is lowered; the patient is unequal to more than moderate muscular exertion; the fits of irritable temper alternate with torpor; headache is frequent; it is difficult or impossible to sustain any mental effort; memory is feeble; and in some instances mania or dementia has ensued.

Treatment.—The hygienic care is of great importance. Careful watch must be kept for the invasion of phthisis. Hence it is often useful in amenorrhœa, whether there exist any special cause for apprehending the invasion of tubercular mischief or not, to winter in a mild, pure air, as in Tourquay, Bournemouth, Ventnor, or the south of France or Italy.

The treatment of acute amenorrhœa from accidental suppression must be governed greatly by the nature of the cause of suppression. If it be the result of cold, a warm bath, rest in bed, sudorifics, as acetate of ammonia, ipecacuanha, a moderate opiate, or terebinthinate enemata will be useful.

But if there be evidence of pelvic congestion or inflammation, it will be unwise to seek to provoke the menstrual flow by local excitants. If there be much pain, increased on pressure, a quickened pulse with hot skin, some leeches applied to the groins or anus, hot fomentations to the stomach, salines, constitute the best treatment. When the pain has come on very suddenly, and with great severity, there is reason to fear that an effusion of blood has taken place from the turgid Fallopian tubes or ovaries into the peritoneum. This case will be discussed under "Hæmatocele."

Chronic amenorrhœa usually falls practically under the same rules as the primitive amenorrhœa. Iodide of potassium, iron, strychnine, suitable hygiene, are our chief resources.

AMENORRHŒA FROM RETENTION: RETAINED MENSES FROM OCCLUSION OR ATRESIA OF THE UTERUS, VAGINA, OR VULVA, OR FROM IMPERFORATE HYMEN—OCCULT MENSTRUATION—HÆMATOMETRA.

The study of those cases in which amenorrhœa is only apparent, in which the secretion is effected, but is retained in the cavities of the uterus or vagina, will, for clinical reasons, be most conveniently undertaken here. In its practical bearings it will be found naturally to take its place between amenorrhœa and dysmenorrhœa.

The history and symptoms of retained menses very much resemble those of dysmenorrhœa. For a considerable time, the negative sign of absence of the ordinary menstrual flow chiefly attracts attention; and the case may be looked upon simply as one of amenorrhœa.

The leading clinical feature is the combination of signs of dysmenorrhœa with amenorrhœa. And since retention commonly induces enlargement of the uterus, and hence of the abdomen, the combination of amenorrhœa and this enlargement leads to the suspicion of pregnancy. When things have arrived at this point, the character of the patient, no less than the physical distress and danger, imperatively point to the necessity of an examination.

The usual history is as follows: A girl, having arrived at puberty, does not menstruate. Month after month, perhaps for two or three years or more, pass by, and nothing is seen. But every month, perhaps with occasional intermission, pains in one or other iliac fossa, such as commonly indicate difficult ovulation, are felt; pain in the centre of the pelvis referred to the uterus follows or precedes, often of a forcing or bearing-down character, that is, uterine colic, such as occurs when the organ is struggling to expel something from its cavity; frequently the pain spreads to the abdomen, so that the patient cannot bear to be touched, and suggesting the presence of peritonitis. Flushed face, accelerated pulse, headache, vomiting, pains down the legs, irritation of the bowels and of the bladder commonly attend. After a few days these symptoms subside, seldom entirely; and the patient is left to an interval of comparative ease. But her general health suffers. A degree of irritability of nervous system remains. Not seldom, occasional rigors appear, and these are followed by quickened pulse, increased temperature, nausea, muddy complexion; in short, the usual signs of blood infection. When irritative, hectic, septicæmic, or pyæmic fever sets in, the case is commonly hastening to a climax; and the physician is soon compelled to search for the source of the disorder.

In other cases, the irritative fever, although existing in a minor degree, is not the immediate cause of chief distress. This is due to the distension of the uterus, or vagina, or both, progressing so as to distend the abdomen. The pain, causing vomiting and prostration, may be so great that the local source cannot be overlooked. The enlarged uterus may press the bladder forwards, and jam it against the symphysis pubis, causing retention of urine. The distress arising from this, and the enlargement of the abdomen, admits of no delay.

