

THE FREQUENCY OF CONTRACTED PELVES IN BALTIMORE.*

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Five years ago I wrote a short article, entitled *Pelvimetry for the General Practitioner*, in which I endeavored to show that pelvic mensuration was grossly neglected in this country and that our obstetrics suffered severely in consequence.

At the present time, I am glad to say, far more attention is being paid to it, and students generally are taught that it should constitute an important part in the examination of the pregnant and parturient woman.

In the article referred to, after discussing various aspects of the subject and urging that pelvimetry be made an integral part of the first obstetric examination, I stated: "Any one, who will regularly pursue this course, will be amazed to find how many moderately contracted pelves do exist, and will then be able to explain, in a rational way, many difficult cases of transverse or other presentations, which previously he merely turned or delivered by forceps or cranioclast, and whose abnormal presentation or mechanism he ascribed to some freak of nature rather than to a rational and sufficient cause."

Since the opening of the Out-door Obstetrical Department of the Johns Hopkins Hospital, a little more than a year ago, external and internal mensuration of the pelvis has been made an integral part of the examination of every pregnant or parturient woman who applies for aid, and the results have amply substantiated the prediction just quoted.

Up to March 15, 1896, we have collected the measurements of one hundred women, nearly all of whom were examined several times during the course of pregnancy, while a few were examined only at the time of labor. It is to the results of these observations that I desire to direct your attention.

I might say, in passing, that all the women were examined by Dr. Geo. W. Dobbin, the Assistant Resident Obstetrician of the Hospital, but in almost every case mentioned in this article the examination was also controlled by me, so that there is no reason to attribute any of the cases to faulty pelvimetry.

The study of pelvic contraction is of comparatively recent date. Until the sixteenth century, absolutely nothing was known concerning it; it being supposed that the pelvic bones separated during labor, and that any obstacle to the birth of the child was due to resistance offered by the soft parts.

As the first accurate description of the pelvis was given by Vesalius (1514-1564), any idea as to abnormal pelves was impossible before that period. And it was not until after his

death that one of his pupils, Julius Caesar Arantius' (1530-1589), described the first recognized case of contracted pelvis. The teachings of Arantius, however, exerted but little influence, and the earlier uncertainty concerning the normal anatomy of the pelvis continued for many years, and naturally the doctrine of contracted pelvis remained undeveloped.

It appears from a careful perusal of the works of the great Mauriceau¹ that he recognized contracted pelves in only two cases; one of them being the case upon which Hugh Chamberlen attempted to illustrate the advantages of the forceps invented by his uncle, and so ignominiously failed.

It was not until the first part of the eighteenth century that the doctrine of contracted pelvis began to exert any influence upon obstetrical practice, when Heinrich van Deventer,² in his "New Light for Midwives," described the flat and generally contracted pelves, and demonstrated their effect upon the course of labor. Since then the doctrine of contracted pelvis has never been lost sight of, and nearly all the greatest names in obstetrics are associated with its rise and development.

The great Smellie³ played an important part in this regard, and his teachings exerted great influence. It is only necessary to recall the fact that he originated the method of manual mensuration of the diagonal conjugate, and the estimation from it of the length of the conjugata vera, to appreciate the extent of his services.

Baudelocque,⁴ in the latter part of the same century, devoted a great deal of attention to the subject, and it is to him that we are indebted for the first pelvimeter and our knowledge of the importance of the external pelvic measurements.

Stein⁵ was the German who played an important part in developing the subject, and in impressing its importance upon his fellow-countrymen.

Since the introduction of pelvimetry and more accurate knowledge concerning pelvic deformity by Deventer, de la Motte, Smellie, Baudelocque, Stein and others, its importance has steadily increased, and the methods of pelvimetry and our knowledge of contracted pelvis have gradually improved.

