

"TRENFIELD"
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On CONTRACTED PELVIS, with special reference
to the treatment of medium degrees of contraction, and
the employment of the operation of PUBIOTOMY, with
illustrative cases.

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INTRODUCTION, -

In obstretrical practice no greater skill is needed than in dealing with medium contractions of the pelvis. In the major and minor cases one can roughly follow a rule of treatment, the former by Section or Craniotomy, and the latter by forceps if not delivered spontaneously.

In the medium degree no one method can be laid down; and only by a careful estimation of the type of contraction, and measurement of the size of pelvis and foetal skull, can the obstretician successfully lower the enormous infant mortality.

When at the Coombe Hospital, Dublin, as Assistant Master, I looked up all the statistics for induction of premature labour, and was astonished at the infant mortality.

In New Zealand we have had three cases where it was thought right to induce labour, and only one child lived, and that lived only after the most careful nursing.

In New Zealand one rarely meets with any case which is greater than the medium degree; and so its importance cannot be over-rated, when one sees forceps used indiscriminately, and the contraction in relation to the foetal skull not carefully estimated.

The following statistics of pelvic contractions, in different localities and according to various authorities, give some idea of their incidence, -

Dr. Munro Kerr gives Glasgow Hospital statistics as, -

			1% to 3%
Edinburgh	"	"	2% " 5%
London	"	"	4% " 5%
Boston,	2%	in British women.	
"	6%	" Foreign "	
			(Reynolds).

Williams of Baltimore, - 7%

Michels, in 1000 cases gives 131 contracted pelves.

Winchel, - ... 5%

Schauta, - ... 20%

French, - ... 5% to 15%

Austrian, - ... 2% " 8%

Russian, - ... 1% " 5%

These statistics show the necessity of every practitioner being able to diagnose pelvic deformity, and that a knowledge of pelvimetry is quite as essential as percussion and auscultation to the physician.

By contracted pelvis one means three degrees, -

1. Major, - under 7.5 cm. = 3"
2. Minor, - over 9.3 cm. = 3 $\frac{3}{4}$ "
3. Medium, - 9.3 cm. to 7.5 cm.

In cases of minor degrees we have very little anxiety. The majority have been able to overcome the difficulty with the help of the Walcher's position, and have

rarely required more assistance than is provided by the typical forceps application. In the major cases the treatment evolves into Caesarian Section or Craniotomy.

In the medium degree spontaneous delivery of the normal head through the brim occurs in a comparatively small percentage of cases, and therefore operative surgery is necessary. It is this latter that I particularly wish to deal with, as I feel sure if these cases were diagnosed early and Pubiotomy performed, after waiting a reasonable time to see if the mother could expel the child spontaneously, by slight traction, the infant mortality would be reduced.

CLASSIFICATION OF TYPES OF CONTRACTED Pelves.

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Hirst in his book follows Schauta's classification as the most convenient, with a few modifications.

1. Anomalies of the pelvis, the result of faulty development.
2. Anomalies due to disease of the pelvic bones.
3. Anomalies in the conjunctions of the pelvic bones.
4. Anomalies due to the superimposed skeleton.
5. Anomalies due to the subjacent skeleton.

Eden¹ says that there is a large number of

types, but that the majority are so uncommon that only two types are frequent enough to require special attention.

1. Generally contracted pelvis (small, round).

2. Flat Pelvis:-

(a) Non-Rachitic.

(b) Rachitic.

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Munro Kerr in his cases at the Glasgow Hospital places Rickets as the chief cause, comparing it with Osteomalacia which is so prevalent in the Rhine Districts and the North of Italy. He also favours the simple classification of Schauta.

²

Williams, in his long history of contracted pelvis says while our knowledge of the fundamental factors underlying the production of the many forms of contracted pelvis is so meagre, he favours the classification of Schauta, and from a practical point of view the one by Tarnier and Budin.

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Herman gives, as Eden, a very limited scale, and puts types of small deformity which we are dealing with as the flat pelvis, and the generally contracted or the small round pelvis. The common kind of great deformity is the small Rachitic pelvis. Most cases of pelvic deformity result either from, -

1. Softness of the bones from disease making them yield to pressure and pulling; or

2. Faults of development which affect the shape.

We know nothing of the causation of non-Rachitic flat pelvis. Tweedy³ gives a new list of classification of three sets of six, viz, -

1. Six pelvises flattened from before backwards.
2. Six pelvises flattened from side to side.
3. Six pelvises irregularly distorted.

Jellett classifies according to treatment, irrespective of pathology or cause.

After carefully reviewing different papers, I have decided to classify the types we are dealing with as follows. Pelvic contractions may consist of changes in size only, or in size and shape. The frequency of pelvic contractions is very variable. The most common are:--

1. Generally contracted pelvis, or Pelvis Aequibilater Justo Minor, (including Infantile, Dwarf and Masculine.)
2. Flattened pelvis, without general contraction.
3. Generally contracted, flattened pelvis.

THE GENERALLY CONTRACTED PELVIS is least common of all three. In it all diameters are more or less shortened; but there is little if any change in their relative proportions. The general shape is preserved, so that at first glance the pelvis may appear quite normal, and narrowing only discovered after careful measurement. Thus it differs from normal in size, whilst the general shape is preserved.

