PROGRESS
IN
CLINICAL
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AND
GYNECOLOGY

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By

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PREFACE

It has been my aim in writing this book to give an account of recent developments in clinical obstetrics and gynæcology. It consists mainly of information not found in standard text-books, compiled for the benefit of the specialist who has not had facilities for keeping up with the literature, and for the post-graduate student who is specializing. In particular I hope it will prove to be of value to those who are reading for the M.R.C.O.G. examination. I have described the latest advances and also given a brief outline of present day clinical practice in each subject. Throughout the book I have placed emphasis on progress in clinical work, but I have also discussed recent laboratory and experimental findings when they have had direct clinical implications. Although I wanted to include most of the subjects in which there has been progress of permanent clinical value in the last ten or fifteen years, some omissions are inevitable in a book of this size for it is concerned with both obstetrics and gynæcology. For instance, I have written nothing on occipito-posterior positions, ectopic gestation or endometriosis. On the other hand, I have selected several subjects because they are controversial, e.g., postmaturity, the treatment of breech presentation, the third stage of labour, infertility, thrombo-embolism and carcinoma of the cervix; and I have tried to present the evidence without prejudice before drawing conclusions. I make no apology for including many statistics, for much of the evidence upon which modern obstetrical and gynæcological practice is based is statistical. A study of these figures, moreover, should enable the reader to assess for himself the value of any of the changes in clinical practice that are proposed.

New subjects which I have described in detail include the effects on the fœtus of rubella in early pregnancy, afibrinogenæmia, amniotic embolism, pre-diabetes, retrolental fibroplasia and kernicterus and hyaline membrane in the new-born, intra-epithelial carcinoma of the cervix and the cytological diagnosis of uterine malignant disease. Among the many modern developments, of which I have considered the uses and limitations, are antibiotic treatment, the radiological diagnosis of placenta prævia, the giving of hormones to pregnant diabetics, oxytocin drip infusions in uterine inertia, new techniques in breast feeding, new methods in the treatment of hæmolytic disease of the new-born and neonatal asphyxia, the use of antibacterial drugs in pelvic tuberculosis, new operations for stress incontinence and

pelvic exenteration for inoperable malignant disease with the consequent disturbances in electrolyte and water balance. I have examined new theories in toxæmia of pregnancy for their implications in prevention and treatment. There are new concepts of mitral stenosis as the result of modern techniques in cardiac investigation. A change in attitude of the obstetrician to pulmonary tuberculosis follows observations on the effect of pregnancy on the disease when the results are compared with those in non-pregnant controls. I have described also modifications in the treatment of carcinoma of the uterine body, ovary and vulva and given an account of recent work on chorionepithelioma and functioning ovarian tumours.

I am very grateful to all those of my friends and colleagues who have helped me write this book. I am particularly indebted to Wing Commander G. H. Dhenin, A.F.C., G.M., and Mr. J. S. Tomkinson, who read the manuscript and made many helpful suggestions and to Mr. J. M. Holmes who assisted me in correcting the proofs. I wish to express my grateful thanks to Dr. H. P. Ferreira and the Departments of Pathology and Photography of the Chelsea Hospital for Women, to Dr. A. E. Claireaux of the Bernhard Baron Memorial Research Laboratories, Queen Charlotte's Hospital, and to Dr. E. Rohan Williams for their kindness in providing me with several of the illustrations; to Mr. J. M. McArthur for reading the sections on radiotherapy; to Miss M. Morgan for her willingness in typing the manuscript; to Miss M. J. Waldron for the line drawings; and to my wife for helping me with the references and, more important, for her continual encouragement and moral support.

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PART I—Obstetrics

CHAPTER 1

THE CHANGING PRACTICE OF OBSTETRICS

With special reference to:

1. Antenatal care.
2. Trends in methods of delivery: forceps; Cæsarean section; ruptured Cæsarean scar.
3. Trends in the relief of pain in labour.
4. Changes in the natural history of puerperal pyrexia, puerperal sepsis and puerperal mastitis.
5. Principles of antibiotic treatment.
6. Changes due to the National Health Service.
7. Trends in Maternal and Perinatal mortality.

