Gynecological Problems of Adolescents*

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Introduction

In childhood, prior to adolescence, vaginal bleeding is only rarely a problem. During adolescence, however, vaginal bleeding (or the lack of it) is a common complaint.

The average age of first vaginal bleeding, or menarche, in the United States is between 12.5 and 13 years. Around two years prior to this, however, there has been budding of breasts and the appearance of pubic hair. During the year before menarche, there is pigmentation of the nipples and the breasts fill out. Axillary hair does not appear until about the same time as the first menses.

The degree of skeletal maturation is a better indicator of the stage of a girl's development than her chronologic age. It is generally agreed that most girls have their first menstrual period when their skeletal age is between 13.5 and 14 years, regardless of their chronologic age.

The average menstrual cycle lasts 28 or 29 days, although cycles from 21 to 40 days are considered within physiologic limits. The normal human female usually ovulates between the 11th and 17th day of the menstrual cycle; this is usually 14 days before the beginning of the next menstrual flow. The bleeding usually lasts from 3 to 7 days and blood loss is about 60 ml. Normal menstrual bleeding consists of a sloughing off of the more superficial portions of the endometrium, leaving only the basal layer. This occurs when the endometrium has been caused to proliferate by priming with estrogen and then is converted to a secretory state by progesterone. When the progesterone is withdrawn, the sloughing or normal menses occurs. On the other hand, when progesterone has not acted upon the endometrium (as would be the case if ovulation had not occurred) and the endometrium has been stimulated only by estrogen, the woman will not experience menstrual type bleeding. She may experience

uterine bleeding, but this is usually of an irregular nature and due to fluctuations in the estrogen level. When the estrogen level decreases somewhat, the more superficial portions of the endometrium do not have adequate hormonal support and break away, often resulting in heavy and prolonged bleeding. These episodes of bleeding do not occur at any cyclic interval, and in fact the woman may experience no menses at all for prolonged lengths of time.

The first vaginal bleeding cycles are commonly anovulatory. Some authors divide adolescence into early and late periods using the first ovulation as the dividing point. They consider early adolescence synonymous with puberty, beginning with the menarche and ending with the first ovulation, and define late adolescence as beginning with the first ovulation and ending when the woman becomes mature. Early adolescence may last two or more years, but may never occur if the girl ovulates before her first episode of vaginal bleeding. The young woman may then pass rapidly into the state where she is capable of normal reproduction, although the fact that a human female is able to produce a fertilizable egg is certainly not to say that she is mature.

Amenorrhea

If menarche has not occurred by age 16, some investigation is in order. A diagnosis of primary amenorrhea is not usually made until after age 18, but if no menses have occurred between age 16 and 18, the condition is called "delayed menarche."

In cases of amenorrhea, a complete history should be taken, with particular emphasis on symptoms which could be caused by endocrine pathology or previous abdominal surgery. The family history should include menstrual and reproductive histories of the mother, aunts and sisters. Examination of the patient should include a general physical examination as well as a pelvic examination. Particular attention should be paid to lateral visual fields and the thyroid gland. The presence or absence of facial, axillary, pubic, chest and other body hair should be noted. Breast development

and general body habitus may also be significant. Some form of pelvic examination should be done for all of these girls. Certainly the external genitalia may be inspected and the clitoris examined. In the vast majority of these girls, a speculum examination of the vagina may be done, perhaps using a small speculum. The cervix may be visualized and a smear taken from the upper vaginal mucosa for a maturation index of the superficial cells. A gentle bimanual examination using one or two fingers is then done, and the uterus and adnexal areas palpated in this manner. A rectal examination is done routinely, and in some patients, a rectal examination will offer the only opportunity for palpation. In such patients with a small vaginal introitus, inspection of the vagina may be performed using an endosope such as a culdoscope lens system.