Further minor differences are:--

1. Inclination of plane of brim.
2. Curvature of Sacrum.
3. Promontory at higher level than normal.
4. Angle made by plane of brim with horizon consequently increased.
5. Concavity of Sacrum from side to side deepened.
6. Concavity of Sacrum from above downward somewhat increased in consequence, while change slightly exaggerates diminution of antero-posterior diameter of cavity. All diameters of outlet proportionally diminished.

Sometimes this type of pelvis approximates to male pelvis.

OCCURRENCE, - In women of otherwise normal development.

In women who are very small, but not otherwise deformed.

In dwarfs not subject to rickets.

Said to occur most frequently in America.

Occasionally in women of large stature.

DIAGNOSIS, - is established by external and internal measurements. Generally contracted pelvis may be suspected in small women, especially poorly-developed working women.

INTERNAL EXAMINATION, - shortened conjugate vera, difference between this and diagonal conjugate often as much as one inch owing to unusually high promontory of Sacrum. Size of cavity much under normal, contraction increasing from above downwards. In extreme cases, transverse diameter of outlet may be as small as three inches.

THE MASCULINE PELVIS occurs in strong, muscular women, rather tall in proportion to breadth, with somewhat masculine appearance. This pelvis is a variety of uniformly contracted pelvis, showing approximation to male type. Bones thick and clumsy, pelvis deep, prominences for muscles well marked; transverse diameter too small in proportion to outlet.

THE FUNNEL-SHAPED PELVIS, - closely approximates to the small round pelvis in that the cavity diminishes in size from above downwards; but differs from it in that the pelvis as a whole is not a small one; while the bony development is greater than that normally met with in women.

The transverse diameter is that in which the contraction towards the outlet is greatest. The essential changes are length and narrowness of Sacrum, so that promontory is higher than usual above brim, and difference between diagonal and true conjugate is increased to over an inch.

Diagnosis cannot be made during pregnancy; condition only discovered by difficulty of delivery. It may be impossible to reach promontory, owing to its height, by ordinary digital examination.

LABOUR WITH SMALL, ROUND PELVIS, - is practically the same as normal pelvis, but foetal head too large. The head can enter pelvis, but cannot easily pass through. There is difficulty throughout whole passage of head. In first stage of labour, as head can fill pelvic inlet, and its advanced part can press into os uteri, no tendency to premature rupture of membranes.

If pains are very strong, head jammed into pelvis, and cervix nipped all round, and retraction over head prevented. Flexion extreme to enable head to enter oblique diameter at all, so that sub-frontal diameter and no other can occupy brim. If flexion not complete, larger diameter will lie across pelvis, and entry be impossible. With extreme flexion of head, posterior fontanelle lower down, and nearer middle of pelvis than usual. Early rotation occurs, because head cannot get through pelvis unless it accommodates itself to the bones, and narrowing of transverse diameter at outlet causes long diameter of head to go into long diameter of outlet. Also with small pelvis and large child, rotation must be complete. Change in direction of long diameter of head characteristic of non-impacted head, because most room for long diameter of head in oblique diameter. Head

subjected to moulding, and child may not survive.

Breech presentation in small, round pelvis does not present greater difficulties than head, unless, by untimely pulling, arms or head get extended, and small space makes getting down arms and head more difficult than usual.

It is in the second stage that treatment is needed, and urgently; but difficulties should be prevented by induction of premature labour, which is frequently put off until too late, because of difficulty in estimating proper time to bring on labour.

Where discovery of small, round or funnel-shaped pelvis is not made till patient is well advanced in labour, then forceps should be resorted to. The conditions are usually favourable to application of forceps, because head is well flexed, and membranes do not rupture prematurely.

Considerable and prolonged traction is usually needed, and soft parts and foetal head are severely pressed on, with risk of vesico-vaginal fistula. If pressure is maintained too long, large proportion of children are born with white asphyxia. If delivery by forceps fails, perforation of head or division of pelvis must be adopted. Version must never be tried. Perforation of head is indicated where forceps traction fails, and where division of pelvis is contra-indicated. Pressure on head in

these cases is always severe, and it is undesirable to operate further on mother, unless there is reasonable chance of live child being born.

DIVISION OF PELVIS is best suited to small, round and funnel-shaped types of pelvis, because operation gives general enlargement of the cavity. Moreover presence of deformity being not generally recognised until second stage is well established, time of election for Caesarian treatment has passed. Advisability of performing Symphysiotomy or Pubiotomy depends on circumstances of case. Where expert help is obtainable, where condition of mother and child is satisfactory, and where tentative attempts at forceps traction show delivery can be easily effected if pelvis is somewhat enlarged; then one of these operations, preferably Pubiotomy, should be done. In the reverse of these conditions, perforation of head should be done. Caesarian Section in small and funnel-shaped types of pelvis chiefly performed by deliberate pre-arrangement on account of difficulty in past labours. Where induction has been tried and failed, choice lies between induction at earlier date, Caesarian Section at time of election, or division of pelvis in labour. Induction of labour is useless before 36th. week. Probably Pubiotomy is best in cases where the second stage of labour is reached before obstruction discovered. Where decision has to be made during pregnancy, if induction has been

tried and has failed, then Caesarian Section is the best course to take. If contraction is discovered during first stage, decision must be between leaving labour to proceed, subsequently attempting delivery by forceps, supplemented by division of pelvis, if need be, and Caesarian Section. If the labour is a first one, the head presenting no extreme disparity between it and the pelvis, the first course is the best. If there is a history of previous severe contraction, or if disparity between head and pelvis is very marked, or if breech presenting, the second course is advisable.

