# NOTES UPON EXPERIMENTAL OBSTETRICS.

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## I.—The Effect of Different Postures of the Pregnant Woman Upon the Antero-posterior Diameter of the Pelvic Inlet and Outlet.

*The True Conjugate.*—The true conjugate can be estimated from the diagonal conjugate by constructing a triangle formed by the two conjugates and the symphysis pubis, of which the diagonal conjugate corresponds nearly to the hypothenuse and the true conjugate to the base. The diagonal conjugate, the

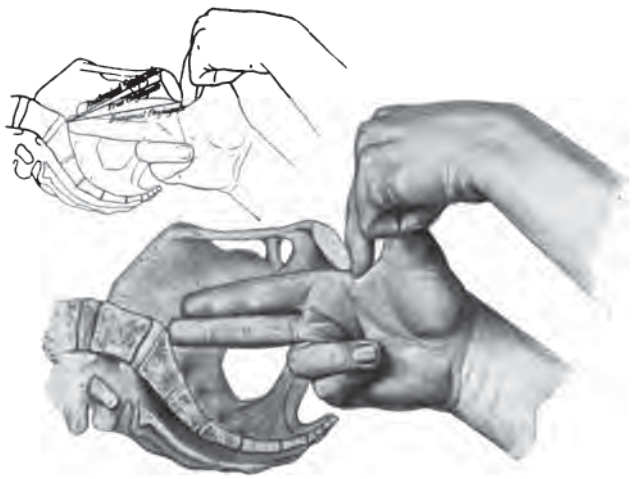

FIG. I.—DIGITAL METHOD OF MEASURING THE DIAGONAL CONJUGATE OF THE PELVIC INLET. (FROM A PHOTOGRAPH.)

known quantity, is the longest of the three sides, and the true conjugate, the unknown quantity, can be obtained from it by subtracting on an average 1 inch (2.5 cm.). The amount to be deducted, however, will vary with the height, thickness and

inclination of the symphysis and the height of the sacral promontory. When the symphysis is 1½ inches (3.75 cm.), or over, ¾ inch (1.905 cm.) should be subtracted from the diagonal conjugate; and when it is less than 1½ inches (3.75 cm.) a little less is to be subtracted. The estimation of the conjugata vera by this plan can only be approximated, since it depends upon so many variable quantities.

By this method it is very common for marked variations in the length of the diagonal conjugate to be found in the same patient by different observers, and in the estimate of the true conjugate we have a further source of inaccuracy (Fig. 1).

Exact pelvimetry demands that the true conjugate shall be measured directly by means of some metal non-flexible instrument that shall eliminate the foregoing sources of error.

Such an instrument is that of Farabeuf.

FIG. 2.—DIRECT INSTRUMENTAL METHOD OF MEASURING THE TRUE CONJUGATE OF THE PELVIC INLET WITH THE FARABEUF PELVIMETER. (FROM A PHOTOGRAPH.)

*True Conjugate with the Farabeuf Pelvimeter.*—This resource was introduced into pelvimetry by Farabeuf for the purpose of lengthening the index finger, in case the accoucheur should be unable to reach the promontory, either by reason of the shortness of his finger, or because of unusual dimensions of the pelvis (Fig. 2). While fingers of average length are sufficient for pelvimetry in contracted pelves, this is by no means necessarily the case in general pelvimetry, and, therefore, the device of Farabeuf is excellent in routine and obstetrical practice. The custom of reinforcing the finger with a vesical sound is open to criticism, from the fact that it may be given a wrong direction;

and a further disadvantage is the absence of a device to indicate the exact position of the symphysis. The thimble-like pelvimeter consists of two delicate steel arms, which are parallel for a short distance, but which then diverge and afteward roughly assume the contour of a tapering forefinger. This frame is provided on its inferior surface with two incomplete rings, designed to fit the first and second phalanges of the exploring finger. The elasticity of the steel arms permits the rings to slip over a finger of any normal dimensions. Attached near the extremity of this steel frame is a delicate horseshoe-shaped piece of steel, which turns in either direction, up or down, and which constitutes the extension to the exploring finger (Fig. 2). The parallel portion of the steel arms also constitutes a groove, along which