Several conditions may become apparent at the time of physical examination. The first of these is an imperforate hymen. The hymen is located at the site where the lower portion of the vagina buds from the urogenital sinus. If a lumen does not develop at the point where the vagina arises, the result is an imperforate hymen. Usually these are not discovered until puberty and symptoms may arise from the accumulation of menstrual blood. Cyclic abdominal pain is a common symptom, but in some cases large amounts of blood can accumulate in the vagina, uterus and tubes without causing great discomfort. On examination, the hymenal membrane may be seen bulging and a mass will be palpated anteriorly on rectal examination. The treatment of this is simple incision or excision of a triangular flap.

A transverse vaginal septum is a similar condition. It probably arises as a failure of union between the downgrowing Mullerian duct and the upgrowing urogenital sinus during embryologic life. In some cases, a transverse vaginal septum may be associated with a sinus tract through which the patient menstruates. In other cases, the septum may be complete and symptoms similar to those of imperforate hymen will be seen. Usually the septum will occur at the junction of the upper and middle thirds of the vagina, providing the girl with a short vagina. Unless the sinus tract is large enough to dilate, the treatment of this is surgical, the exact procedure being determined by the thickness of the septum. This condition may be confused with testicular feminization, because in either case patients appear to be feminine and have short vaginas with no identifiable cervices. A buccal smear usually distinguishes the two groups, the patient with the imperforate hymen having a normal female Barr body present.

Congenital absence of the vagina may also be present. Sometimes these people have a normally developed lower vagina for a few centimeters, but most times the entire vagina and uterus are absent. The diagnosis is not usually made in infancy or childhood, but instead the patient seeks medical advice because she has amenorrhea despite the development of normal secondary sex characteristics and growth. These girls have ovaries and usually have the upper portion of the fallopian tubes. These commonly end at about the level of the uterine cornua, although in some instances a rudimentary uterus without an endometrial cavity may be present. Urinary tract anomalies are associated in a significant number of these patients, so x-ray of the urinary tract is desirable. An artificial vagina can be satisfactorily created surgically. Following surgery, this has a tendency to constrict unless it is kept dilated, so surgery is deferred until about 6 months prior to marriage. This allows the operative site time to heal and during this time the patient wears a foam rubber dilator, initially all the time, and later only at night. After marriage, regular coitus is adequate to maintain dilatation. Some adolescent girls with congenital absence of the vagina will develop psychiatric problems because of this, and in this group the procedure may be done prior to any plans for marriage, "to keep her from being different."

In cases of amenorrhea where there is no obvious physical cause, the initial laboratory work should include a test of thyroid function and a test to exclude the adrenal as a cause for the amenorrhea. These are currently done by obtaining serum for free thyroxine and a 24-hour urine collection for 17-ketosteroids. If there is any suggestion of Cushing's syndrome from physical examination or history, a 24-hour urine for 17-hydroxysteroids should be collected. If there is any suggestion of adrenogenital syndrome, a determination of urinary pregnanetriol would be indicated. As noted earlier, a maturation index is obtained from the vaginal mucosa.

Once this initial laboratory work has been done, the patient is given a pure progestin to help establish the diagnosis of anovulation. If the patient's problem is simple anovulation, that is, she is producing adequate estrogen but is not ovulating, the addition of a progestin such as oral medroxyprogesterone 10 mg daily for 5 days will result in withdrawal bleeding resembling menses several days after the cessation of treatment. The progestin converts the proliferative endometrium to secretory endometrium and its withdrawal is then followed by a slough of the superficial endometrium. If bleeding does occur, this (1) suggests there is adequate endogenous estrogen being produced and that anovulation is the problem, (2) establishes the fact that the patient is not pregnant, and (3) also establishes the fact that the patient has an endometrium capable of bleeding and that this blood has a passageway to escape from the uterus to outside the body. If the progestin is given and there is no withdrawal bleeding in 1 week, the patient is then given an estrogen as well as a progestin. This could be done by giving her oral norethynodrel 5 mg with

