

A labour-saving manoeuvre

K. DOUGLAS SALZMANN M.D., M.R.C.P.Ed., D.Obst.R.C.O.G.

Medical Officer-in-charge, General Practitioner Obstetrics Unit, Reading

SUMMARY. Slow progress in the first stage of labour was treated in 792 mothers by digital dilatation. This manoeuvre is described. Partial dilatation was converted to complete dilatation in 94.4 per cent of all cases, the incidence of success being 90.0 per cent in primiparae and 96.0 per cent in multiparae. Difficulties are described, but serious complications were conspicuously absent.

The manoeuvre was helpful with mothers unable to resist premature bearing down, and especially valuable for reducing delay before applying forceps for fetal distress. The early perinatal loss of 20 (in the first 200 cases) was reduced to 3.3 (in the last 599 births) after a change of technique.

Introduction

Prolonged labour is dangerous for mother and fetus (Butler and Bonham, 1963). It aggravates hypertension, intensifies asphyxia and distress, increases the likelihood of post-partum haemorrhage, predisposes to instrumental and operative delivery, and these hazards are further increased when failure to progress occurs despite frequent strong contractions.

Second stage delay can usually be overcome with forceps and an episiotomy, but poor progress in the first stage is less amenable to active treatment—particularly in general practice. Practitioners either treat such mothers passively with repeated sedation, or transfer them to a consultant unit. This transfer may be dangerously belated, but often in consultant units first stage fetal distress leads to a Caesarean section. Unfortunately evidence of fetal distress may denote a deformed or diseased fetus that is incapable of survival, and the fact that a relatively drastic procedure (Caesarean section) may be employed for delivery of suspect or non-viable babies seems an obvious indictment of alternative measures for dealing with first-stage delay.

The partly dilated cervix also raises another problem for the general practitioner. It is safer theoretically for a competent obstetrician to be present at the delivery, so minimising any delay in dealing with unexpected complications, but many keen and skilful practitioner obstetricians rarely attend multiparous births. They have found the second stage often too brief to enable them to arrive in time unless they are summoned considerably before dilatation is complete; and then they are apt to arrive much too soon. Whether their arrival is too soon or too late, they have grounds for complaint that their time has been wasted. The midwife resents the complaint, and doctor-midwife disharmony results.

If some simple, quick, but safe way were devised for completing dilatation, and if it were equally suitable for use in hospital and general practice, one might be able to reduce the number of fruitless Caesarean sections, avoid hours of painful labour, rescue numerous asphyxiated babies from damage and death, and possibly even encourage doctors to attend more deliveries. This article describes the use in general practice, during 23 years, of a manoeuvre seemingly able to achieve these objectives.

DIGITAL DILATATION

The basis of the manoeuvre

The underlying principle is to make maximal use of natural mechanisms—uterine contraction and retraction, and distension of the os by the bag of waters and presenting part. The manoeuvre is employed when these mechanisms appear to be unsatisfactory, and it is used only to supplement—not as a substitute for—nature's forces. To minimise any weakening of the contractions only analgesia is employed, and sometimes no analgesia at all.

Technique

The mother lies on her back, as for a simple vaginal examination, her hips well flexed and knees wide apart. After swabbing the vulva, two fingers, well lubricated with anti-septic cream, are inserted to determine the dilatation of the cervix and the level and normality of the presenting part. When the cervix is very thin and closely applied to the fetal scalp it is easier to employ an ungloved hand.

The manoeuvre, partly active and partly passive, consists of:

(1) a preparatory pause; (2) fundal pressure; (3) cervical stretch; (4) relaxation for readjustment. The second, third and fourth steps may be repeated several times before reverting to the first step.

(1) Preparatory pause

Until nature's forces are ready for action, i.e. until there is a fully-developed contraction, the examining fingers remain inactive. During the contraction nature is endeavouring to dilate the os, partly from fundal contraction pushing the uterine contents downwards into the os, and partly (though much less) from upward pull of the longitudinal muscle fibres inserted into the cervix.

