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THE OCCIPITO-POSTERIOR POSITIONS OF THE VERTEX AND THEIR COMPLICATIONS *

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In opening this discussion on the occipito-posterior positions of the vertex it is necessary to define and limit the conditions about which we are to speak. For the purpose of promoting a useful discussion I propose that we should consider the case of the patient at or about full term, in whom labour is unduly protracted, and in whom the foetal head presents with the occiput in some position other than the anterior or antero-lateral. By choosing this definition we shall include the common occipito-lateral position, which, if it persists until the head is driven low into the pelvis, may give rise to serious difficulty, and is then often spoken of as "deep transverse arrest" of the head.

Ere confining myself to the above limitations, subsequent discussion may be clarified if a few words are said regarding ante-natal examination. Different authorities give widely differing estimates of the frequency of the occipito-posterior position in the ante-natal clinic. I believe that the reason for this discrepancy lies in the fact that in the majority of women the occiput, before labour, points directly laterally, or lies within a few degrees of this position. If the custom is observed of classifying the position according to one of four possibilities, it becomes a personal matter whether such cases are classified as "anterior" or "posterior." Here I would make a plea for the freer use of the terms "L.O.L." and "R.O.L.," which more accurately describe the position in question.

Not till labour starts does the head usually come to lie in one or other oblique diameter of the pelvis; normally the occiput rotates forward, much more rarely it rotates backwards, and in exceptional circumstances it may even come to lie in the hollow of the sacrum. It is convenient here to say that I view with much misgiving the habit which seems to be arising of trusting to abdominal examination to determine the position of the foetal head. Such examination may give fairly reliable information in the ante-natal clinic, but it becomes increasingly inaccurate as labour advances and the head sinks into the pelvis. Moreover, it is sometimes mere guesswork to diagnose the position of the foetal head from palpation of the body. I have seen a patient in whom the foetal occiput was situated well within the posterior half of the pelvis while the foetal back was still distinctly anterior;

and x-ray examination has also shown many instances of pronounced rotation of the foetal head on the neck. Attempts to "divine" the position of the head are dangerous, and in dealing with a patient whose labour is unduly protracted a thorough vaginal examination is essential, and nothing short of this can give the required information. I shall refer to this matter again later.

Frequency of Persistent Occipito-posterior Position of the Head

It is common knowledge that the great majority of posteriorly placed heads rotate to the front during labour, and that a spontaneous delivery is the rule rather than the exception; we have here to discuss the case in which rotation does not occur and in which the labour is unduly prolonged. Although such cases form but a small proportion of the whole they constitute a major problem in obstetrics. At a meeting of this Section in 1928 Dr. Douglas Miller read a paper on "Unsuccessful Forceps Cases," and presented an analysis of statistics gathered from various maternity hospitals which showed that the occipito-posterior position of the head—usually undiagnosed—was associated with nearly one-third of the total number of cases. Had the "rachitic areas" of the country been excluded from this analysis the proportion would doubtless have been even higher.

Cause of Dystocia

The increased difficulty of labour associated with a posterior position of the occiput is usually ascribed to a larger diameter of the foetal head being forced through the pelvis. No doubt there is truth in this belief, but I confess that the more I study the actual foetus after delivery in such cases the less impressed am I with this explanation. The real cause of the difficulty is, I believe, a simple one, and is essentially a maladjustment of the shape of the foetus to the shape of the birth canal. The baby after birth lies with the long axis of the head at an angle to the long axis of the body. In other words, the foetal contour is sharply angled or curved. The birth canal through which this foetus is forced is also sharply bent at the lower end, and it is only when the two curves coincide (as in the occipito-anterior case) that easy delivery results. To use an analogy, if I force my foot and leg (which are angled to each other at the ankle) through a tall Wellington boot (which is also curved at the ankle)

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my foot will slip into position only if the two angles or curves coincide. Were I to attempt to thrust my foot down backwards, progress would be arrested at the ankle of the foot, and if great force were used either my foot would be sorely bruised or the foot would be ruptured. If, however, I now use skill and carefully rotate my foot round to the normal position, I am able to push my foot with ease to the bottom of the foot. Essentially similar mechanical difficulties arise in the birth canal when the head descends with the occiput directed posteriorly. This conception introduces the theory of the unequal foetal flexibilities, which I have fully discussed elsewhere (1932).

"Face-to-pubes" Delivery

It is true that delivery can sometimes be accomplished with surprising ease when the foetus lies with the face directed towards the pubes, but usually in such cases the mother's pelvis is abnormally large (a fairly common finding) or the foetus is small. Occasionally, too, delivery is facilitated by a lax or absent perineum, which results in a virtual abolition of the normal curve of the birth canal. To quote such cases as an argument against the need for rotation of a posteriorly placed head in obstructed labour is to my mind false reasoning. I am aware that at least one school of midwifery holds views to the contrary, but I maintain that while a foetus *may* be born without difficulty in the face-to-pubes position, it is certain that delivery can be still more easily accomplished if the occiput is directed anteriorly; and when in addition the relative sizes of the foetus and pelvis are such that there is likely to be slight dystocia, then the added handicap of the occipito-posterior position becomes a serious matter, and is not infrequently the cause of complete obstruction to delivery.