In other cases the enlargement of the abdomen is slow, and the pain is tolerated. It is only when amenorrhœa and enlargement of the abdomen excite suspicion of pregnancy that advice is sought. In some of these cases the history of the enlargement, extending over a longer period than the normal time of gestation, and other circumstances, are enough to remove all doubt of her chastity from the minds of all but the censorious.

The governing fact, then, is retention of the menstrual fluid in the uterus or vagina. Menstruation is non-apparent, but it exists. The proper term, then, is not amenorrhœa, or amenorrhœa from retention, which is a contradiction in terms, but "occult, or concealed menstruation." The ovaries act, the uterus responds, the menstrual blood is secreted, but owing to some physical obstruction it cannot be excreted, that is, it is retained. These cases may be divided into two kinds: 1. There is retention *ab initio;* there is some congenital defect, or some condition acquired in childhood. 2. The retention has arisen after puberty, and most frequently after child-bearing, and is the consequence of an obstruction acquired after maturity.

We have, then, to examine the cases of *Atresia of the Vulva, Vagina, and Uterus*, and the *other defects of formation* which lead to retention of menstrual secretion.

Atresia (α priv. τρῆσις, perforation) of the genital canal may be congenital or acquired, primitive or secondary. The congenital conditions consist in abnormal formation from imperfect or defective or excessive development.

Atresia or occlusion may be *complete* or *incomplete*, the degrees of incomplete atresia, of course, varying greatly. The incomplete occlusions, differing somewhat in their pathological and clinical history, will be discussed in succeeding chapters under other heads, as "Dysmenorrhœa," etc. In this place I propose to describe the history of occlusion, complete, or nearly complete.

Atresia may affect any part of the genital tract from the vulva to the uterus, and even the Fallopian tubes. It will be convenient to begin with the description of occlusion of the vulva, and to ascend from this point.

Puech distinguishes three kinds of closure of the *Vulva:* 1. *Adhesion of the labia majora*, always of accidental origin, the result of inflammation or injury; 2. *Adhesion of the labia minora*, also the result of accident, and, like the first, chiefly distressing from impediment to micturition; 3. *Hymeneal atresia*, the most common, and usually spoken of as an imperforate hymen, generally congenital. It may come under notice before puberty from the collection of mucus in the vagina causing distension, or it may be detected soon after birth. I have several times incised an imperforate hymen in infants.

The closure of the *vagina* may be congenital or accidental. The congenital kinds may be formed by transverse membranous septa, composed of the folds of mucous membrane with some connective tissue or muscular fibres between. In some cases, imperforation of the cervix uteri complicates that of the vagina. The accidental closure of the vagina is far more frequent; it is almost always the consequence of cicatricial contraction after injury or inflammation. The walls cohere; the vagina is more or less perfectly obliterated.

True occlusion or atresia of the *os uteri* is commonly the result of a cicatricial process following upon ulceration, granulation, or laceration. The most frequent cause is laceration or sloughing, arising from severe labor, with or without instrumental aid. It has been caused by burns suffered during childhood; by cauterization of the os uteri with potassa fusa; from cicatrization following inflammation in smallpox, scarlatina, typhoid; from sloughing of the mucous membrane of the vagina, from use of a too concentrated solution of perchloride of iron (Tissier, *Gaz. des Hôp.*, 1869); after amputation of the cervix, for want of sufficient care to maintain the patency of the canal during cicatrization; also from advancing senile atrophy, which produces a kind of concentric obliteration of the os. Rokitansky describes this last form. I have seen many examples of it. Klob describes a peculiar form of obliteration of the os externum as following upon prolapsus, with inversion of the vagina. A small pit alone shows the seat of the os, and the atresia is caused by a milk-white membrane formed of layers of vaginal-epithelium.

