

Version for contraction of the pelvic brim; with an  
account of twenty-one cases personally conducted.

Thesis for the degree of M.D.

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Version for contraction of the pelvic brim; with an account of twenty-one cases personally conducted.

The respective value of the use of the long forceps and of the performance of 'pudic version' in cases of contracted pelvis is one of the most interesting and also one of the most difficult questions in the practice of midwifery. In a difficult labour, when the head, by reason of deformity of the pelvic brim, refuses to engage the question at once arises and has to be decided promptly, what is the best treatment to be adopted, should forceps be applied, or version performed. Speaking of midwifery generally, in that branch of the profession more than in any other, each case must be treated on its own merits, as it is not only foolish but misleading to classify certain labours and say in these forceps must be applied while in those version ought to be performed.

In the majority of cases of contracted pelvis we are too inclined to content ourselves with ascertaining the conjugate diameter forgetting that the transverse may be quite as important as in a generally contracted small pelvis or even of greater importance as in cases of osteomalacia. The possibility of an irregular deformity of the pelvis must also be taken into account. Perhaps the most common example of this, in England at all events, is the rheniform pelvis, or even the figure of eight variety where there is not only a marked projection of the promontory of the sacrum but also a projection backwards the greater or less degree of the symphysis pubis. In these cases there is often more room at one side of the pelvis than at the other, and I have invariably found the right side of the pelvis was of greater capacity than the left. This may have been due in my experience to a mere coincidence, or perhaps may be to a certain extent an illusion of the sense of touch owing to the patients lying in the ordinary British midwifery position on the left side. This projection backwards of the symphysis was clearly demonstrated without vaginal

examination by a case in the Maternity Hospital. This was a case in which labour was induced at 7½ months on account of the deformity of the pelvis whose diagonal conjugate measured 3½ inches. During labour the child lay with its head in the transverse diameter and with the right side looking towards. Version was performed and delivery completed quickly and without difficulty. The child which weighed 5 lbs. had a deep and long depression on his right parietal bone. This indentation, judged from the position in which the child had lain throughout labour, could only have been caused by pressure of the beak of the symphysis. On careful examination some days later, there was found to be a projection backwards of the symphysis sufficient to cause the mark on the head. By the time the child left hospital the depression had almost disappeared.

Again there are many cases in which the pelvis is of fairly normal size and yet operative interference is necessary owing to the size of the child's head. On this account it is of great importance to make out both by vaginal and abdominal examination the size of the head in every case in which it is arrested at the brim. I do not refer to cases of hydrocephalus which for the most part are self-evident and easy to diagnose. A more difficult case to deal with is that in which along with a slight increase in size of the head there is an abnormal hardness and loss of elasticity in the bones owing to premature ossification which may go as far as closure of the fontanelles and sutures. Here even with a normal pelvis it may be impossible for the woman to be naturally delivered, and as a case of this description is too apt to end in craniotomy it is of great consequence to make out the condition early in labour. Unfortunately there is little to go on in diagnosis beyond perhaps the smallness of the anterior fontanelle which often is out of reach, and the feeling imparted to the examining finger of increased resistance in the fetal head, a feeling which can of course be gained only by experience.

Now can we ever rely in the case of a multipara on the history of her former labours for there are many instances in which operative interference has been required in the earlier labours whereas in the later ones the woman has been safely delivered of living children without any assistance, while on the other hand and perhaps more commonly owing chiefly to the larger size of later children operative interference may be required in a certain case although in her former confinements the woman was delivered by the natural powers.

Lastly there are cases in which delivery has been effected naturally which can only be explained on the hypothesis of the yielding of the bones or joints of the pelvis.

The following extracts from standard works on midwifery show the diversity of opinion as regards the management of labour in cases of contraction of the brim of the pelvis. :-

1. Haultain completely ignores version as a method of treatment in contracted brim. His general treatment is, "with a conjugate measuring from 4 inches to 3 foreceps, from 3 1/4 inches to 2 1/4 symphysectomy or induction of labour, from 3 inches to 2 craniotomy."
2. Hanchis is also much in favour of forceps as against version. He says, "Try to apply forceps in any case when the pelvis is not obviously too narrow to admit of their entrance, . . . . . When we can apply the forceps to the sides of the head, we have the case under our control and can deliver if the disproportion between head and pelvis is not too large to be overcome without craniotomy. Version when performed by the internal method greatly endangers the mother."
3. Playfair makes a statement which is obviously incorrect: "When the antero-posterior diameter of the brim measures from 2 3/4 - 3 inches it is universally admitted that destruction of the child is inevitable. . . . . The forceps is generally considered to be applicable in all degrees of contraction down to about 3 1/4 inches in the conjugate of the brim."
4. Thurstle says "Version is indicated in contracted pelvis only, where the child's heart beats with nearly unimpaird vigour."

and in fetuses measuring between  $2\frac{3}{4}$  and  $3\frac{1}{2}$  inches antero-posteriorly, with the extraction limited to the brim and with sufficient amplitude in the transverse diameter. With  $3\frac{1}{2}$  inches and upwards in the conjugate no interference is as a rule called for. In the case of a dead child or of one in which the heart sounds have notably begun to fail, version affords no advantage over perforation."

