

THE AMERICAN  
JOURNAL OF OBSTETRICS  
AND  
DISEASES OF WOMEN AND CHILDREN.

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VOL. XXVI. AUGUST, 1892. No. 2.

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ORIGINAL COMMUNICATIONS.

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HEGAR'S SIGN OF PREGNANCY.

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(With three illustrations.)

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THE first publications issued with reference to the extreme compressibility of the lower uterine segment peculiar to pregnancy—a sign recognized by Hegar as particularly important in the diagnosis of the earliest months of that condition—were those of Reinl<sup>1</sup> and Compes<sup>2</sup> in the years 1884 and 1885. Since then the observations regarding the consistence of the pregnant uterus have been continued with special care at the Gynecological Clinic of the Freiburg University. During that time we have become more and more convinced that the above-mentioned quality of the lower uterine segment constitutes a very valuable and reliable sign of pregnancy. The fact that we can now refer back

<sup>1</sup> Prager med. Wochenschr., ix, 1884, No. 26.

<sup>2</sup> Berliner klin. Wochenschr., 1885, No. 88.

to a larger number of appropriate observations is not the only reason for our recurring to this subject, but we desire at the same time to contradict some erroneous views which have been uttered in the meantime about this sign. Moreover, its importance is still far from being fully recognized; for, with the exception of Löhlein,<sup>1</sup> we know of no paper reporting personal investigations, and opinions based on them, respecting Hegar's sign of pregnancy.

With reference to erroneous views, it must first be noted that the essential point of Hegar's sign of pregnancy does not consist so much in the possibility *per se* of compressing the uterine walls in the lower segment, but rather in the fact that this compressibility is particularly great, so that the palpating fingers seem to feel only a very thin layer of tissue, at most a few millimetres in thickness; in some very pronounced cases even the continuity between cervix and body appears to be broken. But it must be especially emphasized that this extreme thinning and softness do not extend to the cervix. The remarkable difference between the hard cervix and the soft body of the uterus, particularly in the initial stages of pregnancy, has long been generally known and even by itself always awakens the suspicion of pregnancy. Nevertheless an entirely incorrect description of Hegar's sign of pregnancy has been given in a book entitled "Four Months among the Surgeons of Europe" (Chicago, 1887), by Dr. Senn, of Milwaukee, who visited various European clinics in 1887 and was present in Freiburg during the examination of a case of pregnancy. Senn's statement that "Prof. Hegar places great confidence on certain conditions of the upper portion of the cervix as an almost infallible sign of early pregnancy," must be ascribed to a confusion of corpus and cervix uteri. It is evident that Senn has mixed up two different cases which were examined in succession. One was a normal pregnancy in the fourth month; in the other—the case which Senn reported from the Freiburg clinic in his book—pregnancy had ceased to exist, but there was retention of decomposing placental detritus after abortion in a myomatous uterus. Hemorrhages had recurred for months, the ovum had been expelled some indefinite time

<sup>1</sup> Deutsche med. Wochenschr., 1859, No. 25, p. 503.

previously, and the spontaneous enucleation of a myoma about the size of an orange was in progress. Hence the conditions present were altogether different from those in an interrupted pregnancy, for the cervix was already softened by pains and admitted one finger. In exact opposition to the other cases, the walls of the cervix here appeared soft, and, especially above, more strongly compressible than those of the corpus uteri, which had been influenced in a contrary manner, as regards their consistence, by the pains and the partial evacuation. This opposite condition to the one shown by an existing pregnancy was particularly emphasized during the presentation of the patient. Among the German authors who in the later obstetrical text books mention Hegar's sign in more or less detail, J. Veit, although he repeatedly describes it quite correctly, gives an erroneous view of the conditions, at least according to our observations, when he states that between the vaginal portion and the body of the uterus we feel the very much softened upper part of the cervix, while the lower part of the uterus is really not to be felt at all, and to the examiner the pregnant organ appears to be detached from the vaginal portion.<sup>1</sup> On the contrary, this apparent separation manifests itself, not in the cervix, but above the internal os in the lowest portion of the body, and it is wrong to look for the characteristic compressibility as low as the supravaginal cervix. In this location it could show itself at most only when a portion of the supravaginal cervix has really been drawn upon to form a part of the uterine cavity. It may be that the supravaginal portion of the cervix may at times feel somewhat softer than the vaginal portion, but in that case this diminished consistence is distinctly less marked than the pronounced difference between corpus and supravaginal cervix.

