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## Symphysiotomy and fetal destructive operations

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Symphysiotomy and fetal destructive operations – while rarely, if ever, performed in developed countries – are an option in developing nations of the world. Problems endemic to developing countries not infrequently predispose to patients arriving at health care facilities in a moribund state with neglected labour. The health care provider then has to decide on the options available to him to deliver the mother by the safest route without incurring morbidity and mortality. Under the circumstances, the outcome for the baby will depend on factors prevalent at the time. If the fetus is alive, then the choice is between a Caesarean section and symphysiotomy, and if the fetus has died, a destructive procedure is an option to abdominal-route delivery which carries considerable risk to the mother. The following review outlines the role of symphysiotomy and fetal destructive operations and their role in modern obstetrics.

**Key words:** symphysiotomy; fetal destruction; obstructed labour; antenatal care.

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Neglected labour in industrialized countries is rarely seen in modern obstetrics. Conversely, the clinical problem of obstructed labour remains a reality in everyday practice in the developing world. When there is mechanical difficulty during labour, the safest route of delivery is Caesarean section. Throughout the developing world, where maternal mortality remains high and medical services are minimal, the problem of managing prolonged obstructed labour is of critical concern. If labour has been prolonged and neglected, other modes of delivery need to be considered.

Symphysiotomy and fetal destructive operations are options which, if properly selected and performed, reduce the need for Caesarean section – which may not be the correct choice under the circumstances. Sufficiently skilled staff to undertake abdominal-route delivery may not be available, nor may the patient have access to skilled supervision in her subsequent pregnancy if Caesarean section were to be done. The added risk of overwhelming infection following Caesarean section in patients – who invariably are already septicaemic – makes alternatives a worthwhile proposition. One such option is the performance of a symphysiotomy: the surgical separation of the fibrocartilaginous symphysis pubis and its reinforcing ligaments with a scalpel. The aim is to enlarge the diameter of the pelvic opening by dividing a disproportionately small

maternal pelvis to permit the easier passage of the fetal head, thereby securing spontaneous or assisted birth.

In its initial introduction in obstetric practice enthusiasm for symphysiotomy was based on its role in reducing the number of Caesarean sections that were undertaken for mild-to-moderate cephalopelvic disproportion. Moreover, it was able to reduce the number of cases of difficult and often traumatic operative vaginal delivery. Zarate (1955), the most ardent enthusiast of symphysiotomy in Latin America, even thought that use of the procedure would result in the abolition of Caesarean section.<sup>1</sup> It has not gained popularity because of its urological and orthopaedic complications and is viewed as an outdated obstetric intervention in the developed world and even among the medical profession in developing countries. That it is not used more frequently is due entirely to the seeds of prejudice sown in the minds of doctors in the nineteenth and early twentieth centuries from ill-chosen and illogical evidence.<sup>2-5</sup> Symphysiotomy has a role in the management of cephalopelvic disproportion, being an example of appropriate technology. It fulfils the sociocultural needs of achieving vaginal delivery in areas in which Caesarean birth is a much disliked option involving a woman's disgrace in failure to give birth in the normal way.<sup>6-8</sup> However, for most obstetricians symphysiotomy will remain 'little more than a name with an unenviable reputation' and 'barbaric veterinary obstetrics'.<sup>9,10</sup> It earned its poor reputation because it was used in ill-advised circumstances to complement operative procedures such as dilatation of the cervix and rotational forceps, and because the safe limits of symphyseal separation were exceeded.

## HISTORY OF SYMPHYSIOTOMY

Ever since Hippocrates, childbirth was thought to be accompanied by spontaneous pelvic enlargement by separation of the symphysis pubis.<sup>11</sup> This view was supported by Pare in the 16th century and by Harvey in the 17th century.<sup>12,13</sup> It was only after Vesalius questioned the notion of spontaneous pelvic enlargement in his *De Humani Corporis Fabrica* in 1543, where he viewed the symphysis pubis as an inseparable unit during the process of birth, that the idea of artificial separation of the symphysis took shape.<sup>14</sup>

