the bowel pressing upon the ureter. At that time I knew nothing about the bacteriology of the intestinal tract and its relationship to such inflammations. The irritation of dammed-back urine from partial obstruction to the urinary flow seemed to explain the origin of the inflammation. In this case there was no inflammatory pelvic exudate, no tumor and no pathological displacement of the uterus to cause pressure.

The treatment consisted of purgatives to clear out the intestinal tract. Quinine was given because I thought it possible that malaria might be a factor in the causation. This, with rest in the recumbent position, and diet largely of milk, was the

treatment. Subsequent examination of the urine in the non-pregnant condition in this case showed an absence of pus or any other sign of disease of the urinary tract. In 1893 she was under my care during her second pregnancy and confinement, when she gave birth to twins. There was no recurrence of the trouble either during (this second) pregnancy or the puerperium. She was under my care in her third pregnancy and confinement in 1895, giving birth to one child. There was no recurrence of the trouble during this pregnancy or subsequently.

Case II.—Mrs. T., aged 25 years, in her second pregnancy. I had attended this patient in her first pregnancy and confinement in 1893, and the pregnancy, labor and puerperium were normal in every particular. I first saw her in her second pregnancy March 10, 1897. She had last menstruated on December 8, 1896. Examination of her urine at this time, March, 1897, was negative. On examination of the abdomen on April 15, the uterus could be felt well above the pubes, and seemed larger than one would expect for the period of pregnancy. The fundus seemed more to the right side than usual. At this time she was complaining of some vague abdominal pain and some frequency in micturition. On May 3 she was out in the rain and got her feet and skirts wet, and on May 4, about five months from date of last menstruation, she was seized rather suddenly with severe pain in the back over the right kidney, with frequent micturition, bearing down in the pelvis, and the passage of large quantities of urine. Temperature was normal, the pulse was increased some in frequency. Her urine was found to be acid and contained pus. On May 5 the evening condition was about the same. Her temperature had risen to 100 degrees F. *On May 6 a catheter sample of urine* showed the following: Reaction, acid. Pus cells numerous. Epithelial cells. No casts. Quantity reported by nurse for twenty-four hours was ninety ounces.

From this time up to the end of July following, this patient had frequent recurrences of pain and elevation of temperature at times reaching 102° F., these attacks lasting for several days, and at times requiring morphia to relieve the pain.

During this period of nearly three months she was confined mostly to her room, *and in bed during the acute attacks.* She emaciated considerably, and at times the question as to the ad-

visability of emptying the uterus was seriously considered. From the end of July, however, she began to improve, and this improvement continued, although she was unable to get about much. On September 17, labor pains came on about noon, and after a normal labor, a well-nourished female child was born at 9 P.M.

The presentation was a head, and the position L. O. A. Her puerperium was normal, and on November 4, a sample of urine not taken per catheter, showed only one or two pus cells. An examination of the urine subsequently in August, 1898, showed a complete absence of pus.

In 1900 I attended this patient in her third pregnancy and confinement, the pregnancy, labor, and puerperium being normal, there having been no recurrence of the urinary trouble. The treatment of this case during her illness from the pyelitis complicating her second pregnancy was rest, diet largely milk, occasional doses of morphia for the pain, salol and quinine.

This patient passed through her fourth pregnancy, labor and puerperium in 1902 without any trouble.

Case III was seen in consultation with Dr. Logie of Sarnia, on October 29, 1904. Mrs. J., aged 31 years, married seven years, about five and a-half months advanced in her second pregnancy. She had not been well for two or three weeks, but was confined to her bed for only two or three days previous to my visit. Her symptoms were pain in the right lumbar region and down the right side along the course of the right ureter. She was having distinct chills, and chilly sensations, with an elevation of temperature from 99° F. to 102° F., followed by sweating. Urination was not markedly frequent. The quantity of urine was increased. The urine was acid. Sp. gr. 1012. Albumen a trace; considerable pus; no casts. Diagnosis: "Pyelitis complicating pregnancy." The treatment advised was rest in bed, milk diet. Urotropin with large quantities of water by mouth. Saline cathartics to clear out the intestinal tract, and moderate doses of morphia if required, for pain.

This patient went to full term, and had a perfectly normal labor. Her convalescence was normal, the urine clearing up in a few weeks after delivery.

Dr. Logie told me that this patient had some urinary trouble with pus in the urine in her first pregnancy, the urine clearing up

after delivery, and from his casebook notes of the first pregnancy the trouble was undoubtedly a pyelitis, beginning in the sixth month.

In looking up the literature on the subject, I find in some of the recent text-books on obstetrics, Edgar, Williams and Webster, brief reference made to the disease under the heading "Pyelonephritis in Pregnancy." Hirst also briefly mentions it under the heading, "Pyelitis in Pregnancy."

From what is said in these text-books, I am led to believe that these authors have had little personal experience with the disease. In other recent works, Dorland, Davis, King, Jellett, etc., no mention is made of the disease. The best recent article on the subject I have seen is a paper by Cragin, published in the New York *Medical Record* of July 16, 1904.