Antenatal Care

At the present time two factors seem to be mainly responsible for the improved results in obstetrics: a higher standard of antenatal and intranatal supervision, and an improvement in the general health of mothers, possibly arising out of better living conditions and improved nutrition. Almost every pregnant woman in Great Britain now avails herself of the widespread facilities for antenatal care. No longer is it the sole aim of those conducting antenatal supervision merely to detect toxæmia, disproportion and malpresentation. For in addition the occasion is made an opportunity for raising the standard of health of the patient as a whole; and as a contribution to this the State provides the pregnant woman with a free supply of vitamins A and D and she is entitled to buy orange juice and a pint of milk daily at a reduced price.

Severe toxæmia is decreasing throughout the country but this is most noticeable in the north of England and in Scotland where it was more prevelant. This may be due to better antenatal supervision leading to earlier recognition and treatment; it may be due to better nutrition. An interesting experiment involving control of the weight and diet of patients in pregnancy and aiming at preventing pre-eclampsia and eclampsia is being conducted in Australia and is referred to on page 50. In the treatment of eclampsia itself new drugs are being used with better results (see page 59).

For some time obstetricians have known that the hæmoglobin level of the blood in pregnancy normally falls, and this they believed

was caused by a disproportionate increase in the plasma volume, a state they referred to as the "physiological anæmia" of pregnancy. Whitby and Britton (1950) considered that 10 g. hæmoglobin per 100 ml. (68 per cent Haldane) was the lower limit of normal in pregnancy. However, several workers have recently shown that the giving of iron to pregnant women raises the hæmoglobin to levels normally found in healthy non-pregnant women (Benstead and Theobald, 1952; Fisher and Biggs, 1953; Davis and Jennison, 1954). For instance, Fisher and Biggs (1955) treated 104 patients with iron during pregnancy. By the 38th week in 92 the hæmoglobin level rose to, and remained at, 98 per cent; in 12 there was no response, the hæmoglobin level falling slightly as pregnancy proceeded.

Therefore it is suggested that there is commonly an iron deficiency in pregnancy due to the increased blood volume and the demands of the fœtus for iron associated with an inadequate intake of iron in the diet; and it is claimed, moreover, that there is good reason to give an iron preparation as a routine to every pregnant woman. Gatenby and Lillie (1955) showed that two tablets of ferrous sulphate gr. 3 given thrice daily were effective in raising the hæmoglobin level of anæmic patients, but that half of them were unable to take the tablets because of nausea and vomiting; and this was so whether the ferrous sulphate was molydenised or not. Ferrous gluconate, however, was tolerated by over 90 per cent of the patients and was as effective as, but no better than, ferrous sulphate. In patients with achlorhydria, 15 minims of acid hydrochlor. dil. three times daily sometimes aids the absorption of iron given by mouth. Preparations of iron and ascorbic acid are not only tolerated better than iron alone but they are also absorbed more easily. Iron and ammonium citrate, in doses of 30 minims three times daily, is readily absorbed but is not well tolerated.

Patients who are unable to take ferrous gluconate by the mouth and those who fail to respond to oral iron through malabsorption can be given saccharated oxide of iron ("Ferrivenin") into a vein. In order to detect hypersensitivity a preliminary test dose of 25 mg. is given, and if there is no reaction to the injection 100 mg. can be given daily for a week and thereafter on alternate days for not more than three weeks. Each 25 mg. given are found to raise the hæmoglobin level by 1 per cent.

A very few cases of anæmia in pregnancy do not respond to any form of iron therapy and they are usually found to have a megaloblastic anæmia. They can be diagnosed from pernicious anæmia—which is very rare in pregnancy—by the absence of splenomegally, glossitis and neurological complications and by the presence of hydrochloric acid in the stomach. They respond to folic acid in doses

of 15 to 30 mg. daily and injections of crude liver extract. Unfortunately intravenous iron may on occasion cause unpleasant reactions in hypersensitive patients or when large doses are given (Nissim, 1954). During the reactions there is pain over the kidneys in the back, headache, shivering, flushing, dyspnœa and faintness; these symptoms may come on immediately after the injection (early reaction) or half to six hours later (late reaction). According to Nissim the early reactions, which occur in up to 10 per cent of patients, are allergic manifestations due to impurities; and the late reactions are due to intravascular precipitation of iron from over-dosage. Nissim reviewed the literature on these reactions and found only one fatal case which occurred in a man with severe coronary occlusion. Severe early reactions can be avoided by giving the injection very slowly and stopping as soon as the patient complains of any unpleasant symptoms; and the late reactions by not giving more than the standard dose.