Closure of the *uterus* most frequently takes place at the os internum or os externum. It may be the result of extrinsic causes, as from external pressure of tumors; from flexions of the uterus, more especially from bending of the body forwards or backwards upon the neck, so as to form an acute angle at the seat of flexion; from tumefaction of the mucous membrane, as from catarrhal or other inflammation; from the growth of cancerous or fibroid tumors in the substance of the neck; from

plugging by clots, membranous substances, or pseudoplasmata. These conditions may be diagnosed from true atresia, and sometimes may be relieved by passing the uterine sound.

Another form of closure is due to the sealing of the os externum or internum by a false membrane, as described by Naegele. This has been observed to take place during pregnancy, so that at the time of labor no os uteri could be felt.

Absence of uterus, according to Kussmaul, is very rarely complete. Even when exploration is made by finger in rectum and sound in bladder, a rudimentary uterus may evade detection by slipping on one side. Even on dissection, unless very carefully conducted, a rudimentary uterus may escape detection. In one case (Perkins, cited by Howship) the uterus, containing two pounds of blood, was found *behind* the closed vagina.

An apparently absent vagina is no proof of absent uterus. An artificial route has several times been made to the distended uterus. (Amussat.)

In some of these cases of *absent vagina* the os uteri has opened into the rectum or urethra, and these canals being used by the intromittent organ, impregnation has occurred. According to Dr. Oldham, there is, in many cases of closure or malformation of the vagina, an original dilatation of the urethra, a circumstance which has embarrassed the examining surgeon. This enlargement of the urethra has been commonly supposed to be the result of accidental or voluntary substitution of the urethra as a copulative organ; but Dr. Oldham is, no doubt, right in recognizing it as pre-existing and independent of this use. Dr. Routh related a case (*Obstetrical Trans.*, 1870) confirmatory of Dr. Oldham's view. It may, however, be due in some cases to surgical examination. Uterhart[1] relates a case of nearly complete occlusion of the introitus vaginæ by cicatricial degeneration, in which the function of the vagina was performed by the dilated urethra. The defect was cured by operation. The urethra then contracted to its normal state. Karl Rokitansky described (*Medical Record*, 1877) a case in which the urethra served for vagina.

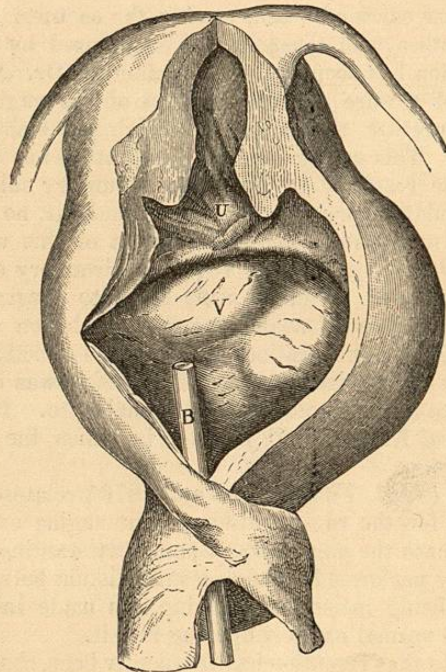
Spencer Wells (*Med. Times and Gaz.*, 1870) relates cases where the urethra was used for the vagina, although the vagina existed closed by hymen. In one case the vagina was apparently wanting, but menstruation was regularly performed through a small fistula between the urethra and anus. This being incised, an opening was made into a well-formed vagina above, the normal os uteri opening into it.

It is remarkable that retention has frequently been observed where the uterus was two-horned, or double. One uterus is occluded, and becomes the seat of retained menstrual fluid, whilst the other uterus performs its function normally, or is the source of metrorrhagia. Decès (*Bull. de la Soc. Anat.*, 1854) tells a case in which retention in one uterus led to rupture of the horn, and fatal peritonitis. Leroy (*Journ. des Connaiss. Méd.*, 1835) published a case in which there was occlusion of the right uterine neck, retention of menstrual flux, and formation of a tumor reaching to the umbilicus and simulating pregnancy. Rokitansky relates

[1] Berlin. Klin. Wochenschrift, 1869.

