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## The Role of the Gynecologist

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ONE of the most poignant problems of modern marriage is involuntary childlessness. One out of every six couples will not be blessed with parenthood unless they avail themselves of the remarkable advances in recent years in the science of human reproductive physiology.

God does not necessarily will permanent childlessness for any couple. In His ordinary providence He usually helps those who help themselves. Yet many of these heartsick young people, either through ignorance, inertia or false modesty, are reluctant to seek relief. Youth is the talisman of fertility. Late marriage and delay in seeking fertility studies have resulted in a tragic loss of precious years of opportunity for many of our people. It has been estimated that there are three million childless couples in the United States. If they would persevere with medical planning for parenthood, five hundred thousand of these couples would find their heart's desire.

Due to an age old prejudice, it is usually the wife who seeks relief from the "curse of barrenness." Marriage infertility, however, is a mutual family problem. At the very first interview both partners should be seen together, and it must be emphasized that often both partners may be at fault. Most infertility is relative. In almost fifty per cent of the cases the husband is in some measure at fault. At the time of the first interview, this cardinal fact must be stressed—no one is to blame.

Male pride which often confuses infertility with impotence prevents many couples from even beginning fertility study. Understandably, many Catholic husbands resent requests for semen samples, when the request in non-Catholic clinics involves the use of masturbation or coitus interruptus-methods which are contrary to the natural law. This is perhaps one of the major reasons why every Catholic hospital should have its own fertility clinic. Since 1948 there has been available to husbands a method of semen sampling which reputable Catholic theologians agree is entirely consonant with moral law and the teaching of the Church. The cervical spoon, a small plastic spoon, is inserted into the vagina beneath the cervix to act as a plastic lining for the vagina and an open receptacle for the seminal pool. It is removed thirty minutes after coitus, allowing ample time for much of the sperm to have passed natu-

rally to the cervix and its contents deposited in a small jar for transport to the laboratory for study.

The study of fertility is a relatively new specialty. (The First World Congress for the Study of Fertility was held in New York in May 1953.) The purpose of this symposium is to present the simple standard procedures which constitute modern infertility studies. The general practitioner or the isolated gynecologist can conduct fertility studies. But there is no denying that the team work of the urologist, internist and psychiatrist working together with the gynecologist offers more productive opportunity for effective results.

It is an extravagant hope which expects a solution for the problem of marital infertility after one or two visits. The first and most important procedure is a careful complete history and physical examination of both partners with special attention to past history of mumps, appendicitis or venereal disease. Complete blood studies including the RH test, as well as complete urine studies should then be done. The basal metabolic rate of each partner should be determined. Sub-clinical hypothyroid states often underlie relative infertility.

The functional tests of human infertility can best be planned if one keeps in mind what is the precise biologic problem. It is this. There is a period in each month when the mature Graafian follicle will expel its liquor folliculi and float the egg down the side of the pelvis where if tubal motility and patency are unimpaired one of the tubes will siphon it up and propel it toward the uterus. If coitus has been timely, sperms will have ascended through the mucus cascade, which exudes from the cervix at this time even though third degree retroversion of the uterus is present. A few sperms will have reached the distal end of the tubes, where one of their number will penetrate the ovum. If the endometrium has been properly prepared in response to ovarian hormones after a three day journey through the tubes the conceptus will nidate and develop.

It is obvious that since we cannot know whether the ovum escapes nor in a given instance how it makes its way into the tubes, any data that help to determine even approximately the time of follicle rupture is of cardinal importance. We have presented evidence that the ovarian cortex is the first hazard to the escape of the ovum, there being several hours of intrafollicular and perifollicular hemorrhage before the follicle exudes a small amount of liquor. We have observed by culdotomy that the tubes may grasp the ovary but not necessarily precisely over the follicle itself and that in the majority of instances the egg is apparently aspirated from the sides of the pelvis or the cul-de-sac. We have corre-

lated the relationship of actual rupture of the follicle with the basal thermal shift. In the three cases in which actual eruption of the follicle was observed, it occurred at the lowest temperature of the month in two cases, and on the day following the rise in the third case. A study of several recent corpora lutea, however, revealed that ovulation may have preceded the lowest temperature of the month by forty-eight hours. Since Barton and Weisner in their large series of pregnancies achieved by artificial insemination obtained no pregnancies beyond forty-eight hours subsequent to the thermal shift, we may conclude that the thermal shift while a useful indication of the ovulatory phase of the cycle, is not necessarily an actual indication of rupture of the follicle itself. Hence, the basal morning temperature shift is the best concurrent index of the ovulatory phase of the cycle. The recent work of Buxton in dating recent corpora lutea similarly indicates that there is a period of approximately five days—two days before and the day of the shift and two days subsequent to the shift—which more likely constitutes a span of fertility phase. We have ourselves observed good temperature shifts in patients whose ovarian biopsy specimens revealed pseudoluteinization of the follicle. Since fertilization may occur forty-eight hours after coitus because of the known survival of sperm in the tubes for this length of time, it is obvious that the determination of actual "conception time" will always be an elusive thing. It is our considered opinion that it is unwise to have patients timing coitus only on the day of the thermal shift. Much less psychic tension will be aroused if patients are simply given a four to five day optimum fertility phase and told to exercise their marital right during that period as frequently as they desire. It has been shown that too intensive anxiety can actually precipitate utero-tubal spasm which may either prevent conception or lead to tubal pregnancy.