For those patients in whom it is important to give iron, but therapy by mouth is ineffective and it is contra-indicated or impossible by the intravenous route, a new dextran-iron preparation (Bengers Ltd.) can be given intramuscularly. Baird and Podmore (1954) injected iron deep into the gluteal muscles and found the method successful, 43 mg. of dextran-iron raising the hæmoglobin by 1 per cent; there was no reaction during the treatment of 40 anæmic patients. The disadvantages of intra-muscular therapy are that absorption is slow and it takes four to nine weeks for a maximum response, the injection may be painful and serious staining of the skin may occur.

Advances in the medical and surgical treatment of heart disease and tuberculosis and a greater knowledge of the association of pregnancy with diabetes, essential hypertension and chronic nephritis, have altered the attitude of the obstetrician to patients suffering from these diseases both during pregnancy and at delivery itself. Separate chapters are devoted later in this book to each of these conditions.

The use of radiology as an aid to the antenatal diagnosis of disproportion is well established, and by its use the obstetrician becomes much better informed about the shape of a pelvis and its measurements (see page 227). Soft tissue radiography is gaining favour as a means of locating the placenta, and in some patients placenta prævia can be excluded without the need for vaginal examination (see page 173). Largely as the result of the work of Macafee (1945) the expectant treatment of placenta prævia is generally practised. By allowing the fœtus to grow and then delivering it by Cæsarean section in the more severe degrees of placenta prævia, or following rupture of the membranes in the lesser degrees, the fœtal survival rate has been remarkably improved (see page 168).

Since 1940 when Landsteiner and Wiener discovered the Rh antigen there has been tremendous progress in our knowledge of Rh isoimmunization (see page 139). Although sensitization of the mother occurs comparatively seldom, every pregnant patient now has her red blood cells tested for the presence of Rh antigen and, if she is Rh negative, she has her serum examined for antibodies. By serological tests on the mother it is possible to anticipate hæmolytic disease in the fœtus. This can be confirmed at birth by tests on the fœtal red cells; and, according to the maturity of the fœtus, the hæmoglobin level, the serum bilirubin concentration and the clinical condition, a decision can be reached about the need for immediate exchange transfusion. Although it seems inevitable that a few affected babies will die *in utero* a great many more are being saved by avoiding premature delivery (except in special circumstances) and performing exchange transfusion when necessary; and there is evidence that by exchange transfusion soon after birth, which may have to be repeated in a few days, bilirubin can be washed out of the tissues of the fœtus and kept below the concentration at which it damages the brain and causes kernicterus (Lathe, 1955).

In 1941 Gregg in Australia noted an association between congenital cataract and a history of rubella in the early months of pregnancy. Much work on this subject has since been done (see page 134) but it is not yet possible to say how likely a mother who has rubella in early pregnancy in this country will produce a congenitally deformed baby, but it seems that the chances are much less than in Australia.

Obstetricians in this country are becoming increasingly aware that the postmaturity may be dangerous to the fœtus. Recent experimental work (Walker and Turnbull, 1953) shows that this is due to anoxia from placental insufficiency, which becomes worse the longer the pregnancy goes past term. The problem, its diagnosis and treatment, is considered in detail on page 191.

All obstetricians agree that external version without anæsthesia should be done antenatally to prevent a breech delivery, but not all agree that if version fails another attempt should be made under anæsthesia (see page 207). Those who dissent argue that breech delivery is safer for the fœtus than version with an anæsthetic, but the mortality figures for breech delivery in most institutions do not support their view. Nevertheless, the fœtal survival has improved, partly because of a careful selection of cases, many of those with a doubtful pelvis or other associated abnormality being delivered by Cæsarean section, and partly because those selected for breech delivery are treated by improved techniques of which the advances of modern anæsthesia are specially important (see page 211).

