Some observations regarding the diagnosis and treatment of atresia vaginae.

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SOME OBSERVATIONS REGARDING THE DIAGNOSIS AND TREATMENT OF ATRESIA VAGINÆ.

Case I.—A. S., unmarried, aged 18, a native of Iceland, was admitted to Ward 24, R. E. I., on July 24th, 1891, complaining of a swelling in the abdomen with pains which had troubled her for nearly three years.

No facts about the previous history were ascertained, owing to the difficulty of holding communication with her. Through the Danish consul it was found out that the swelling had gradually increased and that the pains were felt only at intervals of three or four weeks.

State on admission.—The patient was a well-nourished, robust-looking girl with a pleasant expression. The mammæ were large and pendulous like those of a married woman. Around the nipple was a large, dark areola. No secretion could be expressed from the breasts.

The abdomen presented a prominence most marked toward the left of the navel and extending from a point slightly above it downward and inward toward the pelvis. On palpation it was of firm consistence, scarcely movable, and not painful to touch. The percussion note was dull over it; on auscultation a faint bruit was heard.

The external genitals were fairly well developed. The hair of the mons veneris, instead of being arranged, as is normally the case in women, with the upper limit transverse, tailed up toward the navel as in males.

There was no ostium vaginæ, the hymen being quite imperforate and having a thick, fleshy appearance. On recto-vesical examination there appeared to be but a thin partition in place of the vagina. Above this was felt on bimanual examination the uterus, somewhat enlarged and only slightly movable; extending outward from it on the left side was a swelling the size

of a fetal head, immovable and apparently cystic. The right appendages could not be made out.

The case was diagnosed as one of atresia of the whole vagina, with retained menstrual blood in the tubes, chiefly in the left one. Operation was decided upon, and the question arose as to whether the cervix should be reached by tunnelling through the atresic vagina or whether laparatomy should be performed, the distended tubes being removed. As the recto-vesical septum appeared to be too thin to warrant the establishment of a good or permanent vagina, it was decided to perform abdominal section. This was carried out on July 29th. On opening the abdomen many vascular adhesions were found between the swelling and adjacent parts, among which were several cysts containing serum. After division of the adhesions the swelling, found to consist of the greatly distended left tube, was separated from its adhesions and opened. A quantity of thick, brownish-red fluid, apparently altered blood, escaped. The lumen of the tube was somewhat loculated and appeared to be shut off from the uterine cavity. No fluid could be squeezed from one into the other. The greater part of this tube sac and the corresponding ovary were then removed along with the appendages of the right side.

After-progress.—The patient did well for some weeks and was quite convalescent. Then symptoms of septic peritonitis set in and the patient gradually sank. She died on September 19th.

Post-mortem examination.—The pelvis and abdomen were removed intact and frozen. A vertical mesial section was made and afterward each slab was dissected.

Microscopic examination of the uterus was also carried out The appearances found on vertical mesial section are represented in Fig. 1.

The condition of parts was as follows:

Uterus.—The uterus is upright, slightly anteflexed, and enlarged to the length of four and three-eighths inches, the fundus being one and three-eighths inches above the brim. The body measured three and three-quarter inches in its widest part transversely and two and one-eighth inches antero-posteriorly.

The body wall is thickened and of a pale yellowish gray with a pinkish tinge; no vessels can be seen in it. Its cavity is almost entirely empty, appearing as a mere slit on vertical mesial section. The anterior and posterior walls of the body are

smooth next the cavity, but on each side the mucosa is rugose, resembling the arbor vitæ of the cervix, this condition extending down to the cervix.

The cervix is very abnormal. Its cavity is much distended in all directions, on vertical mesial section appearing lozenge-shaped. It measures a little more than an inch in its vertical and transverse diameters. It contains a thick, greenish fluid filled with fibrinous septa. The wall of this cavity is rugose,

