

# A Review of the Results of Vaginal Delivery Following Caesarean Section\*

DENIS W. P. LAVERY, M.D., *Associate Professor and Head of Department of Obstetrics and Gynaecology, Baragwanath Hospital, Johannesburg*

## SUMMARY

An analysis of the type of delivery which occurred after one previous delivery by caesarean section was carried out on all patients attending Baragwanath Hospital during the 15-month period October 1969 to December 1970. The group consisted of 485 patients who fitted the requirement of one caesarean section, and 72.9% succeeded in a vaginal delivery after a 'trial of scar'. The age and parity of the majority of the patients were consistent with the optimal obstetrical career of women. The foetal loss as a direct result of the treatment was 3 babies who were extruded into the abdominal cavity through a complete rupture of the scar (0.9%). Vaginal delivery was considered possible for 333 patients and 243 (72.9%) succeeded, with a small partial rupture in one patient and a haematoma in the region of the extremity of the scar in another.

Failure to deliver vaginally after a trial of scar occurred in 90 patients and the section was repeated. In this group 4 (4.4%) developed a rupture of the scar, which was total and complete in 2 lower segment scars, in 1 unsuspected classical scar, and partial in 1 lower segment scar. The incidence of scar rupture in the trial group was 1.8%. The indications for the previous caesarean section differed quite considerably from those of the repeat section while the infants' weights were essentially the same.

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When the dictum 'once a caesar always a caesar' was in vogue, it was based on the experience of practising obstetricians and practitioners. The operation used at that time was the classical caesarean section which resulted in a scar in the uterus which was not safe and which tended to rupture in a subsequent pregnancy or during labour.

With the introduction of the transverse incision in the lower segment of the uterus, the resultant scar was more satisfactory and the incidence of rupture dropped dramatically. However, when reporting on a series of ruptured uteri in 1954, I found 6 scar ruptures, 5 of which had occurred in classical scars.<sup>1</sup> In 1958 a further series was reported and once again 6 scar ruptures were found but this time 5 had occurred in lower segment scars.<sup>2</sup>

The question as to the safety of a scar in the uterus has exercised the minds of practitioners dealing with obstetric patients for some time and the need to know the answer is becoming more urgent as the indications for the operation broaden. The use of antibiotics, the availability of blood for transfusion and the tremendous advances made

in anaesthesia are factors which have made this mode of delivery much safer and therefore more popular.

The safety of a section scar is of particular interest to those who work predominantly with Bantu patients, since these people, for various reasons, still tend to be a migratory and not a stable population. A patient who has a caesarean section in one of the major centres for a non-recurring condition, may be in some area far from a hospital when next she is pregnant.

The following are the questions to be answered when confronted by a patient who gives a history of delivery by caesarean section:

1. Is it feasible to subject the scar to labour without danger to mother or child?
2. If the section is to be repeated, should it be done as an elective procedure or should labour be allowed to supervene before performing the operation?
3. Should labour be induced, and if so, should medical or surgical means be used?
4. How long should the patient be permitted to labour?
5. What signs and symptoms can be relied on to warn that impending rupture of scar is about to occur?
6. If the scar ruptures should the treatment be repair only, repair with sterilization, or hysterectomy?

The answers to some of these questions, (1, 2 and 4), are to be found in this report. Briefly the answer to question 3 is 'No'—labour should not be induced in a patient with a scar in the uterus for if the need exists to terminate the pregnancy urgently then a repeat section should be performed.

As regards question 5, it is our experience that very seldom, if ever, can 'scar tenderness' be relied on to denote impending rupture. Many trials have been terminated because of this sign, only to find a very healthy intact scar at section. Conversely, ruptured scars have been found after normal vaginal delivery or section with no complaint by the patient.

The answer to question 6 is very controversial, but at Baragwanath Hospital the policy is to repair and sterilize. Sterilization is withheld in young women with no living issue. Hysterectomy is only carried out if it is found impossible to repair the scar, which in fact seldom occurs. The statistics at this hospital indicate unequivocally that repair is a superior form of treatment to hysterectomy and carries a significantly lower mortality and morbidity rate.

If the previous section was performed for a non-recurring condition such as prolapse of the cord, malpresentation, foetal distress or placenta praevia, the decision as to the type of delivery in the present pregnancy is of importance, since to limit the obstetric life of a patient by performing a second caesarean section may be unjustifiable, particularly in the Bantu patient. Most obstetrical

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schools today agree that a patient who has had 2 deliveries by caesarean section should be delivered in all subsequent pregnancies by section, and most subscribe to sterilization at the third operation.

This restriction on the obstetrical life of Bantu patients can be a major problem since the neonatal and infant mortality rates are so high in this population group. It is not uncommon to find that a patient presenting for her third section has no living children.