Labour

There has been a considerable amount of research within the last few years on the characteristics of normal and abnormal uterine action (see page 246). However, we do not seem any nearer to explaining the reason for the onset of labour nor have we any certain means of regulating uterine contractions. Experiments with oxytocin drip infusions are proceeding and there are claims of therapeutic success with the method in certain types of uterine inertia, and as a means of inducing labour (see pages 52 and 257). In the treatment of inertia due to inco-ordinate uterine action obstetricians are performing Cæsarean section sooner than they did previously, mainly because the fœtal survival rate is so much higher and the risk to the mother is lower than if the operation is done late. Consequently the operation of incising the cervix and then delivering the baby with forceps is seldom done at the present time.

Delivery

Although the ideal delivery is a spontaneous one, a timely application of the forceps or Cæsarean section may save the life of many a baby besides being in the best interests of the mother. In the past few years the risks of these two operations have been reduced and the indications for them have consequently increased.

Forceps delivery. Modern trends in the use of forceps are discussed by Jeffcoate (1953). In hospital deliveries forceps are being used with increasing frequency. Thus at the Liverpool Maternity Hospital the forceps rate in 1950 had risen to 16-17 per cent and at Queen Charlotte's Hospital in 1951 it was 13·4 per cent. Associated with the increased number of forceps deliveries is a decrease in the risk of the operation. In 3,522 forceps operations at the Liverpool Maternity Hospital from 1936-1950 13 women died, 6 of the deaths (1·7 per 1,000 births) being due to the anæsthetic or the operation, while in 1,793 operations at Queen Charlotte's Hospital from 1946-1951 2 women died, neither of these deaths being related to the operation. At the same time the fœtal mortality among cases delivered by forceps has fallen to 2 per cent at the Liverpool Maternity Hospital and to 5 per cent at Queen Charlotte's Hospital.

The indications for the use of forceps have been affected by the present day outlook on Cæsarean section. It is no longer a justifiable procedure to attempt to overcome disproportion above the level of the mid-pelvis with forceps, since the chances of producing a live baby are so much greater with Cæsarean section. This is especially so when the delivery involves a difficult manual rotation of the

unrotated head, or when it has been shown by intrapartum radiography that an attempt at vaginal delivery is unlikely to succeed. Contracted pelvic outlet, on the other hand, hardly ever gives rise to great difficulty in delivery, provided that the inlet and cavity of the pelvis are adequate.

Whereas formerly maternal and fœtal distress constituted urgent indications for the use of forceps, obstetricians now anticipate these complications by applying forceps when the fœtal head is held up on the perineum before there is undue prolongation of the second stage of labour. A low forceps delivery of this sort performed in anticipation of fœtal or maternal distress was referred to by De Lee in 1920 as a "prophylactic forceps" operation.

A prolonged first stage of labour often leaves a mother too tired to co-operate in the second stage; then feeble uterine contractions do not contra-indicate the use of forceps, for it has been shown that postpartum hæmorrhage does not occur with greater frequency than usual and the uterine behaviour can be controlled with ergometrine (see page 286).

In domiciliary practice it is seldom wise to apply forceps unless the fœtal head is below the level of the ischial spines and visible at the vulva. This is the sort of forceps delivery that can be satisfactorily accomplished with Wrigley's forceps.

In hospital it is safer to deliver the fœtal head from a slightly higher level in the pelvis. Jeffcoate (1953) stresses the need for abandoning an unsuccessful attempt to deliver with forceps in favour of performing a Cæsarean section while the fœtus is still alive. He recommends the procedure of a "trial of forceps" for mid-pelvis deliveries; the obstetrician deliberately applies the forceps as a tentative measure, with the declared intention of abandoning the operation in favour of Cæsarean section if with gentle traction it does not prove successful. This is also advised by Parry Jones (1952) and Douglass and Kaltrieder (1953).

The remote results of difficult forceps delivery in Glasgow were reported by McLennan *et al.* (1953) in a follow-up of 86 children, out of 167 cases mostly with mid-pelvic disproportion. Eighty-one of these children were alive and well with no evidence of abnormal defect, four had strabismus and one was mentally defective. The stillbirth rate had been 11·4 per cent. The risk, therefore, of such forceps deliveries seems to be mainly an immediate one, and perhaps the importance of the remote effects of the trauma of forceps delivery has been over-stressed in the past.