Heishman says "We may say in round numbers, that when the conjugate diameter is less than 3 inches to attempt to turn would be to subject the woman to needless risk as we may be confident that nothing but failure could attend our efforts." But he admits that even in doubtful cases it is advisable to turn, thus giving the child a chance of life though the case may ultimately end in craniotomy.

b. Schröder is very quoted in his statements on this point "Whenever we perform version in contracted pelvis we decide in favour of this operation without knowing in case this is not done how the head would enter the true pelvis and how it would pass through. This renders the question as a practical one so difficult, and will probably thus keep it for a long time probably forever."

7. Galabin says "Version should never be performed with a conjugate under  $2\frac{3}{4}$  inches, nor with one under 3 inches if there is evidence that the head is large. No prolonged efforts to extract with forceps should be made with a conjugate less than  $3\frac{1}{4}$  inches.

Turning now to those authors who are more inclined to favour version we find :-

8. Zweifel says, "The application of the forceps to the movable head is not impossible but to seize it firmly is purely accidental; application of the blades over the parietal bones is absolutely impossible and even if the head were thus grasped it could not be drawn through the conjugate."

9. Barnes considers turning to be applicable to cases in which the conjugate measures from  $3\frac{3}{4}$  inches to  $3\frac{1}{4}$ . In comparing the

Two conservative methods of delivery, he says: "I have on several occasions been called to an obstructed labour in which the head was resting on a brim contracted in the conjugate diameter. ----- I have tried the long double-curved forceps, trying what a moderate compressive power aided by a considerable and sustained traction would do to bring the head through and have failed. I have then turned and the head coming bare first has been delivered easily."

10. Braxton Hicks records four cases in which forceps was tried unsuccessfully, in all of which version was used, three of the children being born alive.

11 Parvin says: "In flat pelvis of nature is unable to effect the passage of the head through the inlet, resort to forceps is not indicated but podalic version. ----- The usual rule is to wait after rupture of the membranes and dilatation of the os, with the hope that the head may enter and pass the inlet, but if after a reasonable delay this does not occur, podalic version is to be performed."

12 Donald carries his view on the subject to the extreme and advocates turning even in cases in which you know it is impossible, to save the child, considering it better to perform craniotomy on the aftercoming rather than on the presenting head.

13 Spiegelberg says: "With an unfavourable position and attitude (i.e. presentation of the anterior or posterior parietal bone, extra-medial presentation a position of the head which does not correspond with the shape of the pelvis, face or brow presentation) as soon as it becomes evident that the head cannot be spontaneously rectified and fixed, podalic version should be performed. ----- If the head is delayed in engaging at the brim ----- version and extraction may also be indicated."

In his chapter on forceps he gives the following rule: - "The head must be in a position adapted to the use of the forceps i.e. its greatest circumference must have traversed the pelvic brim. ----- If the head lies firmly and fully

in the brain ..... even then the instrument should only be applied as an experiment. Forceps can only be used with benefit when the head has already overcome the contraction, either through having got beyond or through having become moulded and adapted to it. Now under such circumstances delivery of course takes place spontaneously, provided there are good parts."

These quotations from a few of the best-known works on midwifery serve to show how varied are the opinions on this subject and how impossible it is for a beginner to be rightly guided by what he reads.

I shall now consider the advantages and disadvantages of each of the two methods of treatment taking up first, the question of the use of the long double-curved forceps.

The advantages claimed by the use of forceps at the brim in preference to the performance of version are generally held to be chiefly the two following :-

1. You can exert a much greater amount of traction without involving the risk of injuring the spinal cord when forceps is being used than when the child is being extracted after turning.

To prove this experiments have been made to ascertain how much traction the spinal column will stand without yielding.

But to me this seems a very weak argument in favour of the long forceps because in the delivery of the after-coming head the main force is, or at any rate ought to be, applied by pressure from above and not by traction on the neck of the child; so that the question of injury to the cord from traction should not enter at all into the argument in favour of forceps.

2. The other advantage claimed for the forceps is that delivery can be effected slowly and safely, whereas if, as Galabin says, the delivery of the after-coming head is delayed more than a minute or two the child's life will be sacrificed. This is surely killing the child in a very short time and I think five minutes is nearer the mark as the period during which the head may be delayed without certain death. I have more