an important case (*Zeitsch. d. Gesellch. d. Aerzte*, 1860). He dissected a woman who died under symptoms of pelvic inflammation. The uterus had a complete septum. The right half only communicated with the vagina, which was single. The left half was shut off from the vagina, and expanded into a pouch containing a dirty ichorous matter. This pouch formed a fluctuating projection into the roof of the vagina. The septum between the two uteri was perforated by ulceration. Rokitansky concluded that there had been imprisonment of menstrual fluid in the blind half of the uterus, causing, first, distension of the cervix, then inflammation and perforation of the septum, with consensual inflammation of the collateral (left) ovary, leading to abscess and peritoneal effusion. Dr. Beronius relates a similar case (*Mon. f. Geburtsk.*, 1862). The distended half of the uterus was punctured; but death ensued from acute peritonitis in thirty-six hours.

Fig. 62.



From a Preparation in St. George's Museum. (Half-size.)
U, dilated uterus; V, dilated vagina above the seat of atresia, traversed by B, a piece of bougie. The Fallopian tubes are not dilated (R. B.).

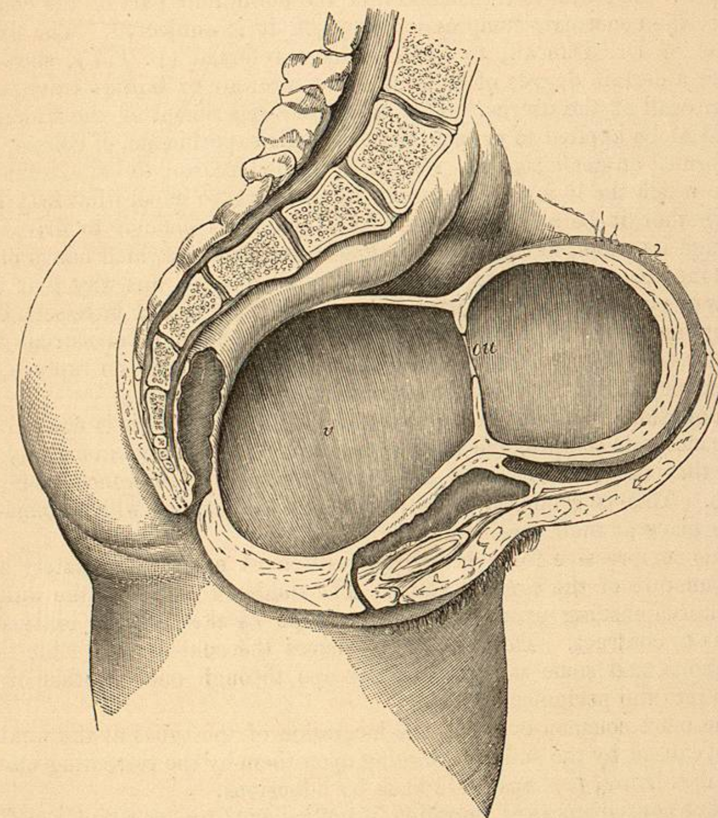
G. Simon relates[1] a case of congenital atresia of the left half of the vagina at the vulva, with duplex uterus. There was retention of menstruation in the closed half, and contemporaneous metrorrhagia from the open half.

In the *senile form of occlusion*, pain of an acute kind ensues whenever

[1] Monatsschrift für Geburtskunde, 1864.

there is any secretion forming in the cavity of the uterus. In women in whom the menstrual function has ceased, there sometimes exists a form of catarrhal inflammation of the lining membrane of the uterus, giving rise to a mucous or muco-purulent secretion, which, being retained, produces symptoms resembling those from retained menstrual blood. If the fluid is watery, this is called hydrometra. The uterus seldom attains a size comparable to that observed in cases of retained menses; but the cavity is always somewhat enlarged. On examining by the finger, the uterus is felt enlarged, often retroflected; the os externum is sometimes difficult to make out, from the vaginal-portion of the uterus being atrophied, and so leaving the os flush with the roof of the vagina. Generally, however, the point of the sound will penetrate a little way; and by persevering with gentle pressure, sometimes a passage is gradually found into the uterus.