Cragin claims that the condition is not rare, he having personally seen ten cases in four years. He appears to think, however, that the disease is frequently not recognized by either the general practitioner or specialist.

Quoting from Cragin's paper, "The etiology of the condition, according to Vinay, seems to depend on two factors. (1) Compression of the ureter by the pregnant uterus. (2) Infection of the urinary tract above the point of compression."

The first factor, "compression of the ureter by the pregnant uterus," I mentioned as a cause in my former paper. I also, in that paper, gave what I considered a reason why the ureter is more liable to injurious compression during pregnancy than in the nonpregnant condition. Quoting from that paper, I said under the heading, predisposing causes, that "Skene tells us that the passive hyperemia and edema of the pelvic organs during pregnancy may interfere with the proper nutrition of the ureters, and in consequence they are softer, less elastic and less resistant to injury during labor than in the normal state," and I said, "if this statement by Skene be true, they would be less resistant also to injurious pressure during pregnancy."

"It appears, from the experiments of Ludwig, that the normal downward pressure of the urine in the renal pelvis is very low, so that little compression of the ureter is required to retard the current."

"From the record of autopsies on pregnant women by Olshausen, Stadfield and others, it has been proven that compression of the ureter with resulting dilatation does occur in preg-

nancy, and that the right ureter is the one most frequently compressed and dilated."

The causes which have been suggested for this difference on the two sides are, (1) "The greater prominence at the brim of the pelvis of the right over the left common iliac artery, exposes the right ureter to greater pressure between the uterus and iliac artery." (2) "The more frequent rotation of the uterus on its long axis from left to right forward places the enlarged uterus more in the right oblique diameter of the pelvis than the left, and thus exposes the right ureter to greater pressure." (3) "The greater frequency of the fetal head in the right oblique diameter of the pelvis increases the frequency of the pressure upon the right ureter."

When I reported my first case in January, 1891, I did not know that the disease in nearly all cases was right sided.

In my three cases reported the disease was right sided. Cragin says that in all of his ten cases and in all authentic cases which he could find reported the lesion was primarily right sided, and usually remained confined to the right side.

In eight of the ten cases reported by Cragin the position of the head was noted and in seven of these it was in the right oblique diameter of the pelvis.

In my first case the position of the head was R. O. P. In my second case it was L. O. A. In the third case Dr. Logie tells me that it was a head presentation and that the labor was easy and perfectly normal. I would therefore assume that in this case the position was L. O. A.

In Cragin's ten cases, seven were primigravida, and three were multigravida.

In Vinay's nine cases, two were primigravida and seven were multigravida.

In my three cases, one was primigravida and two were bipara. With regard to the second factor, "infection of the urinary tract above the point of compression." Irritation of the mucous membrane by the dammed-back urine would naturally render it more susceptible to infection, but as to whether the infection is an ascending or descending infection there is some difference of opinion. "Reblaud and others believe that the infection is caused by organisms being eliminated through the kidneys, and along the urinary tract, and in some cases by direct transmission to the pelvis of the kidney from the contiguous

intestine." In my own cases, as there was no evidence of cystitis preceding the onset of the symptoms referable to the pelvis of the kidney, I must, naturally infer that the infection was a descending one.

"In all reported cases in which a bacteriological examination of the urine was made, with one or two exceptions, the infecting organism in the 'pyelitis of pregnancy' was found to be the colon bacillus."

In my three cases the period of pregnancy at which the pyelitis started was between five and six months. Cragin says that it usually occurs between five and eight months.

In the history of the cases I have reported, the diagnostic symptoms of the disease have been, I think, sufficiently dwelt upon. There is one fact, however, that Cragin has pointed out, that should be kept in mind, namely that at the very onset of the disease no pus may be found in the urine, nothing, perhaps, but a trace of albumen and a few hyaline casts. Pus, however, soon appears in varying quantities.

I cannot see how, if a careful investigation of the case is made, the disease could be mistaken for salpingitis or appendicitis or typhoid fever, yet in the hands of a careless physician such mistakes may occur. Possibly, too, some cases are mistaken for *cystitis*, but in cystitis urination is frequent and painful, and the urine is alkaline, while in pyelitis, urination though usually frequent, is not painful, and the urine (although containing considerable pus), is acid, and besides, there is pain and tenderness over the kidney.

Judging from my own cases and the cases reported, the disease called "pyelitis complicating pregnancy," with which this paper deals, should have a favorable prognosis under proper medical treatment.

From my personal experience I agree with Cragin, when he says that "the interruption of pregnancy is seldom, if ever, necessary." The medical treatment I would favor, in the light of past experience, and present knowledge of the subject would be rest in the recumbent posture, fluid diet, largely of milk, and large quantities of water. Laxatives and saline purgatives to keep the intestinal tract cleared out. Urotropin in grains v, doses about every four hours, given with copious draughts of water, is probably (at the present time) the best urinary antiseptic we can administer in this disease.

Locally, for the pain, an ice bag applied over the loin is recommended. In some severe cases of pain not relieved by the ice bag, small doses of morphia may be given.

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