In 1655, the first symphysiotomy was performed by de la Courvee as an alternative to post-mortem Caesarean section. Around that time Willoughby reported a similar practice in Irish women.<sup>15</sup> The first recorded symphysiotomy on a living person dates back to 1777, when Sigault undertook the procedure to ensure the safe delivery of Madame Souchet, a rachitic Parisienne, who delivered her first live-born baby after four previous stillbirths delivered by destructive operations.<sup>12,16,17</sup> Though welcomed as a great innovation, the early results were not very promising, with tragic outcome for 14 mothers and 18 newborns of the first 36 symphysiotomies performed.<sup>4</sup> After initial enthusiasm, the operation fell into disrepute. In the late 19th century a revival took place in Italy. Morisani, among others, reported many cases with a maternal mortality under 5% and a perinatal mortality under 12%.<sup>12</sup> Encouraged by these results, it soon met with the support of many distinguished obstetricians in other countries, such as Pinard, Varnier and Zweifel. These symphysiotomies were almost exclusively performed in the predominantly Roman Catholic countries of Italy, Spain, France, Ireland and some of the Latin American countries, possibly, as sterilization by the Roman Catholic church was frowned upon. It also placed the interest of the newborn above that of the mother.<sup>18</sup> Evidence has been produced that it was performed for many years by traditional practitioners in parts of Africa.<sup>19,20</sup>

## INDICATIONS AND CONTRAINDICATIONS

Not infrequently, in areas where medical services and doctors are scarce, communication poor and difficult labour commonplace, and if there has been no antenatal supervision, the woman may be admitted as an emergency with obstructed labour. A rapid assessment will have to be made regarding the most appropriate mode of delivery. The choice lies among Caesarean section, use of forceps or vacuum extraction, and symphysiotomy. Whichever method is decided upon depends on three interrelated factors:<sup>2</sup>

- (i) descent of the fetal head;
- (ii) degree of overlap;
- (iii) the dilatation of the cervix.

### *Descent of the fetal head*

In cephalopelvic disproportion it is misleading to describe descent of the fetal head in terms of station as caput formation and moulding may falsify the level. Rather, it would be prudent to use the classification described by Simons and Philpott (1973) of dividing the fetal head into fifths and describing descent as the number of fifths of the fetal head that have passed through the brim of the maternal pelvis.<sup>21</sup> Symphysiotomy should be undertaken only if less than two-fifths of fetal head is palpated above the maternal pelvic brim.

### *Degree of overlap*

It is unwise to attempt a symphysiotomy if there is second degree overlap.

### *The dilatation of the cervix*

It is safe to consider symphysiotomy when the cervix is more than 5 cm dilated in a multiparous patient or 7 cm dilated in a primigravida. It is best not to undertake the procedure before the onset of labour or early in labour. At one time Jellett advocated the operation as an elective procedure before pregnancy or at the time of emergency Caesarean section for proven disproportion in the hope that consequent pelvic enlargement would ensure subsequent normal delivery. Such practice has little to commend it as disproportion cannot easily be diagnosed prospectively.<sup>2</sup> Contraindications to the procedure are: major disproportion, gross obesity, transverse lie, and lower limb, spinal, or pelvic deformity. Concurrent use of forceps at the time of symphysiotomy is also ill-advised as the soft tissue under the symphysis is completely unprotected and may lead to avulsion.

## **Mild-to-moderate cephalopelvic disproportion**

Caesarean section is now the preferred method of dealing with the problem of cephalopelvic disproportion in developed countries but symphysiotomy has been shown to be safer in developing countries.<sup>22</sup> This is the main indication with a vertex presentation and a live fetus. Symphysiotomy should not substitute for good judgement and careful case selection. All major complications are due to poor case selection, in particular the attempt to undertake the operation to overcome gross disproportion.

While its emergency use can save the life of a fetus, symphysiotomy should never be a 'planned' option in a 'trial of labour'.<sup>23</sup> van Roosmalen (1987) felt that intrauterine deaths are a contraindication to the procedure and that destructive operation is an alternative. Gebbie (1974), on the other hand argued that occasionally, when destruction is not easy at a high level and the mother's condition poor, it may be better to undertake symphysiotomy rather than Caesarean section.<sup>2,24</sup>

### **Breech presentation**

The most dreaded complication of vaginal breech delivery is entrapment of the aftercoming head, which, despite proper management, may still occur, often without warning, in about 1 of 12 vaginal breech deliveries.<sup>25</sup> When this is due to disproportion, persistent attempts at vaginal extraction are likely to result in a dead or damaged baby. A minor degree of disproportion which could be overcome in vertex presentation with moulding, good uterine activity and patience, can be insurmountable for the breech baby which has to pass through the pelvis within a few minutes.<sup>26</sup>