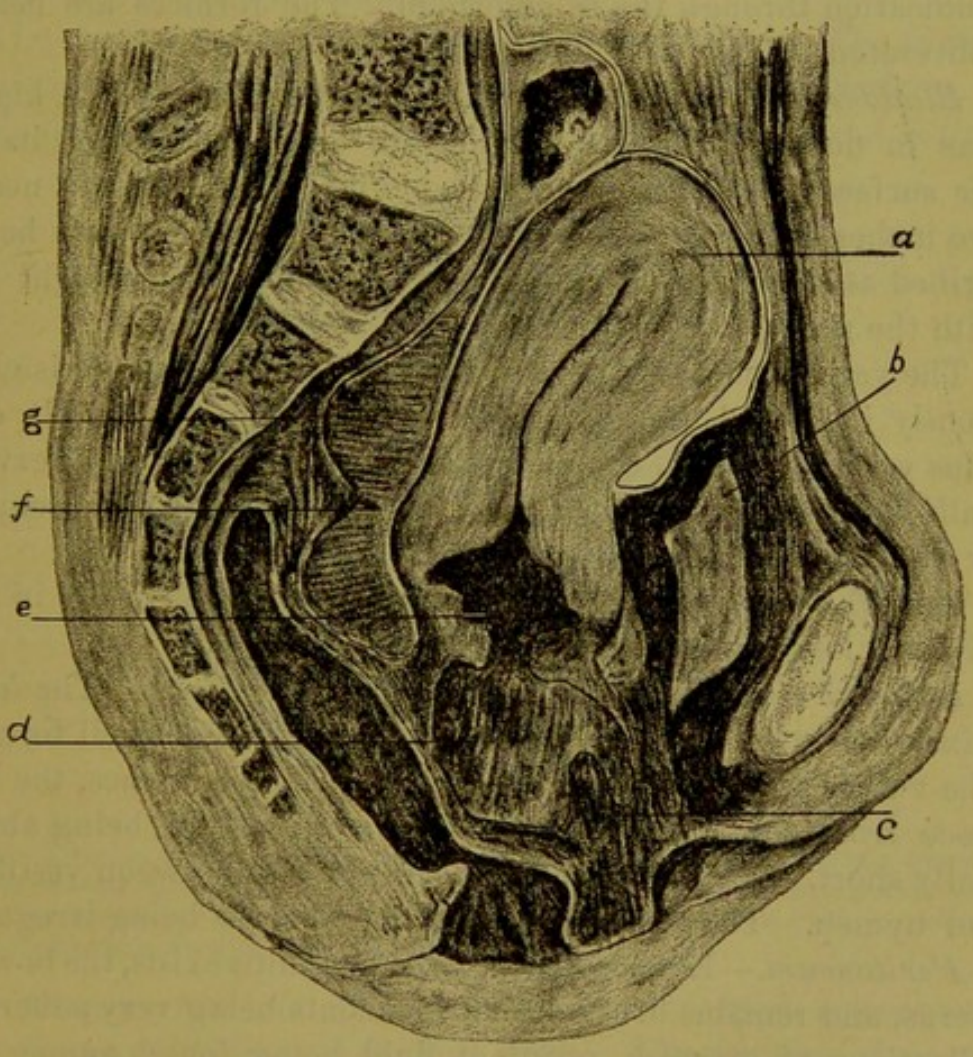

FIG. 1.—Vertical mesial section of pelvis. *a*, uterus; *b*, bladder; *c*, atresia of lower part of vagina; *d*, vagina distended with fluid above the atresia; *e*, cervical canal distended; *f*, peritoneal adhesion; *g*, fluid in peritoneal cavity.

colored slightly red, and covered partly with flakes of fibrin. The thickness of the cervical wall is much less than that of the body. The os externum admits the end of the little finger.

The whole organ is fixed by extensive adhesions to surrounding structures. A fine probe can be passed along the interstitial part of the left tube toward the stump left from the operation. On the right side the tube is impervious.

Vagina.—This is found to be a cavity two inches in length, two and three-quarter inches wide in its upper part and one and three-eighths inches in its lowest. Below it ends blindly, owing to the presence of the atresic portion, a dense, fleshy band of irregular thickness but averaging about seven-sixteenths of an inch. The vaginal walls are ragged and considerably injected in their upper portion. The cavity is filled with the same thick fluid that was found in the cervical cavity. They are in communication through the os externum. The fornices are nearly obliterated.

Bladder.—The bladder contains a little urine and is higher than in normal cases, the peritoneum being reflected on its upper surface from the anterior abdominal wall at a point nearly two inches above the symphysis pubis. The viscus may be described as standing vertically, its cavity being in a straight line with the urethra.

The vertical measurement of the utero-vesical septum is enormously increased, being nearly two inches in length. It contains very little loose connective tissue, the bladder and cervical walls being almost in apposition; in its lower half it is occupied by a small collection of serum.