It is the practice at Baragwanath Hospital to permit attempts at vaginal delivery after caesarean section in selected cases, and the present analysis was undertaken to assess the results of this policy.

## MATERIAL

The case histories of all patients who had been delivered by caesarean section before the present pregnancy were obtained for the 15-month period from October 1969 to December 1970. The patients who had had 2 sections were excluded from the study as it is accepted practice to repeat the section in the next pregnancy. The analysis deals only with patients who had one caesarean section scar in the uterus.

During this period, out of 624 patients who had been delivered by caesarean section, 485 complied with the requirement of one scar in the uterus, and these patients formed the study group.

One of the first observations to emerge from the analysis was the fact, often reported, that Bantu patients do not attend antenatal clinics. In spite of being told on discharge from hospital after a caesarean delivery, that they must go to a hospital for antenatal care and delivery, only 56% of the study patients had done so. The balance were seen for the first time on admission to hospital.

### Age and Parity (Tables I and II)

The majority of the patients in the series were between 15 and 29 years of age and in the 1-3 parity group. This is to be expected as the obstetrical life is maximum at this age. The patients who were older and of higher parity and who were permitted to attempt a vaginal delivery had specific reasons for so doing. Many of the older high-parity women simply refused to have a caesarean section, while others had no living issue and were hoping to extend their chances of having more infants. Some of the patients

TABLE I. AGE OF PATIENTS

Age	Vaginal delivery	Repeat section	Total
15 to 19 years	10	18	28
20 to 24 years	87	81	168
25 to 29 years	70	56	126
30 to 34 years	37	49	86
35 to 39 years	32	28	60
40 to 46 years	7	10	17
<b>Total</b>	<b>243</b>	<b>242</b>	<b>485</b>

had had a section for a non-recurring indication and requested to be allowed a vaginal delivery. Since the only indication for repeating the section was age and/or parity, the request was not unreasonable.

TABLE II. PARITY

Parity	Vaginal delivery	Repeat section	Total
1	86	158	244
2	64	38	102
3	34	21	55
4 and 5	26	19	45
6 and 7	25	7	32
7 and 8	6	1	7
<b>Total</b>	<b>241</b>	<b>244</b>	<b>485</b>

### The Baby (Table III)

In the series 7 sets of twins were delivered which increased the total births to 492. The number of babies born alive (456-94.1%) was reduced by 10 neonatal deaths which occurred in 2 mature infants and 8 premature infants. The mature babies were severely asphyxiated at birth and all forms of resuscitation failed. The premature babies were very small and feeble. The largest weighed 1929 g and the smallest weighed 680 g. Five babies weighed less than 1360 g and 2 were 1587 g.

TABLE III. THE BABY

	Vaginal delivery	Repeat section	Total
<b>Live births</b>			
mature	186	210	396
(456) premature	32	28	60
<b>Stillbirths</b>			
(26) fresh mature	3	4	7
fresh premature	5	1	6
macerated mature	7	0	7
macerated prem.	6	0	6
<b>Neonatal deaths (10)</b>			
mature	2	0	2
premature	6	2	8

There were 26 stillbirths, of which 13 were fresh and 13 were macerated. In the mature fresh stillbirths, 2 resulted from prolapse of the cord, 2 from abruptio placentae and 3 as a result of scar rupture with extrusion of foetus and placenta into the abdominal cavity.

Of the premature fresh stillbirths, 1 was an intra-uterine growth retardation syndrome, 1 resulted when the patient arrived at the hospital with the breech half delivered and 1 had multiple congenital abnormalities.

### Presentation of Foetus

The majority of the foetal presentations were vertex (465) with breech occurring in 22 instances, transverse lie in 2, face in 2 and brow in 1. All the malpresentations

(with the exception of the patient with the half-delivered breech) were delivered by repeat caesarean section.

The second stage of labour was reduced in the trial patients by means of forceps extraction in 49 patients and the ventouse extractor in 12. Episiotomy alone was sufficient to reduce the second stage in 102 patients.

The birth weight (Table IV) of the babies delivered by caesarean section in the previous pregnancy was similar to that of babies delivered vaginally in this series up to

TABLE IV. BIRTH WEIGHT

Birth weight	Previous baby		Present baby	
	Caesarean section	Vaginal delivery	Repeat section	Repeat section
Under 2 494 g	103	54	56	
2 522 g to 2 721 g	40	19	20	
2 749 g to 3 175 g	161	82	81	
3 203 g to 3 628 g	92	69	74	
3 756 g to 4 082 g	63	20	11	
4 110 g to 4 535 g	14	4	1	
Over 4 535 g	12	0	1	
Total	485	248	244	

3 175 g. Babies which exceeded this weight were greater in number in the previous section than in the patients delivered by repeat section. This may account for the greater incidence of cephalopelvic disproportion as an indication for section in the first caesarean section delivery (Table V).