To mention in detail the progress in this line would be almost equivalent to writing the history of obstetrics for the past one hundred and fifty years, and we shall therefore only refer to the work of Michealis⁶ and Litzmann,⁷ and then turn from the historical side of the subject. For it is to these two men that we are indebted for perfecting our knowledge upon these lines and making possible the brilliant operative results, of which we are so justly proud.

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Michealis was professor of obstetrics in Kiel from 1843 to 1850, and during those seven years accurately measured the pelvis in one thousand consecutive cases, and found that 72 of them were contracted to 8.75 cm. (3.5 inches) or less in the conjugata vera. This was the first accurate statistical knowledge on the subject, and his results are as valuable to-day as when his book, "Das enge Becken," first appeared in 1851.

Litzmann¹ succeeded Michealis at Kiel and continued the same line of work and soon collected another thousand cases with accurate pelvic measurements, which with Michealis' cases form the basis of our knowledge concerning the frequency of contracted pelvis.

Up to the time of Michealis, the conception as to what constituted a contracted pelvis varied greatly. Many authors considered a pelvis contracted only when it offered an absolute bony obstacle to labor; while others considered the slightest deviation from the normal standard sufficient to justify the employment of the term. Michealis² was the first to suggest a rational terminology, and stated that we should designate as contracted not only those pelvis which directly interfere with the birth of the child by direct mechanical obstruction, but any pelvis which is contracted sufficiently to alter the normal mechanism of labor; all pelvis having a conjugata vera of 8.75 cm. (3.5 inches) or less being designated as contracted.

And Litzmann³ stated: "According to my conception, we must consider the border-line, from which contraction of the pelvis from an obstetrical standpoint begins, as such a degree of shortening of one or more diameters, as under ordinary circumstances (medium size and resistance of child) will exert a direct mechanical, but not necessarily retarding influence upon the course of labor."

He placed the border-line at 9.5 cm. (3.8 inches) for flattened and 10 cm. (4 inches) for generally contracted pelvis, and accordingly found that 14 per cent. of his cases were contracted. Had the same limits been placed upon Michealis' cases he would have observed 13.1 per cent. of contracted pelvis in his series, instead of 7.2 per cent., as he stated.

The limits suggested by Litzmann have been generally adopted, and we usually designate as contracted, flat pelvis having a conjugata vera of less than 9.5 cm. (3.8 inches), while in generally contracted pelvis the limit is placed at 10 cm. (4 inches).

Since the appearance of the statistics of these two observers, many of the German obstetricians have studied their cases in the same manner; and we shall now adduce some of their statistics to illustrate the frequency of contracted pelvis in Germany and its variations in the various clinics. Thus:

Leopold,⁴ in Dresden, 1892-93 (Franke) in 2512 cases, found 24.3 per cent. contracted pelvis.

Schwartz,⁵ in Göttingen, 1862-65, in 463 cases, found 22 per cent. contracted pelvis.

Schwartz, in Marburg, 1859-62, in 501 cases, found 20.3 per cent. contracted pelvis.

Weidenmüller,⁶ in Marburg, 1885-95, in 3214 cases, found 18.1 per cent. contracted pelvis.

Fischl,⁷ in Prag, 1882, in — cases, found 16 per cent. contracted pelvis.

Müller,⁸ in Berne, 1880, in 1177 cases, found 16 per cent. contracted pelvis.

Litzmann,⁹ in Kiel, 1850-57, in 1000 cases, found 14.9 per cent. contracted pelvis.

Michealis,¹⁰ in Kiel, 1843-50, in 1000 cases, found 13.1 per cent. contracted pelvis.

Köttgen,¹¹ in Bonn, 1895, in 2000 cases, found 13.45 per cent. contracted pelvis.

Pfund,¹² in Munich (Winckel), 1885, in 1199 cases, found 9.5 per cent. contracted pelvis.

Schatz,¹³ in Rostock, 1895, in — cases, found 9 per cent. contracted pelvis.