The *Urethra* is of normal length, but stands vertically in line with the long axis of the body.

External Genitals.—The clitoris is well developed. The *labia minora* are very small. The labia majora are fairly well formed. The vulvar slit measures one and one-quarter inches, the distance from the urethral orifice to the perineum being abnormally short. No distance can be made out between vestibule and hymen. They appear as one, the surface being irregular.

Peritoneum.—Extensive purulent peritonitis exists, the bowels, uterus, and remains of the broad ligaments being very adherent, collections of greenish, purulent fluid being found among the adhesions. The lowest dip of the peritoneum behind the uterus is two and seven-eighths inches below the brim, the pouch of Douglas being filled with sero-purulent fluid and containing adhesions. The lowest dip of the utero-vesical pouch is only about one inch below the brim level.

Microscopic Examination.—The great increase in the size of the body is due partly to an increase in the muscular tissue, partly, also, to a proliferation of the connective tissue. Here and there the latter is very dense and sclerosed.

The mucosa has an irregular surface, the superficial layer having somewhat disappeared. No lining epithelium is found anywhere. The gland tubes are narrow and irregular, the lining epithelium having been cast off and disintegrated for the most part. In a few of the glands in their deepest portions the epithelium is found preserved *in situ*, but it is in most of them thrown into the lumen as a cast or as débris. There is marked interglandular proliferation of connective tissue, and a few small hemorrhages are also found.

The wall of the *cervix* is thinned and stretched. The fibrous tissue is mainly dense and firm, and sclerosed in many places.

Folds of mucosa are seen, but the mucous membrane is thin-

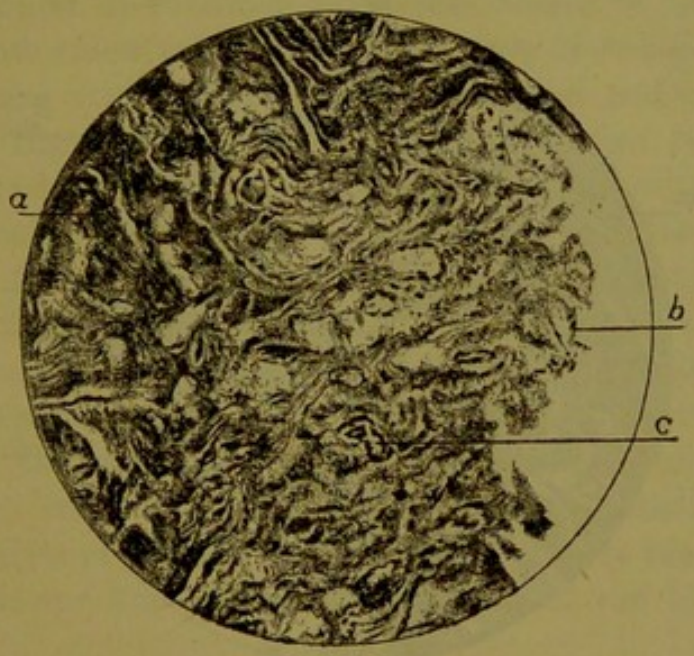

FIG. 2.—Mucosa of body of uterus near os internum. The inner surface is very irregular and its covering epithelium absent. In the substance of the mucosa there is marked interglandular infiltration and destruction of glands. *a*, muscular wall of body; *b*, inner surface of mucosa; *c*, remains of glands. × 80.

ner than normal and its surface has an eroded appearance. The lining epithelium is entirely gone. The remains of a small number of glands are seen, in a few of which the epithelium is attached to the wall. For the most part the epithelial cells have been cast off and appear in various stages of disintegration. All around the surface there is a good deal of chronic inflammatory thickening. In the cavity next the wall are found serum, epithelial débris, fibrin, red and white blood corpuscles, pus corpuscles, and blood pigment.

Remarks.—This case presents several features of great interest. In the first place, in regard to the diagnosis, an error

was made in estimating the extent of the atresia. On careful rectal examination, combined with the examination of the bladder with the sound, the extent of tissue between the bowel and bladder seemed so slight that it was believed that the vagina was completely atresic and represented only by a thin fibrous band.