As to the clinical demonstration of the sign, the erroneous idea seems to prevail that it requires a high degree of development of the tactile sense and calls for an extraordinary dexterity in gynecological examination, perhaps to be gained only by specialists after long practice. This is by no means the case. Of course here, as in any other gynecologi-

<sup>1</sup> See Müller, "Handbuch der Geburtshülfe," Stuttgart, Enke, 1888, Bd. i., Section 309.

cal examination, the greater or lesser facility in demonstrating the characteristic compressibility of the lower uterine segment depends pre-eminently on the behavior of the individual patient. Great anxiety and resistance on the part of the latter, as well as firm and adipose abdominal walls, will materially interfere with a satisfactory palpation of the uterus or even render it altogether impossible. In such cases complete anesthesia will be needed. Then it is usually easy to determine above the harder and narrower cervix the softness and compressibility of the broader lower segment of the

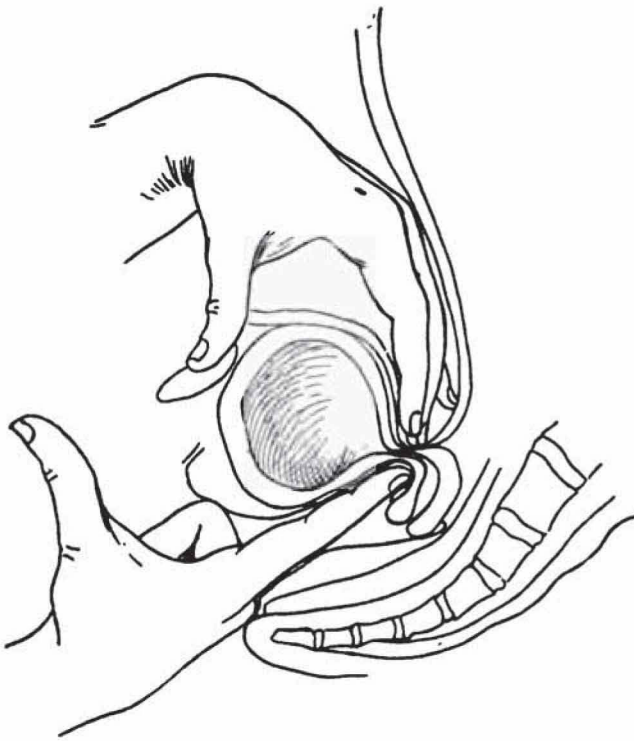


FIG. 1.

body, which are most pronounced in the middle, while the tissue feels somewhat denser toward the sides. In persons with a wide, long vagina and thin, yielding abdominal walls, bimanual examination from the vagina and the abdominal walls suffices for the demonstration of the sign. If the uterus is anteposed the intravaginal finger is placed in the anterior vaginal vault and against the anterior wall of the body of the uterus, while the external hand palpates the posterior uterine wall (see Fig. 1). In retrodeviations of the uterus the procedure had better be reversed: the intravaginal finger is placed in the posterior vaginal vault and against the

posterior wall of the uterus, while the external hand penetrates nearer to the pubic symphysis and palpates the anterior uterine wall (see Fig. 2). If this manœuvre fails we must resort to rectal examination, which, besides, becomes necessary also in persons with a narrow and rigid vagina, usually nulliparæ. As regards this rectal examination, we may once more call attention to the fact that it is not necessary to carry the index finger above the point of attachment of the sacro-uterine ligaments in order to reach the portion of the uterus situated above the internal os; and, further, that the