than once seen cases in which the child was born  
 alive after a delay to the head of several minutes. In a  
 case in which I turned for a Pelvis with a conjugate  
 diameter of under 3 inches, more than five minutes  
 elapsed between the bringing down of the arms and the  
 birth of the head. I was manipulating the head from  
 below and an assistant showing strongly from above.  
 We continued this till exhausted, without affecting  
 the position of the head to any appreciable extent.  
 I then having abandoned all hope of saving the child,  
 left the bedside and washed my face and hands, pre-  
 paratory to adopting further measures. Then thinking we  
 ought once again to attempt extraction of the head we made  
 a last effort to do so. It came suddenly past the  
 promontory with a very marked jerk, and the child  
 which weighed 10 lbs. was resuscitated without much  
 difficulty. But there are surely few cases in which  
 the aftercoming head, if it is going to come at all without  
 requiring perforation, need be delayed more than the  
 minutes or two allowed by Galatin. The delay caused  
 by the soft parts must not be forgotten, but in multi-  
 parae this is rarely more than trivial and in primiparae  
 the vagina should be dilated and the perineum stretched  
 with the hand before version is performed. As to the  
 perineum I very much doubt if there is any greater risk  
 of lacerating it by the comparatively rapid extraction of the  
 aftercoming head, than by slow extraction of the head  
 by forceps. If there is sufficient elasticity in the tissues  
 of the perineum it will stretch without tearing in either  
 case, while if thick and rigid and infertile as it some-  
 times does to the finger a feeling as if it were composed  
 of cicatricial tissue it is almost bound to tear despite  
 the slowest and most careful manipulation.

The chief difficulty in connection with the use of forceps  
 at the brim is I think not the applying of the blades,

which is easy unless the head is lying very freely movable above the brim when the application of the second blade may be difficult, but the keeping of the blades accurately applied to the head during extraction. I do not excuse the carelessness by which the blades are suddenly torn by the extracting force off the head and through the perineum splintering it up as by a knife. That sort of treatment need not be adopted.

What I refer to is the process by which the head, as soon as traction is applied extends itself slowly out of the grasp of the blades. This I think is in some cases unavoidable and is caused I imagine by the one blade pulling down the forepart of the head to which it is applied while the other is unable to pull the broader posterior half of the head past the projecting sacrum or other part of the brim on which it nips. The effect of this is practically to convert the vertex presentation into one approaching a brow so that the position of affairs is hardly improved. There may at first be an apparent advance of the head towards the cavity of the pelvis as evidenced by more of the blades of the forceps coming into view. But this advance is only apparent being caused by the extension of the head, and if traction is persisted in the head eventually throws off the forceps. This happened very markedly in a case in which the true conjugate measured  $3\frac{1}{4}$  inches.

The head was arrested at the brim and I applied Simpson's axis-traction forceps. I pulled slowly and carefully for nearly half an hour apparently making progress to a certain extent. ~~But~~ <sup>period</sup> on examining occasionally during this ~~of~~ traction I each time found that the head had slightly slipped out of the grip of the blades and at last to prevent the forceps slipping suddenly I was compelled to remove the blades. On examining now prior to reapplication I found to my amazement that the head was still free at the brim and the effect of the long-continued traction had been practically nil. I therefore performed version and delivered a living child without any difficulty. For several

days the mother suffered from retention of urine and slight abdominal pain which I am sure would not have occurred had I turned in the first instance without trying forceps.

In most cases of contracted pelvis with a conjugate of 3 1/2 inches or thereabouts the head is found to occupy the transverse diameter of the brim. Now the blades of the ordinary form of long forceps generally lie at the brim almost if not completely in the transverse diameter. Therefore the blades would grasp the head, the one over the forehead, the other over the occiput. This not only gives an insecure hold as we have already seen, but the pressure of the blades on this long occipito-frontal diameter of the head tends to increase the transverse diameter of the head which lies in the antero-posterior diameter of the pelvis, and is of course the very diameter we wish to diminish so that it may be able to pass the contracted conjugate. Even in those cases in which the head inclines perhaps almost as much to an oblique diameter as to the conjugate, so that the blades when applied grasp the head not exactly in the occipito-frontal diameter but show an inclination to fit into the opposite oblique diameter of the pelvis, still there is a strong tendency for them to slip round into the transverse diameter and so lose their hold of the head. There can be no doubt that for cases of this kind i.e. cases in which the head tends to lie in the transverse diameter of the pelvis on account of some contraction of the conjugate, and shows no inclination to engage in one of the oblique diameters it is worse than useless to apply the ordinary form of long forceps. Unless resort is resorted to at once the only rational method of delivery is by some form of antero-posterior forceps such as Cameron's which will grasp the head in its transverse diameter and by the pressure of the locked blades diminish that diameter of the head which we wish to act on.

A third though a less important disadvantage of the long forceps is the uncertainty of the amount of compression

The blades exercise at a given moment when the screw is tightened. The inexperienced accoucheur is apt in his fear of exerting too much compression to leave the screw so loose that when he gives a strong pull the blades slip it may be with disastrous results. On the other hand, in his anxiety to avoid this accident he screws the blades up so tightly that the head is injured by the great pressure to which it is subjected, and the child is born in a state of asphyxia pallida produced by injury to the respiratory centre from which condition it is impossible to resuscitate it. Or even in skilled hands the head is more or less flattened looking as if the cephalotribe rather than extraction forceps had been applied, the result being similar. Without going this length it is troublesome to loosen the screw between each pull and this point is often either forgotten or omitted in the excitement of delivery.

Again, why should we in a pelvis in which there is too little room as it is employ a method of delivery which entails the introduction of an instrument which must to a certain extent occupy some of the space which is already too small for the body which has to pass through it? But perhaps this argument is more applicable to the case of forceps at the outlet where you certainly have in my opinion, a better chance of saving the foetus when that shows a tendency to tear, by removing the blades and manipulating the head part by means of your hands alone.