These remarks are commonplace, and must seem superfluous to anyone who, after unsuccessfully attempting to deliver the foetus in the posterior position, has rotated the head and reapplied the forceps correctly; for the ease with which delivery can then be accomplished is often astonishing, and cannot fail to make a lasting impression on the operator. Yet all too often one hears excuses made for omitting to rotate the posteriorly placed head as a preliminary to forceps delivery. I believe that reluctance to perform this simple operation is due to the prevalence of a false idea regarding its supposed difficulty, which in turn finds origin in the fact that details of the correct manoeuvres are seldom taught to, and are still more rarely learned by, the average undergraduate student.

Recently some new light has been thrown on the problems of the mechanics of labour by the use of radiological methods of study. Some years ago Thoms (1933) of the Yale Medical School drew attention to the frequency with which occipito-posterior positions of the foetus are associated with the dolichopellic pelvis—that is, the pelvis in which the antero-posterior exceeds the transverse measurement of the brim. More recently Caldwell, Moloy, and D'Esopo (1935, 1936) of the Sloane Hospital for Women, New York, using advanced methods of x-ray study, have confirmed this finding, and in a personal communication expressed the view that in certain types of pelves delivery can be more easily accomplished if the foetal head lies with the occiput in the posterior position. I respect the opinion of these workers and look forward with eagerness to their further contributions to obstetrics, but it is only right to say that the evidence so far presented by the latter group is not likely to lead to the general acceptance of the last-mentioned claim. In any event such pelves are extremely rare, and their detection

requires the use of x-ray pelvimetry; in the meantime it therefore seems unwise to complicate obstetrical teaching on this simple issue in order that the very exceptional case may be treated by methods of as yet unproved superiority.

Cause of Non-rotation of Head

Non-rotation or malrotation of the foetal head may result from several causes. I have already mentioned three—a large pelvis, a small foetus, and a deficient perineum. In such cases there is usually an easy delivery. Certain unusual postures of the foetus *in utero* or an increased inclination of the pelvis may both, in my opinion, favour a posterior lie of the head and hinder its forward rotation. A poorly flexed foetal head is another important cause of non-rotation. In such a case the long axis of the head is no longer set at an angle to the long axis of the body; the forces which normally bring about rotation are therefore not evoked, and obstruction may result.

Still more serious are the cases in which non-rotation of the head is a manifestation of some other abnormality. Not infrequently persistence of the posterior position is associated with a mild degree of pelvic contraction which delays or prevents the head from reaching the lower pelvis and reacting to the curve of the birth canal. Serious obstetrical difficulties may then arise, for the combination of abnormalities is far more difficult to deal with than either taken separately. Similarly, in the occipito-posterior case there is often an early escape of liquor amnii, and this, together with the prolonged labour, favours abnormal retraction and moulding of the uterine muscle around the foetal neck—the so-called contraction ring of the uterus. This condition is by no means unusual, and should always be looked for if difficulty is encountered in rotating the foetus. Speaking from my own experience, I have no qualms in dealing with the uncomplicated posteriorly placed head, but I dread a narrowing of the lower pelvis or a contraction ring of the uterus, of both of which conditions the persistence of the posterior position of the occiput is sometimes merely the token.

Danger to Mother and Foetus

The increased danger associated with non-rotation of the head is strikingly shown by a table which I borrow from Douglas Miller's excellent paper on the subject (1930). The foetal mortality is deplorably high, yet, especially with regard to cases in which the child is forcibly extracted in the face-to-pubes position, the danger is actually underestimated, for many infants die in the first days of life or suffer from injuries of a non-fatal variety. The forceps blades do not take a kindly hold of the posteriorly placed head: they are difficult to lock, and they easily slip, causing serious injury to the vagina. Extraction is almost impossible without rupture of the perineum, and the tear may easily extend into the rectum.