The post-mortem examination showed that the vagina was normally developed in its upper three-fourths and atresic only in its lower fourth. It is probable that its walls were very thin, and not so thick as they appear in the specimen, which represents a condition found seven weeks after the operation, when some hypertrophy had resulted from the distention of the va-

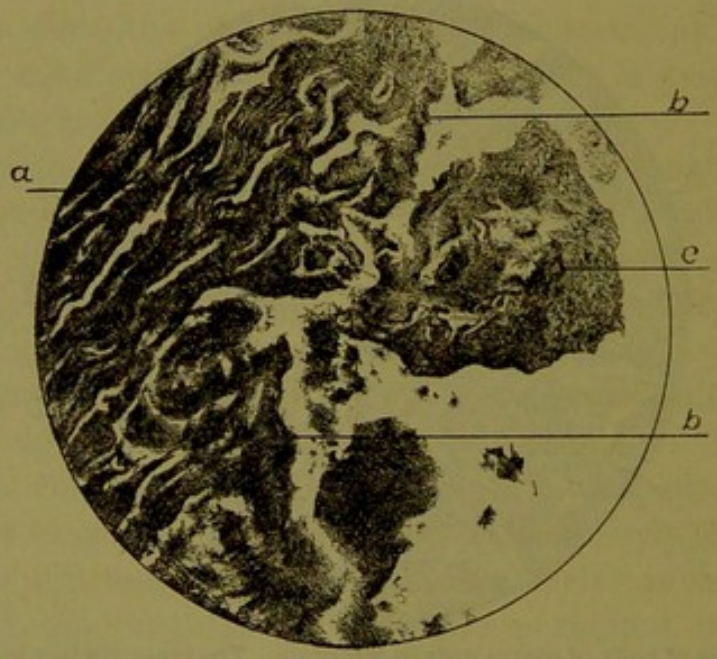

FIG. 3.—Lining of cervical canal. The mucosa has an eroded appearance. The glands are almost entirely destroyed and there is present considerable inflammatory infiltration. *a*, muscular part of wall; *b*, inner surface of mucosa; *c*, coagulum lying close to wall. × 80.

ginal cavity during this interval. The presence of a well-formed uterus was the strongest indication that the vaginal atresia was not a complete one, because usually entire atresia is found only in connection with atrophy of the uterus. Thus Breisky,[1] the chief authority on this subject, found in five cases a rudimentary uterus and in three entire absence.

Of extreme interest, also, is the observation, which appears to be unique, that, notwithstanding the fact that the patient's his-

[1] "Diseases of the Vagina," Cyclopedia of Obstetrics and Gynecology, edited by Grandin, vol. xi., p. 225.

tory pointed to menstrual retention for about three years, *there was no distention of the vagina or uterus.* Breisky says that in every deep-seated atresia the distended vagina forms a large part of the retention tumor. It has been often noted that one of the earliest symptoms of retention may be difficulty in urination or defecation, due to the pressure of the vaginal swelling. G. Veit [1] has pointed out that this may occur even before the uterus has become distended. Neither was there any accumulation in the uterus, this organ on careful bimanual examination only appearing to be a little enlarged. It is usual in similar atresia cases of old standing to find the uterus becoming gradually distended from below upward. It is noticeable, indeed, that the only collection of retained blood was found in the left tube Usually both tubes are distended. A case of unilateral hematosalpinx along with distention of the vagina and cervix is described by Breisky.[2] This condition in the tubes is more commonly found where there is atresia of one half of a double genital canal. The source of the blood in the distended tube in this case is not clear. It is either purely tubal, or purely uterine menstrual blood which has been forced upward into the tube, or a mixture of both. In favor of the first hypothesis is the fact that at the examination of the patient before operation no distention of the uterus was found—a condition which has never before been recognized in a case where menstruation had progressed and its products retained for one or more years. Against this view is our knowledge of the origin of the blood in menstruation.

It has been alleged by Bandl [3] and a few others that in menstruation blood is poured from the tubal as well as from the uterine mucosa, and that one of the chief causes of hematosalpinx is the retention of this tubal flow owing to some obstruction in the tube lumen. Against this view in the present case is the fact that the tubal distention was unilateral. All recent researches, however, go to show that the tubal mucosa does not bleed during menstruation. Moreover, at the time of operation no communication could be made out between the uterus and the distended tube. The frequency of closure or constric-

[1] Breisky, op. cit., p. 227.

[2] Op. cit., p. 229.

[3] "Diseases of the Tubes, etc.," Cyclopedia of Obstetrics and Gynecology, vol. xii., p. 36.

tion of the interstitial part of the tube in hematosalpinx is noted by Hennig,[1] and to this fact he attributes the tubal origin of the blood in this condition.