When labour has advanced to the second stage, Caesarian Section is not indicated as a rule.

VERSION is totally contra-indicated in all types of commoner general contraction, especially the small, round and funnel-shaped pelvis.

PELVIS IN WHICH CONTRACTION IS SITUATED AT THE

BRIM, - The commoner forms of these are, -

The non-rickety flat or ovate pelvis.

The rickety flat pelvis.

In both cases the upper entrance into pelvis is narrowed from before back by the projecting promontory.

Non-rickety flat or ovate, - (also known as elliptic, flattened pelvis). In this type the Sacrum projects forwards, and cartilage between first and second vertebrae is unduly prominent, so that a

false promontory is formed. The deformity results in narrowing the true conjugate, and increase, or relative increase, in transverse diameter at the brim. Remaining diameters of true pelvis usually normal. In the false pelvis difference between interspinous and intercrystal diameters may be slightly lessened. Shape of brim resembles an ellipse flattened on posterior side. Concavity of sacrum on transverse section almost or entirely lost; but it is not converted into a projection.

The Rickety flat pelvis, (also known as "reniform" or "kidney-shaped"). In this type the promontory of the Sacrum projects forwards so that the inlet is kidney-shaped, or even, in marked cases, tri-radiate or a figure of eight, and so forms a rounded prominence encroaching on area of brim. Concavity of pelvis is shallow, and at the outlet the antero-posterior and transverse diameters are relatively enlarged.

The intercrystal and the anterior spinous diameters coincide, so that the latter diameter represents the widest points between the crests. The posterior spinous diameter, both actually and relatively to the anterior spinous diameter, is diminished, and the relation may even be as low as 1 to 5.

RICKETY PELVIS MAY BE DIVIDED INTO THREE GROUPS.

1. Large rickety pelvis, in which the pelvis as a whole is not diminished in size, though the brim is flattened. The conjugate is rarely lower than $3\frac{1}{4}$ " in these pelvises.
2. The small rickety pelvis, in which the flattening of the brim is accompanied by general stunting of the bony growth. The conjugate may fall as low as $2\frac{1}{4}$ ".
3. The very small rickety pelvis, in which in addition to the flattening and stunting, the ischial and pubic rami are driven in by the pressure of the femora, producing a triradiate, or even figure of eight shape, of the inlet. In such available conjugate diameter may be less than an inch.

TREATMENT.

Large flat pelvis. True conjugate $3\frac{1}{4}$ " or over. Through such a pelvis a living child may be delivered and survive. Delivery may be effected either by nature or art, by induction, by dilatation of cervix, forceps, version, Caesarian section, perforation of child's head, and division of pelvis.

INDUCTION OF LABOUR. Good results when done for large flat pelvis with true conjugate of $3\frac{1}{2}$ " or over. When deformity discovered sufficiently early in

pregnancy this should be the course adopted.

Date at which induction is advisable depends on size of true conjugate diameter and relation of size of head to that of brim.

The rule of weeks is founded on ascertained lengths of conjugate diameter and duration of pregnancy in weeks. No account taken of variations in size of child's head.

It may be stated as follows:--

<u>Measurement of</u> <u>TRUE CONJUGATE.</u>		<u>Period of Pregnancy when</u> <u>INDUCTION SHOULD BE PERFORMED.</u>
$3\frac{1}{4}$ " 32nd. week.
$3\frac{1}{2}$ " 36th. "
$3\frac{3}{4}$ " 38th. "

This is a reliable method if conjugate measurement and duration of pregnancy accurately determined, but least dependable in later weeks, because of increasing variability in size of child's head. If in spite of induction, passage of head obstructed, treatment should be either forceps or internal version.

Division of pelvis or Caesarian section are both unjustifiable if child under 32 weeks.

Induction of labour before 32nd. week is not worth carrying out as far as child's life is concerned. From 32nd. to 34th. week child's life precarious; after this the outlook is much improved; and from 36th. week onwards the chances of survival of child are almost as good as of birth at term, provided child is cared for properly.

ARTIFICIAL DILATATION OF CERVIX. One of the chief difficulties of a flattened pelvis is frequency of rupture of membranes before cervix dilated fully. Hence it is inadvisable to leave completion of dilatation to chance of head coming down, for it may fail to do so; or even if it does, much pressure on foetus is caused, and there is certain to be more or less severe tear of cervix in subsequent passage of child. In absence of contra indications it is expedient to complete dilatation with a De Ribes' bag. The **CONTRA INDICATIONS** are partial or complete tonic contraction, when insertion of bag might precipitate rupture of lower segment; and the state of the patient being so unsatisfactory as to require immediate evacuation of uterus, by craniotomy or other appropriate operation. In such cases destruction of child is urgently demanded, and if os is not sufficiently dilated to perform the operation, it must be enlarged by cutting or by mechanical dilator.

FORCEPS TRACTION requires careful consideration, because in certain conditions it is the best treatment, and in others it is strongly contra-indicated.