mestranol 0.075 mg daily for 5 days, or giving ethinyl estradiol 0.1 mg daily for 14 days with medroxyprogesterone 10 mg daily taken concurrently on days 10 through 14. If this is followed by withdrawal bleeding, this indicates that (1) the patient is not producing endogenous estrogen, (2) she is not pregnant, and (3) the endometrium is capable of bleeding and the flow can escape. This is a group of patients in which the assay of pituitary gonadotropins is useful in establishing the cause of no estrogen production. Total pituitary gonadotropin in the urine should be either high or low, but not normal. If the value is high, it would indicate that this primarily is an ovarian problem, and despite high levels of gonadotropins the ovary is not producing estrogen. If, on the other hand, pituitary gonadotropins are low, it would indicate that the ovary is not being stimulated.

The patients who do not bleed after estrogen and progestin therapy should be carefully evaluated for a possible pregnancy. Once this possibility has been excluded, the cervix should be sounded to rule out the possibility of cervical stenosis and the uterine cavity probed to establish the fact that there is, indeed, a cavity to the uterus. In most instances, this can be done in the office without hospitalization.

Most of the patients seen for amenorrhea will be found to have anovulation and to be producing adequate endogenous estrogen. They may then be treated with oral medroxyprogesterone 10 mg daily for 5 days, beginning cycle day 22 of each month. This will result in regular withdrawal bleeding, occurring about every 28 days and lasting a normal length of time. When administered in this way, the drug certainly will not interfere with spontaneous ovulation, should it occur. Until spontaneous ovulation does occur, the patient will experience regular bleeding. Such medication may be administered for 6 months and then temporarily discontinued to see what bleeding pattern the patient will exhibit on her own. After experiencing several such episodes of bleeding, some girls indicate that they would rather not be bothered with vaginal bleeding at monthly intervals. It is beneficial for the superficial endometrium to experience a slough as normally occurs from a secretory endometrium several times a year, so this group of girls may be given a progestin at 4 month intervals until spontaneous menses begin.

The amenorrhea associated with anovulation may be secondary to psychogenic factors. Psychic shock, fear, unhappy home or school conditions, and insecurity can cause both primary and secondary amenorrhea. Sometimes this is associated with simple anovulation but at other times the patient stops producing estrogen also. In this latter group, the administration of progestin alone will not result in withdrawal bleeding and the patient must receive estrogen priming before such withdrawal bleeding will occur. If pituitary gonadotropin levels are low in the face of no endogenous

estrogen production, pituitary and hypothalamic pathology should be excluded. Old injuries (such as from high fever or trauma), tumor and pharmacologic effects should be ruled out. The history, skull x-rays and visual fields are particularly helpful here. In a few cases of hypothalamic disease, amenorrhea will be associated with galactorrhea, but such cases are rare.

Other causes of amenorrhea with a hormonal basis include Turner's syndrome, gonadal dysgenesis without Turner's syndrome, testicular feminization, adrenogenital syndrome and polycystic ovary syndrome (Stein-Leventhal syndrome).

In Turner's syndrome, the condition begins with an accident in miosis or mitosis of the ovum. These people have only one sex chromosome instead of two, and when the area normally occupied by ovaries is examined, usually only a streak of fibrous tissue is found. Histologically this resembles ovarian stroma which contains no follicles. These individuals do not ovulate or produce estrogen or progesterone and their pituitary gonadotropin levels are high. In addition to the lack of any secondary sex characteristics and menstruation, there are associated findings which are not caused by estrogen lack. These include shortness of stature, scant pubic and axillary hair, exaggeration of the carrying angle of the elbow, webbing of the neck, and coarctation of the aorta. These patients do have a vagina and uterus, and when exogenous estrogen and progestin are administered, they will develop secondary sex characteristics and have menses.