I shall now consider version as a means of delivery in deformed pelvis. The chief and incontrovertible advantage of version over the application of the long forceps is the fact that you can undoubtedly deliver a living child by version through a pelvis so contracted that any attempt at extraction by forceps could end only in failure. That of itself seems to me a very strong argument in favour of version.

The physical causes which lead to this advantage are chiefly two: (1) After version has been performed the diameter of the head that engages in the brim of the pelvis is the bi-mastoid

instead of the bi-parietal or bi-temporal of the presenting head. As is well known the bi-mantoid is the smallest diameter that can engage measuring on an average three inches as against 3 1/4 to 3 3/4 inches in the bi-temporal and bi-parietal respectively.

(2) As Simpson demonstrated so clearly the aftercoming head is moulded into a shape totally different to that assumed by the presenting head. The force exercised in the delivery of the aftercoming head causes it to assume a more elongated form, its vertical diameter is increased at the expense of its transverse which is diminished by the lateral pressure of the walls of the pelvis. On the other hand when the head is presenting in a pelvis whose conjugate diameter is say less than 3 3/4 inches or in any special case less than the bi-parietal diameter of the head that diameter cannot engage in the narrowed brim. The parietal eminences never reach the level of a plane including the sacral promontory and the upper part of the symphysis. The part of the head that is caught by the brim lies nearer the sagittal suture than do the parietal eminences and the result of pressure is to flatten the top of the skull and to increase the transverse diameter which is the very one we wish to diminish. It is almost equivalent to attempting to drive a wedge through a small aperture, with the broad end first instead of the narrow one.

(3) The third advantage in turning is that the aftercoming head adapts itself more accurately to the requirements of a deformed pelvis than the presenting head, and ~~the aftercoming head~~ can be guided into the most roomy part of the pelvis. This is of special value in the rachitic pelvis in which very often one side is wider than the other, when you turn so as to bring down the large posterior portion of the head into the roomy side of the pelvis.

(4) Another argument in favour of turning is that the os need not be so fully dilated for the performance of version as for the application of the forceps. This however is of value only in those cases in which we wish to arrest haemorrhage by the direct pressure of the leg

which is brought down through the so as in cases of placenta praevia and of no value in uncomplicated cases of deformed pelvis in which if for any reason it is thought desirable to accelerate labour the os may be most readily and safely dilated by the accoucheur's hand.

(5) Lastly every now and then we meet with women who on no account will allow forceps to be applied or an anaesthetic to be administered. In these cases it is quite possible to turn without the woman's being aware that anything beyond a mere examination is being practised and the case is finished with much greater satisfaction to the patient and friends and with very much more credit to the accoucheur. This may appear to be a trivial and almost absurd point in favour of turning but it is at any rate a practical point and would be granted I have little doubt by many who have had to deal with this labour question in the West end of Glasgow.

I shall now consider the disadvantages and difficulties of version. There are undoubtedly cases in which it is impossible to turn cases of deformed pelvis, nearly always in primiparae, in which labour has been going on for hours and the uterus is tightly contracted on the body of the child. The liquor amnii may or may not have drained away and I don't think it makes very much difference in the treatment of the case. I have several times had cases in which though the membranes were unruptured the uterus was so tightly contracted that turning was considered inadvisable and the child's head had to be crushed before it could be extracted. On the other hand I have seen ~~the~~ cases in which the membranes had been ruptured as long as forty-eight hours the uterus being of course tightly contracted on the child, and yet with the exercise of great patience and care version was safely accomplished. Therefore I think that in skilful hands and by the persistent avoiding of all attempts at hurry or forcing matters turning could be safely accomplished in a very

large majority of such cases. Spiegelberg says, "only very rarely will it be necessary instead of turning to remove the fetus by embryotomy." In those few cases in which it is considered too risky an expedient I think it will generally be found that the child is either already dead, from arrest of the placental circulation caused by the great pressure to which the placenta is subjected as it lies jammed between the child and the uterus in a state of tonic contraction, or if not dead it will be in too feeble a condition to survive the extra pressure involved by delivery with forceps. The application of forceps in cases like this in which version is impossible is attended with much danger both during the introduction of the blades and during extraction. To introduce the blades in such a case an altogether inadvisable amount of force is undoubtedly required, force if applied with the least inaccuracy may end in shoving the instrument through the thinned and easily ruptured lower segment of the uterus or even into the child's head instead of alongside it. Again the extraction of the child in such cases is certainly not free from danger to the mother. The pressure to which the vaginal walls is subjected during the long delivery is very apt to lead to injury of those parts which may go the length of sloughing. The neck of the bladder may also be injured causing incontinence of urine after delivery and the sphincter ani may be paralyzed or torn through, and incontinence of feces result. This state of matters I have seen end in the death of the mother a result which would hardly have happened if forceps had not been used.