Since the head in these cases has not, or only partially, entered the brim, and so lies above cervix, high operation has two disadvantages---

1. Blades of forceps very likely to grip head in faulty position.
2. In any case head must be pulled through a partially dilated cervix.

Seriousness of 1. obvious.

As regards 2. it is seriously rupturing cervix, hence never apply forceps to head either not engaged or engaged in abnormal position, nor in incompletely dilated or without, if case otherwise suitable, first dilating with a De Ribes' bag.

For the best chance of success, axis-traction forceps are absolutely necessary.

In general, with head in favourable position, if no advance with strong axis traction for three-quarters of an hour, at most, the attempt should be given up, as delivery by this method will not be effected.

Amount of force justifiable to apply should not exceed full force of operator's arm, applied through axis-traction forceps; to supplement with weight of body is dangerous.

If axis-traction fails, other courses open are:--

1. To perforate the head.
2. To turn the child.
3. To divide the pelvis.
4. To perform Caesarian section.

Perforation is the easiest resort, and, as a rule, best, as causing least risk to mother by damage or infection of genital canal, which apart from their immediate gravity, are often followed by sterility. When the state of the child is precarious, or it is already dead, perforation of head is the only proper

course.

Version should not be resorted to after failure of forceps traction, because there is no likelihood of better result being obtained with after-coming head. Moreover, patient having been in labour some time, most of the liquor Amnii will have drained ~~away~~ and the uterus become rigid.

INDICATIONS FOR VERSION ARE, - Malpresentation of head, prolapse of cord, external os less than dilated. Contra-indications are still more important.

It is useless to turn if disparity between head and pelvis so great that former presenting normally is unable to enter brim; because difficulty with after-coming head would be such that the child would perish. Version absolutely improper if uterine wall is rigid. After version, the chief difficulty is delivery of after-coming head. In flat pelvis it is important not to attempt this until both arms have ~~been~~ brought right down; then head is delivered by face and shoulder traction and supra-pubic pressure. Head must enter brim in transverse diameter, and by applying simultaneously traction from below and pressure from above considerable force can be applied. If after-coming head cannot thus be delivered, or if cord stops beating, no further attempt should be made, but head should be perforated at once.

CAESARIAN SECTION as primary method of delivery must be considered under three distinct sets of cir-

cumstances:--

1. Where true conjugate is between $3\frac{1}{4}$ " and $3\frac{1}{2}$ " and before 32nd. week of pregnancy, patient should be given choice between induction with practically absence of danger to herself, but undoubted risk to the child; and the abdominal operation with its high maternal mortality, and its favourable chances for the child.
2. Where previous induction has been unsuccessful, or patient presents herself too late for induction; then Caesarian section is generally advisable.
3. If patient already in labour, Caesarian section in alternative to forceps traction, version and division of pelvis.

If child large, head may be quite disproportionate even to a pelvis with a true conjugate of 4". In such cases question of Caesarian section should be very carefully considered.

If operation is carried out under favourable circumstances, and before attempts to deliver by vagina have been made, it will probably prove successful for both mother and child; but before deciding it must be ascertained that child is alive and vigorous, and mother's condition good. Mortality and morbidity of a severe delivery by the natural passages are de-

idedly greater than well performed Caesarian section with woman in good condition and uterus not infected.

Caesarian section is contra-indicated where forceps have been tried and failed; or where patient has been subjected to much manipulation, or mother's condition or that of the child unfavourable; or where necessary assistance and appliances are not obtainable: and under all or any of these circumstances perforation of the head should be proceeded with.

PERFORATION OF THE HEAD is indicated in obstructed labour in large flat pelvis under the following conditions:--

1. As primary measure, where child dead, or, where though alive, disparity between brim and head is so great that there is practically no hope of live delivery either by forceps or version, and Caesarian section or division of pelvis at the same time contra-indicated or impracticable.

2. As secondary measure after forceps traction or version has failed.

It is a ready and justifiable resort in cases of difficulty where choice lies between an attempted delivery by forceps or version in which great difficulty may with certainty be anticipated.

In 1. certainly perforation should be chosen. Birth of dead or moribund child, even though intact, at cost of severe bruising or laceration of maternal passages is poor result to set against very considerable mortality and morbidity risks which such a labour involves.

DIVISION OF PELVIS, - viz., operation of Sym-physiotomy and Pubiotomy, especially the latter.

Maternal mortality of Pubiotomy is about 2% and that of children about 4% when operation carried out in suitable cases, by experts, under favourable circumstances; but expert technical skill, efficient assistance, and aseptic surroundings are essential to success.

Both operations have considerable morbidity rate, puerperium being pyrexial in many cases, owing chiefly to lacerations extending from vagina to the site of section of the bone, sometimes involving urethra or bladder. Late results good. Union is fibrous in most cases, and leaves degree of enlargement of pelvis, and potentiality of stretching which often allows subsequent labours to be effected by unaided nature, and no disability in walking occurs.

Gain to conjugate diameter is one-third of an inch, or a little more; also general increase in all dimensions of pelvis.

The operations, in cases of flat pelvis, should be

reserved for those where conjugate is not less than $3\frac{1}{4}$ " , and only then when the disparity between head and pelvis is not sufficient to deter the head from engaging the brim.