Some women will also have streak ovaries which do not produce estrogen but present an entirely different clinical picture. These women have normal female sex chromosomes, and all of their findings are secondary to the absence of gonads. The associated findings of Turner's syndrome are absent. Instead of being short, these patients are eunuchoid, tall, and have an appearance similar to that seen in persons castrated prior to puberty. These patients may be also treated with estrogen and progestin. In these cases, epiphyseal closure may be promoted and there will also be development of secondary sex characteristics and menses.

Individuals with testicular feminization have the XY chromosome compliment seen in normal males, but certainly do not appear to be males. In fact, these patients on cursory examination appear to be normal females. They are of normal height, have normal breast development, and are not hirsute. Pelvic examination will disclose a short vagina and the absence of a uterus. There is usually scant or absent axillary and pubic hair and the patient may have an inguinal hernia or evidence of a previous herniorrhaphy. The hernias are associated with cryptorchid testes. The clinical findings are due to a lack of end-organ response to androgens. All testes normally secrete some estrogen as well as testosterone. In these people with testicular feminization the testosterone exerts no pe-

ripheral effect, so estrogen is the only sex hormone acting, and female secondary sex characteristics develop. Since these cryptorchid testes have a malignant potential, removal has been advocated, and after castration, testosterone levels fall precipitously and estrogen levels fall somewhat less dramatically. Following this surgery, most of these patients should be given replacement estrogen medication.

The adrenogenital syndrome due to congenital adrenal hyperplasia has its onset in intrauterine life. It is due to enzyme blockage in the adrenals with resulting elevation of urinary 17-ketosteroids. There are several types of this syndrome, but the most common one has a partial block in the synthetic pathway for cortisol resulting in the production of 17-ketosteroids and pregnanetriol. In addition to the amenorrhea, these people will have early development of hirsutism, accelerated development in length and weight, advanced bone age on x-ray and associated virilization. Treatment with cortisol will result in the onset of ovulatory menses and in many cases reduction of the hirsutism. When hirsutism is associated with amenorrhea, one should also exclude adrenal and ovarian tumors as well as Cushing's syndrome.

Patients with polycystic ovary syndrome will have bilaterally enlarged polycystic ovaries and failure of ovulation. Typically, a girl goes through normal early adolescence and may even ovulate for a time before stopping. In some cases there may be no spontaneous menses. Hirsutism may be mild or severe, but virilization does not occur. The ovaries in this condition are about two to four times normal size and contain many small follicles beneath the capsule. The primary defect, however, is not thought to be in the ovary, but in the hypothalamus or higher centers resulting in an improper secretion of pituitary gonadotropins. The traditional treatment for polycystic ovary syndrome was wedge resection of the ovaries. In some manner, reduction of ovarian mass changed the feedback effect on the hypothalamus, and pituitary gonadotropins were then secreted in a proper ratio. Such effects did not last forever, and commonly after a year or so of ovulatory menses, the original condition returned. More recently, it has been possible to induce ovulation in most of these women by the use of clomiphene citrate or menopausal gonadotropin. This is given only during the months when pregnancy is desired. In order to have regular menses at other times, withdrawal bleeding from exogenous sex steroids may be utilized. In most cases, sequential estrogen-progestin is given here, because the estrogen has a beneficial effect on the hirsutism; the progestin then induces a secretory change in the endometrium resulting in a menstrual type slough when the progestin is withdrawn. In some cases, the estrogen is given continuously; in others, both estrogen and progestin may be stopped on the same date, with the estrogen therapy being resumed one week later.