The best results for fetal survival will be obtained when Caesarean section is undertaken electively for a breech presentation.<sup>27</sup> Until emergency situations have been eliminated from clinical practice, symphysiotomy is often useful to reduce some of the very high perinatal mortality in breech deliveries. The proper role of symphysiotomy in breech delivery is for the rare cases where mechanical difficulty has occurred without warning of trouble with entrapment of the aftercoming head. It has been stressed by a number of writers that one should proceed quickly to symphysiotomy without first attempting the traumatic, and often fetical, manual methods to force the head into and through the pelvis.<sup>28-31</sup>

Symphysiotomy performed to free the trapped aftercoming head will save at least 80% of babies if performed without delay without any major complications in the mother.<sup>10,23,32,33</sup> It is possible to reduce fetal mortality in such situations but impossible to eliminate it.

### **Malpresentation**

In brow presentation, provided that the rules regarding fetal head descent, overlap and cervical dilatation are followed, and the pelvis is adequate, symphysiotomy may be undertaken. There is, however, no justification in permitting labour to continue when the diagnosis is made in early labour in the hope that symphysiotomy will eventually be possible.

In face presentation symphysiotomy may be undertaken in the occasional case when the second stage has been reached, the mentum anterior and the head engaged.<sup>2</sup>

### **Shoulder dystocia**

In cases of shoulder dystocia when conventional methods have failed, symphysiotomy may be a life-saving procedure. In recent times a plea has been made for it to be included in the management of shoulder dystocia.<sup>9,34</sup>

## SYMPHYSIOTOMY AFTER OBSTETRIC SURGERY

Symphysiotomy permanently enlarges the pelvis so that further deliveries are usually easier. A 2 or 3 cm separation of the pubic symphysis increases the transverse diameter by an average of 1 cm, and the diameter of the true conjugate by 4 to 5 mm. A 2 cm separation of the pubic symphysis increases the brim area by 10–15%; a 3.5 cm separation by 20–25%.<sup>1,35–37</sup> In a gynaecoid pelvis every centimetre of symphyseal separation produces an increase of approximately 8% in the pelvic brim, cavity and outlet area. Transverse diameters tend to benefit almost three times as much as antero-posterior diameters. Post-operative healing is by fibrous tissue, but tends to soften and stretch in subsequent pregnancies and labour; further symphysiotomies are possible.<sup>38,39</sup> A previous symphysiotomy is said to cure cephalopelvic disproportion, and the outcome of subsequent labour in women with a history of previous symphysiotomy shows an 87% vaginal delivery rate.<sup>24</sup>

There is no place for permitting a vaginal birth after Caesarean section (VBAC) in the hope that a symphysiotomy will be undertaken. If VBAC is permitted and operative delivery becomes necessary because of disproportion, Caesarean section rather than symphysiotomy should be the method of delivery. In an emergency situation when the patient with a previously scarred uterus is admitted in advanced labour and conditions are favourable symphysiotomy may occasionally be justifiable in fetal interest. After delivery uterine exploration should be conducted to ensure that it is intact. Wherever possible, however, symphysiotomy is to be avoided where there is a uterine scar.<sup>2</sup>

## TECHNIQUE

Current practice of symphysiotomy is based on the closed technique advocated by Crichton and Seedat,<sup>38</sup> based on the principles of Zarate.<sup>1</sup> Whereas Zarate advised only partial division of the symphysis with the knife, which is then completed by forceful abduction of the thighs, the modification advocated by Crichton and Seedat completes the division with the scalpel, as forceful abduction damages the sacro-iliac joints, possibly resulting in permanent pelvic instability and pain. Furthermore, Crichton and Seedat stress the importance of avoiding the hyaline cartilage by strict adherence to the midline when dividing the symphysis pubis. Deviating from the midline predisposes to osteitis pubis and subsequent difficulty in walking. The following symphysiotomy protocol is adapted from Crichton and Seedat,<sup>38</sup> Gebbie<sup>2</sup> and van Roosmalen.<sup>40</sup>

When the decision to perform a symphysiotomy has been made:

1. Ensure that the bladder is empty at the start of the procedure.
2. When a trial of vacuum extraction is indicated, before proceeding to symphysiotomy, adhere to the 'rule of three pulls' (dislodge–descent–delivery); when the head has not been born after the third pull, proceed to symphysiotomy.
3. Inject 10–15 ml of a 1% solution of lignocaine at the site of the symphysis pubis and if the actual joint space is not readily identifiable, the needle may be left in situ as a guide. The perineum is also infiltrated in the line of the proposed episiotomy. A pudendal block is avoided because this tends to abolish the pelvic-floor reflex and thereby inhibits bearing-down efforts.
4. Using aseptic technique, insert a conventional Foley catheter (size I4 Charriere with a 5 ml bulb) if the head can be dislodged or a firmer No 6 Jacques catheter if the fetal head is difficult to push up.

5. Place the patient in the lithotomy position with two assistants supporting the patient's legs in their hands, with the patient's knees and thighs resting against their chest. The angle between the legs never exceeding 80 degrees; refrain from abduction of the legs during and after symphysiotomy in order to prevent straining of the sacro-iliac joints.
6. Place the index and middle fingers of the left hand in the vagina and displace the catheter, and thereby the urethra, aside. The index finger should identify and lie directly beneath the symphyseal joint. (Figure 1)
7. A solid-bladed scalpel (bistoury knife) is inserted through the overlying skin using a stab incision to enter the joint in the midline at the junction of the upper and middle thirds, traversing the joint, until the point of the blade is felt impinging on the vagina by the underlying finger of the left hand. Using the upper one-third of the uncut symphysis as a fulcrum against which the scalpel is levered, incise the lower two-thirds of the symphysis. Cut through all the fibres of the joint and arcuate ligament, being careful to preserve the triangular ligament. After the desired transection is achieved, return the scalpel to the vertical position, without withdrawing the blade from the joint, and rotate through 180 degrees to permit incising of the remaining upper portion of the symphysis pubis with its overlying ligamentous supports (Figure 2).
8. When the procedure is complete, it will be possible to insert a thumb's breadth (2.5 cm) into the divided joint. The resultant separation leaves the anterior vaginal wall with the urethra unsupported, and any tension may produce tearing and damage to the urethra. To obviate any such injury an episiotomy is performed.
9. Adduct the legs at crowning of the head and, whether spontaneous or by ventouse extractor, deliver the baby over the perineum and not, as is usual, upwards over the mother's abdomen. This manoeuvre will avoid trauma to the soft tissues under the symphysis pubis.



**Figure 1.** Protection of the urethra by the left hand during the procedure of symphysiotomy.

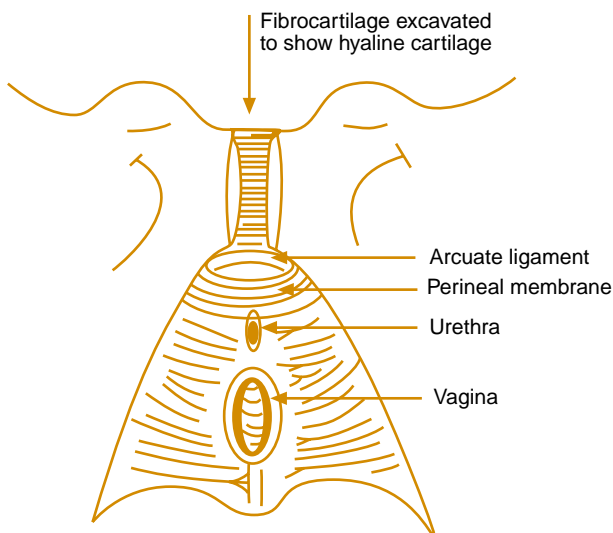
10. After delivery, compress the symphysis with the thumb above and the index and middle fingers beneath for a few minutes to express blood clots and promote haemostasis. Explore the genital tract gently to exclude uterine rupture and inspect the cervix and vagina for lacerations. The stab wound should be closed with catgut suture and the episiotomy repaired.
11. Post-operatively, the patient is nursed on her side without strapping of the knees.<sup>41</sup> Bladder drainage may be continued for 3 days, after which the Foley catheter may be removed. Gebbie<sup>2</sup> argued against bladder drainage in the absence of haematuria, and if present, continuous urinary drainage should be undertaken until the urine has been clear for at least 3 days. A broad spectrum antibiotic may be prescribed.
12. Ambulation should be encouraged as soon as the patient wishes to get up. Walking-aids, physiotherapy and use of local short-wave diathermy may be of help in aiding recovery. The patient may be discharged when her gait is confident and when she is free of pain. This may vary from 5 to 14 days.