FIG. 3.—MEASURING THE HEIGHT AND THICKNESS OF THE SYMPHISIS WITH THE FINGERS.

slides the measuring rod, which is bent at its terminal end into a right angle. This bent portion is intended to enter the urethra in order to abut against the internal aspect of the symphysis. The proximal end is provided with a ring, while the upper surface of the rod has a graduated index (Fig. 2). With this pelvimeter the obstetrical conjugate can be measured directly. The steel arms are introduced against the promontory, followed by the passing of the measuring rod into the bladder (Fig. 2).

Since 1895, whenever opportunity offered, I have been making observations at the Emergency Hospital upon both primiparal and multiparal to determine this point. The ages of patients ranged from 18 to 40 years.

FIG. 4.—DIGITAL METHOD OF MEASURING THE ANTERO-POSTERIOR DIAMETER OF THE PELVIC OUTLET. (FROM A PHOTOGRAPH.)

EXPERIMENTS.

1. The true conjugate was measured with a Farabeuf pelvimeter through the bladder with patients in the dorsal posture and the thighs moderately flexed upon the abdomen.

2. The same measurement was made as in 1, but with the patients' thighs strongly flexed against the abdomen.

3. The true conjugate was measured with a Farabeuf pelvimeter through the bladder with patient in the Walcher posture.

4. The antero-posterior diameter of the pelvic outlet was measured digitally with patients in the dorsal posture and the thighs moderately flexed upon the abdomen.

5. The measurement was made as in 4, but with the thighs strongly flexed upon the abdomen.

6. The antero-posterior diameter of the pelvic outlet was measured digitally with patients in the Walcher posture.

CONCLUSIONS.

1. In the Walcher posture the true conjugate was increased in every case, the variations being from one-fourth to half an inch (0.635 to 1.27 cm.).

I found the greatest gain in muliparæ near full term and under thirty-five years of age.

The smallest gain was in primiparæ near full term and over 30 years of age.

2. The antero-posterior diameter of the pelvic outlet was diminished in all cases by the Walcher posture from ¾ to 1 cm.

3. Moderate flexion of the thighs upon the abdomen does not, in my experience, affect the length of the true conjugate.

4. Strong flexion of the thighs against the abdomen causes a decided lessening of the true conjugate.

5. Moderate flexion of the thighs upon the abdomen does not affect the length of the antero-posterior diameter of the pelvic outlet.

6. Strong flexion of the thighs against the abdomen causes an appreciable increase in the antero-posterior diameter of the pelvic outlet.

7. The difference between the antero-posterior diameter of the pelvic inlet in the dorsal posture as compared with that of the Walcher will depend upon whether the measurement of the former is taken with the thighs moderately or strongly flexed against the abdomen.

The greatest differences I found when the thighs in the dorsal posture were strongly flexed.

In 1898, at the New York Maternity Hospital, I measured several series of cases from among the pregnant waiting women with a Farabeuf pelvimeter in the lithotomy posture with both moderately and strongly flexed thighs, and also in the Walcher posture, and the results do not differ materially from the above.

## II.—Cleidotomy—A Neglected Operation.

Cleidotomy, a division of both clavicles in dead fetuses as a preliminary to delivery of the shoulders, has for its object the diminution of the bisacromial diameter of the fetus.

This simple operation, rarely if ever mentioned in obstetric text-books, has never, in my opinion, taken its proper place in obstetric surgery, as a valuable means of lessening maternal morbidity and mortality.

How often do we witness a difficult extraction of the shoulders in a generally contracted inlet or outlet after the perforation and extraction of the head.

I have seen an hour consumed in the delivery of the shoulders. I have seen the head dragged from the body by the excessive traction.

During the past ten years cases have been admitted to my service at the Emergency Hospital with the head delivered and the shoulders still within the pelvis. These last, however, are usually midwife cases.

