CLINICAL ASPECTS OF PROLONGED PREGNANCY

BY

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The average duration of pregnancy in the human is 281 days, but it is customary to allow a lapse of a further 14 days, making 295 in all, before pregnancy is regarded as prolonged. The incidence of prolonged pregnancy is hard to determine, firstly because figures are obtainable only for hospital confinement, and in this country at least hospital confinement is usually the end-result of a process of selection, so that hospital figures do not represent the overall picture for the country as a whole. Broadly speaking, however, the incidence is probably of the order of 3%, and in most hospital reports post-maturity or prolonged pregnancy constitutes the second commonest indication for surgical induction of labour, the commonest, of course, being pre-eclamptic toxæmia.

Significance of Prolonged Pregnancy

It is still denied in some quarters that prolonged pregnancy is of any significance, but the consensus of opinion at present is that it constitutes a distinct hazard to the foetus, and this opinion is strongly supported by the findings of the Perinatal Mortality Survey by the National Birthday Trust. This hazard may arise in two ways. Firstly, if the placenta is a good one with ample reserves the baby continues to grow during the extra week or two of pregnancy and disproportion may ensue, often associated, too, with uterine dysfunction (Ballantyne and Browne, 1922; Clayton, 1941; and others). Secondly, there appears to be a limit to the useful life of the placenta, and when this is reached the baby at first ceases to grow, then suffers increasingly from placental insufficiency, and finally dies from anoxia. The appearance of the child in such cases has been described by Ballantyne (1902) and more recently by Clifford (1957). The child may be large, though it may be of normal size or even smaller than average. The skin is devoid of lanugo hairs and is cracked and desquamating. It is often stained with meconium, as is the cord. The skull tends to be harder than usual, and ossification as demonstrated by x-ray examination is well advanced.

If the child is stillborn the post-mortem findings are those of anoxia—that is, multiple petechial haemorrhages throughout the whole body—and very often of inhaled liquor and meconium, and pneumonia. In these cases the placenta may appear to be extensively infarcted, or may seem relatively normal, though minute gritty calcium deposits are palpable throughout its substance and x-ray examination before labour may demonstrate the placenta by virtue of its calcification. If neonatal death occurs, this is due to asphyxia or intranatal pneumonia or to birth trauma.

Placental Insufficiency

Work recently carried out in my department at Hammersmith by Elliott and Inman (1961) has shown that after 37 weeks the volume of the liquor, which at that

time reaches its maximum of about 1,200 ml., diminishes steadily, until by 43 weeks there may be only 100 ml. of liquor altogether. Most clinicians will agree that when the membranes rupture in a case of prolonged pregnancy the liquor is often extremely scanty, and what there is is deeply stained with meconium. Elliott and Inman showed that by 42 weeks the volume of the liquor had fallen to about 200 to 300 ml. The maternal weight, which has been steadily increasing throughout pregnancy, often diminishes after 40 weeks, and clinically I am accustomed to regard a fall in weight, in the absence of other reasons for it, as an indication of placental insufficiency so commonly associated with prolonged pregnancy. These changes occur also and at an earlier stage in pregnancy in the chronic hypertensive and the pre-eclamptic woman (in the absence of oedema), and constitute in my opinion good clinical evidence of placental insufficiency.

Dixon (1961) has carried out biopsies of the placental bed at caesarean section in prolonged pregnancy and has shown that there is a marked spasm of the arterioles supplying the chorio-decidual space, and decidual necrosis. My own work (which is now some years old) (Browne, 1954) suggested that there was a disturbance in maternal circulation to the placenta, suggesting an acceleration of the blood flow, which may be regarded I suppose as a compensatory mechanism on the part of the mother in an attempt to maintain, in spite of placental degeneration, the vital foetal oxygen supply. Except for the acceleration of blood flow, these changes may be found at a much earlier stage, say 37 weeks, in the presence of hypertension, whether it be pre-eclamptic or essential in nature. Here the placental blood flow is diminished (Browne and Veall, 1953), the volume of the liquor is decreased, there is maternal loss of weight, and, finally, foetal death *in utero*, with post-mortem signs of anoxia.

Prolonged pregnancy then is accompanied by evidence of placental insufficiency similar to that found at an earlier stage in pre-eclampsia and essential hypertension.

Correctness of Dates

How should we deal with this problem of prolonged pregnancy? First, we must be certain that the diagnosis is correct. It is important in my opinion to determine as early as possible in the pregnancy whether the menstrual dates are correct, and I would emphasize that one of the chief reasons for early booking is to enable an accurate assessment of the correctness of the dates to be achieved. An error in the dates is usually of the order of a month, a decidual bleeding having been mistaken for a period, or a woman having missed a period before becoming pregnant. A woman seen at any time between 6 and 12 weeks has a uterus which in size is characteristic of the duration of pregnancy—for example, there is little possibility of confusing on bimanual examination the size of the uterus at 6 weeks with that of a 10 weeks' pregnancy, nor of confusing an 8 weeks' pregnancy with a 12 weeks' pregnancy. After 20 weeks the apparent size of the uterus depends so much on the amount of liquor, the size of the baby, the amount of abdominal fat in the mother, her height and build, and so on, that it is impossible to form an accurate opinion of the dates in the woman who is first seen in the latter half of pregnancy.

