VAGINAL DELIVERY AFTER CAESAREAN SECTION*

BY

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IN the last 20 years it has been confidently claimed on many occasions that the old dictum "once a Caesarean, always a Caesarean" was no longer true. It is, therefore, disconcerting to read Greenhill's statement (1949): "I now almost routinely perform a Caesarean section on all women who previously have had a Caesarean section, regardless of the indication for the first operation." It is perhaps even more disturbing to find that similar views are expressed by obstetricians in England. Theobald (1949), for example, says in referring to a group of 20 to 30 women delivered *per vias naturales* after previously being subjected to Caesarean section: "we have recently been impressed with the dangers of this line of treatment and in consequence the number of repeat sections is likely to increase during the next few years." These challenging statements provoked me to make a retrospective investigation into the obstetric history of all patients delivered in the Maternity Hospital at Leeds after Caesarean section. The investigation covers the years 1926 to 1948 inclusive, and includes all patients previously subjected to Caesarean section, irrespective of whether the operation had been performed in the hospital or elsewhere.

The obstetric management of the previously sectioned patient has been discussed frequently in recent years (Kuder and Dotter, 1944; Duckering, 1946; Hindman, 1948; Iturriaga, 1949; Schnitz and Baba, 1949; Browne, 1951; Cosgrove, 1951; Hayes, 1951; and Schnitz and Gajewski, 1951).

Most writers are in general agreement that there are two fundamental questions to be answered before deciding whether or not repeat operation should be adopted as the standard method of delivery for patients previously subjected to Caesarean section. The two questions are: (1) Is the frequency of rupture of the uterine scar so great as to make vaginal delivery unjustifiably risky?; (2) What results may be expected if previously-sectioned patients are allowed to go into labour?

The results of this investigation are summarized in Table I, and this material has been analyzed to find an answer to the two questions posed above.

* Read at a Meeting of the North of England Obstetrical and Gynaecological Society, held in Newcastle on Friday, 6th June, 1952 (see page 266).

TABLE I

	Classical section	Lower segment section	Total
Number of primary sections	806	1161	1967
Number who subsequently conceived	286	353	639
Number of subsequent pregnancies	427	472	899
Result of subsequent pregnancies:			
Abortion	27	23	50
Repeat Caesarean sections: (*a*) Not in labour	222	139	361
(*b*) In labour ...	104	189	293
Vaginal delivery	74	121	195
Number of cases of ruptured scar	4	2	6

(1) *Is the frequency of rupture of the uterine scar so great as to make vaginal delivery unjustifiably risky?*

(*a*) *Rupture of the classical scar.* There were 4 cases of rupture of the scar after classical section among 286 patients who had a total of 427 pregnancies after primary section. Of this total, 27 pregnancies ended spontaneously before the 28th week; of the remaining 400, 222 were terminated by repeat section before the onset of labour, and 104 by repeat section after at least 3 hours of active labour. The remaining 74 were delivered vaginally.

The 4 cases of rupture all occurred after the onset of labour; the incidence of rupture is therefore 1 per cent of all mature pregnancies, and 2.2 per cent of all cases subjected to a minimum of 3 hours of active labour. All 4 mothers and 2 of the babies survived.

(*b*) *Rupture of the lower segment scar.* There were 2 cases of rupture of the scar after lower segment section, using a transverse incision in the uterus, among a total of 353 patients who had a total of 472 pregnancies. Of this total, 23 ended spontaneously before the 28th week. Of the remaining 449 cases, 139 were delivered by repeat section before the onset of labour, 189 by repeat section after a minimum of 3 hours in labour. The remaining 121 were delivered vaginally.

Both cases of rupture of the scar (previously reported by Lawrence, 1949) occurred after the onset of labour at term; the incidence of rupture is therefore 0.47 per cent of mature pregnancies, and 0.65 per cent of cases subjected to a minimum of 3 hours of active labour. Both mothers and both babies survived.