On discharge she must be warned against undue physical activity for a period of 3 months, and the need for delivery in a hospital in subsequent pregnancies.

## COMPLICATIONS

### *Haemorrhage*

Bleeding from the vascular area over the pubic symphysis is sometimes alarming, resulting from unavoidable injury to the vesical venous plexus and anastomotic branches of the external pudendal vessels. The resultant haemorrhage is usually venous and tends to subside following the delivery of the baby or from digital pressure on the anterior vaginal wall and overlying skin.<sup>2,38</sup> Departure from the midline, unnecessarily deep



**Figure 2.** Diagram of symphysis pubis.

penetration, too low an incision and perineal membrane transection increases the danger of bleeding and should be avoided.

Occasionally, retropubic haematoma may form after the procedure, but appears to be self-limiting, and does not require operative intervention.

### *Urinary tract*

Infection of the urinary tract is as frequent as it is in any patient who has been catheterized in labour and usually tends to settle within 48 hours of removing the catheter.<sup>2,38</sup>

If haematuria is present it may be trivial, in which case continuous bladder drainage is advised for at least 3 days after the urine has cleared. On occasion there may be inadvertent incision of the bladder wall with the dividing knife with more pronounced haematuria. Bladder drainage for a period of at least 10 days may then be warranted; a fistula needs continuous drainage for 6 weeks.<sup>40</sup>

The incidence of urinary stress incontinence resulting from symphysiotomy is difficult to assess in the majority of women. Reports vary from 2.0 to 3.3% in patients followed-up for a period of up to 10 years after the operation, with one report from South Africa not having had this complication in 505 cases.<sup>24,39,42-44</sup> The duration of this complication can last for an average of 4 months (range 1-7).<sup>45</sup>

### *Bone*

Infection at the operation site, if left unchecked, may result in a retropubic abscess and osteitis pubis. In a series of 1752 symphysiotomies this complication arose in 0.6% of cases.<sup>24</sup> Adherence to the principles of symphysiotomy and judicious use of antibiotics readily prevents severe infection.

Permanent pelvic injury with subsequent ambulatory difficulty is difficult to ascertain as follow-up is difficult in areas where symphysiotomies are undertaken. Available evidence suggests that it is not as common as might be expected.<sup>2,24</sup> Sacro-iliac pain and backache are frequent complaints in the post-operative period; however, the incidence is no different from that in women who do not undergo the procedure.<sup>42</sup>

## **SYMPHYSIOTOMY COMPARED WITH CAESAREAN SECTION**

Maternal mortality after Caesarean section in developing countries, especially in rural hospitals where most are performed by generalist doctors or medical auxiliaries, range from 0.6 to 5.0%.<sup>46-48</sup> Retrospective comparison of the results of symphysiotomy with Caesarean section performed in advanced labour showed no difference in maternal morbidity, with a lower mortality rate following the former procedure. There were three maternal deaths from a total of 1752 symphysiotomies in the analysis by van Roosmalen,<sup>24</sup> a rate of 1.7 per 1000 births, none of which were related to the procedure: two were due to eclampsia and the other followed a Caesarean section in a woman with a failed symphysiotomy. Hartfield<sup>49</sup> compared the outcomes of 105 consecutive first lower segment Caesarean sections with a similar number of matched symphysiotomy cases. There were two maternal deaths following Caesarean section, one from infection and anaemia, and the other from peritonitis, whereas in the symphysiotomy group there was one death resulting from eclampsia.



A maternal morbidity of 2% is probably a realistic estimate and compares favourably with that following Caesarean section.<sup>39</sup> This can be effectively lowered by strict adherence to a protocol.

Other benefits of symphysiotomy over Caesarean section in the study by Hartfield,<sup>49</sup> was the shorter duration of hospital stay and the reduced need for blood transfusion. The mean number of days of stay in hospital was 11.2 days after symphysiotomy and 11.4 days after Caesarean section. Eight of the patients in the symphysiotomy group received blood as compared with 19 in those who underwent Caesarean section. Saving on hospital stay and use of blood is a significant advantage in areas where resources are limited.