Fig. 63.



From Specimen in Radcliffe Museum, Oxford.—(Case described by Dr. Tuckwell.) (One-third size.)
v, cavity of vagina distended; *o u*, os uteri, and cavity of uterus above it also distended. Complete occlusion of vulva (R. B.).

There is a feature in the history of stenosis and atresia of the genital canal, which it is interesting to describe, on account of its bearing on

treatment. Under the condition of stenosis or atresia long persisting, this canal obeys the same law which rules over other canals or hollow organs. It undergoes retrograde dilatation above the seat of stricture. This is the almost inevitable consequence of the futile attempts of the muscular coat to expel the retained contents. This successive ascending dilatation of vagina, cervix, body of uterus and tubes, is illustrated in Figs. 62 and 63, taken from preparations in St. George's and the Radcliffe Museums. This effect is seen in the most marked form in cases of imperforate hymen. The vagina being the most distensible part of the canal dilates first, forming a large pouch; then the cervix uteri is distended; then the cavity of the body of the uterus; and lastly, the Fallopian tubes. This dilatation, conservative in its effect by accommodating the contents which cannot be evacuated, has its limits. When these are reached, the danger of rupture or perforation at the weakest part is great. But before this comes to pass, there are two events which may happen. The first is transudation of the more fluid part of the contents under the concentric compression to which it is subjected. The experiments of Dr. Duncan, to which I have referred (p. 177), show that under a certain degree of hydraulic pressure, air or liquids traverse the entire wall of the uterus. This is the old experiment of the Florentine metal globe applied to organic tissues. His experiments, of course, were performed on dead tissue. But there is good reason to believe that the force which the living uterus exerts in its efforts to expel what may be in it, whether it be a fœtus or imprisoned fluids, is enough to drive fluid through its walls, in the form of a fine oozing or dew, which hangs on the peritoneum. It seems to me probable that it is in this way that some cases of puerperal pelvic peritonitis are produced; and I have seen cases of septicæmia and peritonitis occurring from retention of menstrual fluid, greatly resembling puerperal fever, in which there was no rupture, and no escape of fluid by the open ends of the Fallopian tubes.

Supposing that the structures retain their integrity, it is natural that the concentric compressive force should drive the contents along any passage that may be pervious; hence the escape by preference along the tubes. This is rendered more likely by the dilatation which commonly takes place at their uterine ends.

This compressive force is exerted with most effect immediately after the puncture of the closed hymen. The sudden collapse of the walls of the uterus ensuing upon the partial escape by the opening excites the uterus to contract. This contraction drives the contents in all the three directions, and some will probably escape through one or other of the tubes into the peritoneal cavity.

The more common event is the laceration of the tubes at the weakest place, caused by the sudden dragging upon them by the retreating uterus, the tubes being, perhaps, held back by adhesions.

Other consequences of retention, if not relieved by operation, are: the distension of the uterus leads to perimetritis, with adhesion to the surrounding parts, especially of the Fallopian tubes to the ovaries and broad ligaments. The thinning of the uterus may proceed to bursting. The distended Fallopian tubes may burst, or without bursting, an overflow of blood may escape into the peritoneum, causing peritonitis. (Brodie, Kiwisch.)

Béclard relates a case in which the uterus burst, discharging into the bladder. Scanzoni and Arthur Farre relate cases in which the distended hymen burst; in Farre's case death resulted. In other cases (see Puech) the obstructing membrane has given way by ulceration, and a cure has resulted.

