

THE INCOMPETENT CERVIX AS A CAUSE OF SECOND-TRIMESTER ABORTIONS *

AN ANALYSIS OF A SERIES OF CASES OPERATED ON AT THE KARL BREMER HOSPITAL

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The incompetent cervix as a cause of second trimester abortions is one of the most exciting new concepts in obstetrics, and it relates to the mechanical function of the cervix in maintaining a pregnancy. Many years of experience of second trimester abortions following on high amputation of the cervix focussed attention on the role of the cervix in maintaining a pregnancy.

Fisher¹ reported on the influence of this surgical procedure in causing late abortion or premature labour. The first clinical report of repair of an incompetent cervix, with salutary effect on two subsequent pregnancies, appears to be that of Palmer and la Comme (1948). This repair was done during the interval period. In 1950 Lash and Lash² presented a document on the importance, diagnosis and repair of cervical defects as related to late habitual abortions.

Since that time this entity has been generally recognized. Some authors performed trachelorrhaphy either before^{2,3} or during⁴ pregnancy. More recently the emphasis has been on repair during pregnancy by means of a constricting band or suture at the level of the internal cervical os, following the example of Shirodkar.⁵ Some authors⁶ claim that MacDonald of Melbourne was the first to use this technique of encirclement of the cervix in these cases, and that Shirodkar⁵ was the first to describe it in the literature.

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ANALYSIS OF A SERIES OF CASES TREATED AT THE KARL BREMER HOSPITAL

The modified Shirodkar operation was performed on a total of 22 patients from October 1956 to January 1961.

Selection of Patients for Operation

Where possible all causes, other than incompetence of the cervix, which might have been responsible for the previous or present threatened abortion were excluded before it was decided to do a modification of the Shirodkar operation on these patients. All of them either gave the typical previous history associated with this condition; or, on examination, presented with an incompetent cervix, admitting at least the tip of one finger; or had a combination of the typical history and clinical findings.

The typical history is usually that of a mid-trimester abortion or abortions which may be preceded by no symptoms at all or by an excessive watery vaginal discharge, lower abdominal discomfort, or a sensation of fullness vaginally. This is followed by the premature rupture of the membranes and the passage of the products of conception. Labour itself is usually brief and rather painless. The foetus is fresh with no apparent foetal abnormalities, and is very seldom viable. This tragic sequence usually repeats itself a couple of times, and these patients have no difficulty in falling pregnant as a rule. On examination they usually present with the membranes, not under tension, bulging through a partially dilated cervix. In other cases the cervix admits the tip of one finger.

In this series 13 patients presented with both a typical history and the finding of an incompetent cervix on

examination. Six patients gave a typical history, but on examination no incompetence of the cervix could be demonstrated, while in 3 the cervical os admitted 1 finger on examination without a typical history.

All the patients had a negative Wassermann reaction. The rhesus factor did not play a role in any of these cases. There were no diabetics and no congenital abnormalities of the genitalia were detected.

Previous Obstetric History and Possible Aetiological Factors

Previous Pregnancies

These 22 patients had had 75 pregnancies. Of these pregnancies, 17 (22.6%) had been successful, terminating in the delivery of viable infants; 58 (77.4%) had ended in an abortion. Of these 58 abortions, 12 (20.7%) had occurred before the 14th week of pregnancy, and 44 (75.9%) between the 14th and 28th week; while 2 patients (3.4%) had gone into premature labour with the infant not viable.

The Possible Cause of the Incompetence of the Cervix

It was very difficult to ascertain with certainty the possible aetiological factor that could have caused the incompetence of the cervical os. Of the 22 patients operated on, 10 had never had a full-term pregnancy, and in 6 of these no history of any previous trauma could be obtained. It would seem that in these 6 patients there could have been a congenital weakness of the internal cervical os.

Nine patients gave a previous history suggesting trauma to the cervix — 1 had had a previous high amputation of the cervix, 4 had had possible birth trauma, and 4 had had a previous dilatation of the cervix that could have caused the incompetence of the internal cervical os.

Other possible causes of trauma to the cervix mentioned in the literature are: overdilatation of the cervix, overzealous curettage of the cervical canal, previous abortions, vaginal hysterotomy, rapid labour, and lower-segment caesarean section.

The Operation

The Time of Operation

These patients were all operated on during pregnancy. Wherever possible the operation was not done before the 12th week of pregnancy (that is, in order to avoid the precipitation of a first trimester abortion). However, 4 of the patients were operated on before the 12th week with a 100% successful outcome. Fourteen patients had the operation between the 12th and the 20th weeks; of these operations, 8 (57%) were successful. Four patients had the operation between the 20th and 30th weeks of pregnancy; of these operations, 3 (75%) were successful. Two of the patients were operated on twice during the same pregnancy, because on re-examination (at a later stage) the cervix was found to be incompetent again.

According to the literature the optimum time for operation is between the 14th and 18th weeks of pregnancy. After 20 weeks the effacement of the cervix may make the procedure very difficult, and before the 12th week an abortion may be precipitated.

Operative Technique

The technique was that of a modified Shirodkar operation. The aim was to keep the procedure as simple as possible, by inserting a purse-string suture at or about the level of the internal cervical os. In none of the patients was the bladder disturbed or the mucous membrane of the cervix incised anteriorly or posteriorly. In 20 patients the suture material used was No. 2 'surgilon' and in 2 we used No. 2 'dermalon'.