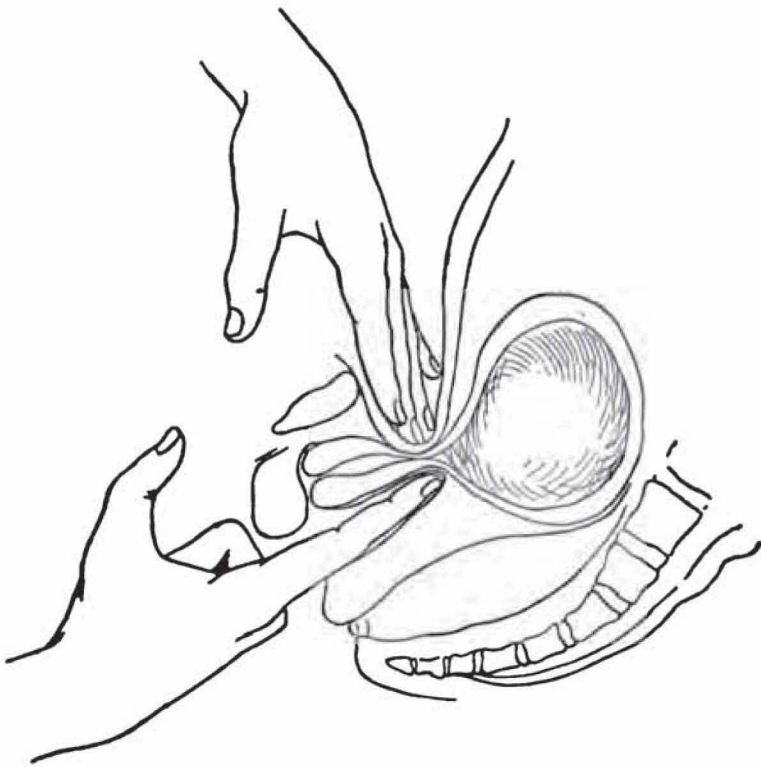


FIG. 2.

thumb of the same hand must be inserted into the vagina as far as the vaginal portion, so that the cervix may be positively controlled (see Fig. 3). If necessary, this mode of examination may be facilitated by distending the rectal ampulla with a moderate injection of warm water and by crowding the uterus down with the external hand. Only very rarely will it be necessary to draw the uterus down with a tenaculum hooked into the vaginal portion. In this way it is possible, even in the most difficult conditions, to bring the thin part of the lower segment above the cervix between the

examining fingers, and to demonstrate any existing extreme compressibility of the tissue. At our clinic, for purposes of instruction, the sign has repeatedly been demonstrated on anesthetized patients in the initial stages of pregnancy by advanced students somewhat familiar with the technique of gynecological examination, and this even in cases when all mention of the absence of menstruation and other signs pointing to the diagnosis had been intentionally suppressed.

The fact that it is possible to compress so strongly certain portions of tissue of the pregnant uterus does not depend merely on the specific softening and loosening of the walls of



FIG. 3.

the gravid organ, which of course are most pronounced at its thinnest part, the lower segment of the body, but also on the circumstance that the contents of the uterus—the entire ovum—can be displaced from the lower into the upper portion. This causes temporarily a greater tension of the elastic walls of the latter, which return to their former state with the cessation of the pressure. In my opinion it may not be impossible at times to compress even the ovisac and crowd its contents—liquor amnii and fetus—toward its upper part, as in a rubber ball not quite filled with water. Moreover, under normal conditions, in the earliest period of pregnancy

neither uterus nor ovum is tightly distended, as Veit<sup>1</sup> has very happily described.