They should only be performed where cervix is at least three-quarters dilated in primiparae or two-thirds in multiparae. They are ideally indicated when forceps delivery fails, and it is reasonably certain that the additional room gained will allow head to pass, condition of mother and child being satisfactory. Also in probably infected cases, where head made some attempt to enter brim, or strong objection to Caesarian section. Where however case reasonably deemed uninfected and head quite unable to enter brim, Caesarian section is quickest, most humane, and best method of delivery, assuming child alive and mother is in good condition. During and after division patient should be placed in Walcher's position, i.e., patient's legs hanging over edge of table, from hips downward, and time allowed for the head to come down and dilate cervix if necessary; otherwise forceps should be immediately applied and head carefully extracted.

Where division of pelvis is to be employed as a resort after failure of forceps traction, it is essential for success that all the indications for their application be properly observed. Forceps must not be rashly applied to an unsuitable case, relying upon the operation to redeem their failure. Con-

ditions should offer a reasonable chance of success by traction. Directly it is apparent the head is not likely to be pulled through the brim, the operation should be carried out. For this reason it is advisable to have the saw ready at hand to be used immediately upon failure of forceps.

Division of pelvis indicated also where head presents abnormally, but only if head can be manipulated beforehand into good position; for if head be pulled down by forceps in faulty position severe lacerations of soft parts almost inevitable. If delivery by breech necessary, division of pelvis contraindicated, as probably child will be born dead in spite of operation.

The remaining two classes of Rickety flattened pelvis - the small, and the very small in my classification - are unsuited to treatment by any of the foregoing methods, and must be dealt with by Craniotomy or Caesarian section. The same applies to the generally contracted, flattened pelvis of the primary classification.

TREATMENT OF LABOUR IN MEDIUM DEGREES OF CONTRACTION OF THE PELVIS, IRRESPECTIVE OF TYPE.

Under the head of medium contraction may be placed pelvis with a true conjugate from 9.3 to and including 7.5 cm.

Before turning to the actual treatment I

will briefly discuss the diagnosis of contracted pelvis. The diagnosis is not difficult, but by no means is it easy to estimate the exact degree of malformation. Neither by our hands nor by the pelvimeter can we be accurate; and the variability of the child's head, as regards size and consistency, must also be taken into account.

What however concerns us in any case is the relative size of the maternal pelvis and foetal head, and how the latter fits ~~the~~ maternal pelvis. "The foetal head is the best pelvimeter." (Barbour.) A modification of Muller's method is the best. By bimanual examination, the fingers of the left hand in the vagina feel how the head accommodates itself to the brim, the thumb outside feeling to what degree the head overlaps the pubis; the right-hand meanwhile, by Pawlik's grip, forces the head down into the pelvis. An anaesthetic is necessary, and should a breech present, one should turn when possible by ext. podalic version.

1. Careful measurements should be made of the pelvis by hand and pelvimeter.
2. Relative size of the head and pelvis should be estimated, and that should be the basis of treatment.
3. An estimation of the size of the child's head should be attempted both by the palpation and cephalometer.

Spontaneous delivery has been known to writer to occur even in a pelvis of 7.5 cm., so one should

remember the factors that influence delivery.

1. Variety of parietal presentation.
2. Size and consistency of head.
3. Position of occiput.
4. Parity of mother.
5. Strength of uterine contractions.

The external measurements of the pelvis should be taken, for a pelvis with an external conjugate of 16 cm. would indicate contraction, and when over 21.5 cm. no likelihood.

The transverse measurements of the superior strait cannot be got directly, and the "IS" "IC" "IT" give us the indication of its contraction. The true conjugate is got from the diagonal by subtracting about 1.75 cm., but this subtraction varies according to the height of the symphysis and the promontory; so one cannot be sure to a fraction. One might here mention the value of the measurement given by Herff, namely the ratio of a diameter between the most prominent part of the child's head anteriorly and the last lumbar vertebrae (the so-called "~~Rucken Kopf~~ Mass") to the external conjugate. If equal to or less than the external conjugate, the head enters the pelvis easily; if 3 cms. larger it will not do so.

From 9.3 cm. to 7.5 cm. spontaneous expulsion of normal head through the brim occurs in a com-

paratively small percentage of cases, and therefore operative interference is necessary.

The methods of treatment usually adopted are:--

1. Forceps.
2. Induction of premature labour.
3. Efforts by means of diet to regulate the size of the child.
4. Postural treatment during labour at full term.
5. If the mother fails to expel the head through the brim:--
 - (a) Caesarian section.
 - (b) Enlargement of the pelvis by means of Pubiotomy or Symphysiotomy.

1. FORCEPS.

Here the abuse has been so great, and the foetal mortality so high, that in America and on the Continent their use has been practically given up.

However, one cannot go so far as that here, as one is impressed by the success attending forceps delivery in a number of cases that have been carefully estimated as proper for their use, requiring only a little extra help given to the uterine pains to bring the head through the brim. In the use of forceps one must be sure, -

- (a) That the disproportion between the head and the pelvis is only such that spontaneous delivery would take place if the uterine contractions

were stronger.

(b) The second stage must go on until mother or child cries for help.

(c) The head must be fixed in the brim, and only moderate traction employed.

