

# A TEN-YEAR SURVEY OF CAESAREAN SECTIONS\*

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Since the art and science of medicine was first practised changes have constantly taken place, either slowly or dramatically, but with a never-ending striving for improvement. We are today in an age of dramatic changes brought about

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by the wonderful discoveries of recent years, and these have affected the practise of obstetrics like every other branch of medicine. It was with this thought in mind that it was decided to analyse one small aspect of obstetrics at the Queen Victoria Hospital, Johannesburg. A 10-year period of Caesarean section was chosen, the period being from 1947 to 1956.

### Incidence

There has been a steady and progressive increase in the number of deliveries for the 10-year period 1947-56, the increase being mainly among the booked or antenatal-clinic cases rather than among the unbooked emergency admissions. The total number of deliveries in 1947 was 2,995, while 9 years later, in 1956, it had risen to 4,632. The total number of deliveries (booked and unbooked, hospital and district) for the 10-year period was 38,679.

During the same 10-year period 1947-56 the incidence of Caesarean section deliveries has likewise shown a gradual rise, actual and relative (Table 1). There were 786 Caesarian sections done during the 10-years—an incidence of 2.03%. The percentage of Caesarean-section delivery increased gradually till 1954 and then more steeply in 1955 and 1956. The relative incidence of Caesarean section in 1956 was 3 times as great as in 1947.

TABLE I. INCIDENCE OF CAESAREAN SECTIONS, 1947-56

Year	Total Deliveries	Total Caesarean Sections	Percentage of Caesarean Sections
1947	2,995	35	1.17%
1948	2,981	31	1.04%
1949	3,708	50	1.35%
1950	3,852	53	1.37%
1951	3,886	71	1.83%
1952	4,031	86	2.13%
1953	4,046	86	2.13%
1954	4,127	87	2.11%
1955	4,421	126	2.85%
1956	4,632	161	3.47%
Total	38,679	786	2.03%

Of the 786 sections performed, 15.14% (approximately 1/7th) were done on unbooked patients.

### Age

A little under 5% of the patients delivered by section were very young—under 20 years of age, while just over 11% were 40 years or more (Table II). One has a natural tendency to

TABLE II. AGE DISTRIBUTION OF PATIENTS SECTIONED

Less than 20 years of age	38 (4.8%)
Between 20 and 29 years	341 (43.4%)
Between 30 and 39 years	318 (40.5%)
40 years or more	89 (11.3%)

avoid abdominal delivery in the very young patient out of regard to her future reproductive life; a large proportion of the sections done in this group were for cephalo-pelvic disproportion. On the other hand a patient over 40 years of age is nearing the end of her reproductive period of life, and the age here causes one to lean towards Caesarean section, particularly in the face of primiparity or relative infertility.

### Parity

Almost 40% of all the sections performed were on primiparae: primiparae 310 (39.5%), multiparae 476 (60.5%). Nearly half of the multiparae had had some previous operation on the uterus; no less than 100 of the 476 had undergone a previous classical Caesarean section with a

TABLE III. PREVIOUS OPERATIONS ON THE UTERUS IN MULTIPARAE

Previous classical Caesarean section	100
Previous lower-segment Caesarean section	133
Previous Caesarean section, type unknown	2
Previous extensive myomectomy	1
Total	236 (49.6%)

previous delivery and a further 133 a lower-segment section (Table III).

### Duration of Pregnancy

Not all sections were done at or near term, such conditions as placenta praevia and severe pre-eclampsia often demanding termination of pregnancy well before term was reached (Table IV). The postmature group of patients (i.e. 42 weeks

TABLE IV. DURATION OF PREGNANCY AT TIME OF SECTION

36 weeks or less	104 cases (13.3%)
37-39 weeks	227 cases (29%)
40 or 41 weeks	390 cases (49.7%)
42 weeks or more	62 cases (7.9%)
Not recorded	3 cases.

