

On the cervix uteri in pregnancy / by J. Matthews Duncan.

Contributors

Duncan, J. Matthews 1826-1890.

Publication/Creation

Edinburgh : Murray and Gibb, 1859.

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ON

THE CERVIX UTERI IN PREGNANCY.

BY

J. MATTHEWS DUNCAN, M.D., F.R.C.P.E.,

LECTURER ON MIDWIFERY, ETC.

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THE CERVIX UTERI IN PREGNANCY.


A. MATTHEWS BUNNAN, M.D. F.R.C.P.E.

LECTURER OF MIDWIFERY, &c.

[REPRINTED FROM THE EDINBURGH MEDICAL JOURNAL FOR APRIL 1859.]

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Fig. 1.

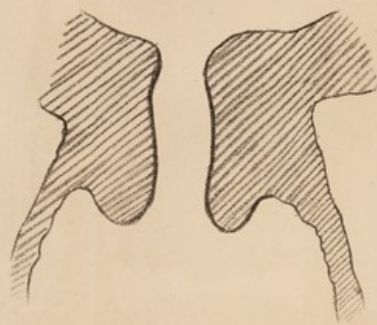


Fig. 2.



Fig. 3.

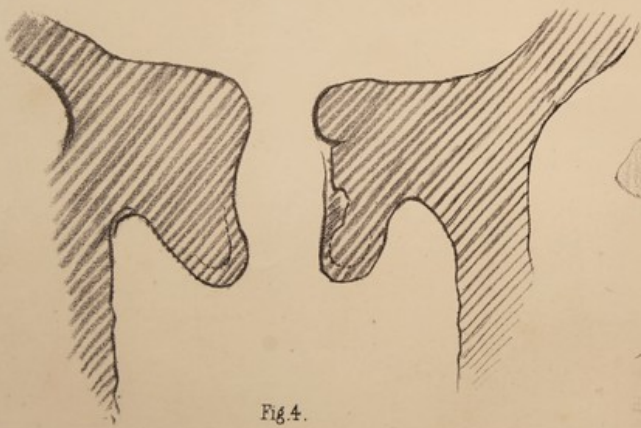


Fig. 4.

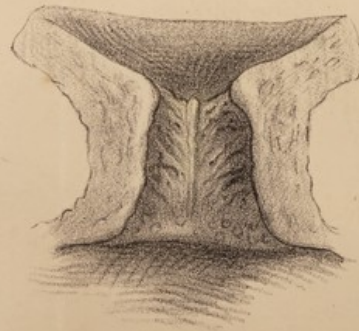


Fig. 6.

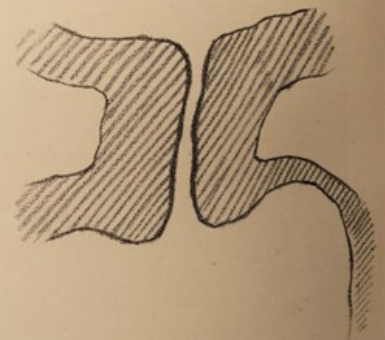


Fig. 5.

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THE condition of the cervix uteri at different periods of pregnancy is a subject not only of great physiological interest, but has also many practical bearings of the highest importance. Of late years there have been published some interesting papers regarding the condition of the surface of the vaginal part of the cervix in pregnancy, as seen through the speculum ; but to these still very imperfect investigations I have no intention now to refer. My remarks will be confined to those conditions of the neck of the womb which have long held a prominent place in the descriptions of pregnancy. Till 1826, these conditions were pretty uniformly described by obstetric writers, as they still are by most in this and other countries. In that year important progress was made by Professor Stoltz of Strasbourg, in a paper which I have unfortunately never seen, but which enunciated views on the practical bearings of this subject much more correct than those generally taught. For the description of these views, I am indebted to the work on Midwifery of M. Cazeaux of Paris. Although a great improvement on pre-existing doctrines, Stoltz's views have made very little progress to general acceptance in the profession, partly, I believe, on account of some imperfections in them, and chiefly because they are founded only on the same imperfect methods of observation as were the source of the doctrines they were intended to supplant. My present object is to inculcate the views of Stoltz with some modifications, and especially so to connect them with actual anatomical observations¹ as to make it

¹ In his excellent work, M. Jacquemier (*Manuel des Accouchements*, p. 178, tome i.) points out this deficiency in Stoltz's arguments, and apparently on that account he retains the old views. After describing Stoltz's views he says:—"Ces observations, de même que celles d'après lesquelles on en admet une autre, n'étant fournies que par le toucher, laissent nécessairement beaucoup à désirer."

imperative on obstetricians to accept them implicitly, or disprove them by other observations as carefully made.