Perinatal mortality differed markedly in the different series, with an overall rate of 112 per 1000 (range 19–296 per 1000) and may reflect different levels of obstetrical skills and technical support. Although comparison is therefore difficult, fetal prognosis does not appear to have greatly improved since the period between 1900 and 1960.<sup>24</sup>

## FETAL DESTRUCTIVE OPERATIONS

In 1860, Simpson discussed the conditions that justify the ‘diminution’ of the fetal head, ‘modes’ of delivery in cases of obstructed labour, and ‘modes’ of operation. He stated that Caesarean section in the mid-19th century almost invariably sacrificed the mother.<sup>50</sup> In cases of obstructed labour the options may vary with the circumstances; if the fetus is alive and there is mild-to-moderate cephalopelvic disproportion, symphysiotomy should be considered. If there is gross disproportion, however, a Caesarean section may have to be performed in spite of the risks. When labour is obstructed by transverse lie or compound presentation and the fetus is alive, the route of delivery is by Caesarean section. Internal version and breech extraction is not a safe alternative as any attempt at manipulating the fetus is almost certain to rupture the uterus. When the fetus is dead, cephalopelvic disproportion can be relieved by reducing the size of the head by craniotomy, and obstruction due to transverse lie can be similarly relieved by decapitating the fetus.<sup>51</sup>

The incidence of fetal destructive operations vary between 0.2 and 1.6% of deliveries in Nigeria.<sup>52–55</sup>

Although the majority of cases with a dead baby will need to be delivered by Caesarean section before full dilatation of the cervix, the situation is different when the cervix is fully dilated. Many of these cases will be compounded by gross infection, and an abdominal operation carries with it the risk of maternal death which can be as high as 70%.<sup>55</sup> Gogoi<sup>56</sup> emphasized the risk where Caesarean section is performed for infected cases. Of 107 patients delivered by Caesarean section, 18 developed post-operative shock and 70 developed peritonitis; 13 of the women died.

## PRINCIPLES OF MANAGEMENT

In the majority of cases the woman with obstructed labour is extremely ill and will require resuscitation fairly rapidly as operative intervention is usually urgent. The quality of resuscitation will depend on the duration of obstruction and the facilities and resources available at the institution. If an anaesthetist is available to help it will be of great advantage.

1. Important principles of management in the mother would be: to correct the shock, dehydration, electrolyte deficit and acidosis. Hypovolaemic shock will require

- infusion of crystalloids or colloids and blood transfusion using a central venous pressure manometer and urine output to monitor the fluid status. Infection must be assumed and broad-spectrum antibiotics should be prescribed as septicæmic shock may supervene at any stage. A Ryle's tube is passed to empty the stomach contents, and a non-particulate antacid is administered followed by an anti-emetic.<sup>57</sup>
2. General anaesthesia, or regional anaesthesia combined with sedation, is ideal for the procedure. Where these forms of anaesthesia are not available, or unsuitable because of the poor state of the patient, an intravenous injection of 100 mg of pethidine and 10 mg diazepam will provide sufficient analgesia and relaxation.<sup>58</sup>
  3. The abdomen should be examined for signs of uterine rupture or impending rupture and, if present, a laparotomy is indicated, even if the fetus is dead. In the latter circumstances it is feasible to open the abdomen and, if the lower segment is found to be intact, to proceed to a destructive operation from below. This saves the hazard of a destructive procedure with a uterus that might rupture, and at the same time avoids a Caesarean section for a dead baby in the presence of intrauterine infection.<sup>57</sup>
  4. The cervix should be fully dilated, although destructive surgery may be performed by an experienced operator when the cervix is 7 cm or more dilated.
  5. The true conjugate of the pelvic brim should not be less than 8 cm.
  6. After performing the procedure it is imperative that the uterus and genital tract be explored for rupture or lacerations, and appropriate steps be taken at the time. Removal of any fetal bones through the maternal genital tract must be done gently to avoid injury to tissue that is already compromised.
  7. A self-retaining catheter should be left in the bladder for at least 48 hours. If there has been prolonged pressure of the presenting part on pelvic structures, there is danger of fistula formation and the catheter should be left in the bladder for 10–14 days.
  8. Post-partum haemorrhage resulting from an atonic uterus should be avoided by commencing an infusion of 20–40 units of oxytocin immediately following the delivery of the baby. The patient should be nursed in a high-care setting or in a labour ward until stable.
  9. When the patient has recovered, the cause of her traumatic experience and its prevention must be fully explained to her.