(2) Fundal pressure

To reinforce the dilator (bag of waters or presenting part) and bring the os more within reach of the operating fingers, firm fundal pressure is exerted during each contraction. This pushes the uterine contents still deeper into the pelvis, increasing the stretching of the os; it also encourages 'fixation' of the posterior lip of the cervix, which results partly from being hooked over the bulging membranes or presenting part, and partly also from longitudinal muscle pull exerted during contractions. Because of uterine bi-polarity the circular muscle fibres of the cervix should be relaxed, and less resistant to stretching, during contractions.

Fundal pressure may, in addition, to some extent divert attention from discomfort associated with the next step.

(3) Cervical stretch

While maintaining abdominal pressure, two supinated fingers push up the anterior lip of the cervix, gently but firmly, the force employed depending on the resistance of the cervix and the reaction of the mother. Apart from the anterior lip disappearing from reach, and the mother feeling an urge to push, full dilatation is commonly marked—especially in multiparae—by sudden descent of the fetal head, which is felt sliding down the back of the fingers.

If the bag of waters is still intact at the start of artificial stretching it should not be ruptured until approaching full dilatation—particularly if the presenting part is not very low. This preservation should, in theory, reduce any danger of infection if the dilatation is slow or unsuccessful, and labour is prolonged or possibly results in a Caesarean section. If however, at the start of the manoeuvre only a rim or anterior lip

of cervix remains, the membranes should be ruptured without delay. With a widely dilated cervix, rupture of the membranes leads to the rapid appearance of (previously absent) moulding, and descent of the head—encouraging the onset of the second stage.

(4) Relaxation for readjustment

Pressure on the fundus is removed between contractions, while the fingers in the vagina likewise relax pressure on the cervix, although remaining just in contact with it. Relaxation of the abdominal pressure allows nature's non-traumatic dilators—the bag of waters and presenting part—to rise again, and the slightly more dilated cervix to readjust its position. When, with further fundal pressure, the dilator next descends, the posterior lip of cervix is situated slightly more posteriorly in relation to the dilator, and is more easily 'fixed'—or hooked behind it—in preparation for further stretching.

Results

Frequency of stretching

It took me several years to realise that it was not necessary to wait for the next contraction before repeating stretching, and that with a lengthy contraction it could be repeated two, three, or even four times. The resulting change in practice sharply increased the rate of progress in dilatation, and some results bordered on the sensational.

(a) Mrs G., a 23 year-old primigravida, was only three fingers dilated after 36 hours of labour; stretching completed the dilatation with three more contractions.

(b) Mrs W., a 31 year-old primigravida, was three fingers dilated after 15 hours of labour; dilatation was then completed with two contractions.

(c) Mrs C., a 22 year-old primigravida, three fingers dilated after 25 hours of labour, became fully dilated in one contraction.

(d) Mrs T., a 29 year-old primigravida, four fingers dilated after 17 hours, became fully dilated with the next contraction.

(e) Mrs X., a 21 year-old primigravida, four fingers dilated after 14 hours, became fully dilated with one contraction.

Munro Kerr (1949) stated that he found manual dilatation of the cervix was occasionally easy and satisfactory in multiparae, but very rarely so in primiparae. Yet all the cases described above were primiparae.

Incidence of success

Digital stretching successfully led to full dilatation in 189 (90 per cent) of 210 primiparae and in 559 (96.0 per cent) of 582 multiparae—a total incidence of 94.4 per cent in the 792 mothers.

Relation to initial dilatation

The effectiveness of digital dilatation clearly depended on the degree the cervix was dilated before stretching was started (table 1). With the cervix initially less than two fingers dilated the manoeuvre completed dilatation in 68.3 per cent (28 out of 41 mothers). The rates of success for the others were 86.4 per cent (95 out of 110) in those initially two to two plus fingers dilated; 95.2 per cent (179 out of 187) in those initially three to three plus fingers dilated; 97.6 per cent (207 out of 212) in those four to five fingers dilated; and 100 per cent both in 78 mothers with a rim of cervix, and in 144 with an anterior lip. In 20 other cases, 16 of which were successful, the initial dilatation was not recorded.