Breisky[2] has only seen one case in which the interstitial portion of the tube was dilated. There was the possibility that this closure was of recent origin and that it only developed after the blood had collected in the tube; the post-operation collection in the cervix and vagina somewhat favors this view. Before the operation it may be supposed the menstrual uterine blood was forced in the direction of least resistance, which happened to be the left tube. After the operation this means of escape was cut off and so accumulation began in the uterus itself.

Against the purely uterine origin of this hematosalpinx is the supposition that reflux of blood from the uterus into the tube could not go on for a long period through the very narrow lumen of the interstitial portion. We know, however, that instrumental pressure can force fluids in this direction, and there is no reason why it should not take place as a result of strong contraction and resistance of the uterus owing to the way of escape being cut off below. In this relation should be remembered the tendency of blood in the genital tract to keep fluid.

It is remarkable, if this explanation be correct, that reflux should take place only into one tube, if the lumen in both were patent. The explanation could only be that the resistance to the reflux, for some reason or other, was so much greater on one side that the flow, having started in one direction, continued on that side only.

If the reflux hypothesis as to the origin of the tubal blood be not true, then either no blood had escaped from the uterine mucosa, or, having done so, reabsorption had soon taken place. That a uterine discharge of blood must have taken place there can be no doubt. It occurred after the operation when the greater part of the stimulus to its discharge had been removed.

There is no appearance of old, laminated, tough fibrin lining the walls of the uterine cavity, so that not much alteration could have taken place in the blood after its escape.

The third hypothesis is that the hematosalpinx is partly uterine and partly tubal in origin.

It is not an unlikely thing that after the tube wall had been

[1] "Die Krankheiten d. Eileiter," Stuttgart, 1876. [2] Op. cit., p. 243.

somewhat stretched as a result of reflux uterine blood, hemorrhage might take place into the tube lumen from the vessels in the wall in the successive periods of menstrual congestion in the pelvis. Were the menstrual congestion alone the cause of the tubal hemorrhage, then it should have acted on both sides. As only one side is affected, the damaged condition of one tube is the only factor which suggests itself as explaining why hemorrhage might take place from the wall of that tube rather than from that of the opposite side.

The condition of the uterine mucosa at the post-mortem throws very little light on the condition previous to the operation. As I have stated, it is in a condition of chronic inflammation, the epithelium and glands being largely destroyed. It is impossible to say how much of this is due entirely to post-operation changes. The source of the fluid found in the vagina and cervix is also doubtful. It may be mainly due to the exudation from the inflamed area, a little blood having escaped from small hemorrhages in the mucosa, though it is to be noted there is no marked vascularity or hemorrhagic tendency in the mucosa. The fluid may have resulted, however, from actual menstruation which occurred even after the operation. While the right appendages were entirely removed, it is to be remembered that a small bit of the lower portion of the dilated left tube was left behind, and the occurrence of menstrual discharge in the uterus in such a condition is a fact which has already been noted by several observers, notably by Lawson Tait.

The origin of the sepsis so long after operation is not evident. There was a good deal of peritonitis about the sac when the patient was first examined, but this improved greatly during the first few weeks after operation.

Case II.—J. P., unmarried, aged 21, a mill worker, was admitted to Ward 24, R. E. I., on November 6th, 1893, complaining of amenorrhea and of pains in the abdomen which began when she was 13 years old.

The patient had been in the ward in July, 1892, and her history up to that time was as follows: Family history is good and her home healthy and cheerful. She is a stout, well-conditioned girl, and, apart from the abdominal pains, has never suffered much from illness. Since her thirteenth year she has complained of pelvic or abdominal pains which have recurred at intervals of three, four, or five weeks. The pain is felt in

the back and in the iliac regions, especially on the right side when she works hard. When the pain is bad she feels as if something might burst. Before January, 1893, she worked for eleven hours daily; after that time she was only able to work for eight hours.

On examination per rectum, along with the exploration of the bladder with the sound, the atresic vagina was felt as a well-marked septum. Above this was felt a large, rounded mass, apparently cystic, which extended up to the umbilicus. It occupied the hypogastric and partly the iliac regions. It was immovable and only slightly tender on examination. The tubes could not be distinguished separately and it could not be decided whether the tumor was uterine only or partly tubal as well. As the uterus was certainly distended, it was decided to dissect through the atresic vagina.