or more) requiring section was made up of almost equal numbers of primiparae and multiparae (32 primiparae and 30 multiparae). In 26 (or 42%) of these cases an abnormal foetal position existed at the time of operation (occipito-posterior 18, breech presentation 2, brow 3, shoulder 2, face 1). This incidence of abnormal presentations is much above the average, and it is suggestive that they may have played some part in bringing about postmaturity. They certainly must have been an important contributory factor in causing delivery to be done by Caesarean section. The 2 main indications for section in this postmature group of patients were (1) disproportion in 30 of the 62 cases (48%), and (2) foetal distress in labour in 17 (or 27.4%) of the cases. That these should be the 2 commonest indications for section in this particular group will not come as a surprise. All 62 infants were born alive, but 2 died in the neonatal period, one infant dying from atelectasis and the hyaline membrane syndrome and the other being associated with a meningocele.

### Foetal Presentation

The foetal presentations at the time of operation among the total number of 786 Caesarean sections done are shown

TABLE V. FOETAL PRESENTATION AT TIME OF SECTION

Occiput presenting	656 (83.5%)
Breech presenting	61
Shoulder presenting	36 (15.4%)
Brow presenting	21
Face presenting	3
Presentation not recorded	9

in Table V. Thus in 15.4% (or approximately 1/7th of all the cases the foetus presented otherwise than by the occiput.

### Time of Section in relation to Labour

It is a surprising fact that of the 786 patients sectioned a little more than one-half were not in labour. This group was largely made up of patients who had elective Caesarean section because of previous classical sections, disproportion and placenta praevia or pre-eclampsia where labour was not yet

TABLE VI. STAGE OF LABOUR WHEN SECTION DONE

Not in labour	..	..	..	..	..	398 (50.6%)
First stage	..	..	..	..	..	359 (45.7%)
Second stage	..	..	..	..	..	27 (3.4%)
No record	..	..	..	..	..	2

established. Of the Caesarean sections performed on patients in labour, the great majority were carried out during the first stage of labour and only a small number in the second stage (Table VI).

#### Indications for Caesarean Section

Though Caesarean section was originally intended to answer the problem of insuperable cephalo-pelvic disproportion, its use has been extended today to deal with a great variety of obstetric problems. In this analysis no less than 43 separate indications for section were found. Through the aid of blood transfusions, antibiotics and improved anaesthesia, Caesarean section has become a relatively simple and safe procedure. Because of this it has become the easiest—though not always the best—way out of a large number of obstetric difficulties.

TABLE VII. INDICATIONS FOR CAESAREAN SECTION

1. Disproportion	..	..	..	..	273 cases (34.7%)
2. Placenta praevia	..	..	..	..	118 cases (15%)
3. Previous classical C/S	..	..	..	..	91 cases (11.6%)
4. Elderly primipara plus other unfavourable factor	..	..	..	..	64 cases (8.1%)
5. Foetal distress	..	..	..	..	60 cases (7.6%)
6. Severe pre-eclampsia	..	..	..	..	37 cases (4.7%)
7. Brow presentation	..	..	..	..	21 cases (2.8%)
8. Diabetes	..	..	..	..	13 cases (1.6%)
9. Prolapsed cord	..	..	..	..	12 cases (1.5%)
10. ? Rupturing L.U.S. scar	..	..	..	..	12 cases (1.5%)
11. Long history of sterility	..	..	..	..	11 cases (1.4%)
12. Uterine inertia plus maternal distress	..	..	..	..	10 cases (1.2%)
Total	..	..	..	..	722 cases (91.8%)

At this stage it must be stressed that a conservative attitude should still be adopted towards delivery by Caesarean section for, though it offers an easy way out of an immediate obstetric problem, it is a major operation that carries a definite risk both for the mother and foetus, and it creates fresh obstetric problems for the future.

Of the 43 indications only the 12 commonest will be mentioned, which accounted for 722 (91.8%) of the 786 Caesarean sections done (Table VII). The remaining 31 indications were distributed among 64 patients and account for only 8.15% of the sections done. Here a very wide variety of indications were found, varying from a previously ruptured uterus to a cerebral tumour.

Disproportion, as can be seen from the above list, is by far the commonest indication for abdominal delivery. The figure of 273 cases sectioned for disproportion includes all the failed trials of labour as well as the repeat sections done for disproportion. Obviously, over a 10-year period an individual patient may have come back two or three times and may have featured as a Caesarean section on each occasion.