In discussing this subject, I intentionally omit the latter days of the ninth month of pregnancy. During these days, which are included in the full term of utero-gestation, silent and painless labour is often really going on;—I mean, that contractions of the uterus, usually without pain, are effecting the complete obliteration of the cervical canal. Although generally painless, these contractions frequently attract attention, and not rarely cause a degree of suffering. When they do cause pain, they give rise to many of those occasional cases where women describe themselves as having been in labour for many days. It is, therefore, not only convenient, but perhaps, also, physiologically correct, to exclude all this rapid change in the lower part of the uterus produced by contractions from among those conditions of pregnancy which we propose now to discuss.

First proposition.—*The length of the cavity of the cervix uteri undergoes little or no change during pregnancy.*

It is necessary here, first of all, to define what limits we assign to the cervix, whose length we propose to measure. Its superior boundary is made by many to be, in the unimpregnated uterus, the most contracted point separating what are called the cavities of the body and cervix. This purely artificial limit may, in some cases, tally with the natural one we propose, along with the best writers, to adopt; but it is impossible in most unimpregnated uteri to fix it, and in the pregnant uterus it would probably be found to indicate a quite different anatomical point from what it did in the unimpregnated. For the natural limit is the only one observed in pregnancy; the parts above it, and they alone, distending as the ovum grows. It is marked by the anatomical differences of the cervix and body of the womb, and is indicated by the union of the rough rugous surface of the cervix and the smooth surface of the body. The inferior boundary is the margin of the os externum, or the lowest line of the projecting vaginal portion. In advanced pregnancy, when, as may happen, the projecting vaginal portion is obliterated, the inferior limit of the cervix is indicated by the distal margin of the nabothian follicles. The length of the cavity, it will be observed, is here alone considered, as it affords the only means whereby a distinction of cervix from body can be at all effected. On the exterior of the uterus, or in its fibrous structures, there is no indication of difference between these different parts of the organ.

It is not consistent with the scope of my observations to enter at any length into the history of the opinions regarding the length of the neck of the womb in pregnancy that have heretofore been entertained in this and other countries. The old doctrine, taught in recent times by Desormeaux, Gooch, and Montgomery, still retains its place in the most modern midwifery text-books, including those of Ramsbotham, Churchill, and Tyler Smith. Ever since I began to teach midwifery, I have pointed out the erroneous character of

these views, showing that they contained some valuable truths if the sensations acquired by the examining finger were the only criterion, but that, when subjected to a rigid scrutiny, they were found to be entirely erroneous. In this respect, they resembled the popular notion of the sun's course in the heavens, which, although true to the eye, is repudiated by all who wish to be consistent with facts and with nature.

The following extract from the second edition of Dr Montgomery's work on the Signs and Symptoms of Pregnancy, published in 1856 (p. 180), describes clearly the opinion generally received in this country. "It is usual (he says) to state the abbreviation of the cervix by exact proportional parts; and thus, it is said, that during the sixth month, it loses one quarter; that in the seventh, it is only one-half its original length; that in the eighth, only one quarter remains, which, in the ninth month, is reduced to an eighth, which is obliterated before the end of that month. Now, all this may be true in very many cases, and I believe it is so, but we can derive from it little or no practical benefit. Such precision is only available with a uterus in a preparation, or on a dissecting table, but not in the examination of a living woman," etc. To this clear statement of the gradual diminution of length as an anatomical fact, we shall add a few words from the Manual of Obstetrics of Dr Tyler Smith, published in 1858, to show the opinion generally entertained as to the results produced by this shortening. He says (p. 104), "About the fifth month the uterus is found to have risen half way to the umbilicus. It is now that the cervix uteri begins to shorten its cavity, being taken up into the general uterine cavity by a process of development commencing at the junction of the cervix with the body of the organ, and terminating at the os itself."¹