Turning is spoken of by many as an operation performed for the relief of the child, and on this account they say should never be performed if the child is dead. In which case when forceps is inapplicable craniotomy should be performed. I cannot see the reason for this opinion. Why should we not adopt the easiest method of delivery when the child is dead as well

as when ~~the~~ it is dead? The answer given would be version causes much greater shock than craniotomy. I believe this idea about the shock of version is to a very great extent erroneous and exists only in the minds of theorists. I have had within the last two years a pretty fair experience of cases of version, and can honestly say, looking back on a record of about forty cases that I have never seen shock or anything like shock as a result of turning, on the contrary I have almost invariably found that in cases of turning the mothers were able to be up and going about at least as soon as in ordinary cases of labour.

Indeed it used in my time to be a joke in the Maternity if you wished to treat a case successfully and have a normal temperature during the puerperium you must turn. Of course this is going a little too far and I should not like to advocate the practice of turning in every case of labour, still even a remark made in fun often has a grain of truth in it and in my own experience it proved fairly accurate.

I suppose the shock arises from the introduction of the hand into the uterus and is due to the effect on the sympathetic nerves. But in many cases turning can be effected without the introduction of the hand into the uterus.

I think the performance of bipolar version which necessitates the introduction of only one or two fingers into the uterus, or even external version with both hands acting on the abdominal wall should be strongly urged upon those who fear the shock of the ordinary internal method.

I am convinced that the bipolar method is not employed nearly so often as it might be. Lately I have used this method in almost every case and found it workable even after rupture of the membranes and escape of the liquor amnii. A great advantage in this method is that the administration of an anaesthetic is not essential. It is not such a quick method of turning as internal version but there are few cases in which speed in the actual turning is of any value.

On several cases of induction of labour I have turned by the bipolar method as soon as the os was wide enough to admit one



finger, thus leaving less to be done when labour had reached the second stage which in some cases was not till two or three days later.

There is one class of cases of deformed pelvis in which it is against all rules to turn, the generally contracted small pelvis. There are excellent theoretical reasons advanced against turning in those cases, the chief one being that there is no one diameter of the pelvis specially long, like the transverse in a rachitic pelvis, which can to some extent make up for the other diminished diameters. If you turn here, the long occipito-frontal diameter of the head is thrown by the inevitable extension into a pelvic diameter which is smaller than it ought to be and of necessity the head is jammed. Whereas if left to itself the head in a pelvis *aequaliter* - just - minor engages and attempts to pass the brim in a state of exaggerated flexion, and if it will not pass of its own accord, the application of forceps is the correct treatment. But suppose this fails then as version is incorrect treatment and also as by the time the forceps is abandoned the head is probably hopelessly jammed, the only resource is craniotomy and a child is sacrificed that might have survived had turning been employed in the first instance. Having aside theory and speaking from experience I may say that I have on several occasions turned, after induction of labour at the eighth month, in cases of generally-contracted pelvis in which the conjugate diameter measured on an average three inches and on two occasions has there been any difficulty in the birth of the head.

No turn up version in contracted pelvis should, in my opinion, be performed in the following cases: -  
1. Judging from internal pelvimetry by means of the finger, empty version in any case in which the true conjugate measures from  $2\frac{3}{4}$ " to  $3\frac{1}{2}$ ". Below  $2\frac{3}{4}$ " I believe the choice of operation lies between craniotomy and Caesarian section unless symphysiotomy is adopted; above  $3\frac{1}{2}$ " I think most cases would end naturally if left to themselves.

This is most noticeable in primiparae in whom with slight contraction of the brim there is invariably arrest of the head for some time but eventually, if not interfered with will mould past into the cavity of the pelvis.

2. Speaking generally perform version (a) in a primipara in labour and the head not engaging (b) in a multipara when after rupture of the membranes a fairly long time say an hour is allowed and at the end of that time the head is found still free at the brim.

In a primipara the head during the last week or two of pregnancy lies lower in the pelvis than in a multipara and even before labour has begun tends in a normal case to enter the brim of the pelvis. Therefore if you find a primipara in labour and the head not engaging you may be pretty sure that there is a sufficient degree of contraction of the brim to necessitate turning.

The case is entirely different in a multipara. Here even in a normal pelvis it is by no means uncommon to have the os fully dilated and yet the head swinging free above the brim in the unruptured bag of membranes. Then if you rupture the membranes it is astonishing to note the speed at which the head is often propelled down through the pelvis. After rupture of the membranes if the head is going to pass they will engage at once, but if an hour or so has elapsed and the head is still free at the brim it has no intention of ever engaging and turning had better be done at once before the uterus has time to contract firmly round the body of the child.

This does not seem to leave much to be done by forceps at the brim and I am convinced this instrument is too frequently used especially in the case of primiparae in whom as I have already stated the head will often mould past a conjugate of 3 1/4 inches. Practically I have found very little use for forceps at the brim in my own experience. In close on 800 cases I have applied forceps to the head

at the brim on only eight occasions and of these only five were cases of contracted pelvis the true conjugate in no instance measuring less than  $3\frac{1}{2}$  inches, so that it is possible that even these five cases could have done without forceps. Therefore I think that forceps at the brim should be used only in those few cases of complete arrest of the normal head at the brim with a conjugate of  $3\frac{1}{2}$  inches and upwards, and in normal pelvis for reasons other than deformity, such as rigidity of the os, eclampsia, etc. causes which hardly come under discussion here.