Placenta praevia has come to the fore as the second commonest indication for section, following the recent trends in the treatment of placenta praevia.

For fear of rupture of the old scar it has been our policy over the past few years to deliver all patients by the abdominal

route who have undergone a classical Caesarean section at the previous delivery. This policy has made previous Classical section the third commonest indication in this series of cases.

Elderly primiparity has been universally accepted as an indication for Caesarean delivery because of the reduced time left to the patient in her reproductive life, because many of these patients do not labour well, and because there is an increased risk of a stillborn infant, often unaccountable, in this group. Certainly when there is some other unfavourable factor present as well, then the case for section becomes very strong.

Foetal distress in the first stage of labour was the indication for Caesarean section in 60 patients. The presence of meconium-stained liquor associated with a slow or irregular foetal heart-beat before full dilatation of the cervix was taken as an indication for immediate abdominal delivery. Of these 60 patients, 17 were postmature by 14 days or more. (Of the 786 sections performed, 62 were done in postmature patients, and the remaining 724 in patients who were not postmature. In the first small group 17 sections were done for foetal distress, i.e. 27.4% of the postmature group. In the larger group—not postmature—43 sections were done for foetal distress, i.e. only 5.9%. Thus foetal distress was 4 times more commonly an indication for section in the postmature patients.)

It is of interest to study each of the indications over the 10-year period to see what has accounted for the increase in the number of Caesarean sections (Table VIII). The repeat Caesarean sections were mainly done for previous

TABLE VIII. INCIDENCE OF THE INDICATIONS FOR CAESAREAN SECTION

Indications	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	Total
1. Disproportion	12	12	18	23	29	24	23	31	49	52	273
2. Placenta praevia	3	3	7	6	10	17	14	13	23	22	118
3. Previous classical C/S	6	3	10	7	10	13	15	5	10	12	91
4. Elderly primiparae	3	2	10	12	9	3	7	1	8	9	64
5. Foetal distress	1	2	1	1	3	6	8	9	12	17	60
6. Severe pre-eclampsia	2	3	1	0	4	5	7	6	4	5	37
7. Brow presentation	0	0	0	0	2	0	5	2	1	9	21
8. Diabetes	0	0	0	0	0	4	3	3	1	2	13
9. Prolapsed cord	0	0	0	1	0	0	0	1	0	10	12
10. ? Rupturing L.U.S. scar	0	0	0	0	0	0	1	2	4	5	12
11. Sterility	1	0	0	0	0	3	1	3	0	3	11
12. Uterine inertia and maternal distress	1	1	0	0	0	0	0	4	0	4	10
13. All other indications for C/section	4	5	3	3	4	11	2	7	14	11	64
Repeat C/section	10	12	17	15	20	28	27	24	36	47	786

classical Caesarean sections or for disproportion, and a certain number would be included in group 13 in Table VIII—'other indications'. It will be seen that there has been a steady increase in the number of repeat sections done each year.

Table VIII shows that the increase in the Caesarean-section rate has not been due to any one particular indication. The most striking increase has taken place in the number of sections done for disproportion. This can hardly be due to cephalo-pelvic disproportion having become suddenly more common. It can be explained by the fact that repeat sections for disproportion have increased and that Caesarean section has been resorted to earlier in trials of labour. There has also been a steady increase in the use of section for the treatment of placenta praevia. This is in accordance with modern trends accepted in most schools.

Foetal distress in the first stage of labour has quite recently



come to the fore as an indication for urgent abdominal delivery. It is also of interest to note that in this series no Caesarean sections were done for diabetes before 1952; thereafter, it became accepted practice particularly if the patient was a primipara, if there was marked hydramnios present, or if the foetus was thought to be very large. Similarly, prolapse of the cord had usually been treated by vaginal methods, but recently resort has been made to section if the cervix was not yet fully dilated.