Writing on the internal surface of the uterus after delivery, in 1853 (*British and Foreign Medico-Chirurgical Review* for October, p. 506), I said—"The cervix of the uterus is now known to differ so materially in its anatomy and physiology from its body, that it may with propriety be described as almost a separate organ. The researches of M. Stoltz have been confirmed by numerous authors, and seem to show that the cervix uteri does not become developed, so as to form part of the cavity of the organ, in the way that it was formerly believed to do. More recent researches by anatomists and obstetricians, too numerous to be mentioned, have shown the entire

¹ This theory will be found graphically illustrated in many obstetric works, affording a fine example of the injuriousness, not to speak of the uselessness, of many cuts, which enlarge the bulk and increase the expensiveness of many modern productions. For examples I may refer to the midwifery text-books of Hohl and Braun. The figures themselves, if studied, are found to be so absurd, as to form a refutation of the doctrine they are intended to illustrate. I must add, that the figures of Cazeaux, illustrating the new views, are not well designed.

difference anatomically and structurally, as well as functionally, of the mucous membrane of these two parts."

The opinion of M. Stoltz, as given by Cazeaux, who corroborates it, is that the cervix undergoes, during pregnancy, at least in primiparæ, a decided though slight diminution of length; and that this diminution is produced, not by the enlargement and distension of the cervical cavity from above downwards, but by the approximation to one another of its two extremities, the cavity becoming more markedly fusiform and filled with its ordinary mucous secretion. To the refinements of this description by Stoltz and Cazeaux I cannot assent. For, first of all, a slight diminution, even if admitted to exist, can be of no practical importance, seeing that it cannot in any way be appreciated or measured during life. Second, it can never be verified in any case, as the real length of the true cervix cannot be minutely made out before death, and after death pregnancy cannot occur, to afford us an opportunity of comparing its length then with its length in the unimpregnated state. Third, because there is no standard length of the true cervix yet demonstrated, to afford us a just means of comparison in questions of slight changes.

My own statement, that the length of the cavity of the cervix uteri undergoes little or no change during pregnancy, is founded partly on the results of vaginal examinations, and chiefly on the examination of the uteri of women that have died at different stages of utero-gestation. By means of this last kind of evidence, I hope to dispel the errors which Stoltz has the credit of first assaulting.

In regard to the evidence of vaginal examinations, I can merely make the statement, that when carefully made, they support my proposition. Only it is necessary to take precautions against receiving erroneous impressions. These are, firstly, not to be misled by the frequent apparent obliteration of the vaginal portion of the cervix, that being a cause only of fictitious, not real shortening; secondly, not to mistake contracted dimensions produced by the finger's pressure on a softened cervix for real shortening; and, thirdly, to place no confidence in the impressions conveyed by the finger pushing before it the vaginal reflexion, and feeling the external surface of the part.¹ In addition, I would recommend the investigator to measure the length of the cavity by gently intruding his finger through the external os uteri, as can generally be done in advanced pregnancy, in multiparæ, and frequently in primiparæ also. And I would especially insist on the value of examinations made immediately before labour, when the cervix is extremely softened and largely dilated, and its long lips can be felt surrounding the internal os uteri.

Practitioners are not frequently called upon to make a vaginal examination just before the obliteration of the cervix begins, that

¹ For evidence that this mode of examination was confided in by observers, see the work on pregnancy by Desormeaux and Dubois, *Dict. de Med.*, Tome xiv. p. 364.

is, generally some days before active labour supervenes. But to this general statement cases of placenta prævia form an exception. In them, it is well known that about the full time hemorrhage commences quite unexpectedly. It in fact begins with the commencement of the dilatation of the internal os uteri, that is, with the commencement of the ordinarily painless contractions which precede active labour. If, at this time, examination is made, the cervix will be found quite softened and open inferiorly, but not yet shortened—a circumstance which I might illustrate abundantly by examples from my own experience, and from published records.