Gönnner,¹⁴ in Basel, 1882, in — cases, found 7.9 per cent. contracted pelvis.

It accordingly appears that from 8 to 24 per cent. of all the women entering the German clinics present more or less pelvic contraction. In other words, every twelfth to every fourth woman has a contracted pelvis.

It is possible that Leopold's figures may be somewhat too high, as they are based in great part upon external measurements alone, and accordingly are not of as great value, as if based upon the results of both external and internal mensuration.

Winckel¹⁵ states that it is safe to say that from 10 to 15 per cent. of the women in Germany present some pelvic contraction, but that only about 5 per cent. are sufficiently contracted to give rise to difficult labors; while Schautz¹⁶ considers that we may assume that every seventh woman will present more or less contraction.

I have been unable to find accurate French statistics to compare with the German, but note that Pinard,¹⁷ in a recent article on symphysiotomy, states that he observed 107 contracted pelvis in his clinic during the year 1895, and as he has a material of about 2000 cases a year, this would correspond to a frequency of about 5 per cent. Out of these 107 cases he performed twenty symphysiotomies, which clearly shows that many of them were seriously contracted.

The statistics just adduced give some idea as to the frequency of contracted pelvis in Germany and France, and it now remains to consider their frequency in this country.

It is generally believed that contracted pelvis are of very rare occurrence in this country, and a casual review of the American text-books would serve to confirm this belief.

Dewees,¹⁸ in his Compendious System of Midwifery, stated that in all his experience he is doubtful if he had met with three cases of contracted pelvis; and this statement concerning their frequency has been very generally accepted and handed down to the present time.

Lusk,¹⁹ in the latest edition of his work, states that all varieties of pelvic deformity may be observed among our foreign-born population, but considers that contracted pelvis exist but rarely in our native-born women.

This appears to be the general opinion, and in a discussion before the New York Obstetrical Society, Fruitnight²⁰ stated that he had observed only 2 contracted pelvis in 1000 labor cases.

All the evidence which has been adduced in support of the rarity of pelvic deformity in this country has been of a very

general character, and I am acquainted with only one author, Reynolds,* who has attempted to study the question from a statistical standpoint. In 1890 he read a paper before the American Gynecological Society** on this subject, and stated that he had observed only 30 contracted pelves in 2227 labor cases which had come under his control in Boston. This would represent a frequency of 1.34 per cent.

He designated as contracted all pelves having a conjugata vera of 8.75 cm. (3.5 in.) or less, when flattened, or 10 cm. (4 ins.) when generally contracted, and stated that they nearly all occurred in foreign-born women, only three or four of the cases occurring in native-born Americans.

From his own confession, it appears that he only measured the pelvis when some obstacle to labor arose which required operative interference, and it is evident that a large proportion of cases thereby escaped observation, as it is well known that the great majority of women with contracted pelves have spontaneous, if slow, labors.

I agree entirely with Winckel,* who says "the publication of Reynolds unfortunately fails to prove anything, because only those cases were measured in which operative interference was necessary. It therefore cannot be claimed that his material was thoroughly worked up," etc. And "so long as it is not demonstrated that rachitis, for example, occurs far more rarely on that side of the ocean than with us, so long as thousands and thousands of pelvic measurements are not adduced, so long will all such statements rest upon a very uncertain foundation."

It is evident that Winckel* has struck the keynote, and not until we are in a position to present series of pelvic measurements from thousands of consecutive labor cases shall we be able to prove or disprove the general statements of the text-books.

There is, however, absolutely no doubt to my mind that they occur far more frequently than is generally supposed.

How many of the men here present have not performed craniotomy after fruitless attempts at forceps or version? How many cases of vesico-vaginal fistula have you observed? No doubt, the vast majority of such cases were due to contracted pelves.