Considering now the operation of internal podalic version, I am afraid there is little new to be said about it, but I should like to touch on just a few points in the operation. The choice of hand seems to be entirely a matter of opinion and has not much practical importance. Some advise using the left hand in cases where the child is lying dorso-anterior and the right in the dorso-posterior position. I have always used my left hand and have never found any difficulty in its use, or seen any reason to suppose the right would have been preferable. When the patient lies in the left lateral position there is indeed an advantage in using the left hand as it accommodates itself to the pelvic curve more easily than the right and the right hand is left free to manipulate the body of the child through the abdominal walls. In cases where the os has to be freely dilated before turning can be accomplished, it need hardly be said that this dilatation should be performed with the hand that has not to be used for turning. Holding the arm up for a few seconds preparatory to turning seems to give a slight advantage in the introduction of the hand, and blowing on the wrist has a remarkably soothing and relaxing effect on the tired arm.

There has been great controversy over the question as to whether it is better to bring down both feet together or only one. So far as I can see this is of very little importance and I have followed either plan indifferently. I think one may be quite content to

bring down the first foot he touches without striving to grasp the other and so subject the uterus to further strain and more prolonged irritation.

In version for contracted pelvis it is practically a dead certainty that no matter what amount of care is taken the arms will become extended. The risk of breaking the arms while bringing them down has I think been much exaggerated, and with a very little care may in most cases be avoided; speaking from my own experience I may say that I have never broken a living child's arm though more than once I have had great difficulty in bringing the arms down. When it is possible the fingers should be passed up to the child's elbow but in many cases this cannot be done. In those cases the arms ought to be brought down by pressure applied as near the upper end of the humerus as possible. The sure way to break the arm is to apply pressure to the middle of the humerus; but even if the child's arm is broken it unites very easily.

Among the many writers on obstetrics hardly one lays any stress on the great importance of assisting the delivery of the after-coming head by exercising pressure from above. Husk says "it is usual to combine pressure from above exercised by a skilled assistant upon the head through the abdominal walls, with traction from below." Here we see the main cause that has led to the minimising of the great advantages of version in deformed pelvis, this almost utter neglect of the most important sequel to the operation of turning. This is what has led to the absurd fear of dislocating the child's head or in some way injuring the spine by the great traction that requires to be used to deliver the after-coming head, and this above all things I imagine has caused the rate of infant mortality from version to be much greater than necessary. Siegelberg speaks more strongly than others on this subject "traction must always be assisted by pressure on the fundus and body of the uterus." Everyone talks of the "extraction" of the after-coming head as if that were the correct mode of delivery; I should prefer to speak of the expulsion of the after-coming head. Just as we speak of the expulsion not the extraction of the placenta, and know that expulsion and not

traction is the correct method of removing a retained placenta, so right, we to consider the delivery of the aftercoming head as strictly an act of expulsion not of extraction. Therefore in the delivery of the aftercoming head, where tractive force is necessary we ought to consider the pressure from above of primary importance as it undoubtedly is, and to speak of combining some traction from below with the pressure from above, and not the opposite way as is usually done.

I am a very strong believer in working from above in the practice of midwifery, and certainly think that a great deal more can be done in this way than is generally acknowledged. Most presentations and positions can be recognized by manipulation through the abdominal walls. Every retained, and even some slightly adherent placentae can be expelled by pressure from above. Cases of so-called delayed second stage in which the head as we are told "hangs on the perineum" for an apparently indefinite time can be certainly accelerated by pressure from above, and even the necessity for the application of forceps at the outlet can be in some cases avoided by the practice of expelling the child by abdominal pressure. But of far greater importance than in any of the foregoing cases is pressure from above in dealing with the aftercoming head. I should imagine it would be by no means difficult to kill the child by hauling on its body while the head is stuck in a contracted brim, but it would hardly be possible to injure the child by the application of manual pressure through the abdominal walls. Of course I do not mean to imply that there should be no manipulation from below, and in very stiff cases, even traction to a considerable extent, but the plan to which we should trust is that of abdominal pressure. I have seen many cases in which no amount of traction would have brought the child through had it not been employed only as an adjunct to very efficient pressure; and I have also seen cases in which the child has been lost solely from traction having been trusted to, and abdominal pressure neglected or inefficiently employed. I may be accused of over-rating the importance of this factor in the delivery of the aftercoming head.

head, but I am speaking of what I have seen in the treatment of about forty versions for contracted pelvis and am quite convinced that it is impossible to insist too strongly on this point.

The following is a short account of the twenty-one cases which form the basis of this paper.

Out of this number twenty of the mothers lived, and one died. This fatal case was one of induction of labour at the 8th month for contracted pelvis with a C.V. of  $2\frac{3}{4}$ " ; proteral pyaemia supervened and the patient died of purulent peritonitis seven days after the operation. A resume of this case is given below.

Six of the children were stillborn. The first was in a pelvis with a C.V. of 3", and was lost I believe solely from want of skill on the part of operator and assistants.

