SYMPOSIUM ON CÆSAREAN SECTION.

PART IV.

CÆSAREAN SECTION, WITH SPECIAL REFERENCE TO SUBSEQUENT CHILDBEARING

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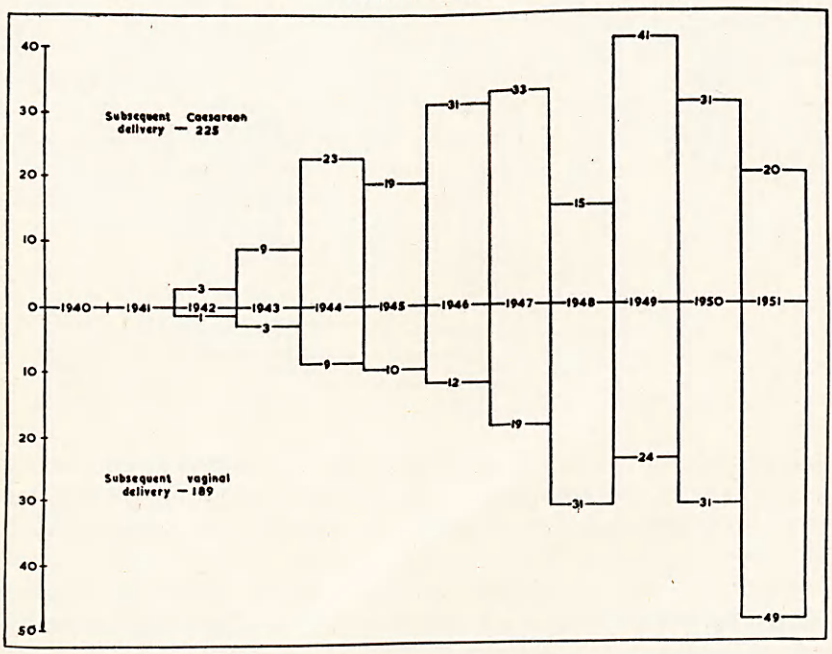
Review of all Cæsarean Sections carried out in the Simpson Memorial Maternity Pavilion, the Western General Hospital, the Eastern General Hospital, Edinburgh, and Bangour General Hospital, West Lothian, in the decade 1940-1949.

THE incidence, indications and results of Cæsarean section for both mother and baby, each operation being regarded as an event in itself, have been considered. It is now our privilege to place before you the

TABLE XVIII



sequence of events leading from the primary Cæsarean operation for those women who subsequently return pregnant. We have traced many of these women through one or more subsequent deliveries, and from their experience you may judge the long-term results of Cæsarean section, and whether these results could have been improved upon.

The first part of the paper outlined the indications for the primary

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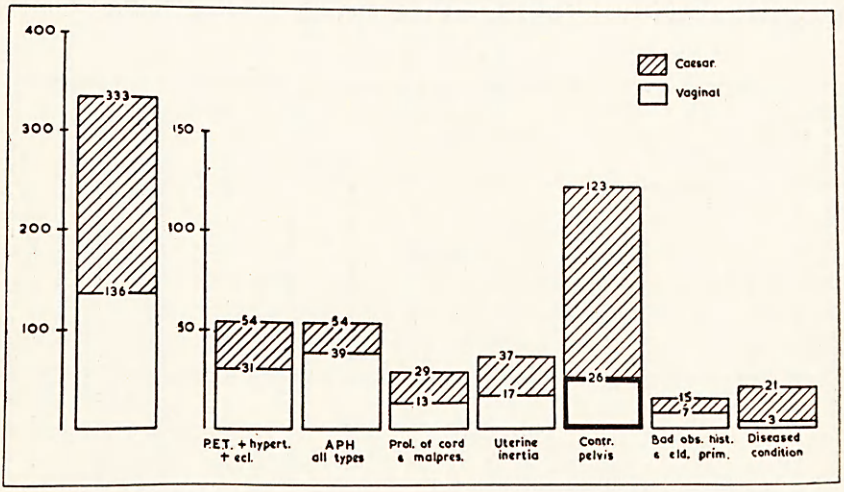
operation in 1486 cases. Let us look again at these women, of whom 1008 were primigravid. One-third (360) had a classical operation, and of these nearly one-quarter (81) have been traced as having subsequent deliveries. The other two-thirds (640) had a lower segment section, and again more than one-quarter (164) have returned (*i.e.* 245 women).