As a matter of routine in these cases, I always divide the fetal clavicles, and it is amazing how the diminution of the bisacromial

diameter thus produced renders the subsequent extraction of the fetal shoulders a comparatively easy task, and quickly and completely changes the clinical picture for the better.

FIG. 6.—FETAL CADAVER BEFORE CLEIDOTOMY.

FIG. 7.—FETAL CADAVER AFTER CLEIDOTOMY.

I have resorted to the operation repeatedly at the Emergency Hospital, in cases in which the birth of the head had been accom-

plished by forceps or perforation and cranio-traction, and the shoulders resisted all ordinary methods of extraction.

The operation has its limitations. I have never been able to reduce the bisacromial diameter more than two inches in full-term fetuses. From the measurements I have made at the bedside and from experiments upon six fetal cadavers I find that the reduction in the bisacromial diameter produced by the operating ranges from ¾ of an inch to 2 inches (Figs. 6 and 7).

*Operation.*—For the operation I always use a pair of heavy straight or curved obstetric scissors of the Dubois type, two fingers of one hand being used to guide the blunt points to the middle of each clavicle (Fig. 5).

It is usually necessary to strongly extend or flex laterally the fetal head so as to give room for the use of the scissors (Fig. 5).

FIG. 5.—OPERATION OF CLEIDOTOMY, PERFORMED WITH LONG CURVED SCISSORS.

## III.—Experimental Therapeutics of the Puerperium.

What place have drugs and various non-medicinal agents in hastening the termination of the puerperium as regards lochia and involution and in the prevention of subinvolution?

I have experimented with various drugs and non-medicinal means at the Emergency and New York Maternity Hospitals during the past ten years, and at the Emergency Hospital these experiments were limited to the use of ergot.

The following special printed history blank was used for the recording of the results, and the records were entered upon the

chart by the resident head nurse, but all measurements of the depth of the uterine cavity were made by myself with a blunt-pointed notched uterine sound on the tenth day of puerperium.

The following is the form of the history blank:

CASE No. ....

Name .... Age .... Para .... Birthplace ....

Presentation .... Position .... Month of gestation ....

Labor { *spontaneous or not, duration, complications, full-term or not, cervical, vaginal, and perineal lacerations,* } ....

## PUERPERIUM.

1. Height of uterus above symphysis:
   1st day .... 2d .... 3d .... 4th .... 5th .... 6th .... 7th .... 8th ....
   9th .... 10th .... 11th .... 12th .... 13th .... 14th .... 15th ....
2. Posture in bed { *dorsal, dorsal—elevated, lateral, abdominal, was posture frequently changed?* } ....
3. After-pains { *occurred on what days? duration, intensity, treatment,* } ....
4. How were bladder and rectum emptied? { *catheter, bed-pan, kneeling in bed, commode or vessel out of bed,* } ....
5. What day first sat up in and left bed? { .... .... }
6. Was lactation normal? ....
7. Medication { *drugs, frequency,* } ....
8. Douches { *vaginal—frequency, intra-uterine—frequency,* } ....
9. Lochia { *less than usual, normal quantity, profuse, excessive, ceased on what day?* } ....

## EXAMINATION ON DISCHARGE.

DAY OF PUERPERIUM ....

1. Quantity and character of lochia present { *bloody, rusty, white, none,* } ....
2. Position, sensitiveness, and mobility of uterus? { .... .... }
3. Dilatation at internal os { *closed, admits index readily, index passed with difficulty,* } ....
4. Depth of uterine cavity from external os? ....
5. Did sound cause any bleeding? ....
6. Old and fresh cervical, vaginal and perineal lacerations? { *location, extent, character,* } ....

Remarks ....

*Signed* ....

*Address* ....

*Date* .... 189

At the Emergency Hospital I have experimented only with fluid extract of ergot, given in drachm doses t.i.d., to 9 primiparæ and 11 multiparæ.

Observations were also made upon 18 primiparæ and 14 multiparæ to whom practically no medication was administered, with the exceptions of two drachms of ergot at the completion of the third stage.

