INDUCTION OF LABOUR AND TRIAL LABOUR.

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It is well that from time to time we should re-examine our accepted ideas and methods in clinical medicine. In most cases we work on the basis of temporarily accepted hypotheses until such time as more evidence is available, either for confirming or destroying these theories. There are relatively few conclusions which are manifestly final, beyond which there can be no advance.

While, for example, the treatment available for a simple inguinal hernia has probably reached finality and is beyond further serious discussion, completely satisfactory curative treatments for most conditions may not be the ultimate that is attainable. Hysterectomy for multiple fibroids causing anæmia is, for certain patients, unquestioned as a satisfactory treatment, but this is only so long as we cannot control the cause and growth of fibroids. There may come a day when their further progress may be prevented and their atrophy induced by a form of endocrine therapy which will render operation unnecessary except in neglected cases.

A large number of accepted ideas can be shaken or shown to be within sight of rejection if subjected to sustained critical examination. Let us take an example from obstetrics.

Induction of labour is widely practised as a treatment for "disproportion." There is some reduction during recent years in the number of women who are treated by this method, but in some clinics and by some individual doctors it is still widely prevalent. The usual indication is the suspicion rather than a certainty, that while the pelvis is not large enough to transmit a full-term child of average weight of 8 lbs., it would offer no obstetric difficulty to a smaller baby, say, from 6 to 7 lbs. On the other hand, the pelvis is not sufficiently contracted to require delivery by Cæsarean section. The clinical signs are: the head is high above the brim in a primigravida, and it is impossible to press it down into the brim even by firm pressure. Pelvic measurements are often said to be small, but internal examination of the pelvis is not often given its due weight or even any consideration in appraising its size. These signs may indicate contraction, but much more commonly they do not. For example, the head may be above the brim for a variety of causes. The inclination of the pelvic brim to the horizontal may be steeper than normal, approaching 90°, the head may be unflexed and there may be excess of liquor amnii. The shape of the brim rather than its size is probably operative, though we do not yet know its full value.

Failure to press the head down may be due to disproportion, but only in a few, as proved by the large number of "high heads" which descend quickly or spontaneously early in labour or even before labour. Lastly, external pelvic measurements are of almost no value in diagnosis of contraction, and certainly of no value whatever in estimating the minor degrees which could be treated by induction of labour. There could be no better test of the necessity for, or value of induction of labour, than the results.

If we imagine a condition of disproportion developing as term approaches, by the gradual growth of the head up to and then above the size which can safely be accommodated by the pelvis, there would, theoretically, be a moment when the onset of labour and delivery of the child would be accomplished without difficulty or danger, yielding the maximum weight of the child compatible with such safe delivery. That is the practical moment for induction. If it were delayed beyond this, there would be a mechanical difficulty which would risk the child's head by forceps extraction, if it were done before this moment the child would be unnecessarily small. The actual "moment" must be a period of several days and might well be a fortnight, for there are other factors which enter into the ease of delivery which blunt the sharpness of the "moment" for induction. For example, the force of uterine contractions

will entirely alter the outlook for the child. Feeble contractions cannot mould the head and will cause delay, which, beyond a certain point, is dangerous for the child. Varying degrees of ossification of the head will also influence the capacity of the head for moulding. We can illustrate by pointing out that a woman who, on the verge of developing disproportion by January 1st, began labour on that day by induction followed by inertia would have a much more difficult time than the same woman entering labour two weeks later with strong contractions. Even if there were a well-defined optimum moment for induction, I maintain that it is beyond our clinical capacity to determine it on mechanical grounds alone. Nor will modern X-ray pelvimetry give us much help. It is true that the measurements of the various pelvic diameters can be given with considerable accuracy to within fractions of an inch by a skilled technique. Also the shape, which is perhaps more important, the width of the sub-pubic angle and the inclination of the brim can also be determined exactly. It is impossible, however, to make the same exact measurements of the foetal head. A large margin of error is inevitable. There are therefore two factors of major importance, which are unknown, namely, the strength of the uterine contractions and the size of the foetal head, while one factor, the size and shape of the pelvis, can be known fairly exactly. It is these unknown factors which are the reason for the unpredictable results of induction of labour. In the past far too much importance has been given to the size of the pelvis, that is *structure*, and much too little attention has been devoted to *function*, which is the efficiency of the uterine contractions and the adaptability of the foetal head. So long as the function in any forthcoming labour is unknown, so long will induction in a primigravida and must multiparæ be an uncertain treatment.

We have been taught for so many years the importance of the size of the pelvis, with relative neglect of the value of the uterine function, that we have regarded delivery as almost purely a mechanical phenomenon. The incursion of radiology into obstetrics has tended to increase emphasis on the consideration of the measurements of pelvic diameters. Unless the deductions by the radiologist can be tempered by the clinical experience of the doctor in charge, as an obstetrician accustomed to watch and study uterine action, there will be an increase in the number of induced labours and Cæsarean section.

The results of induction of labour are evidence of my contention. The prevalence of the operation in some maternity hospitals is extraordinary. Of 2,297 admissions during the year, there were no less than 170 cases of induction for "disproportion" and "post-maturity," or, in other words, 7.4 per cent. of all labours were induced. Further, of the 170 cases of induction no less than 136 were followed by normal spontaneous labour, and only thirty-four required forceps. It does not follow that all or even any of the cases of forceps delivery required assistance because of a "tight fit." The more likely reason was feeble contractions when the head was on the perinæum, ready for extraction. If induction for these patients had been necessary and timed correctly we should have expected not only a greater incidence of forceps, but some actual delay during the second stage for necessary moulding to occur.