The constitution suffers from hectic, the result of pain, and the absorption of the altered blood from the uterus. In some cases—Lizé relates one (*Union Médicale*, 1863)—the impossibility of evacuating the collecting menstrual blood induces amenorrhœa; the ovaries and uterus give up their functions. Lizé believed that in his case atrophy of the uterus was induced. Dr. Murray, of Newcastle, relates a case (*Brit. Med. Journ.*, 1868), of a single lady, aged twenty-seven, whose vagina was closed by smallpox in infancy. Menstruation had been suspended for fourteen years. The vagina being opened up, no collection was found in the uterus, but exactly a month afterwards menstruation appeared, and recurred with tolerable regularity afterwards. In this case it was clear that the ovaries were not atrophied, but that the uterus ceased to pour out menstrual blood. This is in accordance with what sometimes occurs in apparent amenorrhœa, without uterine obstruction. Ovulation may go on without exciting menstrual flow. This returns when a healthy state of the blood is restored. Simon relates (*Mon. f. Geburtskunde*, 1851) a case of complete closure of the vagina, with a distended uterus. A vain attempt was made to establish a vagina. The patient maintained good health notwithstanding.

The character of the retained blood is remarkable. It is dark-colored, deficient in fibrin, of treacly consistence, rarely containing coagula; it contains mucus, and often cholesterine scales. It is glutinous, inodorous. The quantity varies with the duration of retention. Occasionally the tolerance and accommodation are surprising; the uterus may be expanded to the size of the end of pregnancy. Ten pounds of blood have been collected; I have collected forty ounces, and this perhaps is an average amount. Puech deduces from comparison of quantity and time of retention that, as a rule, the quantity is less than the number of menstrual periods would have produced normally. Letheby (*Lancet*, 1845) analyzed forty ounces, which gave water, 875.4; albumen, 69.4; globulin, 49.1; hæmatosin, 2.9; salts, 8.0; fat, 5.3; extractive, 6.7. There is another analysis of retained menstrual fluid by H. Müller in Henle and Pfeuffer's *Zeitschrift*, 1846.

Sometimes the fluid undergoes decomposition, and then gas mixed with the blood constitutes *physo-hæmatometra*.

The *symptoms and diagnosis of retention* are those which might be expected from obstructed functions. "Impediuntur coitus, conceptio, et purgatio." Until the advent of puberty, nothing may cause suspicion of abnormality. But with the onset of menstruation distress begins, due to retention of the menstrual fluid; at first, perhaps, this is limited to passing attacks of uterine colic, marked by pelvic pain and bearing down or expulsive efforts. Vomiting often attends, as in all cases where the uterine fibre is suddenly stretched. These attacks, more or less periodical, are not attended by the expected appearance of the menses. Occasionally there is a vicarious discharge of blood in form of epistaxis. In Pallen's case, one of absence of the vagina, there were marked men-

strual molimina, but no accumulation of menstrual blood in the uterus or neighborhood. When an artificial vagina was made, menstruation took place periodically by this channel, and the epistaxis ceased. Gradually the distress increases. A sense of fulness in the pelvis arises; the hypogastrium enlarges; the abdomen is visibly larger; perhaps pregnancy is suspected; there is sometimes retention of urine from the pressure of the uterus and vagina distended with the accumulating menstrual secretions; defecation is difficult, and the digestive function is disturbed; irritative fever, with a sallow skin, and vomiting—the result of absorption of the watery part of the confined fluid—sets in. A firm, even tumor is felt rising from the pelvis behind the symphysis pubis, sometimes as high as, or even higher than the umbilicus.

The uterus gradually yields under eccentric pressure; as in pregnancy, or when it contains a growing polypus, it then grows, its muscular walls as well as its cavity enlarging. This process meets to a certain extent the pressure of the accumulating fluid; but the contained matter receiving fresh increments at every menstrual epoch, after a time requires more space: then other compensating processes bring alleviation, and stave off for a while the critical moment when the strain can no longer be borne. The more watery element of the contained fluid is absorbed. To supplement the imperfect distension of the uterus, another cavity is formed by the distension of the vagina. The tubes stretching, form further supplementary receptacles. The uterine and vaginal cavities are usually divided by a strait formed by the cervix uteri (see Figs. 62, 63).