The observations appear to show that in the cases in which ergot was given throughout the puerperium, that on the tenth day the lochia was less than in the series in which no medication was used; also that the internal os closed earlier and the depth of the uterine cavity was slightly less.

Although the figures appear to indicate the above, still I am inclined to look upon the results as *entirely negative*.

It is interesting to note, however, that the continued use of ergot during ten days of the puerperium did not interfere with breast-feeding.

I may perhaps be permitted to state here, that since the above experiments were made at the Emergency Hospital I have experimented more extensively at my service at the New York Maternity.

| | No Medication during Puerperium (Ergot 3 ii End Third Stage) 18 Primiparae. | No Medication during Puerperium (Ergot 3 ii End Third Stage). 14 Multiparae. | Ergot throughout Puerperium. (Ergot 3 i t. i. d). 9 Primiparae. | Ergot throughout Puerperium. (Ergot 3 i t. i. d). 11 Multiparae. |
|---|---|---|---|---|
| *Average duration of labor* | 16 hours 44 minutes. | 10 hours 38 minutes. | 14 hours 37 minutes. | 16 hours 1 minute. |
| *Average height of fundus—* | | | | |
| Average height first day | 6.67 inches. | 6.88 inches. | 6.50 inches. | 6.68 inches. |
| " fifth day | 4.29 " | 4.43 " | 5.00 " | 4.15 " |
| " tenth day | | | | |
| *After pains—* | | | | |
| Absent | 100 per cent. | | 100 per cent. | |
| Present | | 75 per cent. | | 70 per cent. |
| *Posture in bed* | Frequent change. | Frequent change. | Frequent change. | Frequent change. |
| Maternal nursing | 100 per cent. | 100 per cent. | 100 per cent. | 100 per cent. |
| Artificial feeding | | | | |
| *Lochia in puerperium—* | | | | |
| Natural | 83.33 per cent. | 75 per cent. | 100 per cent. | 50 per cent. |
| Scant | 10.66 " | 12.50 per cent. | | 37.50 per cent. |
| Profuse | | 12.50 " | | 12.50 " |
| *Vaginal douches* | End third stage. | End third stage. | End third stage. | End third stage. |
| *Medication* | Ergot 3 ii end of third stage. | Ergot 3 ii end of third stage. | Ergot 3 i t. i. d. | Ergot 3 i t. i. d. |
| | | Examination on Tenth Day. | | |
| *Lochia—* | | | | |
| Moderate | | | | 44.44 per cent. |
| Scant | 53.33 per cent. | 80 per cent. | | 11.11 " |
| Absent | 13.33 " | 20 " | 88.88 per cent. | 22.22 " |
| Profuse | 33.33 " | | 11.11 " | 22.22 " |
| *Dilatation of internal os—* | | | | |
| Admits index | 80 per cent. | 81.81 per cent. | 55.55 per cent. | 83.33 per cent. |
| Closed | 20 " | 18.19 " | 44.44 " | 16.16 " |
| *Average depth of uterus* | 3.66 inches. | 3.56 inches. | 2.97 inches. | 3.55 inches. |
| *Bleeding caused by sound—* | | | | |
| None | 6 cases. | 6 cases. | 5 cases. | 2 cases. |
| Slight | 9 cases. | 5 " | 3 " | 6 " |
| Moderate | | | 1 case. | 1 case. |
| *Sensitiveness of uterus—* | | | | |
| Absent | 75 per cent. | 33.33 per cent. | 100 per cent. | 75 per cent. |
| Moderate | 25 " | 66.33 " | | 25 " |

These latter experiments included the administration of quinine throughout the puerperium to 22 primiparæ and to 23 multiparæ; the giving of strychnine for ten to twenty days before and ten after labor to 30 multiparæ; and the administrating of strychnine throughout the puerperium to 48 primiparæ and 54 multiparæ.

I will only say at this time my results here, as at the Emergency Hospital, I consider negative with the exception of those obtained in the use of strychnia.