

Epidural Anaesthesia for Caesarean Sections*

EXPERIENCE AT HARARI MATERNITY HOSPITAL

V. P. DE VILLIERS, M.R.C.O.G., *Consultant Government Gynaecologist, Salisbury Group of Hospitals, and Honorary Clinical Lecturer, University of Rhodesia*

SUMMARY

A series of 51 consecutive repeat caesarean sections is presented. Both epidural anaesthetic and caesarean section were performed by the author. The study was prospective and was undertaken in order to establish the relative safety of an obstetrician or doctor embarking on such treatment single-handed, with the help of only nursing staff. It is considered that such practice is acceptable in a developing country provided that strict precautions are taken to avoid the definite risks associated.

S. Afr. J. Obstet. Gynaec., 9, 64 (1971).

Recent publications have indicated the widespread use of epidural anaesthesia in labour.^{1,2} Various specific advantages such as the correction of inco-ordinate uterine action,³ the pain relief of labour⁴ and the improved morale of patients and ease of management⁵ have been discussed. Epidural anaesthesia, however, has long been practised in the USA⁶ and at the Westminster Hospital, London.⁷ The purpose of this study is to report on the use of epidural anaesthesia in selected caesarean sections and in particular to demonstrate that the method is particularly useful in a developing country such as Rhodesia. Here the doctor-obstetrician, often the only qualified medical practitioner available, is forced to perform both anaesthetic and caesarean section.

MATERIAL AND METHODS

All patients selected for this prospective study were scheduled for elective caesarean section on the basis of two or more previous caesarean sections, or one previous caesarean section and a contracted pelvis. This selection put particular emphasis on the more difficult type of caesarean section in order to fully expose the method. All patients were given epidural anaesthetic and operated upon by myself. Pre-operative amniocentesis was employed to confirm the gestation period as being near or at term. Details of the anaesthetic technique were noted, and the following were recorded: time of action, induction-delivery interval, total operating time, induction-completion time, blood loss at operation, the lowest blood pressure reading during the operation, and the presence of vomiting. The degree of analgesia and relaxation and the baby's condition were also noted.

The obstetric team concerned in this study consisted of myself, a theatre sister with her floor nurse, a paediatric

sister and a nursing assistant who could reliably monitor the patient's blood pressure throughout the operation and who was instructed to take and call out half-minute readings from the onset of the epidural anaesthesia, until the end of the operation.

In order to minimize the dangers of the epidural anaesthesia, and to be prepared for any of its complications, the following preliminary precautions were always taken:

1. An adequate continuous intravenous infusion of Ringer's lactate was commenced.
2. All paediatric resuscitation equipment was always personally checked—laryngoscope, endotracheal tube, water-manometer type of respirator, oxygen supply and suction.
3. All anaesthetic equipment was checked and prepared: Boyle's machine with adequate supplies of oxygen and nitrous oxide, laryngoscope, endotracheal tubes and the particular connections.
4. Ampoules of ergometrine 0.5 mg, diazepam 10 mg (Valium), and 50 mg of metaraminol (Aramine) were drawn up into their respective syringes. Pentothal 0.5 g was kept available.

The technique for administering the block was as follows: with the patient in the sitting position, the skin was prepared with antiseptic solution, and the skin and subcutaneous tissue over the selected vertebral interspace infiltrated with a solution of lignocaine (2%) with 1:100 000 adrenaline; a 16-gauge, thin-walled Touhy needle was then passed into the epidural space, using the loss-of-air-resistance technique.⁸ This lignocaine solution (15 ml) was then injected under force—the 'bolus technique'—and the patient immediately returned to the supine position. After rescrubbing and regowning, the surgeon then returned to perform the Caesarean section.

RESULTS

Between January 1970 and June 1971, 1 017 caesarean sections were performed at Harari Central Hospital. (The total number of all types of delivery for this period was 10 927.) Of the caesarean sections, 690 (67.8%) were performed under epidural anaesthetic. Nine attempts at epidural anaesthesia were unsuccessful and a general anaesthetic had to be used.

Only 1 maternal death occurred in these 690 cases. This took place 13 days after the operation due to fulminating abdominal sepsis, and a concurrent laparotomy. Twenty perinatal deaths were recorded: 9 stillbirths where the indication for caesarean section were severe foetal dis-

*Date received: 2 August 1971.

tress, 1 where the indication for operation was repeated caesarean section and an intra-uterine death, 5 where the foetus was already dead in cases of obstructed labour, and 5 neonatal deaths (1 gross congenital deformity). The perinatal mortality was 29.0 per 1 000 births, and the corrected perinatal mortality was 19.0 per 1 000 births. The 690 epidural anaesthetics were performed by various members of the obstetric staff at Harari Maternity Hospital—consultants, registrars and senior house officers.