According to the statistics of Zinke,* 213 symphysiotomies were performed throughout the world between 1892 and 1894, and of these, 24, or 11 per cent. were done in the United States. All these operations were rendered necessary by pelvic contraction. And does it not appear strange, if they are of so infrequent occurrence as is generally stated, that we should have performed one-ninth of the symphysiotomies of the world; while the European countries, with their large preponderance of contracted pelves, should have to divide the other eight-ninths among themselves?

It is readily understood, in the absence of routine pelvimetry, how a very large proportion of the moderate degrees of pelvic contraction are overlooked, when we consider the relation which the German statistics show to exist between the number of operative and spontaneous labors occurring in these cases. Thus, Michealis* showed that 71 per cent. of his cases ended spontaneously, Leopold* 69.5 per cent., Gönner* 54 per cent., and Pinard* 72 per cent. In other words, from

one-half to three-fourths of the moderate degrees of pelvic contraction would pass unnoticed, if the pelvis were not measured, unless the obstetrician observed his cases far more accurately than is usually the case.

An article on the frequency of contracted pelvis is hardly the place to point out the effect of the pelvic deformity upon the presentation and position of the child, upon the mechanism of labor or its duration, or upon the prognosis for the mother or child, and we shall, accordingly, pass over this part of the subject, and simply state that a careful examination of the pelvis would reveal in many instances the cause of many abnormal presentations and of many a tedious and difficult spontaneous labor, not to speak of the operative cases.

We now turn from the work of others to our own observations. The routine examination of the pelvis in one hundred consecutive cases has shown us that fifteen of them were abnormal.

In our one hundred cases, we have found one-half as many contracted pelves as did Reynolds* in 2227 cases. This is certainly a remarkable showing; and, while I wish it distinctly understood that I consider that we are dealing with too small a number of cases to be justified in basing statistical conclusions upon them, at the same time it serves to prove that Reynolds has overlooked a large number of cases by the omission of routine pelvimetry, and that contracted pelves are far more frequent with us than is generally supposed, and the reason that they are not discovered more frequently is that they are not looked for.

I have designated as contracted only those pelves which presented an oblique conjugata of 11 cm. (4.4 in.) or less, and which correspond to a conjugata vera estimated at 9 cm. or less (3.6 in.)—in other words, only pelves whose conjugata vera is shortened 2 cm. (0.8 in.) or more. In two instances I have departed from this rule and have considered as contracted one pelvis having a conjugata vera of 9.75 cm. (3.9 in.), and another of 9.5 cm. (3.8 in.), for the reason that they both gave rise to difficult labors, necessitating in the one case a difficult breech extraction, and in the other the application of high forceps.

When we analyze our cases according to the variety of deformity presented, we find that we have to deal with:

- four rachitic flat pelves,
- four simple flat pelves,
- five generally contracted pelves,
- one coxalgic oblique pelvis,
- one transversely contracted pelvis of a male type.

It is usually stated by most American authors that the great majority of contracted pelves, which are observed in hospital practice, occur in foreign-born women, while only a small proportion are observed in the native-born.

When we consider our material from this point of view, we find that seven cases occurred in negroes and eight cases in white women.

Of the eight white women, four were native-born, two were German, one Bohemian and one Irish. These figures certainly do not bear out this statement, as they clearly show that eleven of our fifteen cases occurred in native-born Americans.

It is also of interest to consider how the several varieties of deformity are divided among the various nationalities.

We find that our seven blacks presented three generally contracted pelvis, two rachitic and two simple flat pelvis.

Of our four native-born whites, two presented simple flat pelvis, one a flat rachitic and one a coxalgic oblique pelvis.

One of the two Germans presented a generally contracted pelvis, and the other a transversely contracted pelvis which conformed to the male type.

The Bohemian had a generally contracted, and the Irish woman a flat rachitic pelvis.

No doubt, to most of you, the data just adduced possess only a purely scientific interest, and we shall therefore turn to the more practical consideration of the effect of the contracted pelvis upon the course of labor.