For the 478 multiparæ the story is not quite the same. Firstly, the greater proportion (60 per cent., 288) had a classical operation, and secondly, a quarter of these were also sterilised. Nevertheless, 88 of these women have gone forward to one or more subsequent deliveries ; and these represent nearly a quarter of those not sterilised.

What is the future of these 333 women ? More than one-third of the primiparæ and nearly half the multiparæ have later had a vaginal delivery. Table XVIII shows that in recent years there has been a general increase in the number of women who reported having

TABLE XIX



become pregnant again. You will see also that there has been a most marked increase in those having vaginal deliveries, and we may add that the majority of these were subsequent to the lower segment operation.

What were the indications at the primary operation for those women who were later to have either vaginal or Cæsarean deliveries ? Table XIX shows that nearly *three-quarters* of the women who had their primary Cæsarean for antepartum hæmorrhage, and more than half those in the pre-eclamptic group, later had vaginal deliveries. It can also be seen that more than *one-fifth* of the women operated on for disproportion or contracted pelvis were later allowed vaginal delivery, and we may point out that these women going on to vaginal delivery were all (except 2) vaginally nulliparous. It is perhaps surprising to find that these women who had had vaginal deliveries *before* their primary Cæsarean were to have repeat Cæsarean section.

On investigating one other feature which might relate to the future delivery, namely, the puerperium, we found little evidence that this influenced the choice of the subsequent method of delivery.

Another point of comparison of the primary operation with future delivery is the birth weight of the first and second baby. It was noted that the birth weights were considerably heavier in the subsequent deliveries, whether vaginal or repeat Cæsarean section. In 24 cases in whom the original Cæsarean section was for contracted pelvis or disproportion, and who had a subsequent vaginal delivery, we found that only 5 babies weighed less than 7 lbs.

Since we shall shortly study the repeat Cæsarean as an operation in itself, we should like at this stage to give more details about the 136 women of our original primary Cæsarean group who had vaginal deliveries. These women had a total of 189 babies, as many of them had 2, 3 and even 4 vaginal deliveries after the primary Cæsarean section. The gross fœtal loss was 12 stillbirths and 11 neonatal deaths, that is, 12 per cent., a rate apparently higher than in the repeat Cæsarean deliveries, which was 6·3 per cent. This rate cannot be attributed to vaginal delivery, because many cases of fœtal abnormality, prematurity and accidents of pregnancy, were purposely allowed a vaginal delivery, whilst, if the baby had been healthy and at full-term, in some, a repeat Cæsarean section might have been performed. Therefore, if we correct the above stillbirths and neonatal deaths, we are left with only 2 neonatal deaths which might be attributed to labour or delivery. One of these babies died of septicæmia and the other of pulmonary œdema.

To complete the picture of *vaginal delivery* after Cæsarean section, we must add 80 women, who, although their original Cæsarean was not in our series, were delivered in our group of hospitals. The gross fœtal mortality, 8 stillbirths and 2 neonatal deaths, shows a rate of 12½ per cent. Correcting these deaths as we did before, we find that only one stillbirth, due to prolapse of the umbilical cord, can be attributed to vaginal delivery.

In all the vaginal deliveries, therefore, the corrected fœtal mortality is only 3 out of 269 (1·1 per cent.) and the maternal mortality is nil.

Let us now turn from this picture of well-managed labour to our debit column. In our original case-series there were 7 women who returned in a later pregnancy with a ruptured uterus. To these must be added another 6 women whose primary Cæsarean section happened to be outwith our series, but whose subsequent ruptures came under our care. We should like to make it clear that we are only including women who had a previous Cæsarean scar, and we have excluded those who had a traumatic or a spontaneous rupture of the uterus.