Having determined as far as possible what constitutes the optimum fertility phase by observing basal temperature charts we now plan to evaluate the problem of sperm deposition and migration into the cervix since the cervix mucus is much more profuse, watery and penetrable at the preovulatory phase. The study of this phase of the problem has been called the "Sims-Huhner" or post-coital cervical mucus test. It is our practice to assay sperm migration by counting the number of sperm per high power field and grading them one to four according to their motility. In this fashion a quantitative as well as a qualitative record which can be compared from month to month will give us a time of optimum sperm penetration of the cervix. Cohen has shown that at ovulation time the sperm routinely survives for twenty-four to seventy-two hours within the cervical mucus. While this test is essentially a

"straggler" test, nevertheless, it gives us a rough index of the invading forces of sperms that have passed over the bridge of the cervical mucus. If normal coitus at the ovulatory phase results in the observation of only three to five sperm within the cervical mucus, it is our practice to eliminate the possibility of sperm deposition defects by having the patient use the cervical spoon, which elevates the protected seminal pool to intimate contact with the cervical mucus and permits mass migration with minimal death of the sperms due to the acidity of the vagina. If the cervical mucus resists the sperm even under these circumstances, it is our practice to give small doses of estrogen (0.1 mg. diethylstilbestrol) for one or two months at the preovulatory phase, which will occasionally improve the quality and quantity of the mucus. If there is any evidence of infection we give preovulatory antibiotics. Our preference is terramycin in two gram doses daily for four days in the preovulatory phase. We have seen a number of patients achieve improved sperm counts within the cervical mucus as well as pregnancies after each of these types of treatment, particularly after terramycin.

But penetration of the cervix by sperm will not achieve pregnancy unless tubal patency at both uterine and fimbrial ends can be established. Sturgis has shown that even sperm invasion of the tube depends upon adequate motility of the tubes. Freedom of motility of the tubes is quite as important as their patency if the ovum is to be aspirated from the pelvis. Accordingly, the mere passage of air or carbon dioxide through the tubes does not suffice. Rubin has shown that kymographic tracings of tubal pressure variations will reveal evidence of spasm which may mimic occlusion. We prefer the Kidde apparatus which delivers only 100 cc. of CO<sub>2</sub> through a cervical cannula under controlled pressure up to 200 mg. of mercury. Hence abdominal discomfort can be reduced to a minimum. Insufflations of air by old manual pressure methods resulted in considerable distress. Moreover, the method itself was not infrequently producing tubal spasm.

Stallworthy of Oxford has shown in a study of a thousand cases by fluoroscopy and the passage of an alcoholic radio-opaque medium that tubal occlusion was apparent in twenty per cent, but was actual in only thirteen per cent. This type of utero-tubal spasm can be relieved by transecting the utero-tubal nerve supply (Frankenhauser's plexus) which lies in, around and between the uterosacral ligaments across the top of the vagina.

There remains the nidation problem to be studied. Where this defect is suspected (e. g. in patients having late or profuse periods or who exhibit the problem of repeat abortion with a normal appearing fetus)

endometrial biopsies should be done, preferably on day one of the cycle. A prettier microscopic picture will be obtained in the premenstrual phase, but unless the patient has been instructed not to attempt pregnancy that month it is best to wait until the first day of the cycle to avoid interruption of a pregnancy. The endometrium offers an end organ picture of the response of the tissues to both the pituitary and ovarian hormones, and is simpler and less expensive than extensive hormone assays. The microscopic picture can be improved by the use of estrogen and progesterone. We prefer 0.1 mg. stilbestrol daily throughout the cycle. When these agents fail, we must suspect failure of delivery of these hormones to the endometrium.

Since the excellent work of the Smiths with stilbestrol in the prevention of repeat abortion has been seriously challenged by Davis and Dieckmann's recent large series, we feel that there is a place for a more physiologic approach. We have proposed the maximal delivery and utilization of the patient's own hormones by the surgical elimination of autonomic imbalance and vaso-spasm. A more stable blood flow will deliver more hormones to the tissues. We feel, however, that the procedure should be reserved for patients who abort normal fetuses and have evidence of autonomic imbalance by kymographic demonstration of utero-tubal pressures of high degree. To utilize the endogenous hormones of the patient in maximal amount by eliminating vasospasm and improving endometrial circulation we suggest the simple procedure of paracervical uterine denervation, which can be done either per vagina or at laparotomy. A series of seventeen patients who had this type of denervation while under fertility studies conceived fourteen times and delivered thirteen live children during a two year study. (*Jour. Fertility & Sterility*, Mar. 1954)

These are the simple standard procedures which constitute the study of the female partner. If we will only till the barren ground, it will be easier for the Author of life to plant the seed.