Menorrhagia and Metrorrhagia

Anovulation may also manifest itself by episodes of frequent, heavy or prolonged vaginal bleeding. The work up and long-term therapy of such patients is the same as when the primary symptom was amenorrhea. There is in addition, however, the initial problem of getting the bleeding stopped. Dilatation and curettage of the uterus is only rarely needed. Most of these girls will stop bleeding when treated with estrogen. Their bleeding has occurred when their circulating estrogen level has dropped, so they may be logically treated by exogenous estrogen. In some cases, oral estrogen is adequate therapy. In other cases, when hemorrhage has been profuse, bleeding may be controlled by the administration of intravenous conjugated estrogens 20 mg, repeated once in 6 hours if necessary. At the same time that intravenous therapy is given, oral medication is also started. The patient may be given oral conjugated estrogens 1.25 mg three times a day, ethinyl estradiol 0.1 mg daily, or any of the commercially available oral contraceptive tablets (preferably those with higher estrogen content). When oral estrogen alone is given, the patient should take this medication for 21 days and on the last 5 days should take medroxyprogesterone 10 mg. This will cause secretory changes in the estrogen stimulated proliferative endometrium and will result in normal type bleeding when both estrogen and progestin are withdrawn. In subsequent months, medroxyprogesterone alone administered 10 mg a day for 5 days, beginning cycle day 22, is usually adequate to prevent abnormal bleeding.

Dysmenorrhea

Painful menstruation during adolescence is usually primary; that is, it is not associated with congenital anomalies or organic disorders. Such discomfort usually does not appear until several years after the menarche, and is thought to appear at the same time that the girl begins to ovulate and have ovulatory menses rather than while she is having anovulatory bleeding episodes. A distinction was previously made between early and late adolescence on a basis of whether menses were ovulatory. If that classification is retained, primary dysmenorrhea is a symptom of late adolescence.

Dysmenorrhea pain is recurrent, sharp, and cramping or contraction like in character. It is usually located in the suprapubic area and may precede the onset of flow, may not occur until bleeding actually occurs, or may not appear until after bleeding has been established for several days. Associated symptoms may include malaise, headache, backache and lethargy. Since this is usually associated with ovulatory menses, these girls usually do not have any his-

tory of menstrual irregularity, but instead have quite regular menses.

The cause of primary dysmenorrhea is not known. It most likely has something to do with uterine contractions, but the exact nature of this is not clear. In addition, there seems to be some psychogenic influence in that some girls have been conditioned in childhood by their mothers or older sisters to look upon menstruation as "being sick." Physical examination, of course, should be done, in an effort to rule out any organic or congenital obstruction to menstrual flow.

The milder cases can be treated with a combination of mild analgesics and amphetamine. Such medication should not be taken at night, but the effects of amphetamines as a uterine muscle relaxant are beneficial and useful during daytime. If the patient continues to has severe symptoms, the use of an estrogen-progestin combination oral contraceptive agent is useful. This inhibits ovulation, but supplies exogenous progestin. How this prevents dysmenorrhea is unclear, but it does so in a majority of these patients. Some physicians worry about the propriety of giving a medication which can be recognized as a contraceptive agent to an adolescent girl, fearing that if she knows the effects of the medication this will inspire her to engage in premarital coitus. As other contraceptive methods are readily available over-the-counter at drugstores and even at discount stores, the availability to her of another contraceptive method is not likely to influence the girl's social behavior. Since combination oral contraceptive agents have been used for this purpose, the number of presacral neurectomies done to relieve dysmenorrhea has diminished greatly.

Mittleschmerz or ovulatory pain also is a symptom of late adolescence as opposed to early adolescence. The discomfort is usually described as a slight aching in one side of the lower abdomen, although it may be quite severe. At times, it is so severe that when it is located on the right side, the possibility of appendicitis is seriously entertained. The cause of midcycle pain is unknown. Moderate amounts of free blood do not cause peritoneal pain, but in some manner the peritoneum becomes irritated. The menstrual history and the time of occurrence of the pain are most useful in making the diagnosis.

Leukorrhea

Not all vaginal discharge is pathologic. Increased vaginal fluid is very common in adolescent girls. The girl may interpret the normal estrogen stimulated secretion of the endocervical glands as a pathologic condition. In a normal ovulatory cycle, such secretion is greatest at the time of highest unopposed estrogen levels, that is immediately before ovulation. In early adolescence, estrogen is the only hormone which is acting upon the endocervical glands, and such secretion may be present continuously. When the girl begins to ovulate, such secretion will diminish and will be of increased volume for only several days each month.