A case demonstrating this mode of procedure was that of Mrs. C. primipara with a generally contracted pelvis, whose measurements were I.S. 2k., I.C. 26., E.C. 16., C.D. 9 cms. Head was small and hard, but on pushing it down into the pelvis one could feel that only slight moulding was necessary to bring it through the brim. She was thus left in labour, watching carefully her condition, and that of the foetus. The pains were strong, and after some hours she drove it down into the brim; and as she was exhausted, I put on forceps and delivered her of a live child. The child weighed 5 $\frac{1}{4}$ lbs. S.O.B., measured 8.75 cms., the O.F. 11 cms., the V.M. 12 cms., the I.P. 12.5 cms., the circumference 30 cms. In a case like this no diagnostic instrument is of any use, and only by pushing the head down into the brim by the external hand, and with the fingers introduced one feels how much of the head comes through; and externally with the thumb, any over-lapping over the pubic bone. Again, with the internal hand one can feel the consistency of the head. If the head is well ossified, it will not mould like that unossified, as may be seen in a large hydrocephalic head.

Another point of great importance is the size of the fontanelles and the distance between the sutures. In this case, with the head ossified and sutures closed, nothing short of an operation would have delivered it, had the head been of normal size.

CRANIOTOMY should never be performed in a case one has had from the beginning of labour in which the child is alive, as, if in this class of case the head does not come through with moderate traction, Pubiotomy can be done.

2. INDUCTION OF PREMATURE LABOUR is altogether an operation for private practice. It assists the general practitioner when the examination of his patient in the early months of pregnancy reveals that he is dealing with a case of contraction of the pelvis, in getting his patient out of her difficulty with apparently the least amount of danger to herself. The foetal mortality, however, is so great in comparison with delivery at full term that the paradox exists when comparing the results to the child from this method of treatment, with a full-term labour, even terminated in a certain number of cases by Craniotomy - the more children you perforate, the more you will have alive. It is very difficult to estimate the proper time to induce premature labour, and it is frequently found that women for whom induction of premature labour is considered necessary, deliver themselves spontaneously under proper treatment at full

term. For this class of case we must have a conjugate of over 8 cm., the pregnancy at least 36 weeks, and a patient a multipara. In the 36th. week the patient is anaesthetised, and the relative size of the foetal head to the pelvis estimated. If the head fills the brim, induce labour. If head is loose in pelvis, leave for about ten days and examine again; and when it fills the brim terminate the labour.

3. THE DIETING OF A PATIENT to regulate the size of the child is practically impossible in private practice.

If we allow the patient to go to full term, or only see her for the first time when she is in labour at full term, the operation of CAESARIAN SECTION appeals to one as an easy and now-a-days a safe method of terminating what might otherwise be a prolonged and difficult labour. In our opinion, however, this operation is extremely rarely necessary for the degree of contraction we are dealing with, and the patient should be allowed to try and deliver herself. If we decide on the latter course, what cases are most likely to succeed, and what help may we give?

The three factors upon which labour depends must be carefully considered. As much depends on the strength of contraction, the size, mouldability and position of the foetal head, as on the state of the pelvis. In experienced hands the size of the foetal head can be judged, and the size of the sutures and of the fontanelles will give one a clear estimate of how

much the skull is capable of moulding. During the labour we must preserve the strength of the patient, limit the time of dilatation of the cervix as much as possible, and make certain that the head is well fixed. The routine treatment adopted by us is as follows:-

Apply a colpeurynter in order that the membranes when bulging through the cervix may be supported and thus their too early rupture prevented, the bag at the same time dilating the vagina. Procure sleep, particularly at night, during the first stage. The colpeurynter will not prevent the head coming through the brim, and if this has occurred when the cervix is fully dilated and the colpeurynter removed, a tight binder may be applied and the patient placed in Walcher's position, during which time her sufferings may be relieved by small administrations of chloroform.

If after many hours of the second stage, the number of hours being regulated by the condition of the mother and child, the head is still above the pelvic brim, it is now necessary to assist the labour. The operation of Pubiotomy by a sub-cutaneous method will in such cases provide the best results. When the bone is divided before the mother or child is in distress, the patient, lying in Walcher's position and slightly under the influence of an anaesthetic, may proceed with her efforts to deliver herself. If either mother or child is in distress we have to deliver. The vagina already dilated by the colpeurynter

is not likely to suffer as one not so dilated. Pubiotomy when compared with Symphysiotomy shows a mortality of about 2% to that of 10%.

The conditions necessary for this operation are, - the child must be alive; the cervix fully dilated, and the true conjugate not less than 7.5cm. It is indicated when, in spite of treatment, the patient fails to get the head through the brim, or when the disproportion is such that we decide from the beginning that spontaneous expulsion is impossible. The operation also may be indicated in a normal pelvis when the face presents with the chin posterior, and efforts to obtain anterior rotation fail. The operation performed by us is that done by Doderlein. The bladder is emptied, a small transverse incision is made over the pubis between the symphysis and the tubercle, and the tissues divided down to the bone, so that the finger can be inserted behind it. With this finger the tissues are pushed back, so as to keep the bladder out of the way. Doderlein's needle is then inserted, the point hugging the back of the os pubis, about one finger breadth from the symphysis, and guided under the direction of the finger in the vagina.