There were thus 6 cases of rupture in the whole series. None occurred before the onset of labour, and with the marked decline in the use of the classical incision such an occurrence is likely in future to be extremely rare. Rupture of the uterine scar in labour occurred more than 3 times as often after the classical as after the lower segment operation. The occurrence of 2 ruptures among 310 lower segment scars (all transverse) during subsequent labour is a reminder that even a lower segment scar is a potential danger, not sufficient to preclude subsequent labour, but great enough to demand that such labour be managed in hospital under expert supervision.

(2) *What results may be expected if previously-sectioned patients are allowed to go into labour?*

The main points for consideration under this heading are: (*a*) In what proportion of the cases was vaginal delivery achieved? (*b*) In what proportion was assistance required? (*c*) What was the duration of labour? (*d*) Is the risk to the foetus materially increased?

(*a*) *In what proportion of the cases was vaginal delivery achieved?* After classical section 18.5 per cent (74 out of 400) were delivered vaginally, and after lower segment section 26.9 per cent (121 out of 449), with a mean of 22.9 per cent (195 out of 849).

It is certain that these are minimum values. The investigation covers a long period, during the early part of which labour after Caesarean section was regarded as risky, and repeat section resorted to at the first suggestion of delay. Only in the latter part of the period under review, when lower segment operations predominated, did a more courageous attitude result in a more thorough trial and a greater proportion of vaginal deliveries.

When the figures were examined with regard to the indication for the original section, the results shown in Table II were obtained. This table shows that where the original indication can be regarded as persisting (e.g., contracted pelvis and disproportion) the proportion of vaginal deliveries is small, while in those cases in which the original indication is non-recurrent (e.g., antepartum haemorrhage) the proportion of vaginal deliveries is high. This result may be artificial in that, where it is known that section has previously been considered necessary on account of a persisting indication, repeat section is readily resorted to, without adequate trial of labour, whereas a more prolonged test, with a higher proportion of successes, is allowed where the indication is non-recurrent.

(*b*) *In what proportion was assistance required?* Assistance was required to complete 24 of the total of 195 vaginal deliveries. The detailed analysis is given in Table III, which shows that assistance was required on account

TABLE II

Indication	Subsequent pregnancies	Abortion	Repeat C.S.		Vaginal delivery	
			Not in labour	In labour	Number	Percentage
Disproportion	644	29	294	242	79	11.2
Antepartum haemorrhage	68	6	11	10	41	66.1
Distress	34	3	8	11	12	38.7
History	36	2	17	8	9	26.5
Heart disease	1	–	1	–	–	–
Toxaemia	16	2	4	3	7	50.0
Inertia	66	4	18	15	29	46.7
Prolapsed cord	20	–	5	2	13	65.0
Miscellaneous	14	4	3	2	5	50.0
Total	899	50	361	293	195	

TABLE III
Indications for assisted delivery

	Distress		Inertia	Delay in second stage	P.O.P. and D.T.A.	Not stated	Total
	Maternal	Foetal					
(1) Classical section:							
(*a*) No previous vaginal delivery	1	1	1	–	3	1	7
(*b*) Previous vaginal delivery	–	1	–	–	–	–	1
(2) Lower segment section:							
(*a*) No previous vaginal delivery	1	2	1	3	4	3	14
(*b*) Previous vaginal delivery	–	–	1	1	–	–	2
Total	2	4	3	4	7	4	24

P.O.P.=Persistent occipito-posterior. D.T.A.=Deep transverse arrest.

of maternal distress in 2 cases, foetal distress in 4 cases, inertia in 3 cases, delay in second stage 4 cases, persistent occipito-posterior position and deep transverse arrest in 7 cases, and for unspecified reasons in 4 cases. With the exception of the 4 cases for which no reason is given, an acceptable obstetrical reason was given, and it has obviously not been the practice to apply forceps as a prophylactic measure.

Table IV shows that assistance was required for 2 cases within 9 hours of the onset of labour, 1 between 9 and 12 hours, 10 between 12 and 24 hours, 9 between 24 and 48 hours, and 2 after 48 hours of labour, i.e., of 112 patients delivered vaginally after labour of 24 hours or less only 13 required assistance. This again shows that there was no planned resort to the forceps at full dilatation of the cervix, but that where labour was progressing normally no interference was considered necessary.