The whole history of placenta prævia is inconsistent with the old views in regard to the cervix uteri. For if, after the middle of pregnancy, the neck be opened up and gradually developed from above downwards, hemorrhage ought invariably to occur, and that, to a great extent, before the full term is approached; which is not the case. Besides, there should, in cases that go to the full time, be found an atrophied portion of placenta corresponding with that extensive piece of new uterine wall produced by this supposed opening up of the cervix. With the views of Stoltz, on the other hand, the history of cases of placenta prævia quite accords. For while, in many cases, no bleeding occurs till near the full time, when the internal os uteri must begin to open; in others, the bleedings which occur at intervals before reaching the full time admit of easy explanation. They may be due to the slight opening, to the extent of a line or two, which authors have described as occurring occasionally months before the full time, or to vascular rupture at that unsupported point in the placenta which overhangs the internal os; or they may be produced by the great tendency to miscarriage in placenta prævia—a tendency that is often in vain resisted.

On this subject I will not further enter, but refer to obstetric writers, and especially a recent American author, Mr Read (*American Journal of the Medical Sciences*, April 1858), for sufficient evidence of the extremely unsatisfactory nature of the notions now entertained on the subject. But while Mr Read has done good service in exposing the untenableness of the views now entertained, it is necessary to add that his own theory is, perhaps, the most untenable of all. For we find him supposing that the placenta may attach itself to the lowest part of the cervical portion,—a supposition, I need scarcely say, quite inconsistent with all that is known of placenta prævia.

I have already said, that what is felt in careful vaginal examination is confirmed by the results of dissection. In figures (see plate), I have attempted to show the results of several dissections, and in them will be at once observed a marked uniformity of length of cervix at all periods of pregnancy. In this demonstration I shall do no more than explain the figures just referred to.

Figure 1 is an outline of the cervix of an unimpregnated female, after Farre, the author of the recent admirable article, "Uterus,"

in the *Cyclopædia of Anatomy and Physiology*; an article which, I must add, contains views regarding the subject under discussion somewhat resembling those I have here given.

Figure 2 is an outline of the cervix uteri of a woman dying in the end of the third month of pregnancy. It is taken from the Atlas of M. Coste's work, entitled "*Histoire générale et particulière du développement des corps organisés*," etc.

Figure 3 is an outline of a cervix uteri of about the same period of pregnancy as the last. It is taken from a dissection.

Figure 4 is an outline of the cervix uteri at the beginning of the fifth month, from the twenty-eighth plate of William Hunter's Atlas of the "*Anatomy of the Gravid Uterus*;" a work from which I might have drawn other materials for illustrating the present subject.

Figure 5 is an outline of the cervix uteri beyond the seventh month of pregnancy, from a dissection.

The preceding figures pretend to nothing more than giving outlines of sections of cervixes made in various ways; some of them from old preparations, and without attempting to throw the parts into an attitude resembling what I might conceive to be natural. Some of them represent halves of bisected cervixes, while in others the cervix has been forced open after one vertical incision and then drawn, a circumstance accounting to a certain extent for their differences from one another. But in the next figure I have attempted to give a drawing of all the appearances.

Figure 6 is a drawing of half of the bisected cervix uteri of a woman about the end of the eighth month of pregnancy, from a dissection. In this case, the internal os of the cervix was found open to the extent of somewhat more than a line. Above it the expanded cavity of the uterus was covered by its smooth mucous membrane. Below it began the rugæ of the cervix, having a very characteristic appearance. The external os of the cervix is seen to be widely dilated.

In the uteri which I have examined, or of which I have seen careful drawings, the cervix presents some variety in measured length, the convenient term of an inch being sometimes exceeded, in others not reached; and in a part which is soft, as this, it must be remembered that slight variations in length may be recorded by the same observer, according as the part is placed and handled. In the figures in the lithographic plate adjoined the general length is about an inch.

I have refrained from the appearance of greater exactness, being sorry I cannot pretend to have reached it. I think, however, that it is very desirable that a series of careful and minute measurements of this part be made and recorded.

I satisfy myself with barely announcing the *second proposition*.—*The capacity of the cervical cavity becomes gradually greater as pregnancy advances; and this is effected by an increase of its diameters, or breadth, advancing from below upwards, that is, from the external to the internal os of the cervix.*

As Cazeaux has well pointed out, this order of sequent changes is, in primiparæ, often if not generally perverted, in so far as the external os often remains little increased, while the cavity of the cervix above it is dilated.