But the duration of the second stage is recorded as follows :—

Over 3 hours	..	..	2 cases	..	..	..	2.7%
From 2 to 3 hours	..	..	15 cases	..	..	..	20%
From 1 to 2 hours	..	..	24 cases	..	..	..	32.4%
Less than 1 hour	..	..	33 cases	..	..	..	44.6%

for all labours where the child weighed 7 lbs. or more.

A further fact is that in six cases (8 per cent.) the second stage lasted one quarter hour or less. The experiences clearly show that most of these patients either did not need induction on the date on which it was performed (between thirty-sixth to fortieth weeks) or else not at all. It is common knowledge that nearly every maternity hospital in this country could supply evidence of this kind which shows that nearly all operations for induction of labour for "disproportion" or "post-maturity" in primigravidæ are unnecessary.

The results of induction on the mother's condition are usually not harmful. Labour may be some time in beginning after the interference and there may be inertia during labour, but

serious after effects, such as infection, are rare. For the baby, it is different. Four of the babies were stillborn or died just after birth (6.7 per cent.). The stillbirth and neo-natal rate for the whole of the cases of normal labour for the year in this hospital was 0.9 per cent., though, owing to the difficulty of eliminating certain possible abnormalities from the records, it may be that this figure is not exact. It is near enough, however, to show that the child suffers a risk up to five times as great when labour is induced.

If, therefore, induction has no place in the treatment of suspected "disproportion" in primigravidae and most multiparæ, what are the alternatives?

Where possible, so-called "trial labour" should be allowed. This is nothing more than waiting for the spontaneous onset of labour with arrangements ready, should they be needed, for completing delivery by Cæsarean section, if the head is unable to pass the brim after, say, two hours of good contractions after the membranes have ruptured. Clearly, only doubtful cases are submitted to trial labour. Where there is an obvious obstruction caused by the contracted brim or cavity, Cæsarean section is performed as a deliberate operation. But the remarkable result of trial labour in the "doubtful" cases is that the patients deliver themselves normally in nearly every case. It is very seldom that trial labour has to be completed by the Cæsarean operation. It seems, then, from this clinical experience, that spontaneous labour can be expected in nearly all doubtful cases of disproportion or, in other words, unless the obstruction is clinically obvious after the thirty-eighth week, normal delivery is almost certain. Some objections have been raised to trial labour. It is impossible to conduct it in a private house. The patient must be in a hospital or well-equipped home where an abdominal operation can be performed, if necessary. But in these days an increasing number of women are delivered in an institution, and it is not disturbing to the woman of to-day that she cannot be confined in her own home. It is also obvious that the doctor in charge must be able to satisfy himself of the prospect of engagement and passage of the head as labour proceeds, and is either competent to operate himself or call upon a surgeon, should it be necessary. Finally, a word on the progress of labour in a doubtful case of disproportion.

We will assume that the woman is a primigravida at full term, and that the onset of labour finds the head high above the brim but not truly overlapping the symphysis. The measurements may be normal or reduced, but the internal palpation of the pelvis finds no marked contraction such as a very easily palpated promontory, or palpation of the whole length of the brim from the pubes back to the sacrum. Nor will there be a narrow cavity from side to side, a narrow sub-pubic angle, or an inter-tuberosity diameter that will take less than four knuckles of the examining hand. The head is probably flexed and the back anterior.

All these are favourable conditions. After the onset of labour the first event of importance is the time of rupture of the membranes. If this happens either at the onset or just after, that is before the os is three fingers dilated, it may mean that the occiput is posterior or that the brim is actually flat—enough to cause difficulty. But early rupture may have no important significance. If the head sinks into and through the brim before rupture of membranes, labour will end spontaneously. But if it remains high until the membranes have ruptured, it does not necessarily follow that there will be obstruction or difficulty. The two hours following rupture are of critical importance. But, again, no opinion can be formed unless the uterine contractions are strong. If they are infrequent, short, irregular and feeble, no force is being exerted on the head and therefore no prognosis of its descent can be made. If, however, contractions are "good," that is regular, frequent, strong and long, then the head should, and probably will, show signs of descent within two hours. The first change to be noted is an increase of flexion of the head. The forehead becomes more prominent and the occiput disappears from the range of abdominal palpation. If this occurs the head will almost certainly pass the brim. Sometimes the change of relation of the head to the brim is so sudden that it sinks almost with the escape of the liquor as the membranes rupture.

If, after two hours following rupture of the membranes, the head has not flexed and sunk into the brim under the influence of strong and regular contractions, then it is unlikely that the head can pass the brim, and labour should be terminated forthwith by a lower segment Cæsarean

section. It is important to remember that no opinion on the prognosis of a trial labour can be made until after the membranes have ruptured. The change at this point is often dramatically sudden. An apparently hopeless case of disproportion may, and often does, resolve itself into a quick and spontaneous delivery, especially in a multipara. In all cases of trial labour where it is possible that it must be terminated by Cæsarean section, it is obvious that vaginal examinations should not be made lest infection be introduced.

Anxiety seldom arises in trial labour on account of real disproportion. The real difficulty is the absence of strong contractions. If, after the membranes rupture, the uterus acts feebly, and irregularly for some hours, there is little chance of the descent of the head, partly because the *vis a tergo* is deficient, partly because the head remains unmoulded.

It is generally true in obstetrics that a woman can safely overcome one handicap, such as minor disproportion, but she cannot tolerate two handicaps—in this case a minor disproportion plus inertia. If, therefore, during a trial labour the head remains high in the presence of inertia which persists for some hours after the membranes rupture, the lower segment operation should be performed.