(*c*) *What was the duration of labour?* The duration of the first labour after Caesarean section is shown in Table IV, and ranged from 2 to 49 hours. There is a striking similarity in the average duration of labour in the two main groups. Those who had had a previous vaginal delivery averaged 14 hours in the classical group and 13 hours in the lower segment group. Corresponding figures for the patient who had had no previous vaginal delivery were 20 hours and 19 hours. In the matter of duration, therefore, the type of previous section does not seem to have any important influence.

Where there has been no vaginal delivery previously the length of labour approximates to that of labour in a primigravida, and where there has been a previous vaginal delivery it approximates to that of labour in a multigravida.

Where there had been no previous vaginal delivery 71 per cent of the classical group and

75 per cent of the lower segment group were delivered within 24 hours in the first labour after section (Table V). Where there had been a previous vaginal delivery the corresponding figures were 89 per cent and 96 per cent. In only a small proportion, therefore, did labour exceed the usually accepted limits of normal. In subsequent labours the average duration was slightly reduced in 3 of the 4 groups, though here the small number of cases makes the figures unreliable (Table VI).

(*d*) *Is the risk to the foetus materially increased?* Maturity at delivery is shown in Table VII. Twelve out of 195 infants were delivered before the 36th week of pregnancy, and 28 were delivered after the 40th week, but the great majority were delivered between the 36th and 40th weeks, and there does not seem to be any markedly increased risk of premature labour. Not only were the infants mature, but average weight at birth was as great as that of the babies delivered by Caesarean section in 3 out of 4 groups (Table VIII).

There were 19 stillbirths, giving an incidence of 10 per cent (Table IX). In 7 cases death occurred *in utero* before the onset of labour, and no adequate explanation is offered. In 3 cases the death of the foetus was attributed to disease in the mother, and in 1 case to congenital abnormality of the foetus. One premature baby was born dead before the mother reached hospital. There remain, however, 5 cases in which death was attributed to birth trauma, and it seems that in these cases the obstetric manage-

TABLE IV

Duration (in hours) of first labour after Caesarean section

	0–3	3–6	6–9	9–12	12–24	24–48	Over 48	Range	Mean
(1) Classical section:									
(*a*) No previous vaginal delivery	0	2	2(1)	4	12(3)	6(2)	2(1)	5–49	20
(*b*) Previous vaginal delivery	2	2	3	4	5(1)	2	0	2–32	14
(2) Lower segment section:									
(*a*) No previous vaginal delivery	0	7	8(1)	11(1)	29(5)	17(6)	1(1)	4–57	19
(*b*) Previous vaginal delivery	1	6	2	0	12(1)	1(1)	0	2–27	13

The figures in parentheses show the numbers of assisted deliveries, i.e., forceps or breech extraction.

TABLE V

	Number delivered within 24 hours	Percentage
(1) Classical section:		
(*a*) No previous vaginal delivery	20	71
(*b*) Previous vaginal delivery	16	89
(2) Lower segment section:		
(*a*) No previous vaginal delivery	55	75
(*b*) Previous vaginal delivery	21	96

TABLE VI

Duration (in hours) of labour after Caesarean section

	First labour	Labour other than first	All labours
(1) Classical section:			
(*a*) No previous vaginal delivery	20	7	18
(*b*) Previous vaginal delivery	14	9	13
(2) Lower segment section:			
(*a*) No previous vaginal delivery	19	11	17
(*b*) Previous vaginal delivery	13	15	13

TABLE VII

Maturity at delivery

	28–30	30–34	34–36	36–40	Over 40	Twins	Stillbirths
(1) Classical section:							
(*a*) No previous vaginal delivery ...	–	1	–	26	5	2	4
(*b*) Previous vaginal delivery	–	1	1	21	2	–	4
(2) Lower segment section:							
(*a*) No previous vaginal delivery ...	1	6	–	71	16	2	9
(*b*) Previous vaginal delivery	–	–	2	19	5	1	2
Total	1	8	3	137	28	5	19