In the second case the C.V. measured  $3\frac{3}{4}$ " and the presentation was right mento-posterior. The labour had been going on slowly all night, and in the morning the students in charge of the case sent for me as no progress was being made. The face was well down into the brim of the pelvis and all but jammed, one arm was down alongside of the head. I considered version to be the most suitable method of delivery under the circumstances. It was with very great difficulty that I managed to push the head up past the brim, and a large portion of the cord prolapsed as the head receded. Even after getting hold of a foot it was with great difficulty that the head swung round and it was only by means of a nose round the foot and by direct pressure upwards on the head, that version was finally accomplished.

There was no pulsation in the cord from the time of its prolapse, and I believe the child had been dead for some time before my arrival. The only alternative to version in this case would, I believe have been craniotomy.

The third and fourth cases in which the children were lost were cases of induction of labour.

In the third the C.V. measured under 3", and labour was induced at eight months by means of bougies and Barnes' bags.

When the os was about the size of a florin the membranes ruptured and a large length of cord prolapsed. I at once finished the dilatation of the os by means of my fingers, and turned. Though the liquor amnii had not been escaping for more than half an hour the uterus was surprisingly firmly contracted on the child, and version was difficult to perform. The arms became extended and were brought down <sup>unbroken</sup> in some mysterious way over the child's back, that being the only way they could be moved. The head was easily expelled but the child was dead.

In the fourth case the C.V. measured  $2\frac{3}{4}$ " and labour was induced at 7½ months by means of bougies and Barnes bags. Bi-polar version was easily performed, but on bringing down a loop of cord when the child was born as far as the umbilicus no pulsation was found in it, and an hour's artificial respiration failed to resuscitate.

In the fifth case the C.V. measured only  $2\frac{1}{2}$ " and the patient was told to come into the Maternity Hospital for induction of labour at 7½ months. She unfortunately delayed coming in till about the eighth month when labour came on of its own accord. Version was then performed on the remote chance of saving the child, but the head stuck and craniotomy had to be performed.

In the sixth case the patient was sent to the Maternity for craniotomy. She had been 24 hours in labour and the membranes had been ruptured for eight hours. Forceps had been applied and had failed; the child was dead on admission. C.V. measured  $2\frac{3}{4}$ ". There was some difficulty in introducing my hand, but none in turning and delivering. The child weighed eight pounds and its head was very soft.

The following is a short resume of the fifteen cases in which the child lived.

1. C.V.  $3\frac{1}{2}$ " Multipara. 1st stage of labour lasted 48 hours. Version performed and child weighing  $10\frac{1}{4}$  lbs delivered easily. The case is interesting from the following reason: - On pulling

down the loop of cord no pulsation was felt. The child  
breathed and cried immediately on delivery, and the cause  
of the non-pulsation was found to be a pretty firm knot in  
the cord which of course must have been tied during version.

2. C.V. 3 3/4" Multipara. 1st stage 12 hours. Three hours after  
rupture of the membranes the case was found to be making no  
progress. On examining I found the head face at the brim  
and lying in the 4th cranial position; one arm and a loop  
of cord were lying by the side of the head. Version was  
performed easily enough and one leg brought out of the vagina  
as far as the knee, but at this stage it stuck and no  
pressure from above or traction seemed to have any effect.  
On passing my hand up I found a loop of cord tightly  
wound round the other thigh. After the loop was disengaged  
and replaced delivery proceeded smoothly. The cord was also  
found wound round one of the arms. Artificial respiration  
had to be continued for half an hour before the child breathed.

3. C.V. 2 3/4" Multipara. 1st stage 20 hours. Version performed easily.  
There was great difficulty in delivering the head, so much so  
that after manipulating till exhausted I was compelled to stop  
for a short rest. On resuming work the head came suddenly  
past the promontory with a jerk, and a few minutes artificial  
respiration sufficed to resuscitate the child which weighed 10 lbs.

4. C.V. 3 1/2" Multipara 1st stage 26 hours. After the membranes  
had been ruptured for some time the head was found not  
engaging and lying in the 3rd cranial position. Version was  
performed and delivery effected without any difficulty.

5. C.V. 3 1/2" Multipara. 1st stage 27 hours. Presentation right arm.  
I found the membranes unruptured, and the right arm lying  
over the os which was about the size of a florn. The head  
was found by palpation to be lying in the right iliac region  
and the breech in the left. I dilated the os digitally, and  
with a little difficulty reached a foot and turned. Delivery  
was difficult, but the child breathed immediately.

6. C.V. 3 1/4" Multipara. 1st stage 16 hours. Owing to delay of the



second stage I applied axis-traction forceps to the head free at the brim. After vainly endeavouring for half-an-hour to bring the head past the brim I took off the forceps and turned without difficulty. The placenta was firmly adherent, and there was some postpartum hæmorrhage. Patient was troubled for a few days with retention of urine but by the sixth day felt quite well.

7. C.V. 2<sup>3</sup>/<sub>4</sub>" Multipara. Patient had been confined on three previous occasions; twice at full time when craniotomy had to be performed and on the third occasion labour was induced, but the child was stillborn. She was now 7½ months pregnant.

