FORCEPS DELIVERY UNDER LOCAL ANALGESIA

BY

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It has become increasingly evident in recent years that the use of general anaesthesia for forceps delivery is associated with a definite risk to the mother from aspiration of vomitus. Jeffcoate (1953) stated that the greatest danger of forceps delivery was anaesthesia and that this constituted the chief reason for advocating the use of local analgesia for all easy low-forceps deliveries. Parker (1954) reviewed the literature on maternal deaths from aspiration of vomitus, described five further cases, and showed that the risk of general anaesthesia, though small, was very definite. A plea was made for the wider use of local analgesia, "the safest of the common methods available." Other means of diminishing the maternal risk from this cause have been suggested by various authors. Among these are the stomach tube, spinal or caudal anaesthesia, chloroform, and the lateral position. All have disadvantages and dangers, and it seems to us that local analgesia is the safest of all.

In view of this we have used it for as many as possible of our forceps operations and have found it satisfactory not only for easy low-forceps deliveries but for a considerable number of more complicated cases.

The purpose of this paper is to describe a technique of injection and to assess the results of using it for forceps delivery.

Material and Selection of Cases

Out of a total of 105 consecutive forceps deliveries conducted personally by us, 65 (61.9%) were performed under local analgesia. The total is a combination of two smaller series drawn from two different hospitals. (1) East End Maternity Hospital, London: 33 cases (local analgesia 27, general anaesthesia 6). (All these cases were delivered by one of us.) (2) St. Mary's Hospitals, Manchester: 72 cases (local analgesia 38, general anaesthesia 34). It is proposed to assess the results of the 65 deliveries performed under local analgesia. The series included a large proportion of cases other than "low forceps" (Table I).

TABLE I.—Distribution of 105 Cases

Type	Local Analgesia	General Anaesthesia
Low	36	3
Mid	29	34
High	0	3
Total	65 (61.9%)	40 (38.1%)
Manual rotation:		
Occipito-posterior ..	4	11
Deep transverse arrest ..	2	13
Forceps rotation ..	2	4
Face to pubes ..	8	2

The outlook towards forceps delivery was conservative throughout. Thus forceps were never applied without strong indication and rarely before the cervix had been fully dilated for two hours. "Prophylactic" forceps delivery was never practised.

The selection of cases for local analgesia was made at the time when the need for intervention became apparent, and it involved general, abdominal, and vaginal examination.

We were strongly biased in favour of local analgesia when there were features such as pulmonary or cardiac disease and in cases in which undue prolongation of labour had given rise to vomiting and ketosis. In these circumstances the risks of general anaesthesia were considered to be increased.

We avoided local analgesia when vaginal examination suggested that the rotation of the occiput or the actual extraction of the head was likely to be attended with considerable difficulty. Our one failure and the other unsatisfactory cases were all met with when the delivery proved

FIG. 1.—The sites of injection.

FIG. 2.—Labia separated to show the fanwise manner in which the mucosae of the posterior and lateral walls of the vagina are infiltrated.

FIG. 3.—Coronal section of the ischio-rectal fossa.

to be difficult. We did not, however, hesitate to use the method simply because the head was above the ischial spine plane or because the position of the occiput was abnormal, and when the widest part of the head was past the ischial spines we used local analgesia almost invariably.

Nervousness *per se* has not been a contraindication, and we have often been greatly surprised at the result of the method in highly excitable patients. Local analgesia is, however, impossible in the hysterical patient who will not lie still in spite of repeated reassurance.

Method

A technique was devised with the object of depositing the solution bilaterally in the following sites (see Figs. 1, 2, and 3):

A. In the vicinity of the pudendal nerve as it traverses the pudendal (Alcock's) canal on the lateral wall of the ischio-rectal fossa. (The pudendal nerve has usually divided, before it reaches this level, into its two terminal branches—namely, the perineal nerve and the dorsal nerve of the clitoris. Both lie in Alcock's canal.)

B. Among the branches of the inferior haemorrhoidal nerve which pass medially across the ischio-rectal fossa to be distributed to the deep and subcutaneous portions of the external anal sphincter and to the skin between the anus and the ischial tuberosity. (The inferior haemorrhoidal nerve may have an independent origin from the sacral plexus or be a branch of the perineal or of the main trunk of the pudendal.)

C. Beneath the skin covering the lateral aspect of the labium majus as far anteriorly as the pubis, with the object of anaesthetizing the branches of the two superficial perineal nerves, the long perineal nerve of Soemmering, the ilio-inguinal nerve, and the genital branch of the genito-femoral nerve which supply the skin in this vicinity.

D. Beneath the skin of the perineum proper, including the line of the intended episiotomy.

E. Beneath the mucosa of the posterior and lateral walls of the vagina in its lower third.

The patient was first reassured. It is believed that this can make all the difference between success and failure. No mention was usually made of forceps, but the patient was told in general terms that it was proposed to inject some local analgesic, examine her, and if possible give her some assistance during her bearing-down efforts. In accordance with Smellie's (1751-2) teaching, the instruments were kept out of her sight. We used 80 ml. of 0.5% procaine (without adrenaline).