It is clear from what has been said above that the sign has a very great diagnostic value. In all cases where the compressibility is found in this great and highest degree, pregnancy is undoubtedly present. On the other hand, the slighter degrees are diagnostic only when other causes can be excluded. Some latitude must here be left to individual estimation, and, if we wish to draw a definite limit for the absolute demonstrative power of the sign, it will be best to set the upper limit at a compressibility to an intermediate layer the thickness of one-half centimetre. Below this limit to an apparent complete separation of body and cervix firm reliance can be placed on this sign in diagnosis, according to our experience. For, outside of pregnancy, there is no physiological or pathological condition of the uterus in which we would find even an approximately similar relation between so marked a yielding and thinning of its walls on the one hand and a like compressibility and displaceability of its contents on the other. Hence the characteristic compressibility of the lower uterine segment *per se* indicates the presence of a developing ovum. The sign, therefore, does not only proceed from the genital organs of the mother, like the other so-called probable signs of pregnancy at our disposal, but also from the product of conception, the fructified ovum. Thus we have gained a positive sign which alone proves the presence of pregnancy, even in the first months.

The advantages of such a diagnostic sign manifest themselves most markedly in complicated cases in which the other symptoms of pregnancy are less clear than usual; for instance, in tumors of the uterine wall or other abdominal organs, or where the size of the uterus does not correspond with the stage of pregnancy indicated by the cessation of menstruation.

But even in normal pregnancy this sign of the compressibility of the lower uterine segment should always be borne in mind, thus guarding against the mistake of diagnosing an extra-uterine tumor through taking the above-described apparent separation between body and cervix for a real one.

<sup>1</sup> Müller. "Handbuch der Geburtshilfe," Stuttgart, Enke, 1888, Bd. i., 3. Abschn., pp. 197 and 210.

The mistake is made frequently enough, not only in pathological hypertrophy of the cervix, but also in its absence, and has already led to the gravest therapeutical measures, such as capital operations. In this respect we find a very instructive case published in the February, 1890, number of *THE AMERICAN JOURNAL OF OBSTETRICS*, by Dr. Wenning,<sup>1</sup> where a uterine pregnancy was mistaken for an extra-uterine one.

The patient, having been amenorrhœic for about fifteen weeks, was first examined under anesthesia by her attending physician, owing to continuous pains in the hypogastrium. He found "the uterus somewhat enlarged, anteverted." "The whole organ was apparently in a state of subinvolution." He thought the uterine cavity to be empty, and introduced the sound, which penetrated to a depth of about three inches. This examination was repeated, likewise with the aid of the sound, after a week. Two weeks later, when the physician in giving an injection of morphine noticed a tumor to the right below the navel, he suspected an extra-uterine pregnancy and consulted Dr. Wenning. The latter also discovered on the right side below the navel an apparently solid, movable tumor, displacement of which was very painful. Contractions could not be demonstrated. On internal examination he found *the cervix high in the pelvis, slightly to the left and pointing toward the sacrum. It was somewhat enlarged, and, although soft on its surface, hard beneath and almost fibrous.* "The whole organ appeared to be enlarged and had the feeling of a subinvolted uterus." Bimanual examination showed the supposed uterus anteposed and to the left, while the main tumor occupied the right side and seemed to be independent of the uterus. The sound was repeatedly introduced, and once penetrated to the depth of four and a half inches. Extra-uterine pregnancy was diagnosed, and, as the pains of the patient increased, attempts were made to kill the fetus. Morphine injections and electricity failed, as did aspiration of the amniotic fluid. Finally laparotomy was performed, when the supposed tumor proved to be the gravid dextroverted uterus. During the operation

<sup>1</sup> Loc. cit., pp. 155 et seq. Wm. H. Wenning, "A Remarkable Case of Dextro-Torsion of the Pregnant Uterus Simulating Extra-uterine Pregnancy."



the sound was again introduced into the uterus and easily passed to the fundus. Then the abdomen was closed. The same evening a six-months fetus was expelled, and on the third day after the operation the mother died of acute purulent peritonitis.