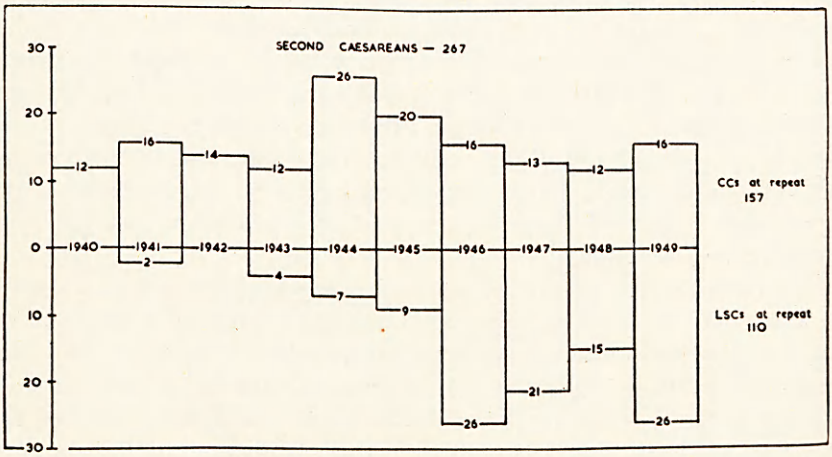
The total number of cases under discussion is 13. We propose to exclude one of these, a fatal case, in whom at operation the lower segment was found to be ruptured, but the scar—which was upper segment—was intact. Among the 12 remaining women in whom the scar ruptured, *only one had a previous lower uterine segment operation,*

and both mother and baby survived; whilst of the 11 women with classical scars, 2 mothers and 10 babies died. Only 3 of the total of 12 women were in labour, whilst 10 were of thirty-eight weeks' gestation or more.

Was there any forewarning of these ruptures, by which they might have been prevented? From a study of the case sheets of the previous Cæsarean delivery, the answer is, No; in fact, many patients operated on for an alleged weak scar were found to have a well-healed uterus. Moreover, some of the 12 cases of ruptured uterus had had a successful vaginal delivery after their original Cæsarean section. From a study of the records of the pregnancies in which the ruptures occurred, probably the two deaths and possibly some of the ruptures could have been prevented if the premonitory signs of ruptures, often difficult to interpret, had been recognised sooner.

To sum up, we have shown that, at the time of the primary Cæsarean

TABLE XX

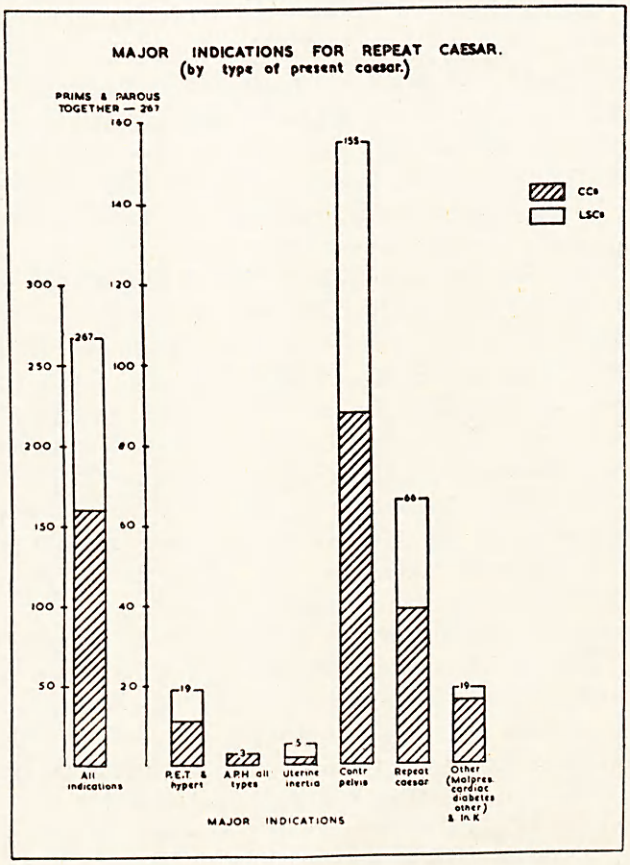


operation, there is no absolute indication for which a repeat Cæsarean will be essential, nor any indication which especially pre-disposes towards subsequent vaginal delivery. However, we have seen that vaginal delivery has been more frequent in women with a lower segment rather than an upper segment scar.