Episiotomy is done routinely in almost all forceps deliveries. In view of the dangers of general anæsthesia and especially the inhaling of vomit, local analgesia is being used with increasing frequency for

episiotomy and in low forceps deliveries. It is particulary suited to domiciliary practice. A method of performing pudendal nerve block is described on page 214. As an alternative, when the head is so well down that the ischial spine is difficult to reach, the perineal branch of the pudendal nerve can satisfactorily be infiltrated with local anæsthetic as it runs through Alcock's canal on the medial aspect of the ischial tuberosity. The perineal skin may also need infiltrating because the posterior part is supplied by the inferior hæmorrhoidal branch of the pudendal nerve and sometimes also by fibres from the posterior cutaneous nerve of the thigh. Since it diffuses rapidly in the tissue 1 per cent lignocaine hydrochloride ("Xylocaine") is the best local anæsthetic for the purpose.

Occipito-posterior position of the vertex and failure of the head to rotate anteriorly from the transverse position are treated by manual rotation before the application of the forceps, or alternatively by the application of Kielland's forceps and rotation by means of the forceps. Parry Jones (1952) has recently described the uses of this instrument. There seems no doubt that obstetricians who learn to make use of this type of forceps for rotation frequently prefer it to the exclusion of all others. In the hands of the inexperienced, however, it can prove dangerous, especially to the mother, who may receive serious lacerations of the vagina, lower uterine segment and bladder. This is mainly because of the difficulties of applying the forceps to the fœtal head.

The use of forceps in delivery of the after-coming head of a breech presentation is well established. This is considered on page 214.

Cæsarean section. The rate of Cæsarean section in modern obstetrics has risen as a result of the greater number of acceptable indications and the reduced risk of the operation, and about 5 per cent of women in hospital are now delivered by the abdominal route. This rate varies from institution to institution according to differences in the proportion of abnormal cases and in local practice. Thus at the Liverpool Maternity Hospital the section rate in 1950 was 15 per cent (Jeffcoate, 1953); and at Queen Charlotte's Hospital from 1945 to 1954 the section rate in 27,930 deliveries was 3·3 per cent. Marshall and Cox (1949) reported an incidence of 6·2 per cent for the section rate at 19 hospitals from 1943 to 1947.

The advantages of the lower segment operation have been shown in almost every type of case, including placenta prævia, so that the classical operation is being performed less and less. Marshall and Cox (1949) reported a collected series of 2,276 electively performed lower segment operations with a maternal mortality of 0·13 per cent and a corrected fœtal mortality of 3·29 per cent. This maternal death rate can be regarded as that due to the operation itself and

not to the condition for which the sections were done. With patients in labour the mortality rate from the lower segment operation increases, but both before and during labour the mortality rate from the classical operation is about three times as high.

Stabler (1949) found that it was safer to deliver an infected patient by lower segment Cæsarean section after failure to deliver with the forceps than it was to perform craniotomy.

Fœtuses that are withdrawn by the feet through a classical uterine incision often inhale liquor before the head can be delivered and this accounts for the difficulty in resuscitating many of these babies who are literally drowned. By delivering the head first through a lower segment incision the operator can clear the air-passages before he delivers the trunk and when the baby is stimulated to take its first breath its mouth is exposed to the air, not to liquor.

With the aid of antibiotics the lower segment operation is safely carried out in this country in potentially infected cases even when the membranes have long been ruptured and several vaginal examinations have been made; extra-peritoneal operations are difficult to perform and their advantage is only theoretical.

The post-operative course after the lower segment operation is less complicated and the incidence of rupture of the uterine scar in subsequent pregnancies is less. Operators in this country favour a transverse incision in the lower uterine segment, and, although it may not be strictly in the lower segment, a low transverse incision before the onset of labour carries with it all the advantages of an incision made in the lower segment during labour.

Classical Cæsarean section will probably be used only when the occasion demands the greatest possible speed in delivery, so that the gain of two or three minutes is vital.

The incidence of Cæsarean section in two groups of cases, one in this country and the other in the United States, is shown in the table on the opposite page.

The relatively high incidence in the Queen Charlotte's figures of Cæsarean section for uterine inertia, placenta prævia, malpresentation, toxæmia and fœtal distress is of interest, because they represent conditions in which a section is often performed as much for the sake of getting a live baby as for the safety of the mother. Since uterine inertia does not appear on the Americans' list of indications above, cases with slow dilatation of the cervix must, presumably, have been classified as cases of disproportion. The high rate of repeat sections in the United States is due partly to the belief "once a Cæsarean, always a Cæsarean". In the case of contracted pelvis and other recurring indications the dictum is obviously true; that it is illogical as it stands, is shown by the results of vaginal delivery

following a previous Cæsarean. These results are considered in the next section.