## CRANIOTOMY

Craniotomy is the most commonly performed destructive operation.<sup>53,59</sup> It is indicated for delivery of a dead fetus in the cephalic presentation when neglected labour results in obstruction. The head is driven firmly into the pelvic brim where it becomes impacted. If the fetal head is palpable more than three-fifths above the pelvic brim or mobile, craniotomy is difficult and dangerous, in which case delivery by Caesarean section is the safer option. Methods of craniotomy that are described are:

- (a) Perforation of the fetal head with a Simpson's perforator which is passed into the skull up to the shoulders of the blades and opened widely; it is then closed and rotated through 90 degrees and opened again to produce a cruciate opening in the vault. The septa and brain substance is broken by inserting the closed perforator deep in the skull then opening the blades and rotating briskly. Extraction of the

fetus is facilitated by traction on the edges of the cranium by the application of volsella, Kocher's forceps, Morris's craniotomy forceps or Maingot clamps.

- (b) The procedure described by Lister<sup>59</sup> commences with a cruciate incision on the fetal scalp and the lifting of the four scalp flaps off the cranium. A sharp instrument, such as a Mayo's scissors, is then introduced into the fetal head through the most accessible suture line. The scissors are opened and the brain evacuated digitally. The delivery is completed by use of traction instruments on the fetal cranium.
- (c) Unlike the other methods where the cervix has to be fully dilated, the method put forward by St George<sup>60</sup> can be employed when the cervix is 7 cm dilated. The steps are similar to those described by Lister<sup>59</sup> but differ in that the posterior fontanelle is perforated to enter the fetal skull. After emptying the brain tissue, two Kocher's forceps are clamped onto the incised scalp and suitable weights are tied to the handles by lengths of bandage. The patient's legs are removed from the lithotomy poles and rested on stools. The weight hanging from the forceps is allowed to hang gently and effectively completes the delivery.

Use of obsolete crushing instruments, such as the cranioclast and cephalotribe, are condemned and should be confined to museums.<sup>51,57,58</sup>

Decompression of the hydrocephalic head is best done transabdominally in the antepartum or intrapartum period, using a spinal needle. In cases of cephalic presentation during labour the transvaginal drainage of cerebrospinal fluid can be accomplished using a sharp instrument such as a Simpson's perforator, a Drew-Smythe catheter, a spinal needle or a pair of scissors. In a breech presentation, the body is delivered at full cervical dilatation and the base of the occiput is perforated *per vaginam* to facilitate decompression. If there is an accompanying spina bifida the cerebrospinal fluid can be drained by passing a catheter through the defect up the vertebral column into the cranium.<sup>58</sup>

## DECAPITATION

When a transverse lie with a prolapsed arm or shoulder presentation obstructs labour, and the fetus is dead, decapitation is the procedure of choice. Considerable skill is required, and careful vaginal examination must be undertaken to determine the exact position of the fetal neck. If the fetus is small or macerated, pulling on the arm or severing the neck with a pair of stout scissors will result in delivery. In the larger fetus, or where the neck is relatively inaccessible, the safest method of performing a decapitation is to use a Blond-Heidler saw.<sup>51</sup> This 43 cm long Gigli-type wire saw with the central portion bare and the two ends protected with rubber tubing is threaded around the fetal neck which is severed by a saw motion. Traction on the arm delivers the trunk, and the aftercoming head is manipulated in the uterus to enable the operator to grasp the stump of the neck with a volsellum. The head is then delivered like the after-coming head of a breech with the operator's finger in its mouth. It is sometimes easier to deliver the head if the prolapsed arm is left attached to the neck when doing the operation to act as a handle on the decapitated head.<sup>57</sup>

A decapitation may also be performed using a Ramsbotham's or Jardine's decapitation hook which is passed around the fetus under cover of the operator's palm to sever the neck. However, it is clumsy and difficult to use, particularly if the blade is blunt.<sup>51</sup>

## CLEIDOTOMY

Division of one or both fetal clavicles can be done to reduce the bisacromial diameter in a dead fetus when the shoulders are impacted. This can be achieved by cutting the clavicle at its mid-point using either scissors or a scalpel.