TABLE V. INDICATION FOR SECTION

Indication	Previous caesarean section	Repeat caesarean section
Cephalopelvic disproportion	146	12
Contracted pelvis	33	90
Foetal distress	48	18
Prolonged labour	58	0
Failure to progress	0	45
Placenta praevia	44	3
Poor obstetrical history	9	11
Malpresentation	58	17
Miscellaneous (pre-eclamptic tox- aemia, eclampsia, abruptio placen- tae, prolapsed cord, fracture of pelvis kyphoscoliosis, elderly primigravida, etc.)	89	46
Total	485	242

### Indication for Operation (Table V)

Contracted pelvis as an indication for section was found to occur 3 times more often among those patients selected for repeat section than had been the case for the primary operation. This difference may be a terminological one,

and may be dependent on what constitutes contracted pelvis *per se*, and what a consequential disproportion. Many of the sections had been performed at other hospitals and the patients were told that 'the baby was too big to be delivered from below'. Very few were informed that 'their bones were too small'.

At Baragwanath Hospital we do make a distinction between contracted pelvis on the one hand, and cephalopelvic disproportion in a patient with an adequate pelvis but a large foetus on the other.

Every patient who gives a history of a delivery by caesarean section has a careful assessment made of her pelvis and foetal size by a senior member of staff. This examination is carried out at 36 weeks for patients attending the antenatal clinic and on admission to the unit for the others.

This assessment was performed on the 485 patients in our series, with the results as set out in Table VI.

TABLE VI. ASSESSMENT OF PELVIC CAPACITY

	No. of patients
Contracted pelvis	106
Borderline pelvis	43
Average Bantu pelvis	301
Large pelvis	29
No assessment done because of APH	6
Total	485

After the pelvic size and shape and the estimated weight of the foetus have been considered the decision as to the type of delivery is taken. The patients attending antenatal clinic are admitted from the clinic to the antenatal ward at 38 weeks and are kept in the ward until the date set for the repeat elective caesarean section, or to await the onset of labour. This form of treatment was instituted in an attempt to have the patients under control from the outset, and has helped to reduce the number of scar ruptures since its inception. This form of therapy can only be applied if the patients attend the antenatal clinic conducted by the hospital.

### Duration of Labour (Table VII)

The duration of labour in the patients permitted to proceed with a trial of scar ranged between 1 and 22 hours. The 8 patients whose labour lasted between 20 and

TABLE VII. DURATION OF LABOUR

Hours in labour	No. of patients
1 to 4	41
5 to 9	80
10 to 14	74
15 to 19	40
20 to 22	8
Total	243

22 hours had a first stage which was not entirely satisfactory with regard to the effectiveness of the contractions, but because both mother and foetus were not distressed labour was permitted to continue because progress, although slow, was definite and constant.

### The Previous Scar

Every patient who has had a vaginal delivery after caesarean section is examined immediately at the end of the third stage of labour to assess the condition of the scar. The whole hand is inserted into the vagina, and the scar in the lower uterine segment is palpated. In most patients, the scar can be felt as a fairly hard ridge of tissue while in others it cannot be defined at all. With practice, skill is attained in assessing the condition of the scar, and ruptures can be picked up even though they be partial in nature. In the present series only one possible partial rupture was missed, which eventually caused a small broad-ligament haematoma.

In the early 1950s this examination was performed under general anaesthesia, but as the admissions continued to increase, the number of patients requiring this examination grew to such proportions that some alternative method became necessary. It was found that the examination could be carried out quite satisfactorily under the influence of 15 mg morphine sulphate, administered intravenously. Of late, Valium 20 mg intravenously has effectively replaced morphine.

The examination of the scar of the 243 patients who succeeded in a vaginal delivery showed a small partial rupture 1.5 cm in length in one patient, and a haematoma at the edge of the scar in another. Both patients were treated conservatively with success, and were informed of the finding. They were instructed to attend a hospital antenatal clinic during any subsequent pregnancy and were given a letter describing the findings and which stated that an elective section was advocated.

The incidence of scar rupture in this group was 2 in 243 patients (0.82%). The 242 patients who were delivered by repeat section included 90 who failed to deliver vaginally after a trial of scar had been attempted. The scar of the previous section was found at operation to have ruptured in 8 patients of this group, 6 of whom had not attended an antenatal clinic and 2 of whom were from the hospital antenatal clinic.

One booked patient who had been selected for a repeat section because her pelvis was contracted, arrived at the admission ward in established labour. The disproportion was marked and an immediate repeat caesarean section was performed, at which time the scar was found to be ruptured. The other booked patient was considered suitable for a trial of scar. Labour progressed satisfactorily but after 6 hours she developed a pain in the lower part of the uterus. The patient was taken to the theatre and a repeat section was performed when it was found that a haematoma 4 cm in diameter was present in the centre of the scar, which many believe to be the precursor to rupture.