The assistant pulls the labia, etc, well over to the other side until the point of the needle presses under the skin of the greater labium. Incise the skin and let the needle out. The grip-saw is fixed to the eye of the needle which is then with-

drawn by the same route as it was inserted. Bring the legs of the patient together, and divide the bone, using the saw in a large arc of a circle. Before removing the saw be sure that the bone is completely divided. The bleeding is controlled by compression. The division allows the C.V. to increase 1 cm. for every 3 cm. of separation between the sawn ends of the os pubis. (Van Cauvenberghe in the L'Obstetrique, Jan. 1905). During delivery the pelvis must be steadied by an assistant to prevent over-separation, as 4 cm., thus obviating injury to the sacroiliac synchondrosis.

After the child is born and the placenta has come away, the vagina is plugged with gauze and a firm compress put over the incisions to prevent a haematoma forming; these are removed in eight hours, and the bladder emptied. Strips of adhesive plaster may be fastened round the pelvis to keep the sawn ends approximated.

The patient may be let up on the fourteenth day. Injury to the bladder is usually due to failure to empty it before the operation.

If the mother should refuse Pubiotomy, rather than perforate the living child, forceps may be applied. The application of high forceps is only justified when the expulsive forces have failed us, and the disproportion between the head and pelvis is not great enough to render it impossible to deliver by this method. When the head is large and not moulded, and the true conjugate less than 8.5 cm. the foetal

mortality is at least 50% with this method of treatment, and therefore sufficiently disastrous to make this procedure quite unjustifiable unless as a last resort.

The forceps should be applied over the parietal eminences and long, steady, gentle traction may succeed with the assistance of the uterine contractions. Violent efforts at extraction are decidedly contra-indicated, as they result in the death of the child and severe injuries to the mother.

A case of considerable interest was that of Mrs. M. who had three children previously delivered by Craniotomy. She came to the hospital with the hope of getting a live child. As soon as she went into labour a Champetier de Ribes' bag was inserted into the vagina to preserve the membranes. Her measurements were, - conjugate vera 8 cm., I.S. 22 cm., I.C. 25 cm., I.T., 29 cm., E.C. 18 cm. The foetus was large, weighing $11\frac{1}{2}$ lbs., and the head was well ossified. Pubiotomy was done for her, and the child delivered by forceps, as the heart became rapid and irregular.

Mrs. L.M. age 32, multipara., labour induced three times, craniotomy and forceps once. Patient looked ill on coming into hospital, after being in labour 14 hours. First vertex, head free from brim, but small; foetal heart was 160 and irregular. The pelvic measurements were 23, 22, 20. External conjugate was 18., conjugate vera 7.5 cm.

Pelvis was generally contracted and flat. The os was fully dilated and the membranes ruptured. Pubiotomy was performed as quickly as possible, owing to the condition of mother and child; and a child weighing 6-lbs. was extracted with forceps. Both mother and child left the hospital on the 24th. day in good health.

Mrs. F. O'D, aged 29, multipara. Pelvic measurements were 26 and 32. External conjugate 17., conjugate vera 7 cm. A rachitic flat pelvis. As the os was dilated, and owing to the size of the conjugate, and the size and hardness of the foetal head, Pubiotomy was performed. Patient was delivered of a $7\frac{1}{2}$ lb. baby, and was up on the 17th. day, and left the hospital on the 23rd., without any difficulty in walking.

8

Munro Kerr speaks of Pubiotomy as the operation for push time, and uses it when spontaneous delivery or forceps with moderate traction with the patient in Walcher's position fails. He thinks the number of pubiotomies done are in an inverse ratio to the obstetrician's diagnosis and judgment. In possibly infected cases one can have no trouble in deciding that it is the safe operation, especially if the conjugate is about 8 cm. Jellet⁹ in his article on contracted pelvis, puts Pubiotomy first as the operation of choice where necessary, unless special complications present. It is specially useful in young multipara with passages dilated, and for

the effect on subsequent pregnancies. He had 19 cases, and they all did well, both from the mother's and infant's point of view. He rightly claims that it is an operation that allows the mother the opportunity to spontaneously deliver herself, and if she fails, it can then be performed. The operation also benefits further labours, as the pelvis is left enlarged and the vagina well opened. Professor Frank, of Cologne, has done 155 cases of Symphysiotomy with no deaths, and infant mortality of 6%. He claims to have raised the survival of infants from 23% where no operative interference was performed.

Dr. Tweedy, of Dublin, says that Pubiotomy or Symphysiotomy is an easier and less elaborate operation than Caesarian section. Professor Kynoch claims that non-operative spontaneous delivery, Walcher's position and forceps with slight traction should be first tried; then version in cases of persistent malpresentation, except in persistent occipito-posterior cases where internal rotation is often enough to allow the head to enter the brim. Dr. Oliphant Nicholson favours the induction of premature labour, and starts it as near as possible at the 36th. week. He carefully compares the size of the head to the cavity, and when he has made up his mind to act, does so in one of these three ways, -

1. Passes a finger through the internal os and detaches the membranes from the lower uterine segment, thus allowing the bag of waters to protrude.

2. If that fails, he packs the lower uterine segment with gauze, and if labour does not now set in,
3. He puts in a Champetier de Ribes' bag. He claims by so doing he has never failed to induce labour.

⁷
Norris, of Philadelphia, thinks too frequent selection of section in moderate degree of contraction is not justifiable, and recommends a careful study of the case, so that all that can be left should be left to nature, or be aided at the appropriate time by Pubiotomy. He pays special attention to the height of promontory, the height of symphysis, the angle of inclination, and the degree of curvature of the sacrum.