Two of the pelvis considered in this paper belong to women who have not yet been confined, but it may be of interest to consider the history of their past labors. The first case is a colored secundigravida, with a generally contracted pelvis, whose previous labor was very slow and was terminated by the forceps delivery of a dead child. And the other case is a German who has had two children. She has a transversely contracted pelvis of the male type, very deep, with a very high symphysis pubis, lateral contraction of the pelvic outlet, the distance between the ischial tuberosities being about 8 cm., and the conjugata vera 8.5 cm. (3.4 in.), both her previous labors having been terminated by craniotomy.

It is apparent that the pelvic contraction in these two cases is quite marked, and played an important part in the production of the fetal mortality in the previous labors.

Of the thirteen cases which have already been delivered, seven were delivered spontaneously, while six necessitated operative interference.

Five of the seven spontaneous cases were delivered at full term of live children. The sixth spontaneous case was a syphilitic colored primipara, with a flat rachitic pelvis, conjugata vera 8 cm. (3.2 in.), who was delivered at the eighth month of a macerated syphilitic fetus; while the seventh case resulted in an abortion at the sixth month. This was an Irish woman, pregnant for the third time. Both her previous labors had resulted in dead children after tedious forceps operations, the last delivery resulting in a complete perineal tear and a large vesico-vaginal fistula, which were repaired at the Johns Hopkins Hospital. This case was spontaneous only because of the abortion, and the probabilities are, had she gone on to full term, that she would have required a symphysiotomy.

The six cases which required operative interference were delivered as follows:

- four by high forceps,
- one by craniotomy on dead child, and
- one by a difficult breech extraction.

No one can hear these somewhat dry statistical statements without being convinced of the very important part played by the pelvic deformity in the cases before us.

It is evident that the deformity alone, or the abnormalities in the mechanism of labor produced by it, were the direct cause of the various operative procedures which we have just men-

tioned, or of the fetal mortality in the previous labors of the women who have not yet been confined.

Who, after hearing these results, can say that the study of moderate degrees of pelvic contraction is not worthy of far more consideration and investigation than are accorded them by most of us?

I believe that I have made it evident that pelvic contraction is of far more frequent occurrence than is generally believed, and that it is the cause, directly or indirectly, of a large proportion of the obstetrical operations which we are called upon to perform.

Does it not then behoove us to be on the lookout for it, and prepared to recognize it before the onset of labor, so that we may be prepared in advance for the eventual forceps or version, and in rare cases for the more serious operations of symphysiotomy and Caesarian section?

This necessitates the careful and routine examination of every pregnant woman before the onset of labor, when we should map out the presentation and position of the fetus and carefully study the form and size of the pelvis.

It is not until this is done that we are doing anything like our full duty by our patients, and if I have succeeded in impressing the importance of the systematic examination of pregnant women, including pelvimetry, upon a single man here, I shall feel amply repaid for the preparation of this paper.

Dohrn¹ stated some years ago, "that the physician who does not measure the pelvis is comparable to one who diagnoses heart and lung troubles without the aid of auscultation and percussion"; and I can only indorse his statement. At the same time I do not wish to be understood as advocating pelvimetry as the *summum bonum* of obstetrics. I have just shown you its importance, but unfortunately its practical teachings are not absolute.

The birth of the child is dependent not only on the size of the pelvis, which we can determine with reasonable accuracy, but also upon the size of the child's head, its compressibility and adaptability, and the character of the labor pains, which unfortunately we can only approximate, but never determine absolutely in the concrete case.

Therefore, in moderate degrees of pelvic contraction, pelvimetry does not give all the information we desire. And with pelvis of the same size, we sometimes find that one patient is delivered spontaneously, while with the next we are obliged to resort to operative interference.

These considerations, however, do not absolve us from the necessity of pelvic mensuration; they only teach us its limitations and enable us to comprehend the more fully the many factors which should be considered by the conscientious accoucheur.

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