TABLE VIII

Birth weight

	Caesarean section			Subsequent vaginal delivery		
	pounds	ounces	(g.)	pounds	ounces	(g.)
(1) Classical section:						
(*a*) No previous vaginal delivery	6	7	(2,922)	7	1	(3,206)
(*b*) Previous vaginal delivery	6	5	(2,866)	6	10	(3,007)
(2) Lower segment section:						
(*a*) No previous vaginal delivery	7	6	(3,348)	7	3	(3,263)
(*b*) Previous vaginal delivery	7	6	(3,348)	7	6	(3,348)

TABLE IX

Stillbirths

19 cases in 195 deliveries (10 per cent)	
Intra-uterine death	7
Birth trauma:	
Forceps (contracted outlet)	1
Breech	3
Craniotomy	1
Prolapsed cord	2
Maternal disease:	
Pneumonia	1
Nephritis	1
Toxaemia	1
Hydrocephaly	1
B.B.A. (premature)	1

ment was at fault, and repeat section would have been preferable. In the 2 cases of prolapse of the cord repeat section might also have been preferable, though if pulsation of the cord had already ceased the repeat operation would have had no advantage.

There are thus 7 cases in which better results might have been expected from repeat section, and in this respect vaginal delivery must be considered as carrying an increased risk to the baby. Had repeat section been performed with delivery of a live child in these cases the stillbirth rate for the cases delivered vaginally would have been 6.3 per cent (12 in 188 cases), which compares fairly well with most hospital statistics.

DISCUSSION

The story would be incomplete without mention of the results of repeat section. In 654 instances pregnancy was terminated by repeat section, 361 (56 per cent) being performed before the onset of labour or within 3 hours. There were 9 stillbirths, an incidence of 2.2 per cent. The average birth weight of the babies born by primary and repeat section differed only by an insignificant amount (Table X).

These results are obviously good, but it is clear that in the majority of cases equally good results could have been obtained had the patients been allowed a fair opportunity to test their capabilities in labour. The high proportion of elective sections before or early in labour indicates the prevailing bias: 48 per cent of the primary sections were performed for contracted pelvis or disproportion, but 86 per cent (562 out of 654) of the repeat operations were performed for this indication (Table XI). There

TABLE X

Birth weight (repeat section)

	First section			Repeat section		
	pounds	ounces	(g.)	pounds	ounces	(g.)
Classical section	6	13½	(3,107)	7	0	(3,178)
Lower segment section	7	5¼	(3,327)	7	4¼	(3,298)

TABLE XI

Indication for repeat section

Indication for primary section		Disproportion	Antepartum haemorrhage	Distress	History	Heart	Toxaemia	Inertia	Prolapsed cord	Miscellaneous
Disproportion	...501	6	4	11	1	–	4	–	12
Antepartum haemorrhage ...	10	2	1	3	1	1	–	–	1
Distress	13	1	2	2	1	–	3	–	–
History	9	–	2	8	–	1	–	–	2
Heart	2	–	–	–	–	–	–	–	–
Toxaemia	4	–	–	–	–	–	1	–	–
Inertia	21	–	4	4	–	–	6	1	–
Prolapsed cord	4	–	–	2	–	–	–	–	–
Miscellaneous	–	–	–	1	–	–	1	–	3
Total	...562	9	13	31	3	2	15	1	18

was obviously a very great readiness to perform repeat section on cases previously operated on for this condition, and a very slight inclination to allow a trial of labour. That good results can be obtained by trial labour after section for contracted pelvis has been shown by Herd (1949) who reported 43 per cent of vaginal deliveries after section for disproportion without foetal loss. His cases were personally observed and carefully scrutinized, and were collected over a short period. My cases extended over a much longer period and were, therefore, subjected to the changing trends of obstetric thought, from the early days of " always a Caesarean " to the present time when the possibilities of vaginal delivery are more fully appreciated.

This account is entirely retrospective, and refers to patients who may almost be said to have achieved vaginal delivery in spite of the obstetrician, since repeat section before or at the start of labour has been the method of choice in so great a proportion of the cases. It would be interesting to compare these figures with those obtained as a result of a strictly conservative attitude to repeat Caesarean section, and a deliberate policy of allowing labour to end naturally wherever possible.

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