Ruptured Cæsarean scar. Recently Eames (1953) and Lawrence (1953) have tried to discover if in a subsequent pregnancy, when the indication for the previous section is no longer present, the mortality from rupture of a Cæsarean scar is greater if the patient is allowed to go into labour than if an elective Cæsarean section is performed.

FREQUENCY OF INDICATIONS FOR CÆSAREAN SECTION

	Flushing Hospital, New York, 1947-51 (Schaefer and Carpenter, 1958)	*Queen Charlotte's Hospital, 1949-50*
	Per cent	Per cent
Contracted pelvis and cephalo-pelvic disproportion	22·2	15·3
Toxæmia and hypertension ...	11·1	15·0
Uterine inertia...	—	12·0
Placenta prævia	8·3	10·8
Previous Cæsarean section ...	37·3	9·0
Faulty presentation	2·4	8·0
Pelvic tumour	2·0	2·5
Premature separation of placenta	3·9	1·3
Diabetes	0·7	1·3
Heart disease	2·1	1·0
Other indications	9·5	24 (including 10 for fœtal distress)
Total incidence of Cæsarean section per cent	4·0	3·9

Eames reviewed the cases in which labour followed a previous Cæsarean section in articles published over the course of two and a half years. In order to determine the risk of elective Cæsarean section he found that only five out of thirteen deaths which occurred in 6,314 sections were attributable to the operation, three deaths being due to anæsthesia and two to pulmonary embolism. This gives a maternal mortality of 0·08 per cent due to section alone. At the same time there were 0·5 per cent of fœtal deaths attributable to the operation.

Among 902 patients with classical scars there were 23 ruptures (2·6 per cent) and among 880 patients with lower segment scars there were 11 ruptures (1·3 per cent). But 24 per cent of ruptures

occurred before the thirty-seventh week of pregnancy and therefore they would not have been avoided by an elective section at that time. The incidence of rupture after 37 weeks is therefore 2 per cent for classical scars and 1·0 per cent for lower segment scars.

Eames collected 44 cases of ruptured classical scar with one death, a maternal mortality rate of 2·3 per cent, and 21 cases of rupture of a lower segment scar with no deaths. The fœtal mortality was 72 per cent for the classical scar ruptures and 7 per cent for the lower segment ruptures.

Thus it can be worked out that the risk of death to the patient whose pregnancy proceeds beyond the thirty-seventh week or who goes into labour with a classical scar is 2·0 per cent (the incidence of rupture) of 2·3 per cent (the mortality of rupture), which is 0·05 per cent; and the risk to the patient with a lower segment scar is nil. But if one assumes a mortality of ruptured lower segment scars of 1 per cent, the risk of pregnancy after the thirty-seventh week or of labour to the patient with such a scar is 0·01 per cent.

These figures are summarised:

MORTALITY FROM RUPTURE OF A CÆSAREAN SCAR IN A SUBSEQUENT PREGNANCY (EAMES, 1953)

	No. of cases	*Incidence of rupture scar*	*Incidence of rupture after 37 weeks*	*Maternal morality of patients with a ruptured scar*	*Maternal mortality of patients who go into labour with a Cæsarean scar*	*Fœtal mortality in rupture of scar*
		Per cent	Per cent	Per cent	Per cent	Per Cent
Classical scar	902	2·6	2·0	2·3	0·05	72
Lower segment scar . . .	880	1·3	1·0	0 (or 1·0)	0 (or 0·01)	7

From these calculations it can be concluded that the risk to a patient going into labour, who has no disproportion or other indication for operation, is less than that of 0·08 per cent for an elective Cæsarean section.

Lawrence (1953) found an incidence of 2·2 per cent of ruptured classical scars in 178 patients in labour and an incidence of 0·65 per cent of ruptured lower segment scars in 310 patients in labour; 74 of those with classical scars and 121 of those with lower segment scars subsequently were delivered vaginally. There were no maternal deaths. In two out of the four ruptured classical scars and in both the lower segment scars the fœtus survived.

Nevertheless, care must be taken to exclude all indications for a second section before submitting the patient who has a uterine scar