This operation was performed, soon after her admission in July, by Prof. Simpson, and an artificial vagina was made sufficiently large to hold two fingers. The uterine cavity was opened into and a quantity of dark, thick fluid escaped slowly. The opening was enlarged, and when the cavity was explored with the finger a large amount of fibrin was found adherent to the walls. The cavity was thoroughly washed out and a glass tube was passed, in order to drain the cavity and to dilate the newly formed canal. The size of the abdominal tumor did not greatly diminish as a result of the operation.

After-progress.—The discharge continued to flow from the uterus, daily antiseptic irrigation being kept up. The abdominal tumor gradually diminished in size.

The patient's health continued good, and she was dismissed from the hospital on October 14th, having been instructed in regard to the use of the vaginal tube and the douche. She continued to wear the tube for two months constantly and afterward only at night.

After she left the ward she menstruated twice. The first period was in October, 1892, and lasted for three days; the second was in February, 1893, and lasted for two days. There was not much blood lost.

On the patient's readmission in November she complained of the old pains. They had recurred at intervals after the operation, but were not so bad as they had been before. They had become more severe, however, just before her return.

She was examined under chloroform on November 21st. The uterus was found enlarged to the size of a cricket ball; it was cystic and slightly movable. Behind it was felt another cystic mass, filling the pouch of Douglas and extending somewhat to the left of the uterus. The upper end of the vagina was considerably contracted and the cervix was closed.

The uterine cyst was evacuated by aspiration through the closed cervix, a thick, yellowish, muco-purulent fluid escaping; the cervix was again opened and dilated. A glass tube was passed through the opening, in order to drain the uterine cavity and to prevent closure of the cervix.

As a result of this operation the uterus diminished somewhat in size. The posterior cyst remained unaltered. After a few months the girl returned to the infirmary, having since her last period of residence suffered from considerable pain. Abdominal section was performed and the cystic mass partly excised. Its exact relations could not be made out, owing to the extensive number of adhesions in the pelvis.

Since this operation she has continued to improve and is now in the best of health.

Remarks.—There was no doubt in regard to the diagnosis of this case. It was one of complete atresia of the vagina. It was impossible, however, to make out the extent of the genital tract, which was distended with fluid. Only one rounded swelling could be detected at first, and it was thought to be the uterus, but it is very likely that the tube was distended but covered in adhesions behind the uterus. The presence of such a well-marked uterus is worthy of note. As has already been stated, complete atresia of the vagina is, in the majority of cases, associated with rudimentary uterus or entire absence of the organ.

In regard to the clinical history of both cases, it is to be noted that neither of them presents the condition very often described in old-standing atresia cases, viz., continuation of pain from one menstrual period to the other. The pains were only felt at intervals, usually of three to five weeks' duration, and were worse when the patient worked. It is also clear that the peritonitis was not associated with continual suffering.

The treatment was unsatisfactory in both cases. In the first case the dilated tube alone was opened, the uterus being untouched; this procedure was followed by distention of the cer-

vix and unopened vagina. In the second case the uterus was opened into through the atresic vagina, the tubes being left unopened; afterward a dilatation of one or both tubes was found in the abdomen; this case was also unsatisfactory in that the cervix closed up after having been opened, in spite of the use of a dilator (perhaps, however, the patient was careless in the use of the tube after she left the infirmary).

These cases indicate that *double operation* is the best method to adopt—*i.e.*, removal of the dilated tubes and opening up of the atresic vagina and cervix where possible. That the former should always precede the latter is the teaching of several authorities, and the soundness of this view is beyond dispute. The danger of rupture of the dilated tube during evacuation of the uterus has been pointed out [1] sufficiently often to emphasize its importance. This danger arises from the fact that the tubal sac, if fixed with adhesions (and it is in the majority of cases), cannot change its position in keeping with the change in size and position of the uterus after its evacuation. Moreover, should septic infection follow the opening of the uterus there is an increased danger of rupture of the tubal sac. If, on the other hand, the distended tubes be first removed by laparatomy, the utero-vaginal swelling can be opened at a later period from below.

[1] Rose, New York Medical Record, ii., No. 26, p. 35. Steiner and Billroth, Wien. med. Wochenschr., 1871, No. 30. Freund, Zeitschr. f. Geb. u. Gyn., Bd. i., 1877.