The second most common cause of leukorrhea in adolescent girls is infection with Candida albicans. The increased incidence in diabetic females is well known. Systemic antibiotic therapy may be followed by Candida infection, and pregnancy as well as therapy with oral estrogen-progestin contraceptive tablets may also predispose to this. The scanty discharge is thick, white and curd-like in appearance. In addition to leukorrhea, the patient may have vaginal and vulvar puritis with associated excoriation on the vulvar areas. The diagnosis can usually be made by inspection of the vagina and may be confirmed by culture on Nickerson's media. Culture tubes containing Nickerson's media are available commercially and may be incubated at room temperature for 2 days and subsequently examined in the physician's office.

Infections may be treated first with nystatin vaginal suppositories which are inserted twice daily for 12 days. If vulvitis is also a symptom, nystatin cream is applied here. If the nystatin does not clear up the infection, gentian violet may be used. This is highly effective in eliminating the condition but the purple staining of undergarments, bed sheets and towels may be a problem.

Vaginal trichomoniasis is relatively uncommon in the younger adolescent. It becomes more common as the girls grow older and is particularly common in girls who have had intercourse. On the other hand, the number of cases in which vaginal trichomoniasis occurs without the possibility of direct sexual contact with an infected male is so large that we must consider this a disease that can be transmitted several ways, only one of which is by coitus. The girl will complain of an irritating profuse discharge. There may be perineal itching or burning with micturition and sometimes the symptoms are worse just before and immediately after menses. On examination the vagina is filled with a copious frothy, watery, dirty ivory colored fluid. When the vaginal mucosa is involved severely, a strawberry or red punctate vaginal eruption may be seen, but many cases of vaginal trichomonous exist without this finding. The diagnosis is made by finding Trichomonas vaginalis in wet smears of the vaginal fluid. The fluid should be examined immediately after being diluted with warm isotonic saline solution. Hypotonic solutions as well as cooling, drying or changes in the pH will quickly kill the organisms. The organisms, which are protozoa, may be seen swimming about on the wet smear. Vaginal trichomoniasis may be treated with metronidazole 250 mg three times a day for 10 days.

Non-specific vaginal inflammations are commonly associated with leukorrhea in adolescent girls. There is little or no irritation or discomfort due to this leukorrhea except that there may be some dysuria.

There is usually no vulvar inflammation, but the vagina is inflammed and the discharge varies from a scanty thin fluid to a purulent grayish-yellow leukorrhea which is profuse enough to necessitate the wearing of perineal pads. These cases, as well as mixed infections with monilia or trichomonas, may be treated with vaginal suppositories of furazolidone with nifuroxime. Sometimes the non-specific vaginitis is associated with a congenital cervical erosion or an erosion which is secondary to the vaginitis. Such erosions do not usually need cautery and if they are secondary to the vaginitis, they clear up when the vaginitis clears.

Venereal Disease

Acute gonorrhea is accompanied by a profuse purulent, yellowish green discharge. This will appear 3-8 days after the girl has had coitus with an infected male and may be associated with dysuria or vulvar burning. In some cases there is very little discomfort. The profuse, thick, creamy vaginal discharge may persist after the acute symptoms have gone away and may be seen to be coming primarily from an eroded cervix. There may be associated infection of the Bartholin's glands or of the periurethral glands. Unfortunately, female patients are not as aware as males of a urethral discharge and 80% of females with gonorrhea are asymptomatic. The gonococcus usually does not rise above the internal uterine os except during menses and this results in symptoms of acute salpingo-oophoritis commonly occuring just after menses. The patient will have bilateral lower abdominal pain and tenderness, adnexal thickening and tenderness, fever and leukocytosis. Pelvic peritonitis, with rebound tenderness and a palpable abscess in the tube or ovary may be associated findings. Gram stain may be applied to smears, and cultures may be made on the new Theyer-Martin or Lesser-Martin culture media which is most specific for gonococcus. The results are available in 48 hours, and as a screening technique this method will pick up about 90% of the cases. It is probably best to take smears from the cervix, vagina, urethra and rectum. The treatment of acute gonorrhea in the female is a single injection of 4.8 million units of procaine penicillin G.