In a review of the case Wenning attempts to palliate his error in diagnosis by calling attention to the concurrence of various symptoms pointing to extra-uterine pregnancy, and maintains that even the most experienced observer would have been deceived in the same manner. He also refers to several similar errors reported in literature. We are convinced that, had the author tried the sign of the compressibility of the lower uterine segment, if necessary by the aid of complete anesthesia and an exploration by the rectum, he would have avoided the mistake in diagnosis and its consequences.

Many a time there were sent to our clinic for examination women whose attending physicians were in doubt as to whether the pregnancy was uterine or extra-uterine. Thus we recollect a case of a multipara at the end of the sixth or the beginning of the seventh month, in whom, owing to a marked atrophy of the abdominal walls and thinness of the uterine walls, the fetal parts appeared to be situated remarkably superficially under the abdominal walls. The attending physician, who had been called on account of pains in the abdomen, had made an internal examination, during which he had found *a body resembling in shape, size, and consistence a normal uterus, quite in the left side of the pelvis*, apparently the cervix surmounted by the body of the uterus. Having felt laterally to the right and above this body the lower segment of a loose, soft sac in which fetal parts could be discerned, he inclined to the diagnosis of extra-uterine pregnancy. During the clinical examination it was found, by means of the most pronounced compressibility of the lower uterine segment, that there was an actual and immediate connection of the remarkably lateroposed, hypertrophic cervix, which had been mistaken for the empty uterus, with the soft uterine body containing the fetus. Twelve weeks later the patient was delivered of twins.

Another very similar case was sent to our clinic for exami-

nation about a year ago. Here likewise the attending physician had thought of the possibility of an extra-uterine pregnancy. As in the case above related, during the examination of a woman in the fourth month of pregnancy he found over the vaginal portion a firm body toward the left and near the pelvic wall which he inclined to believe was the non-gravid uterus, while to the right and above was a soft, elastic swelling apparently completely separable from the other body. Examination made at the clinic under anesthesia, especially by the aid of rectal exploration, at once disclosed the exact state of affairs. The supposed uterine body felt to the left of the pelvis was nothing but the slightly hypertrophied cervix, which was immediately connected with the soft, gravid uterus, the size of a child's head, with an extremely compressible lower segment.

That such mistakes are quite frequent is further proved by two cases observed by Olshausen and Gusserow, and reported by Selmaier in a dissertation entitled "On Primary Isolated Hypertrophy of the Supravaginal Portion of the Cervix" (Berlin, 1891). In both cases a uterine gestation was mistaken for an extra-uterine, and each time the error in diagnosis was due to the fact that the hypertrophied cervix was believed to be the body of the uterus, while the real pregnant organ was taken for an extra-uterine ovisac. In Olshausen's case a very pronounced left lateroflexion contributed to the erroneous diagnosis, while in Gusserow's case the hypertrophied cervix was situated behind the symphysis and in front of the apparent extra-uterine sac. In the former case laparotomy was performed for the purpose of removing the supposed ovisac, when the error in diagnosis was recognized; in Gusserow's case the true condition was determined only by the sound. Neither manipulation, by the way, proved detrimental to the pregnancy, but we are convinced that the error in diagnosis could have been avoided by a trial of Hegar's sign of pregnancy.

Engelmann, of St. Louis,<sup>1</sup> too reports two cases in which he mistook a uterine for an extra-uterine pregnancy owing to the great thinness of the uterine walls. Hegar's sign of pregnancy

<sup>1</sup> THE AMERICAN JOURNAL OF OBSTETRICS, December, 1891, p. 1478 et seq. Transactions of the Southern Surgical and Gynecological Association.

was not taken into consideration. One of the cases terminated in abortion after intra-uterine treatment, the other was recognized only after repeated introduction of the sound without interruption of the pregnancy.