The effectiveness of the manoeuvre in those initially less than two fingers dilated was particularly interesting, because Munro Kerr (1949) stated that manual dilatation proper could not be commenced before the os admitted at least two fingers. In the

TABLE 1
SUCCESS OF DIGITAL DILATATION RELATED TO INITIAL DILATATION OF OS

<i>Initial dilatation</i>	<i>Number of cases</i>	<i>Number successful</i>
Less than two fingers	41	28 (68·3%)
Two to two plus fingers	110	95 (86·4%)
Three to three plus „	187	179 (95·2%)
Four to five plus fingers	212	207 (97·6%)
Rim of cervix	78	78 (100·0%)
Anterior lip of cervix	144	144 (100·0%)
Dilatation not stated	20	16 (80·0%)

manoeuvre above described, when the os was less than two fingers dilated, it was dealt with by passing a finger through the cervix and running it slowly but distendingly in a circle five or six times, thereby separating the membranes from their attachment to the cervix.

This mildly stretching procedure was performed only during contractions assisted by fundal pressure.

In describing the results the term successful requires clarification. Two criteria had to be satisfied:

- (1) quick conversion to full dilatation,
- (2) such conversion to occur during a single contraction or an unbroken sequence of contractions.

The following cases consequently did not qualify to be classed as successful:

(a) Mrs Y, a 22 year-old primigravida had been in labour for 29 hours when her cervix (although taken up) still barely admitted one finger. Digital stretching was performed. By the fourth contraction she had become three-quarters dilated. Slightly alarmed by the rapidity of progress, I then stopped stretching, but she became fully dilated spontaneously one hour and forty minutes later. (b) Mrs Z, a 21 year-old primigravida, was only one finger dilated after 20 hours in labour. Digital stretching was performed during three contractions and then stopped, the dilatation having increased to between three and four fingers. Six hours later she was still only four fingers dilated. Further stretching completed the dilatation with two more contractions.

Rate of dilatation

I can only give an approximate assessment of the increased rate of progress in those successfully dilated, describing it as (a) 'accelerated' (b) 'moderately rapid' or (c) 'rapid' (table 2). When the os was less than two fingers dilated at the moment of intervention, conversion to full dilatation was 'accelerated' in one, 'moderately rapid' in three, and 'rapid' in 25 mothers.

Dilatation tended to be rapid at first, but if—which was unusual—full dilatation was not attained during the first six to eight contractions, the rate of progress thereafter declined. The greater the initial dilatation, not only was the percentage of success higher, but the manoeuvre was quicker and easier to perform.

When initially only a rim of cervix or anterior lip remained, every case was converted quickly to full dilatation. Of the last 50 rims of cervix dealt with, 18 required stretching only during one contraction, 20 during two contractions, seven during three, four during four, and one during five contractions. Similarly with the last 60 anterior lips of cervix, conversion to full dilatation occurred with the first contraction in 45, the second contraction in thirteen, and the third contraction in two. It follows that because

TABLE 2
SPEED OF SUCCESSFUL CONVERSION TO FULL DILATATION

Initial dilatation	Rate of dilatation		
	Accelerated	Moderately rapid	Rapid
Less than 2 fingers	1	3	25
2/2+ fingers	2	14	79
3/3+ fingers	7	26	146
4/5 fingers	3	26	178

a rim or anterior lip of cervix necessitates postponement of forceps, digital dilatation can reduce vital delay to a minimum.

Incomplete dilatation

Altogether failure to complete dilatation at the first attempt was encountered in 43 mothers (5.4 per cent), but these included nine who responded successfully to a second session of stretching—the manoeuvre being repeated after intervals averaging two hours, but ranging from half to six hours. No second session was unsuccessful.