⁸
Fry says if after a few hours of labour, the head cannot be made to engage, Caesarian section should be performed. Reynolds supports Fry and says section is indicated if a woman with a moderate disproportion has one still-born baby, following a difficult instrumental labour. Williams says in all cases of moderate disproportion the induction of premature labour is unjustifiable.

Doderlein (in the Tentralblatt F. Gynaekologie, 24) reports 217 cases of Pubiotomy with 4% mortality, and all patients that died from infection showed fever at time of operation.

¹²
Montgomery states that in 133 aseptic cases of Pubiotomy he had no mortality, and no ill

after effects on the patient. On looking up records one is at first astonished at the difference of opinion as to the course to follow in treatment of these cases; but one knows how, so often, two patients with the same measurements require quite different treatment. I feel sure that induction of premature labour is necessary where no skilled help is available, and no suitable home obtainable. However, this is rare now-a-days, and although it is an operation which is safe where asepsis is observed, the infant mortality is still too high to make it justifiable as a general procedure. I have previously stated what must be present before we perform this operation, and how essential it is to let the foetus grow until its skull fills the brim, and that the pregnancy should be advanced to the 36th. week. Here Pubiotomy must have its right place, for in these cases a large number would have delivered themselves spontaneously, and if they fail we still have something better to offer.

The outstanding recommendations of Pubiotomy are, -

1. That it is safe to the mother, and favourable to the child.
2. That the patient may be allowed to attempt to deliver herself without compromising a safe delivery if she fail, and yet retain the advantage which softening and dilatation of

the passages accompanying delivery per vias naturalis confers on subsequent labours.

(3) That tentative efforts at forceps delivery may be made without prejudice to the operation if forcepation fail.

(4) That the operation itself diminishes the prospect of necessity for operative aid in subsequent confinements.

This latter is a great advantage when compared with Caesarian section as advocated by Reynolds and Fry; for by Caesarian section we prevent the patient from trying to deliver herself, and subsequent pregnancies receive no benefit. In future she must still be so delivered - once a Caesarian section, always a Caesarian section.

It is only in the major and minor degrees of contraction that one can lay down a classical rule; but in moderate degrees of contraction every case must be taken on its merits; and while in one, leaving to nature will be all that is required, in another some operative assistance will be necessary.

Craniotomy I am not discussing, as I feel that it is only justifiable when the foetus is dead, or the case only seen late in labour with the head impacted and malpresenting. The popular idea that it can be performed with no risk to the mother Pinard and Bar show to be wrong, giving a mortality of 11.5 and 9.39 respectively.

CONCLUSIONS:--

In major degrees of pelvic contraction little option lies with the obstetrician, as there are but two measures by which life may be saved, - namely Caesarian section or Craniotomy.

In minor degrees, except there be abnormal development of the child, forceps with or without postural aid, will be sufficient.

In medium degrees of contraction, however, we have a somewhat wide choice, and it is only by correct selection of the method proper to the individual case that improvement in the results will be obtained. Amongst the measures available for these cases, viz., Induction of premature labour, Craniotomy, Caesarian section and Pubiotomy, the latter ought to receive more consideration than it at present does; for it possesses merits of more general application than the others.

Induction of premature labour should not be considered a method of choice, but of necessity, and should be limited to occasions when the surroundings and available assistance preclude delivery at term by surgical means. Craniotomy should be abandoned except when the foetus is dead, vitally deformed, or irremediably impacted. Caesarian section in this class of contraction is applicable only to elderly primiparae, who may sustain severe lacerations by other operations, and in whom the question of future pregnancies is not to

be considered; or where the cervix is rigid, not sufficiently dilated, and the condition of the child requires immediate assistance.

Pubiotomy offers a mode of delivery practically safe to mother and child, in all cases having a conjugate of over 7.5 cm., saving only those exceptions mentioned, with the unique advantage which cannot be urged for any other operation, that it facilitates subsequent deliveries. It is the operation of choice where there is no great disproportion between the foetal skull and the pelvis, one having a reasonable hope that spontaneous expulsion may occur.

Notes of two cases of Caesarian section, -

1. Mrs. D. aged 19, primipara, who had a G.C.P., with a certain amount of flatness, and whose measurements were, - I.S. 23., I.C. 25., E.C., 15., C.D. 9., and C.V. 7. Child was of usual size; the head was hard with sutures closely applied, and fontanelles small. She refused operation, and was watched all night, and although the pains were strong the head did not advance. Walcher's position was tried without success, and as the foetal heart was showing signs of exhaustion, she finally agreed to operation being done to save the child. The os was only half dilated, and owing to the condition of the child abdominal Caesarian section was performed. The child was delivered asphyxiated, & .

but recovered under treatment. The post-parietal bone was indented, the head having rotated transversely, and been forced on to the promontory of the sacrum. The child's weight was $8\frac{1}{4}$ lbs., the measurements of its head being S.O.B. 9 cm., B.P. 9 cm., O.F. $11\frac{1}{2}$ cm., V.M. $12\frac{1}{2}$ cm.

In another case following on this, and very similar, we did an abdominal Caesarian section, as the head was large and hard, and she had passed her time of labour by three weeks.

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