Patients with gonorrhea should also be examined for syphilis, using the absorbed flourescent Treponema antibody test. This becomes positive in about 20 days after exposure, so it is positive during the time of the primary lesion. The presence of a chancre on the vulva, in the vagina or on the cervix, is rarely noted and the manifestations of secondary syphilis may be the first symptoms noted by the patient. The primary lesion, or chancre, develops at the site of innoculation, 3 to 6 weeks after the Treponema pallidum enters the body. It rarely is a well-defined punched out ulcer with a hard base, as seen in the male, but may be a painless, flat, moist abrasion or a flat, superficial, excoriated type of ulcer. The chancre heals spontaneously, and about 6 weeks after its appearance, secondary syphilis may appear. This is typically manifested as a symmetrical, macular, papular, non-irritating rash which may involve the palms and soles as well as the trunk and extremities. Other findings include mucous patches of the oral mucosa, condylomata lata, iritis or neurorectinitis, alopecia, generalized lymphadenopathy, and constitutional symptoms such as malaise, lassitude, headaches and fever. The VDRL (cardiolipin) test is positive by the time secondary syphilis is noted. The treatment of primary or secondary syphilis is a single injection of 2.4 million units of benzathine penicillin G.

Rape

From time to time, girls allege that rape has occurred and they seek medical attention. If the victim is not brought in by the police, officials should be notified. The definition of rape varies from state to state. In Maryland, for instance, penetration of the vagina by the penis is required, but in the Commonwealth of Virginia rape occurs when force is used to cause contact of genitalia without consent of the person being raped. Statutory rape, on the other hand, occurs when the girl gives consent to coitus but is 15 years of age or under.

An evaluation for suspected rape should include a good history, which should be obtained and written down as quotations in the patient's words. The time, place and circumstances should be recorded, as well as the patient's emotional state and whether a bath had been taken since the incident occurred. The examination should include a statement concerning the general appearance of the patient including evidence of trauma such as bruises, lacerations or torn clothes. Particular attention should be paid to evidence of trauma about the external genitalia. A speculum examination should then be carried out with a non-lubricated speculum. A cotton swab should be saturated with fluid present in the vaginal cavity. A small portion of this should be put on each of two glass slides and allowed to dry. The swab should then be placed in a test tube and sealed with a cork. These specimens will be examined microscopically for sperm and biochemically for acid phosphatase. These specimens, along with any garments that appeared to contain stain, should be labeled with the name of the victim, date and hour of alleged rape, hour of medical examination and name of physician. All of this "evidence" should be securely kept under lock until arrangements have been made for transfer to a designated local laboratory or to the office of the Chief Medical Examiner. If it is to be mailed, certified mail or insured mail with return receipt should be used.

The oral administration of 25-50 mg of stilbestrol a

day for 5 days or the oral administration of 2-5 mg a day of ethinyl estradiol for 5 days, beginning therapy the day after coitus, consistently prevents implantation. The primary side effect with this therapy is nausea and vomiting. Sometimes this is quite severe, in spite of the concomitant administration of antiemetic agents. The nausea and vomiting, however, is usually experienced on the first day of therapy and the remaining 4 days are associated with this symptom. The patient may experience breast soreness and the first menses after therapy may be associated with menorrhagia. The mechanism of action is still unclear. The expected basal body temperature rise is frequently inhibited, and the endometrial histologic picture does not progress normally. Perhaps the endometrium is made more acid, and this contributes to failure of implantation.

Since the attacker may have had a venereal disease, some physicians give prophylactic antibiotic therapy. If there is no indication of penicillian allergy, 2.4 million units of benzathine penicillin may be used.