Of the other 34 failures, stretching was deliberately restricted in six mothers to use only during two or three contractions, causing an increase but not completion of dilatation. Twenty-seven other mothers spontaneously became fully dilated later (usually one or two hours after the initial session had failed), and one mother required a Caesarean section during the first stage (because of fetal distress), after failure of the manoeuvre.

Difficulties

When digital dilatation was less easy, or the dilation remained incomplete, I usually found interference with descent of the fetal head. This descent is essential to consolidate the advance and prevent the stretched cervix from closing. Factors impeding descent included uterine inertia, large baby, small pelvis, malpresentation, unruptured membranes, full bladder, loaded rectum, premature cessation of the manoeuvre, and absence of fundal pressure. There was also occasionally cord entanglement, but difficulty is commonest when several adverse factors co-exist.

The manoeuvre was necessarily more time-consuming when the pains were infrequent, as dilatation was only performed during contractions; and when the contractions were weak or short-lasting it was sometimes impossible to perform stretching more than once during each contraction.

Anything reducing uterine activity, e.g. heavy sedation, tended to make progress slower and more difficult, whereas anything increasing activity assisted the advance. Digital dilatation was conspicuously effective towards the end of the first stage, when the uterus was very active.

With patients in hospital, uterine activity can be stimulated by an oxytocic drip, but stimulation in general practice can be produced through artificial suckling—which leads to release of oxytocin in labour, as well as during lactation (Salzmann, 1971a and b). Mrs B, a 25 year-old primipara was four fingers dilated after 41 hours in labour; her contractions had slowed to one in ten minutes, and the fetus was lying in the right occipito-lateral position. Digital stretching failed to complete the dilatation. After half a minute of artificial suckling the contractions increased in strength and rate—becoming one in four minutes. Repetition of stretching was promptly successful.

Malpresentations were common in these slow labours, and commonest in those in whom digital dilatation was difficult or incomplete. Occipito-posterior positions

occurred in 18.0 per cent (144 out of 799), the incidence being 17.5 per cent (133 out of 758) in those successfully dilated, and 25.6 per cent (11 out of 43) in those whose dilatation was not completed.

Midwives sometimes report "it is posterior", when they are referring to the cervix and not the occiput. Certainly both conditions—the occipito-posterior position and the sacral os (that can barely be tipped)—are frequently associated with slow labour, but their responses to digital dilatation are quite different. The occipito-posterior often responds rather slowly, with a tendency for the posterior lip to persist, whereas the sacral os responds extremely well. The dystocia that accompanies a sacral os arises, I believe, from the asymmetrical retraction; the anterior lip, being very elongated, has to be retracted first downwards, then forwards, then upwards—a far greater distance than the posterior lip is retracted. This inequality is corrected by digital dilatation, which assists retraction of the anterior lip, while the extremely posterior situation of the posterior lip greatly helps its fixation prior to stretching.

Normally the membranes were preserved until approaching full dilatation. If, after their rupture and maximal pushing up of the anterior lip, the head fails to descend, it is doubtful whether dilatation is complete. Several more contractions should be allowed to occur, and repeated palpation made of the anterior lip (to ensure it does not come down), before the fingers are removed from the vagina.

Persistence of the posterior lip strongly suggests an occipito-posterior or occipito-lateral position, and the two most helpful aids to mastery are:

(1) for the mother to flex her thighs very fully, drawing her knees up as far as possible towards her shoulders, before attempting to push the anterior lip past the head;

(2) if there is any evidence of inertia, to precede the above step by performing artificial sucking for half a minute.

A big baby and small pelvis are largely unavoidable, whereas the distended bladder and loaded rectum are easily treated—if not overlooked. Another avoidable factor is omission of fundal pressure. I have on various occasions completed the dilatation immediately after a midwife has failed to do so, and every time she has omitted to apply fundal pressure—failing to stabilise and press down the dilator over which the cervix was to be stretched and the posterior lip to be hooked. It appeared that the only time fundal pressure could be omitted without loss of effect was when the mother experienced an uncontrollable urge to push before becoming fully dilated. Instead of vainly trying to restrain such mothers from premature pushing, they can be encouraged to push while digital dilatation is performed.