In 12 cases repeat sections were performed because of persistent pain over the lower segment during the first stage of labour in a patient who had had a lower-segment Caesarean section at a previous delivery. This led to doubts as to the safety of the old scar. In 4 of these 12 sections a rupturing lower segment scar was found.

There has also been an increase in the number of sections done for 'miscellaneous' reasons, particularly in the last 2 years of this series, though this group represents only a small proportion of all the sections done.

#### Type of Section

In the very great majority of cases a transverse lower-segment Caesarean section was performed, though a few cases were delivered by the vertical DeLee incision, while

TABLE IX. TYPE OF CAESAREAN SECTION PERFORMED

Transverse lower-segment Caesarean section ..	729 (92.7%)
DeLee lower-segment Caesarean section ..	16 (2.0%)
Classical Caesarean section ..	41 (5.1%)

just over 5% of the cases were delivered by means of a classical Caesarean section (Table IX). Of the 41 classical sections 24 were done in the first 3 years of this series. Thereafter, classical sections were not done so frequently, the usual indications being a much weakened previous classical scar, placenta praevia, previous repair of a vesico-vaginal fistula, cervical fibroids, and carcinoma of the cervix.

#### Type of Anaesthesia

Of the 786 Caesarean sections performed, general anaesthesia was used for 729 (92.7%), local plus general for 4, local anaesthesia for 2, spinal anaesthesia for 3, and caudal anaesthesia for 2.

#### Condition of Previous Section Scars

As mentioned earlier, of the 236 multiparae who had had some previous operation on the uterus, 100 had had a previous classical Caesarean section, and 133 a previous lower-segment Caesarean section. In 2 patients no information could be obtained and 1 patient had had an extensive myomectomy done previously.

Of the 100 multiparae who had had a previous classical section, no information on the scar was available in 33 cases; the findings in the remaining 67 cases are shown in Table X, which illustrates the relatively high incidence of unsatisfactory scars. It may be that in all the 33 cases where no comments were available the scars were good, but one cannot escape from the fact that there were 6 rupturing scars in the group. In 5 of these 6 cases pain and tenderness were present and haematomata were found over the old scars; the 6th actually ruptured at operation. It must be stated here that 4 patients actually presented with ruptured uteri during this 10-year period, the rupture having taken place through a

TABLE X. CONDITION OF PREVIOUS CLASSICAL SCARS

Condition of Scar	Patient in Labour	Patient not in Labour	Total
Good scar .. .. .	8	23	31
Moderate furrowing .. .. .	3	5	8
Marked furrowing .. .. .	3	4	7
Very thin weak scar .. .. .	7	8	15
Rupturing scar .. .. .	0	6	6
			67

previous classical scar. These cases have not been included under this analysis of Caesarean section.

Of the 133 patients who had had a previous lower-segment Caesarean section, in 45 no information was available as to the state of the old scar. The findings in the 88 cases, in which information was available are shown in Table XI.

TABLE XI. CONDITION OF PREVIOUS LOWER SEGMENT SCARS

Condition of Scar	Patient in Labour	Patient not in Labour	Total
Excellent scar (not seen) ..	10	19	29
Good scar (seen) .. .. .	13	20	33
Wide fibrosed scar .. .. .	1	3	4
Very thin weak scar .. .. .	7	10	17
Rupturing scar .. .. .	4	1	5
			88

Again, it may be that in the 45 cases where no information was available the old scar was good and satisfactory, but nevertheless in 5 cases we definitely know that the previous lower-segment scar was rupturing; 4 of these patients were in labour and the 5th was not in labour. All presented with persistent lower abdominal pain and had great tenderness on palpation. At operation haematomata were found in and over the old scar. This finding comes as a surprise, for one had not expected such a high rate of unsatisfactory lower-segment scars; it is well above the average figures published and taught concerning rupture of scars from lower-segment Caesarean section.

The patient who had had the previous extensive myomectomy was found to have an excellent uterus with no evidence of any weakness.

The above findings confirm that the lower-segment scar is safer than the classical scar in a subsequent pregnancy, but not quite as much safer as we had previously believed. It also brings to our notice very forcibly that any Caesarean-section scar imposes a definite weakness on the uterus that may cloud the patient's future reproductive life.