The time of occurrence of foetal movements is also of some help. The primigravida will notice movements

between 20 and 22 weeks, and the multigravida between 16 and 18 weeks. If she only recognizes movements a month later than she should, this suggests that the dates are wrong. This is by no means an accurate method of checking, but it may be useful confirmatory evidence. If there is still doubt an x-ray film taken at about 36 weeks is of value. At this time the epiphysis at the lower end of the femur should be clearly visible, and that at the upper end of the tibia may be faintly seen. If it is not visible it suggests that the dates are wrong. The measurement of abdominal girth may also be helpful. At 36 weeks it is usually 36 in. (91 cm.), and at 40 weeks 40 in. (101.5 cm.). I do not think that taking up of the cervix is necessarily a sign of maturity. This may well occur if premature labour is imminent; and, conversely, in some cases of undoubtedly prolonged pregnancy even at 44 weeks the cervix may not be taken up. I am sure that it is wrong to say that a pregnancy is not prolonged simply because the cervix is not taken up.

Regular antenatal weighing is of considerable help. It has been fashionable for some years to regard an excessive gain in weight as evidence of incipient pre-eclamptic toxæmia. The value of this is somewhat equivocal, but undoubtedly the woman who loses weight at or about term should be considered seriously as a problem of placental insufficiency; and when the pregnancy according to the menstrual dates is prolonged, loss of weight is clinically highly significant. The woman who has had proper antenatal care from an early date in pregnancy should reach term with the certainty on the part of her attendant that her dates are correct, or with a necessary correction already made—all the evidence of menstrual history, size of the uterus in early pregnancy, the time of first feeling foetal movements, and so on, and if necessary x-ray examination at about 36 weeks, having been weighed, and a decision having been reached—before ever she reaches term—that she is due on such and such a date. Term in these cases is often marked by a "false labour." If she passes this date by two weeks, or sooner if she starts to lose weight, I firmly believe that surgical induction of labour is indicated.

Surgical Induction of Labour

In certain selected cases, that of the elderly primigravida, for instance, elective caesarean section may be preferable. In general, the woman should not be allowed to go more than about two weeks past her dates. If there is any suggestion of hypertension or pre-eclamptic toxæmia, or if the woman is over 30, it is best to induce labour by the end of 41 weeks at the latest, and often earlier. On the other hand, if a woman is para-1 or para-2 and is young, say under 30, she can often be left safely to go as far as 43 weeks provided that no toxæmia develops, and there is no loss of weight. As I pointed out in 1954 (Browne, 1954), the combination of prolonged pregnancy and toxæmia or hypertension is particularly lethal to the baby. Many of these women will respond perfectly satisfactorily to simple induction of labour, by which I mean castor oil, an enema, and a warm bath. This should, however, be followed within 24 hours by surgical induction of labour if labour has not already started. If the liquor is scanty, thick, and meconium-stained, a 15-minute count should be made of the foetal heart. Moreover, even if there is plenty of liquor, if the surgical induction of labour does not succeed within 48 to 72 hours caesarean section

should be undertaken without hesitation. Hesitation means that the indication for surgical induction of labour was not a sound one, and should never have been done. From a clinical point of view one of the most useful objective assessments is the maternal weight. If the woman is losing weight the foetus is in danger, and should be delivered.

Is the hazard of surgical induction of labour as Gibberd (1958) has suggested greater than that of post-maturity? Thirty years ago this was true, but not to-day. In any case the tremendous reduction in this country in perinatal mortality due to such things as eclamptic convulsions, placenta praevia, neonatal infections, etc., in the past 30 years has uncovered prolonged pregnancy as a considerable foetal risk, and makes it imperative that we should not flinch from performing an operation that, properly carried out, now carries but little risk to the life or health of mother or child.

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DANGER OF SUXAMETHONIUM AND ENDOTRACHEAL INTUBATION IN ANAESTHESIA FOR BURNS

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The problems of anaesthesia for burns have been well reviewed by Middleton (1957), Shannon (1957), and Middleton and Wolfson (1958). It has been stated (Middleton, 1957) that anaesthesia should provide a considerable degree of analgesia and a light plane of narcosis to produce rapid awakening at the termination of the operative procedure. These broad principles would be accepted by all anaesthetists, but controversy still exists over the technique and agents of choice. Intubation is often required to ensure full control of the airway. Middleton (1957) strongly advocates endotracheal anaesthesia, and in a series of 502 anaesthetics 497 were intubated, though 3 cases developed severe laryngotracheitis necessitating tracheostomy. It has been suggested that the patient should be intubated using either cyclopropane (Middleton, 1957) or suxamethonium (Middleton and Wolfson, 1958). The danger of intubation in cases of burns is apparent from several reports (Moncrief, 1958; Masters, Hansen, and Robinson, 1959; Finer and Nylén, 1959; Forrest, 1959;