This vaginal pouch may be very large, especially if the occlusion exists at the vulva, when it may so compress the rectum as to obstruct defecation (Tuckwell), or cause retention of urine. The obstruction to normal menstruation is sometimes compensated by menstrual deviation, that is by fluxes from the intestines, bladder, nose, skin, etc. If the occlusion exists higher up the vagina, a pouch is still formed. And it is remarkable that the vaginal wall undergoes hypertrophy in the same way as the uterine wall. In a fatal case, Dr. Sutton (*London Hosp. Reports*, 1867) found the vagina so much hypertrophied that the walls at the upper part were quite as thick as the uterine parietes. Klob contends that in cases of obstruction at the vulva, it is the vagina that chiefly, or almost exclusively, forms the sac, the uterus scarcely contributing. This is certainly not always true; and it may be doubted whether it is even generally so. Dr. Tuckwell's case (see Fig. 63) exhibits manifest dilatation of both uterus and vagina; and that this was also the case in two women whom I relieved by operation, I had distinct evidence. The uterus certainly enlarges considerably, and the easily distensible Fallopian tubes become generally distended, forming distinct tumors, readily felt on either side; sometimes, as Bernuth remarks, mistaken for pelvic phlegmons. The Fallopian tubes have been found distended, even when shut off from the uterine cavity; but generally the uterine orifices of the tubes are expanded. A further stage leads to the escape of blood from the Fallopian tubes at their fimbriated extremities, or through rents into the peritoneum. This event, long ago pointed out by Brodie, has been amply confirmed by subsequent observers. The blood collecting in Douglas's pouch constitutes retro-uterine hæmatocele. The common effect of this is pelvic

peritonitis, sometimes fatal, at others resulting in segregation of the effused blood by plastic matter; a later stage of which is a process of suppuration or necrosis of the posterior vaginal wall and possibly discharge of the hæmatocele and cure. As Bernutz says, and I venture to add my own testimony in support, the foregoing phenomena of obstructed menstrual flow may result from uterine deviations, especially flexions, from spasmodic contraction of the cervix uteri; and, according to my own observation, from congenital narrowing of the os externum uteri associated with a conical vaginal-portion. The symptoms of abdominal shock and peritonitis following upon those of retention of menses, indicate the occurrence of effusion of blood from the Fallopian tubes into the peritoneum. These symptoms depending on the same accident are very liable to follow operations for the discharge of the retained fluid. The history of hæmatocele will be fully discussed hereafter. A tumor is formed, sometimes of considerable size, in Douglas's sac; at first, this is soft, fluctuating; it then gets harder under coagulation, and the effusion of plastic matter around it; a firm tumor may be felt rising above the pubes, even to the umbilicus. The abdominal walls can be made to glide over it; the limit of the tumor may be defined by percussion; inferiorly the tumor sinks into the pelvis. By the vagina, we find the tumor pushing forward the roof and posterior wall of this canal, shortening it, and compressing it from behind forwards, so that the finger is guided to the os uteri driven forwards behind the symphysis. The os felt in this position, and a firm rounded mass extending behind it, has been mistaken for retroversion of the enlarged womb, and this the more readily, because retention of urine has often been an urgent symptom.

Sometimes the atresia, especially in the acquired cases, as when cicatricial occlusion takes place after fevers, sloughing from severe labor, or from injury by instruments, is not quite complete. There may remain a narrow fistulous track, communicating with the expanded sac which receives the menstrual collection, and which affords an occasional, but rarely complete relief by oozing. Such a fistulous tract may act for a long time as a sort of safety-valve, by which extreme tension is relieved. It is liable to complete occlusion at times. The following case is an instructive illustration.

The subject had been delivered by instruments of twins after a severe labor. From that time she had suffered more or less difficulty in menstruation. This difficulty had increased gradually; and at the end of twelve years her condition had become anxious. At each menstrual epoch severe colic with expulsive pains set in. An enlargement was felt rising considerably above the pubes. Partial relief had been obtained by escape of blood and offensive ichorous matter. At times retention of urine had occurred. The passage of the catheter was difficult, owing to the urethra being compressed by the tumor. Distress increased at the menstrual periods. The vagina was quite occluded by contracted cicatricial tissues, extending from the meatus urinarius to the anus, nothing but a scarred furrow marking the site of the vulva. There was a minute fistulous tract, which had probably given partial relief at times. I dissected up carefully between the urethra and anus, and struck the sac