In the 51 consecutive repeat caesarean sections performed by me, the following results were obtained:

As a route of entry the 12th thoracic—1st lumbar interspace was most commonly utilized; 39 blocks were at this level. Other blocks were injected at a slightly higher or lower level. In 6 cases initial failure at one interspace was followed by success at a different interspace. In 1 case, after two failed attempts at different interspaces, recourse to caudal anaesthesia was taken, with excellent result. The subarachnoid space was twice perforated, and a different level selected with the patient in the left lateral position.

The time of action varied between 3 and 6 minutes in 47 of the patients. One took 12 minutes and two others 7 minutes each.

The induction - delivery interval was less than 15 minutes in 48 of the patients. In 1 patient with a subarachnoid perforation the patient was allowed to stabilize before operating. In another the induction - delivery interval was prolonged because of a difficult exposure due to adhesions.

The degree of analgesia was complete in 47 cases. Two cases had residual pelvic pain. In 1 case the analgesia was regarded as satisfactory, but with slight unilateral skin sensitivity. No added analgesia, however, was indicated.

Relaxation was excellent in all but 1 case despite complete analgesia. This was the only case given intravenous diazepam (Valium). In 1 case temporary paralysis of the intercostal muscles occurred.

Hypotension, defined as any systolic reading below 70 mmHg, was only recorded in 2 patients, 1 of which had a pre-operative supine systolic blood pressure of 70 mmHg. Slight fall of blood pressure was invariable, but marked hypotension was consistently corrected by uterine displacement and the simultaneous rapid intravenous infusion of Ringer's lactate. Actual increase of blood pressure mostly followed delivery of the infant. The vasopressor metaraminol (Aramine) and foot elevation were never necessary. Emphasis on the half-minute audibly recorded blood pressure, and early correction, as mentioned above, were regarded as very important.

Blood loss was consistently regarded as of a relatively slight degree. Only one transfusion was indicated at operation and none postoperatively. Postoperative haemoglobin estimations were always carried out, and only twice recorded at slightly below 10 g/100 ml. Clinical impression at operation was that blood loss approximated 1 000 ml in only 2 cases.

Retching or vomiting was observed in 5 cases, always with the closure of the abdomen or with tubal ligation.

Of the 50 infants delivered under epidural anaesthesia, 48 had one-minute Apgar scores of 8-10. One was a macerated stillbirth (2 previous caesarean sections and an

intra-uterine death) and 1 had an Apgar score of 2. One neonatal death in an infant weighing 2.5 kg at birth occurred 20 hours after birth due to hyaline membrane disease.

Convulsions were never noticed and no neurological sequelae were detected.

DISCUSSION

Epidural anaesthesia for caesarean sections has become established as a safe method at Harari Maternity Hospital. The technique is easily acquired and personal performance and reliability improve with experience.

Hypotension is the most common and potentially the most dangerous side-effect for both mother and foetus. Close supervision of the patient and clearly audible half-minute blood pressure readings lead to the early detection of significant falls of blood pressure, and subsequent correction by uterine displacement and a simultaneous rapid infusion of Ringer's lactate. Foot elevation or vasopressors were not required in this study.

Experience at Harari Hospital has been that the epidural anaesthetic can often be performed long before the non-resident anaesthetist's arrival. As can be seen from this study, the time of action is short, so that it is a form of anaesthesia eminently suitable for the urgent caesarean section. Accordingly, it is often employed in cases of severe foetal distress where rapid delivery is necessary.

The usual induction - delivery interval of less than 15 minutes achieves delivery of the infant before peak levels of lignocaine in foetal blood are reached.⁹

An ideal medical team for caesarean section should certainly include an anaesthetist with anaesthetic nurse, a paediatrician, and the surgeon with his assistant. This situation, however, is not possible in most of the peripheral hospitals and mission hospitals of Rhodesia, or of other developing countries.

In the light of the non availability of adequate numbers of doctors, it is imperative to compromise with an alternative arrangement, such as described above. This procedure achieves the maximum safety for the patient and her child—the real purpose of all clinical management in obstetrics.

Although this study was conducted on selected cases, it is felt that the method is safe and can be recommended. However, when marked maternal or foetal distress is present at the caesarean section, additional help in the form of another doctor would be most desirable.

I wish to thank Dr M. Webster, Secretary for Health, Rhodesia, for permission to publish.

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