With the patient arranged in the lithotomy position and draped as for forceps delivery, a skin weal was raised on one side at a point midway between the anus and the ischial tuberosity. A 12-cm. lumbar-puncture needle on a 20-ml. syringe was pushed through the weal and directed antero-laterally so as to impinge on the bone at the mid-point of the medial surface of the ischial tuberosity, the latter being palpated through the skin with the left index finger (A1 in Figs. 1 and 3). The needle was then withdrawn slightly and directed towards a point 1 cm. medial and 3 cm. deep to the tuberosity (A2 in Figs. 1 and 3). Here the tip of the needle lay in Alcock's canal, and, after preliminary aspiration to ensure that a blood vessel had not been entered, 10 ml. of the solution was injected. The needle was then partly withdrawn and plunged at right angles to the skin, into the ischio-rectal fossa of the same side for a distance of 1½ to 2 in. (4-5 cm.), depending on the obesity of the patient. 10 ml. of the solution was then injected here (site B in Fig. 1), the needle being constantly moved about during the process. Without completely withdrawing the needle it was then redirected so as to lie beneath the skin covering the lateral aspect of the labium majus, its point reaching anteriorly almost as far as the symphysis pubis, and 10 ml. of the solution was injected, the needle being slowly withdrawn during the process (site C). The whole procedure was then repeated on the opposite side.

A further 10 ml. of solution was used to infiltrate the skin of the perineum proper, special attention being paid to the line of the intended episiotomy (site D). Finally 10 ml. was injected in a fanwise manner beneath the mucosa of the posterior and lateral walls of the lower third of the vagina, using the index finger of the left hand as a guide (site E in Fig. 2).

The time taken for the whole procedure was about five minutes. It can be seen that the method is essentially a combination of pudendal block and local infiltration analgesia. (A minor modification of the technique was used for some of the cases in that 0.5% lignocaine was used,

and the pudendal nerve was blocked in the region of the ischial spine instead of in Alcock's canal.)

The patient was catheterized and the delivery proceeded with at once. All manipulations were performed very gently, more especially if rotation of the head was required. A right medio-lateral episiotomy was invariably performed, usually at an early stage. Traction on the forceps was exerted only during a labour pain, and the patient was encouraged to bear down at this time. (This is considered to be an important point. It is also of value at the time of crowning to tell the patient that the baby is being born, and that she will shortly hear it cry.)

Ergometrine, 0.5 mg., was given intravenously by an assistant as soon as the anterior shoulder of the foetus had been born. When the cord had been divided an immediate attempt was made to express the placenta. The episiotomy was repaired in the usual manner.

It is thought to be a mistake to give the patient any trichlorethylene or gas and air to breathe during the delivery, as this so dazes her that she may interpret non-painful stimuli as pain and become uncooperative.

Results

(1) *Maternal.—Mortality*: There was one maternal death (1.5%) in the series (Table II). This patient had severe

TABLE II.—*Mortality and Complications in the 65 Cases*

	No. of Cases	%
Maternal mortality	1	1.5
Corrected maternal mortality	0	0
Post-partum haemorrhage	6	9.2
Manual removal of placenta	4	6.2
Perineal complications	3	4.6
Foetal and neonatal mortality	2	3.1
Corrected foetal and neonatal mortality	0	0
Asphyxia neonatorum:		
Mild	10	15.4
Moderate	0	0
Severe	0	0

mitral stenosis. She developed signs of rheumatic chorea and reactivation of rheumatic carditis shortly before delivery. She eventually died on the tenth day of the puerperium. *Post-partum haemorrhage*: Bleeding amounted to 20 oz. (570 ml.) or more in six cases (9.2%). *Manual removal of the placenta*: The placenta was retained on four occasions (6.2%) and required subsequent general anaesthesia for removal. *Episiotomy*: Healing of the perineum was unsatisfactory and required further treatment on three occasions (4.6%).

(2) *Foetal.—Mortality*: There were two stillbirths in the series (3.1%). In one case foetal death *in utero* had occurred two days before delivery because of post-maturity and pre-eclamptic toxæmia, and in the other case the foetus died 17 hours before delivery. The latter case was an emergency admission on account of prolonged labour, post-maturity, and intra-partum pyrexia. There were no neonatal deaths. *Asphyxia Neonatorum*: Mild asphyxia was noted on 10 occasions (15.4%). These babies responded within three minutes to simple treatment, and did not give rise to any anxiety.

(3) *Views of the Patients*.—The patients were questioned immediately after delivery or on the following day. Their reactions were classified as follows:

Satisfied	56 (86.1%)
Moderate discomfort but no pain	5 (7.7%)
Would have preferred general anaesthesia	4 (6.2%)

"Satisfied" was taken to mean that there had been no more discomfort than would have been expected during a normal delivery. None of these patients would have any fears about the prospect of a subsequent similar delivery. In many instances the patient was surprised to hear that she had had a forceps delivery. The nine less satisfactory cases were all encountered in those instances where more than an easy low-forceps delivery was performed.