I wish to say nothing in regard to asserted changes in the shape of the os uteri, believing that they are more apparent than real.

Third proposition.—*The length of the vaginal portion of the cervix, or the amount of its projection into the vaginal cavity, generally diminishes as the uterus rises into the cavity of the abdomen.*

This is far from being a constant phenomenon of pregnancy. When it does occur, it is one of the causes of that error as to the shortening of the cervix into which accoucheurs generally have been led. It is not very easy to account for it, unless a sufficient explanation is to be found in the elevation of the cervix, when the womb rises into the abdominal cavity, producing a sort of dragging on the vagina, which consequently descends, so as to appear to be inserted close on the margin of the os externum. And there can be no doubt that this change takes place in many instances of elevation of the uterus in disease. The opposite result, also, is well known to be produced by depression of the uterus. And even in early pregnancy, when the uterus is slightly depressed in the pelvis, this change has led Boivin and Filugelli to describe the cervix uteri as really lengthened in these months.

I am unable to apply actual measurements, the best criterion, to this point; and I believe it quite possible that such, when made, may show that this apparent shortening of the vaginal portion of the cervix is merely the result of the increased bulk and roundness combined with softness.

Fourth proposition.—*The softening of the cervix uteri, already commenced superficially during the menstruation preceding conception, continues and extends more deeply into the substance of the cervix as pregnancy advances; and the process is generally completed two or three months before the end of utero-gestation. This softening is accompanied by a considerable increase of bulk.*

As I have, on this head, nothing to add to the observations of others, I deem it a work of supererogation to enlarge upon it.

Fifth proposition.—*In vaginal examinations during life, after the middle of pregnancy, the finger of the obstetrician feels the uterine cervix as if it were gradually shortened according as pregnancy still further advanced.*

This is merely a statement explaining how obstetricians have hitherto so much erred regarding this subject. The error might always have been avoided if care had been taken to estimate the length of the cervical cavity, which, with its mucous membrane, forms the only characteristic part of the cervix. The finger examining without passing into the cervical cavity, is led into error by the softness of the part and its easy compressibility. M. Cazeaux has ascribed the erroneous impressions partly to the finger while feeling the

external surface of the cervix being arrested by the vaginal reflexion. But, in my opinion, this cannot often be the case. For the vagina is, at all periods of pregnancy, sufficiently easily displaced for the purposes of this examination, and the exploring finger is arrested by the tumid uterine body, not by the vagina refusing to be displaced. This is easily understood by a reference to figures 1 and 6. In the former, it will be seen that the external surface of the cervix is nearly parallel to the internal, and has nothing overhanging its upper extremity by which the finger may be opposed; while in the latter, the external surface of the cervix is seen to be at least virtually much shortened by the swelling and distension of the wall of the lower part of the body of the uterus, which also forms a firm obstacle to the upward thrust of the examining finger.

ON
THE CERVIX UTERI IN PREGNANCY.

To the Editor of the Edinburgh Medical Journal.

DEAR SIR,—The accompanying letter contains a good illustration of the state of the cervix uteri at the beginning of the fifth month of pregnancy. Like my own observations, it seems to indicate the occurrence of elongation rather than shortening of the cervix uteri in the early half of utero-gestation.—Yours, etc., J. M. D.

55, NORTH CASTLE STREET, EDINBURGH,
March 16, 1859.

DEAR DR DUNCAN,—I send a tracing [see woodcut] of a draw-



ing made by myself *ad nat.*, from a preparation of the uterus of a young woman, who, in perfect health, destroyed herself by poison when at the beginning of the fifth month of pregnancy. The uterus was taken out entire, and injected by Mr Lane. The drawing is from a section, of course after the injection. The preservation of the cervix and cervical cavity at this stage of gestation is complete.

This being a perfect specimen of healthy gestation in a primipara, I thought you would like to have it, as an illustration of the views in your paper in the March number of the *Edinburgh Medical Journal*.—Believe me yours faithfully,

ROBERT BARNES.

12, FINSBURY SQUARE, LONDON,
March 11, 1859.

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