Of the 6 unbooked patients, one arrived at the obstetric ward in advanced labour and on examination was found

to have a severe degree of contraction of the pelvis. An immediate section was ordered and a rupture, 2.5 cm in length, at the right end of the scar was found. Two patients were admitted in early labour and were assessed as unsuitable for vaginal delivery as one had a contracted pelvis and in the other the foetus was presenting in the mento-posterior portion. At repeat section small central ruptures were found in both patients.

The remaining 3 unbooked, unassessed patients were examined on arrival at the hospital and were assessed as suitable for trial of scar. The trial was stopped in all 3 when symptoms of scar rupture, i.e. vaginal haemorrhage, supervened after a short labour. In 2 patients small central ruptures were present and in the third, an unsuspected classical scar had separated completely.

Thus of the 8 scar ruptures which occurred in the patients delivered by repeat section, 4 were found in patients who should have been delivered by elective repeat section had they arrived at the hospital in time, and 4 occurred in patients who were permitted an attempt at vaginal delivery.

The incidence of scar rupture in patients who attempted vaginal delivery and failed was 4 in 90 (4.4%). The incidence of scar rupture in vaginal delivery, successful or failed, was 6 in 333 (1.8%) and in the total group 8 in 485 (1.6%).

### DISCUSSION

A group of 485 patients who had been delivered on one occasion by caesarean section was analysed. In 333 of these, the decision was taken to permit an attempt at vaginal delivery, which is designated a 'trial of scar', and denotes that these patients are to receive extra care and attention over and above that normally given to patients in labour in this obstetric unit.

The basis on which selection is made is primarily the size and shape of the pelvis. If the pelvis is assessed as being average Bantu or borderline, then the foetal size is estimated and if this is considered to be reasonable, the patient is permitted a trial of scar at the onset of spontaneous labour. Other criteria which influence this decision are the indications for the first caesarean section, particularly the non-recurring conditions such as placenta praevia, prolonged labour, foetal distress, prolapse of the cord and malpresentations.

Vaginal delivery was considered to be not possible in 152 patients. The main contra-indication was contracted pelvis with consequential disproportion. Other indications for excluding patients from the trial-of-scar group were conditions such as age, high parity, poor obstetric history, malpresentation, or because antepartum haemorrhage was a complicating factor.

The trial of scar was successful in 243 of the 333 patients selected, a success rate of 72.9%. The scar of the previous section ruptured in 4 patients without danger to the mother, but 3 infants were stillborn because they were extruded from the uterus together with the placenta through the complete rupture of the scar. One of these 3 ruptures occurred in an unsuspected classical section scar, where the incision in the corpus had been performed through a subumbilical skin incision!

The foetal loss as a direct result of vaginal delivery was low (0.9%) and the mother had escaped whatever risk is associated with a major operation and anaesthesia, as well as having her obstetrical life increased by at least one infant.

Of the trial patients 90 did not succeed in a vaginal delivery mainly because of failure to progress in labour. The usual criteria for assessing progress are applied to these patients, but are applied more strictly and rigidly. The slightest suggestion that labour is not progressing as judged by descent of the head and cervical thinning and dilatation, or that the foetal and maternal condition is deteriorating is sufficient to stop the trial and to end labour by repeat section.

There is little doubt that many patients in the trial group could have succeeded in a vaginal delivery given time, but when dealing with an unpredictable scar in the uterus a strict regimen must be outlined and adhered to without any compromise.

There were many patients chosen for repeat section because of age, high parity, poor obstetrical history or no living issue, who could have delivered vaginally but in an attempt to give them a live baby they were not subjected to the risk of labour, small as it appeared to have been.

In the total group of 485 patients, therefore, a fraction over half (243 - 50.6%) succeeded in a vaginal delivery after one previous section with a low incidence of scar

rupture or foetal loss. It appears from the analysis that vaginal delivery after one previous section can be expected in half the patients, which may be of value to those working predominantly among the Bantu.

However true this observation may be for Baragwanath Hospital patients, it must be stressed that this approach to the problem is to be used only if full facilities are available for immediate termination of the 'trial of scar', should conditions warrant it. It would not be in the best interests of either mother or child if delay should occur between the decision to end the trial and the execution of the repeat caesarean.

In a review done at the White Queen Victoria Maternity Hospital over a period of 3 years on the question of delivery after section, 361 patients were analysed. Elective repeat section was performed on 199 patients and 162 were permitted an attempt at vaginal delivery, of which 90 (55.4%) succeeded and 72 (44.6%) failed. The total repeat section rate was 75% and the incidence of scar rupture was 4.4%.

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