Table showing Danger associated with Non-rotation of the Head (after Miller)

					Termination	
					Spontaneous Forward Rotation	Failure to Rotate
Maternal mortality	..	..	..	..	Nil	2.0%
Foetal mortality	..	..	..	..	2.7%	22.3%
Puerperal morbidity	..	..	..	..	6.5%	22.3%

It is perhaps not sufficiently realized that the majority of babies which die during forceps extraction are killed because the forceps blades are wrongly applied, the operator having omitted the preliminary step of rotating the occiput completely to the front. It would be an exaggeration to say that injuries such as facial paralysis and tentorial tears never occur when the blades are correctly applied over each maxilla, but I believe that such a statement would not depart far from the truth. It is always instructive to examine the baby's head after forceps delivery; too often the tell-tale marks make it disappointingly evident that the blades have been applied, not to the robust maxillae, but to the yielding brow and occipito-mastoid region; and from this fact one may deduce that dangerous compression of the cranial vault has taken place. It is not always easy to rotate completely the head which is in "deep transverse arrest," but with practice this manœuvre is usually successful, and by its accomplishment the chances of safe delivery of the foetus are greatly improved.

The Course of Labour and Diagnosis

I shall not do more than touch on diagnosis. Late engagement of the head and early rupture of the membranes in the absence of disproportion between the head and pelvis is an ominous sign. A foetal heart heard far out on the flank, or more especially one heard faintly over a wide area of lower abdomen, may help in diagnosis but must not be relied on.

The character of the uterine contractions is often peculiar. They are short, painful, and unaccompanied by bearing-down effort. It might be supposed that such ineffective contractions are the primary abnormality and the cause of the slow advance of the foetus, but I tend to the view that when the head descends into the occipito-posterior position the vagina is not evenly distended, and consequently the reflex which normally augments contractions and compels the patient to bear down is not evoked. I am always suspicious of the patient who, although she has started labour well, has made little or no advance over several hours, and about whom the nurse in charge querulously exclaims, "If only she would use her pains!" Such a patient should be carefully examined, and not infrequently it will be found that the foetal head has remained unrotated in the occipito-posterior position.

I have already referred to the frequency with which non-rotation of the head is associated with obstructed labour, yet in spite of the commonness of the condition many of these cases remain undiagnosed until too late. The chief reason for this is that the suture lines are obscured by an oedematous scalp; it is only by passing the fingers to a higher level and feeling the foetal ear that a certain diagnosis can be made. To do this an anaesthetic is necessary, and the whole hand suitably lubricated must be gently inserted into the vagina. Such an examination should always precede forceps delivery in any case of doubt. That grand old man of obstetrics Sir Halliday Croom used to speak of this procedure as the "trump card" of obstetrics. I cannot do better than end with his famous words, "Gentlemen, gentlemen, I pray beg each one of you, *when in doubt play trumps.*"

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INTERRUPTION OF EARLY PREGNANCY BY MEANS OF ORALLY ACTIVE OESTROGENS

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It was found many years ago that the injection of oestrogenic extracts after mating interfered with the establishment of pregnancy (Smith, 1926; Parkes and Bellerby, 1926), and subsequent work, including numerous experiments carried out with pure hormone substances, has amply confirmed this observation. Small doses of an oestrogen prevent the ova of mice from passing down the tube (Burdick and Pincus, 1935), while larger doses cause abnormal acceleration of transit (Burdick and Whitney, 1937). Both types of disturbance cause death of the blastocyst. In the rabbit the cleavage rate of the egg is not affected by the injection of oestrone after ovulation, but the embryos die; the maximum sensitivity to oestrone is on the third and fourth days after mating (Pincus and Kirsch, 1936; Pincus, 1936, may be consulted for further discussion).

The prevention of progestational changes in the uterus of the rabbit after ovulation, by injection of oestrogenic hormones, has been extensively studied by Courrier and his co-workers. Adequate doses of oestrone given in the early stages of the luteal phase will suppress endometrial proliferation and prevent implantation of the egg. The administration of oestrone after implantation has taken place causes death of the embryo. The rabbit is very sensitive up to the fourth day after mating, less so on the fifth and sixth, and more so again at the twelfth (Courrier and Kehl, 1932; Courrier and Reynaud, 1933, 1934).

The action of oestrone in inhibiting progestational changes in the uterus is well shown, and can be quantitatively assessed, by experiments on immature or ovariectomized test animals sensitized with oestrone and then injected simultaneously with progesterone and varying amounts of oestrone (Hisaw and Leonard, 1930; Allen, 1932; Robson, 1936; Zuckerman, 1937).

In view of these facts it is clearly of the greatest importance to know whether oral administration of oestrogens can be made effective enough to prevent or disturb implantation of the blastocyst. Recently a new derivative of oestradiol has been prepared by Inhoffen and Hohlweg (1938). This substance, ethinyl oestradiol, is reported to be seventeen times as active by mouth as oestradiol (Inhoffen, Logemann, Hohlweg, and Serini, 1938). Further, the new synthetic oestrogen, diethylstilboestrol, prepared by Dodds, Golberg, Lawson, and Robinson (1938), the biological properties of which have been described by Dodds, Lawson, and Noble (1938), is reported to be highly active by mouth. The capacity of these two substances, given orally, to suppress the progestational action of progesterone and to prevent the establishment of pregnancy has therefore been investigated.

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