Tolerance and pain

Successful digital dilatation calls for co-operation and tolerance, and most mothers were remarkably tolerant. None was told in advance to expect increased discomfort, nor were they led to expect more than a simple vaginal examination. Pethidine or 'Pethilorfan' (50–100 mg), 'Entonox', nitrous oxide and air, or 'Trilene', provided satisfactory analgesia, but many mothers received none at all. Occasionally one encounters highly hysterical mothers, apparently petrified even of a vaginal examination; they require a combination of inhaled and injected analgesics, and sometimes limitation of digital dilatation to two or three contractions at a session.

The ability of the manoeuvre to relieve, far exceeds its capacity to increase pain. It may certainly add to discomfort for a few seconds during a few contractions, but stretching is most effective for completing dilatation at precisely that time—late in the first stage—when the contractions become most worrying and painful. The ability to shorten this period spares the mother much pain.

Potential dangers

In theory the dangers of digital dilatation should be those known to accompany *accouchement forcé*—severe laceration, post-partum haemorrhage, shock, sepsis, the need for deep anaesthesia and rapid instrumental delivery; but in practice these caused almost negligible trouble.

No laceration of the cervix was encountered that needed suturing, and the incidence of comparable cases, with minor cervical tears (observed at the postnatal examination in primigravidae), was not much higher in those subjected to digital dilatation—6.4 per cent (13 out of 204), than in those not so treated—4.7 per cent (18 out of 387).

Post-partum haemorrhage occurred in 31 mothers—eight primiparae and 23 multiparae—an incidence of 3.9 per cent; but only six (0.75 per cent) required a transfusion. Neither shock nor sepsis created any problems.

Deep anaesthesia was never employed for the digital dilatation, though it was used for instrumental deliveries. The total incidence of forceps was 6.1 per cent, the frequency of forceps in digitally dilated primiparae being 20.7 per cent (44 out of 213), and 0.7 per cent (four out of 572)—remarkably low—in similarly dilated multiparae.

Caesarean sections were only required three times (0.38 per cent); once for fetal distress in the first stage, and twice for disproportion in the second stage. Suspected placenta praevia and suspected disproportion were contra-indications to use of the manoeuvre.

Fetal loss

A considerable time elapsed before the original practice of performing digital dilatation only once with each contraction was changed to that of repeating it. The alteration in technique clearly reduced the time required to complete the dilatation, and it coincided with a very marked fall in fetal loss. Four of the first 200 babies were lost, but only two of the next 599. The perinatal mortality thus declined from 20 to 3.3.

The first baby lost in 1953 was a neo-natal death, due to intra-cranial haemorrhage, following prolonged labour in which digital aid, although used, had failed to complete the dilatation. The second was a domiciliary stillbirth, a case of undiagnosed twins. Cervical stretching successfully assisted the birth of the healthy first baby, but the birth of the diminutive second twin was complicated by massive cord entanglement.

The mother of the third baby lost was transferred to hospital after failure of digital aid to complete dilatation. Some hours elapsed before it was decided to perform a caesarean section because of fetal distress. The baby was stillborn.

The fourth loss resulted from prolapse of the cord complicating forceps delivery of an occipito-posterior position in a primipara. Another, more fortunate domiciliary case, had the same complication. A 25 year-old multipara was four fingers dilated when her membranes ruptured and a loop of cord prolapsed. A gauze swab, soaked in 'Dettol', was wrapped loosely round the prolapsed loop, grasped by artery forceps, and (with the loop) pushed past the head—well up into the uterus. The head was then manipulated and pushed down into the cervix. Dilatation was quickly completed by cervical stretching, and a live baby was delivered.

The only two babies lost in the last 15 years were (a) a still-born monster with a huge meningocele, and (b) a "cot-death"—an apparently healthy baby found dead 12 hours after a spontaneous delivery.