(4) *Assessment of Operators' Reactions.*—The operator was entirely satisfied with the analgesia and relaxation in 53 of the cases (81.5%). In only one case (1.5%) was the procedure a complete failure and resort made to general anaesthesia. In the remaining 11 cases (17%) the only objection was lack of co-operation in patients, most of whom ultimately denied undue discomfort.

Discussion and Conclusions

There was one maternal death in the series. This was, however, unavoidable and in no way due to the analgesic. The risk of maternal death as a direct result of general anaesthesia is, on the other hand, sufficiently well known to need no substantiation, and it is probable that this risk is higher where skilled anaesthetists are not available. The incidence of post-partum haemorrhage and of manual removal of the placenta was lower than might have been expected in a comparable series under general anaesthesia. The latter has a well-known adverse effect on uterine contraction and retraction. The incidence of perineal complications was low, and this has done much to allay our fears that local injections around the lower birth canal might increase the sepsis rate and interfere with sound healing.

There were no foetal or neonatal deaths attributable to the delivery, and in no case was any anxiety experienced on account of asphyxia neonatorum. General anaesthesia is a potent cause of the latter, and we have been greatly impressed by the immediate breathing and crying of infants delivered under local analgesia. The incidence of mild asphyxia was somewhat higher than we had expected. This may be a result of the high proportion of unbooked cases admitted because of prolonged labour (7 cases, 10.8%).

It is suggested that local analgesia, used in the manner described, can obviate the risks of general anaesthesia without introducing any new hazards. It is probable that general anaesthesia is still used for the majority of low-forceps deliveries performed in this country, and it seems to us that a much wider use of the local analgesic method is justifiable. Our own experience further suggests that the scope of the method is not limited to low-forceps operations. Thus, while 92.3% of our low-forceps deliveries were performed under local analgesia, 46% of our mid-forceps deliveries were likewise conducted; and of all our cases requiring rotation of the occiput, 22.2% were delivered under local analgesia.

The patient was satisfied in 86.1% of cases, the operator in less (81.5%), and this is as it should be. It should, however, be noted that if the method is limited to low-forceps deliveries the success rate is almost 100%.

The technique should have a valuable place in domiciliary practice. It is not difficult to learn (demonstration is not essential), and it is possible to conduct the delivery single-handed and in a leisurely manner. The term "failed forceps" would lose its serious import, and the fierce determination to deliver that can at times assail the most level-headed obstetrician would be largely forestalled. One of the advantages of the method is that it makes gentleness of manipulation mandatory.

We are aware that the use of local analgesia would present certain difficulties in domiciliary practice. It would be necessary to maintain a supply of reasonably fresh analgesic solution, and a sterile syringe and needles would have to be kept in a special box.

We believe that these difficulties could be overcome and that the disadvantages they represent are far outweighed by the many advantages of the method. Although we prefer the lithotomy position where this is possible, we have used the method for forceps deliveries in the left lateral position and found it to be entirely practicable and satisfactory. All our cases were given ergometrine intravenously, but we do not believe that this is essential.

It is generally agreed that, except where transfer of the patient to hospital is contraindicated, nothing more exten-

sive than a low-forceps delivery should be contemplated in the patient's home; and local analgesia should therefore be almost universally applicable in these circumstances.

Summary

The need for safer anaesthesia for forceps delivery is recognized.

A method of injection is described.

The results of 65 forceps deliveries under local analgesia are discussed.

A wider application of the method is recommended, especially in domiciliary practice.

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ACUTE LEUKAEMIA IN PREGNANCY

REPORT OF A CASE

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Forkner (1938), reviewing the literature, was able to find reports of 53 cases of all types, in 5 of which the diagnosis was doubtful. Grier and Richter (1939) collected 75, while Moloney *et al.* (1943), presenting one of chronic myeloid type, increased the total to 79. Adding another five to this number, Almklov and Hatoff (1946) reported the tenth published instance of acute lymphatic leukaemia in pregnancy. Erf (1947) published a summary of 100 cases of leukaemia in pregnancy, including two of chronic myeloid leukaemia which he personally observed. His figures for the different forms of leukaemia were: acute myeloid, 24; chronic myeloid, 63; acute lymphatic, 10; chronic lymphatic, 3.

Since 1947 the occurrence of leukaemia in pregnancy has been reported a further 17 times. On three occasions (Williams, 1948) the disease was of the acute type, one being acute lymphatic leukaemia; and Shub *et al.* (1953) described a case of chronic myeloid leukaemia which became acute during pregnancy. Allan (1954) reported four new cases of chronic myeloid leukaemia. Thus there has been reference in the literature to 38 instances of acute leukaemia in pregnancy, and 11 of these were of the acute lymphatic variety.

Case Report

The patient, aged 41, was admitted to the antenatal ward in July, 1954, because of increasing pallor, general fatigue, and swelling of the ankles. She was in the thirty-fifth week of pregnancy. The children of three previous normal pregnancies were alive and well. She had a miscarriage in 1940 at four months, preceded by appendicitis, complicated by peritonitis. Her health had been good until the fifth month of the present pregnancy.