We have seen also that the risk of uterine ruptures is much higher after the classical operation. We therefore consider that, both for the sake of avoiding an unnecessary repeat Cæsarean section and for minimising the risk of a ruptured uterus, the classical operation should be used as rarely as possible. It should, at all costs, be avoided in young women who hope to have a future family, especially where their condition is a non-recurrent one such as pre-eclamptic toxæmia or placenta prævia. Finally, it would appear imperative to admit all women with a previous Cæsarean scar to hospital before the thirty-seventh week of gestation, whether for another Cæsarean or for attempted vaginal delivery.

THE SECOND CÆSAREAN.—The second Cæsarean section is now to be considered as a separate operation. Two hundred and sixty-seven women had a second abdominal delivery, of which more than a third had had their primary section outwith the series. Most of them (192) had never had a vaginal delivery, but only the previous Cæsarean baby. At the beginning of the ten-year period, the repeat operation was relatively uncommon. Table XX shows both the *general increase in repeat sections* and the changing *trend towards the lower segment operation*.

TABLE XXI



Those whose primary Cæsar had been a lower segment operation performed in the later 1940's might have been expected to have a lower segment section again in their repeat operation; but a surprising number of women had a classical operation on the second occasion. It would seem that one of the factors dominating the choice of the second Cæsarean is not what type of primary scar is present, but whether the patient is to be sterilised or not.

What were the reasons indicating that a second Cæsarean section was necessary? The opinion "once a Cæsar, always a Cæsar" is on the decline, but the view "two Cæsars lead to a third" is still largely true in this series. Therefore one would expect that, before embarking

on a second Cæsarean section, the indications would be fully and carefully considered. *The indications in our repeat operations fall into two large groups*: the first group, well over half (58 per cent.), were recorded as contracted pelvis or disproportion.

Table No. XXI shows that the other large group (25 per cent.) were classified as " previous Cæsarean section " as the main indication. The only other indication of any size was that of pre-eclamptic toxæmia, and, for the rest, the indications were scattered among the associated maternal diseases, for example, cardiac disease or diabetes. In each group the classical operations greatly outnumbered the lower segment sections.

What are the circumstances at operation for women with a previous classical scar and for those with a previous lower segment scar ? In both groups the proportion of elective Cæsarean sections was 80 per cent. Where there was labour, it was, in the main, of short duration, and only 6 per cent. of the women were in labour for twelve hours or more.

Another noteworthy feature of the repeat Cæsarean section, already briefly mentioned, was the incidence of sterilisation—115 women (43 per cent.) of the 267 were sterilised. This incidence was outstanding in the group having a classical section as a " repeat," for over 60 per cent. of these women (97 out of 160) were sterilised. In the group having a lower segment section as a repeat, approximately 15 per cent. were sterilised. As was to be expected, sterilisation was more frequently performed in women with several previous children ; but, even among those with only the previous Cæsarean baby, nearly 40 per cent. were sterilised. The other aspects of the repeat operations, such as the puerperium, present no features worthy of comment, and, as has been recorded, the only maternal death can hardly be attributed to the operation, since it was due to tuberculous meningitis.

What were the results for the babies in these second Cæsarean sections ? In terms of survival they were good, and the gross fœtal loss was 6 stillbirths and 12 neonatal deaths. Correcting these (as we did with the vaginal deliveries) we are left with only 2 stillbirths and one neonatal death which can be in any way related to the operation—there were 2 cases of atelectasis and one of asphyxia.

So far we have discussed 267 second Cæsarean operations and have confined our study to the indications for these second operations. One hundred and ten of these women had their primary Cæsarean section outwith our series, and no comparison of the indications of first and second operation can be made. One hundred and fifty-seven women came into the series for both operations, and we have made a detailed comparison of the indications on each occasion to see whether the primary indication recurred. As was expected, the group originally classified as contracted pelvis or disproportion was the largest, consisting of 85 women, but only 73 per cent. had this indication given in the second Cæsarean. There was considerable agreement between the primary and repeat indication for women suffering from associated maternal diseases.

One group stands out—more than 25 per cent. (44 women) in the repeat operation had no main indication except " previous Cæsarean section," *but* we can determine the reason for which this previous Cæsarean was performed. Only one-third had contracted pelvis or disproportion in the primary operation ; the remaining two-thirds had pre-eclamptic toxæmia, placenta prævia, disordered uterine action and malpresentation, that is, conditions not generally considered recurrent.