It has been pointed out above that there is a drawback to the practical demonstration of Hegar's sign of pregnancy, namely, that occasionally under certain conditions there may be a lesser but still very marked compressibility of the lower uterine segment outside of pregnancy, and that therefore the slighter degrees of this state cannot be looked upon as quite reliable signs of pregnancy. Such a soft state, which is most pronounced immediately above the cervix, is not rarely found in marked retroversions, and especially retroflexions, of the uterus. In these conditions the compressibility may at times be very pronounced, but it never reaches the high degree characteristic of pregnancy, or even so far that one may be led to assume an apparent separation of the cervix from the body.

In cases of abortion we find the consistence and pressure relations of the uterus to vary according to whether the ovum is still entirely retained in the uterus, has passed into the cervix, or has been completely expelled. According to our investigations, however, there is never so high a degree of compressibility, as soon as distinct evidences of abortion are present, as is shown by the lower uterine segment of the pregnant organ when the development of the ovum is undisturbed. With the very inception of the pains the walls of the uterus suffer an evident diminution of their compressibility, so that it is more difficult to crowd the ovum up into the upper portion of the uterine cavity; and, on the other hand, the pressure relations within the uterus may become more unfavorable to a compressibility of the lower segment by an increase in the volume of the uterine contents by reason of an effusion of blood between uterine walls and ovisac. When stronger contractions of the uterine muscle ensue, the internal pressure becomes so great that an upward displacement is no longer possible, even by strong counterpressure upon the walls of the lower segment. But when the ovum has passed into or through the cervix it is generally still possible to recognize a certain softness and compressibility of the lower portion of

the body of the uterus, but it is much less than the compressibility present during pregnancy. When remnants of the ovum or coagula have been retained in the cervix or the lower segment of the body, it is sometimes possible to feel distinctly a displacement of the uterine contents, or else coagula and shreds may be seen to be completely extruded from the uterus under the pressure exerted.

We have also endeavored to inform ourselves as to the relative consistence of the puerperal uterus, and to this end have examined a number of parturients between the tenth and fourteenth days, mostly on the eleventh day, of the puerperium. The results did not exactly correspond, in so far as the compressibility of the puerperal uterine walls was variable. A certain compressibility of course was present in all cases, but sometimes it extended over the whole uterus, and again was restricted to the lower segment; it was slight in a few cases and quite marked in others. But one condition proved to be constant, *i.e.*, the compressibility and softness extended likewise to the cervix uteri. The latter, even when the compressibility of the puerperal uterine walls was very pronounced, appeared never harder; on the contrary, not rarely it was decidedly softer. This constitutes the chief difference in the relative consistence of the pregnant uterus.

Besides the fourteen cases published by Reinl and Compes, we can refer to fifty observations, which form the basis of this paper, in proof of the regular occurrence of the compressibility of the lower uterine segment in the marked and highest degrees characteristic of pregnancy. In all these cases except three the sign was demonstrated in a thorough examination under anesthesia by different observers. But we have not counted among them numerous dispensary cases examined but not controlled by others. In all the other cases the diagnosis was verified by subsequent delivery or abortion, and in but a single case we failed to get further information about the patient.

However, we must call attention to the fact that it is absolutely necessary to exercise due care in trying Hegar's sign of pregnancy, and to avoid as much as possible repeated and long-continued attempts in this direction. Unquestionably it is not impossible that abortion may be caused by oft-

repeated examinations, which, of course, are applicable only for clinical instruction. We have observed this accident three times after several examinations made by students during clinical instruction. In one of these cases, however, irregular losses of blood had occurred previously. In another case a slight loss of blood occurred with drawing pains in the abdomen, though abortion did not ensue. Although in by far the greatest number of cases even prolonged examinations produced no injurious consequences whatever, we have grown very cautious in testing this sign, and endeavor to avoid any oft-repeated examination. Still the practical question arises whether it might not be possible in this way to induce abortion in the most certain and especially the most harmless manner.