## EMBRYOTOMY

Visceration of the abdominal or thoracic contents is performed in the rare instances where reduction in fetal size is required to attain delivery. Following craniotomy or cleidotomy, a large fetus or abdominal tumour may prevent extraction of the fetus. To reduce bulk a long incision is made on the abdomen or thorax and the viscera evacuated manually.

## COMPLICATIONS

Maternal morbidity in reported series was due to prolonged obstructed labour for which the operations were performed. Vesico-vaginal fistula and recto-vaginal fistula were the more common (27.2%), followed by foot drop (18.2%), puerperal sepsis (18.2%), post-partum haemorrhage (18.2%) and vaginal lacerations (9.1%). Uterine rupture arising from a destructive procedure occurred in 1 of 28 procedures (9.1%) in a report from Ghana.<sup>55</sup> Sahu and Sinha<sup>61</sup> give figures of 2.6% for ruptured uterus, 4.5% for post-partum haemorrhage and 1.3% for cervical and vaginal tears. Minor complications such as urinary retention in the patients and stiffness, pain and cuts to the operator were also reported.<sup>62,63</sup>

Maternal mortality arising from destructive operations in various reports range from nil to 9.5%.<sup>55,61,64</sup> Truly prolonged obstructed labour may result in excessive maternal mortality rates when Caesarean sections are performed rather than destructive procedures. In one study, a figure of 7.5% maternal mortality for Caesarean section deliveries is quoted – as opposed to 2.7% when alternative methods were undertaken in patients presenting with obstructed labour and fetal demise.<sup>61</sup> In another report the figures for the respective procedures were 12.5 and 5.8%.<sup>65</sup> Obstructed labour was the second most common cause of perinatal death in Addis Ababa, Ethiopia, being responsible for 9.1 perinatal deaths per 1000 births.<sup>66</sup>

## SUMMARY

In the developed world obstructed labour due to cephalopelvic disproportion is now a rare phenomenon and the late sequelae of neglected labour are hardly ever seen. Unfortunately, in most developing countries, more so in the rural areas, this is still seen all too frequently. There is often no single cause, and the obstruction may be due to a combination of factors. Because of lack of confidence in modern obstetric care, lack of health facilities, or tradition, women are managed by traditional birth attendants who fail to recognize developing obstruction in the intrapartum period. Other reasons are problems with roads and transport, the vast distances patients have to travel to reach maternity services, the relatively high demands on under-resourced medical facilities and the socio-cultural need to achieve a vaginal delivery under

difficult circumstances, especially in those with a scarred uterus. It may not be surprising to see patients who have been in labour for 2 or 3 days with ruptured membranes, intrauterine infection and obstructed labour. A Caesarean section under these circumstances can be extremely hazardous and fraught with significant maternal mortality, and a symphysiotomy or destructive fetal procedure is ideal.

A combined operation of symphysiotomy and a destructive procedure can be done in the case of borderline disproportion and a dead fetus.<sup>58</sup>

It must be emphasized that, in cases of obstructed labour, treatment must be individualized. The attendant must weigh the options before deciding on the mode of delivery. If he is unsure of which procedure to embark on, is not confident that he can safely perform it or whether he can competently do it, the safer route of delivery for the patient would be a Caesarean section.<sup>58</sup>

The risk of maternal mortality and morbidity after symphysiotomy nowadays has become negligible and is lower than that following Caesarean section performed in advanced labour for the same indications. This warrants a continuation of its use, not only in the less developed areas of the world, but also its inclusion in the curricula of all teaching hospitals.<sup>49</sup>

### Practice points

- *Aims.* Use of symphysiotomy and fetal destructive surgery as an alternative to Caesarean section in cases of emergency. Reduction in maternal morbidity and mortality consequent to abdominal route delivery
- *Management.* Assess suitability of patient to undergo procedure; rule out contraindications; follow protocol when undertaking operation
- *Follow-up.* Educate patient on importance of antenatal care in future pregnancies; impart contraceptive advice; postnatal follow-up for complications

### Research agenda

- training of both undergraduate and postgraduate students in the procedures
- controlled trials may not be considered ethical but there should be long-term follow-up to determine complications in patients who have had the operations

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