#### Results of Caesarean Sections

The results of the 786 Caesarean sections were as follows: 783 infants born alive (there were 7 pairs of twins); 3 maternal deaths (a maternal death rate of 0.38%); 10 stillbirths (a stillbirth rate of 1.27%); 37 neonatal deaths (a neonatal death rate of 4.7%). The total foetal wastage was therefore 5.97%.

The first maternal death occurred in a primipara age 24 years who was admitted as an unbooked case after being in labour for approximately 70 hours. She was a severe pre-eclamptic and foetal distress was present. She died 3 hours

after Caesarean section from acute cardiac failure with pulmonary oedema. The second maternal death occurred in a primipara aged 46. She had been in labour for 4½ hours when section was done. During the operation she inhaled vomitus which caused obstruction to the air passages and death ensued on the table. The third maternal death occurred in a para-3 aged 38 years. She had been sectioned for placenta praevia with foetal distress. She collapsed half an hour after the section and died. The post-mortem findings were those of shock.

To obtain a stillborn infant at Caesarean section is always a great tragedy, though it is not always entirely avoidable. The 10 stillborn infants in this series were as follows:

- 3 were cases of foetal distress in labour.
- 2 were the second of twins (one macerated).
- 2 were very premature infants associated with severe pre-eclampsia.
- 1 was associated with a central placenta praevia that was bleeding profusely.
- 1 presented as a brow in labour and was found to be a hydrops foetalis.
- 1 was associated with an elective repeat Caesarean section for disproportion. The cause of the stillbirth was doubtful.

The 37 neonatal deaths brought the foetal wastage up to 5.97%. It is a noteworthy fact that 30 of the 37 neonatal deaths occurred in infants who were 36 weeks or less (81%) which indicates that prematurity played a major role in bringing about these deaths. Practically all of the premature infants were associated with pre-eclampsia or with placenta praevia.

Of these neonatal deaths 30 were associated with 104 Caesarean sections done at or before the 36th week of pregnancy—a neonatal death rate of 28.85%. This high neonatal death rate must be borne in mind whenever contemplating section at or before the 36th week of pregnancy.

#### *Sterilization*

Of this series of patients 98 (or 12.5%) were sterilized at the time of section; 27 were sterilized after their first Caesarean section, usually because of such conditions as severe essential hypertension, chronic nephritis and grande multiparity; 39 were sterilized after their second section; and 32 were sterilized after their third section.

#### CONCLUSIONS

1. This analysis illustrates the definite trend towards solving more of our obstetric difficulties by Caesarean section. This trend must be examined critically, for it creates its own peculiar problems. The first of these is that, with more sections being done, more repeat sections will also be done in the future. This is unlikely to affect the European population of South Africa to any great extent, because there are reasonable antenatal and midwifery services available for their use. For the African population, however, the picture is different, because there is not an adequate antenatal and midwifery service available to them. An African patient, therefore, may not have the benefit of the special care and attention that a subsequent pregnancy and delivery demands.

Secondly, once repeat section becomes necessary, the patient's subsequent family is almost invariably limited.

Thirdly, as we perform more and more Caesarean sections to solve our obstetric problems, so we lose more and more 'the Art of Obstetrics'. This would appear to be part of the changing face of modern obstetrics.

2. Analysis of the previous Caesarean-section scars confirms that the lower-segment scar is a safer scar than that of the Classical-section, but not so much safer as we had previously thought. It also demonstrates that a Caesarean-section scar imposes a definite weakness on the uterus in perhaps a much larger proportion of patients than we had previously believed.

3. Further evidence is forthcoming to confirm the increased danger of placental insufficiency in postmature pregnancies. One should also note the higher proportion of abnormal presentations which was found in the postmature group of patients that were delivered by section.

4. The high neonatal death rate must be remembered in all Caesarean sections performed at or before the 36th week of pregnancy.

5. This analysis has touched only on the obvious points associated with Caesarean section. It has shown, however, that there are numerous aspects of this subject that still have to be investigated in greater detail. This must be done before we can hope completely to assess the present-day impact of Caesarean section on obstetrics.