The total perinatal loss for these manoeuvre-treated slow labours was 7.5 (six out of 799), there being seven sets of twins.

Discussion

The idea of using manual dilatation in labour is not new. Galen (130–200 AD) referred to it, and Ambroise Paré (1510–1590) devised *accouchement forcé*. The fact that such obstetric procedures have fallen into disrepute is probably due both to their ineffectiveness and dangers. Mention was made earlier of Munro Kerr's view that manual dilatation was usually ineffective. In the mid-twentieth century De Lee (1943) scathingly wrote that *accouchement forcé* almost invariably inflicted severe injuries on the mother, that frequent haemorrhages and deaths were caused by it, and only a few fetal lives were saved. Condemnation would probably be endorsed by all leading gynaecologists today. How then can the favourable findings in this series be explained?

In the first instance, the manoeuvre employed was not *accouchement forcé*, but might be described as *accouchement naturel assisté*. It did not entail manual dilatation with five fingers of one hand, nor two fingers of two hands, but digital dilatation with two fingers of a single hand. It did not need the use of a general anaesthetic to counteract shock. It was not performed between contractions, when maximal traumatic efforts would be required to compensate for the lack of uterine help, but at the height of contractions (unweakened by anaesthesia) when maximal uterine effort should minimise the need for additional digital aid. In addition, the absence of anaesthesia probably reduced the incidence of forceps and the occurrence and severity of post-partum haemorrhage, as well as permitting the mother to object and resist if subjected to excessive force—which might produce shock or severe laceration.

Although sometimes incomplete, dilatation was invariably increased by stretching—so presumably reducing the duration of labour to some extent. It was especially valuable for reducing the vital waiting time before applying forceps for fetal distress.

'Masterly inactivity', the time-honoured policy in the first stage management, has recently been replaced by 'active management of labour', which entails using an oxytocic drip to strengthen inadequate contractions (O'Driscoll *et al.*, 1969). Such treatment is, however, rightly restricted to use in consultant units (Philpott and Castle, 1972). But one might describe both digital dilatation and artificial suckling as 'active management of labour', with the difference and advantage that both can be performed either in or out of hospital—e.g. in general practice.

If the os is less than three fingers dilated, and the contractions are poor, an oxytocic drip is probably the treatment of choice; but with good contractions or a cervix that is three-quarters or more dilated, I believe digital dilatation is preferable. Since the response to stretching tends to decline after six to eight contractions, it might be wise to limit each session of dilatation to six contractions. A single session should suffice to produce full dilatation in the majority, but a second session could be performed, if necessary, after an hour or so. In appropriate cases, the joint use of digital dilatation and an oxytocic drip would probably produce even better results than either measure alone.

The impression that this labour-saving manoeuvre is reasonably safe seems, after 23 years, to be standing the test of time; and it is not an exaggeration to say that, by using it, an obstetrician equipped only with his hands, can in the space of a few minutes—or sometimes a few seconds—reduce the length of labour by hours.

REFERENCES

- Butler, N. R. & Bonham, D. G. (1963) *Perinatal Mortality*, p. 156. London: E. & S. Livingstone.
 De Lee, J. B. & Greenhill, J. P. (1943). *The Principles and Practice of Obstetrics*. 8th ed., p. 931. Philadelphia.
 Munro Kerr, J. M. & Chassar Moir, J. (1949). *Operative Obstetrics*, 5th ed. p. 621, 622, London.
 O'Driscoll, K., Jackson, R. J. & Gallagher, J. T. (1969). *British Medical Journal*, 2, 477–480.
 Philpott, R. H. & Castle, W. M. (1972). *Journal of Obstetrics and Gynaecology of the British Commonwealth*, 79, 592–598.
 Salzmann, K. D. (1971a). *Journal of the Royal College of General Practitioners*, 21, 282–288.
 Salzmann, K. D. (1971b). *Journal of the Royal College of General Practitioners*, 21, 670–678.