To summarise the operation second Cæsarean section, we must conclude that there seems to have been an undue emphasis on the classical operation, regardless of whether the previous scar was an upper or lower segment one. These classical operations have in the majority of cases been accompanied by sterilisation ; and it is our opinion that the lower segment operation is preferable, and sterilisation is no reason for doing a classical section. Moreover, an overwhelming proportion of the repeat operations have been elective Cæsarean sections ; it is possible that in some of these cases a trial of labour might well have resulted in successful vaginal delivery.

THE THIRD CÆSAREAN.—Although the third operation could be considered in a " repeat Cæsarean " group, we have separated them in this brief study, since clearly the indication for a third Cæsarean section is usually " two previous Cæsarean sections." It would hardly be justifiable, therefore, in considering the indications for operation, to compare the indication for this further repeat operation with the primary or second indication.

There were 43 women who had a third Cæsarean section. The operations performed were mainly classical sections (33), and 37 women were sterilised (including one hysterectomy). Although the indication for this third operation is not very important, we may record that in half the group the stated indication was contracted pelvis or disproportion, with a minor indication of " previous Cæsarean section." Of the rest, the main indication was almost entirely " previous Cæsarean section."

Were the circumstances of this third Cæsarean operation different from those of the second ? In the main, both the proportion of elective operations and the type of puerperium were similar to those in the " second Cæsarean " group. As for the babies, 3 were lost, and if we correct these as we have previously done, we find that prematurity accounts for all three.

In the interval between this third Cæsarean operation and the present time, only one of these women has been traced as having a subsequent pregnancy. If may be of interest to know that this is one of the 37 who were sterilised, but in spite of this she returned with a tubal pregnancy.

Before proceeding to our conclusions, there are one or two other matters of interest which we should like to mention. What of fertility following Cæsarean section ? As already stated, nearly one-quarter of the primary Cæsarean group have already had further deliveries

in the few years which have elapsed, and a number of those having vaginal deliveries have had up to 4 babies. There are also 2 women who had vaginal deliveries after the *second* Cæsarean section.

A special analysis of the time interval between Cæsarean sections shows interesting results. Nearly 90 per cent. of the women who had a repeat Cæsarean had it within four years of the primary operation (16 per cent. in the first year after the primary; 40 per cent. in the second year; 15 per cent. in each of the third and fourth years). A similar time distribution is found for the third Cæsarean section, with the majority returning within three years of the second operation.

It is interesting to note also the incidence of abortion following the Cæsarean sections in the series. Many of the women had a history of abortion before the primary Cæsarean operation—in fact, in some cases this history of abortion was the major indication for the operation. Few women have been found to have subsequent abortions, and of the 333 women whose history after the primary Cæsarean section has been fully investigated, only 20 had an abortion.

Summarising these four parts of this paper, our conclusions are as follows :—

1. A full and careful assessment should be made before a primary Cæsarean section is performed.
2. No second Cæsarean operation should be embarked upon without a full and considered *re-assessment* at that time.
3. The indications for the classical Cæsarean section should be severely restricted because of the danger of subsequent uterine rupture.
4. The classical section is to be avoided in view of the high associated morbidity.
5. In future, more attention should be paid to the result for the child, as a sensitive index of the comparative success or failure of different techniques and procedures.
6. There is no place for home confinement in women who have had a Cæsarean section.
7. If the lower segment operation is more generally used there should be no hesitation in allowing vaginal delivery in those cases where operation was performed for a non-recurrent indication.

We would like to thank the Chiefs of the hospitals concerned, who allowed us to peruse their case records, and the Secretaries of the Simpson Memorial Maternity Pavilion, who had the tedious task of collecting these records.

Professor R. J. Kellar gave invaluable help throughout, including the assistance of his secretarial and technical staff in the Department of Obstetrics.

We also wish to thank Dr Stein, Mr Sklaroff, and their assistants in the Department of Medical Statistics who carried out the exacting work of statistical analysis of the data. Without their help such a detailed study would have been impossible.

We are indebted to Dr T. N. MacGregor and greatly appreciated his encouragement and criticism.