Labour was induced by the introduction of a No. 12 gum-elastic bougie into the uterus. 24 hours later as there were no pains a second bougie was introduced. Ten hours later pains began and the os dilated rapidly for 4½ hours when the membranes ruptured. The head was found lying at the brim in the transverse diameter of the pelvis and the brow was presenting. Version was easily performed; the child weighed 5 lbs. The caput succedaneum was formed over the forehead and there was a deep depression in the right parietal bone which had almost disappeared when the child left hospital ten days later.

8. C.V. 3" Multipara (2<sup>nd</sup>) This was a case of pelvis aequiliter pistominor. At her first confinement patient had been at full time delivered of a dead child by forceps at the brim the perineum being ruptured as far back as the anus.

Labour was induced at 8½ months by the introduction of a full-sized gum-elastic bougie. Twelve hours later the os was fully dilated. The head was found free at the brim and lying in the transverse diameter of the pelvis. Contrary to the theoretical rule of treatment in cases of generally-contracted pelvis, version was performed and the child weighing 7½ lb. delivered easily.

9. C.V. 2<sup>3</sup>/<sub>4</sub>" Multipara. Labour was induced at the 8th month by means of a gum-elastic bougie. 19 hours later the os being fully dilated version was easily performed. There was some difficulty in bringing down the breech, but otherwise delivery was easily effected.

- 10 C.V. 3" Primipara. On admission the os was found to be the size of a florin and the right arm was presenting. The os dilated rapidly, and bipolar version was performed. Considerable force was required to get the head past the brim. The child weighed 8 lbs and breathed almost immediately on delivery.
- 11 C.V. 3 1/4 Multipara (2nd) Craniotomy performed on first child. Patient was brought into hospital to have craniotomy performed, as she had been a long time in labour without making any progress. The os was found to be the size of a shilling, so the patient after getting some opium was allowed to rest for the night. In the morning the os was the size of a crown-piece, and the head was found lying in the transverse diameter of the pelvis and not attempting to engage. After some further dilatation of the os version was performed and the child delivered easily. It was very white and flabby, and artificial respiration had to be continued for forty minutes before it revived.
- 12 C.V. 3" Multipara. In previous labours there had always been operative assistance. On full dilatation of the os the membranes ruptured. An hour later the head was found still free at the brim and lying in the transverse diameter of the pelvis. Version was performed. There was great difficulty in bringing down the second arm which was lying anteriorly jammed between the head and the pelvis. The child which weighed 8 1/2 lbs was pale, but quickly recovered.
- 13 C.V. 3" Multipara (2nd) After rupture of the membranes the head was found free at the brim and lying in the transverse diameter of the pelvis. Version was performed, and the child which weighed 8 1/2 lbs delivered without any difficulty.
- 14 C.V. 4 1/4" Multipara. In previous labours there had always been operative assistance; in last labour version had been performed. With a fully dilated os the head was found free at the brim and lying in the transverse diameter of the pelvis. Version was performed, and delivery easily effected.
- 15 C.V. 4 1/4" Multipara. Labour had been induced on several previous occasions. On this occasion labour was induced at the

8th month. On admission to hospital on the 20th day of the month the os was found to be the size of a shilling. Bipolar version was performed, the feet being brought over the os, and the smallest Barnes bag introduced. On the following day the child swung round and again presented by the head. Dilatation proceeded very slowly, and on the 22nd, there being still no pains, a gynecologic bougie was introduced into the uterus. On the evening of the 23rd the os being almost fully dilated bipolar version was performed for the second time. Slight hæmorrhage ensued and delivery was at once completed without any difficulty.

The termination of this case was unfortunately disastrous. The patient kept perfectly well in every respect till the 26th three days after delivery. On that day she began to complain of abdominal tenderness, and her temperature, hitherto normal, rose to 101.2°. On the 27th temperature was 103.4°. Patient was sick, tongue dry, tenderness over the uterus, lochia normal.

28th Temperature 103°. Condition unchanged. The tenderness was so slight that nothing serious was apprehended. Lochia normal.

29th Tenderness over uterus gone, but all day patient had free and painless vomiting of stuff like brown soup. Towards evening she felt much better.

30th Early in the morning patient very suddenly collapsed, temperature ran up to 106.6° and in a few hours death ensued.

At the P.M. there was found to be extensive purulent peritonitis although the cavity of the uterus was to all appearance free from septic material. The very septic condition of the abdominal cavity and the wide-spread peritonitis resembled what one sees in a case of ruptured intestine, and it is noteworthy that such extensive mischief should have occurred accompanied by so slight symptomatic evidences. There was some laceration of the cervix from which the septic process must have started; but why septicaemia should have occurred in this particular case was never determined.

It seems a pity to finish the list with the one fatality that occurred, but it would not have been right to omit it, and the case in itself is a most interesting and instructive.

The following is a list of authors whose works on  
obstetrics have been consulted with reference to this paper :-

- Barnes
- Braxton Hicks
- Donald
- Galabin
- Haultain
- Landis
- Leishman
- Lusk
- Parvin
- Playfair
- Schroeder
- Spiegelberg
- Zweifel