The patient was always given general anaesthesia — usually by means of 'sodium pentothal', nitrous oxide and oxygen — with a high concentration of oxygen. The lithotomy position was used, the vulva and vagina were swabbed with 'hibitane', and the patient was draped with sterile towels. The bladder was catheterized and the anterior tip of the cervix was grabbed with a single-tooth volsellum and the cervix gently pulled down. The cervix was better exposed by using lateral vaginal retractors.

Using a Mayo needle, the suture was inserted as demonstrated in Fig. 1, being careful not to reach the cervical canal.

If necessary the membranes were gently pushed back before inserting the suture, which was then pulled together to grip a No. 5 or 6 Hegar dilator that had been placed in the cervical canal. The cut ends of the suture were left long to facilitate its removal when this became necessary. In some of the cases 2 sutures were inserted.

At no stage was the blood supply of the cervix interfered with in any of these patients.

The suture cut through the cervix in only 1 patient — she had been admitted only after she had been in strong labour for some time. The blood loss at operation was minimal.



Fig 1. Diagram to show the manner in which the purse-string suture was inserted (note that the cervical canal is strictly avoided).

Postoperative

Postoperative Care

On the average the patients were kept in bed for 3 or 4 days postoperatively. If labour did not commence and if there was no vaginal bleeding the patients were discharged on the 5th or 6th postoperative day. They attended antenatal clinics frequently for vaginal and speculum examinations.

As a rule the patients did not receive hormone therapy postoperatively. Six did, and of these, 3 aborted.

All the patients received prophylactic penicillin and streptomycin during their postoperative stay in hospital. If necessary the patients were sedated in the immediate postoperative period.

The Outcome

Three (13.6%) of the patients aborted during the

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TABLE I. RESULTS IN OTHER SERIES*

Author	No. of patients treated	Method of treatment	Successful pregnancies	Percentage success
Mc Donald ⁷	70	Silk purse-string suture inserted when abortion threatened	33	47.1
Shirodkar (<i>op. cit.</i> , ¹³)	56	Fascia lata repair of cervix	45	80.4
Shirodkar (<i>op. cit.</i> , ¹³)	43	Fascia lata repair at level of internal os of cervix	34	79.7
Benson <i>et al.</i> ⁶	41	Purse-string suture during pregnancy	29	70.7
Easterday ⁸	26	Polythene tube containing woven steel wire encircling cervix	20	76.9
Durfee ⁹	24	Prepared ox fascia or permafил repair at internal os	17	70.8
Barter <i>et al.</i> ¹⁰	22	Cervix repaired at internal os with fascia lata	14	63.6
Karl Bremer series (present series)	22	Surgilon or dermalon purse-string suture at level of internal os during pregnancy	15	68.2
Page ¹¹	14	Ribbon catgut with strips of 'oxycel' dipped in benzoin and saturated with sterile USP talc	9	64.3
Green-Armytage ¹²	12	No. 7 or 8 nylon encircling cervix	10	83.3
Neser ¹³	9	Silk purse-string suture during pregnancy	4	44.4
Others ^{2, 14-21}	27	Various methods	23	85.2

* Mean successful pregnancies — 69.2%.

immediate postoperative period; 4 (18.2%) aborted before the 28th week of pregnancy at 5-, 7-, 9- and 13-week intervals after the operation, respectively; and 15 (68.2%) could be considered to have had a successful outcome.

In 8 of the successful cases the suture was cut after the spontaneous onset of labour at 34-40 weeks' pregnancy. In 1 case spontaneous labour started at 30 weeks' pregnancy with the birth of a 2 lb. 4½ oz. live infant who was later discharged from hospital in a healthy condition. In the other 6 cases the suture was cut at 38-40 weeks' pregnancy, before the onset of labour. Of these, 3 went into spontaneous labour shortly after the suture was cut. The remaining 3 patients only went into labour after digital stretching of the cervix and stripping of the membranes.

Method of Delivery

All the patients who had successful pregnancies were delivered vaginally; 13 had spontaneous vaginal deliveries, 1 had a forceps delivery for a deep transverse arrest of the head, and 1 had a spontaneous breech delivery.

Subsequent Pregnancies

Two of the patients with a successful outcome fell pregnant again and in the subsequent pregnancy did not show any signs of an incompetent cervix. This may have been due to fibrosis of the cervix where the suture was previously inserted, or due to a mistaken diagnosis in the previous pregnancy.

Three other patients fell pregnant again and presented with the same trouble during the subsequent pregnancy, and the operation was repeated. Two of these patients were successful with both the first and the subsequent pregnancy. The third was not successful after the first operation, but during the subsequent pregnancy the operation was performed at 8 weeks and again at 20 weeks with a successful outcome.

COMPARISON WITH OTHER SERIES (TABLE I)

Some authors operated during the interval period between pregnancies and others during pregnancy. Most methods vary only in detail. In principle, these procedures all

aim at providing a supporting, constricting band around the cervix at about the level of the internal cervical os, and the method selected is of importance only in that this requirement is fulfilled.

SUMMARY

1. An analysis of 22 patients with incompetence of the cervix during pregnancy, encountered at Karl Bremer Hospital, has been presented.

2. The cases were diagnosed by a suggestive history and/or positive physical signs of an incompetent cervix.

3. The selection of patients for operation, the previous obstetric history, the possible aetiological factors, time of operation, operative technique, postoperative care and eventual outcome are discussed.

4. All the patients were delivered vaginally. There was a 68.2% successful outcome after the suture had been cut at 38-40 weeks' pregnancy.

5. It was stressed that the operation should be as simple as possible, using a suture material which is removable, thereby obviating the need for caesarean section.

6. The results in this series compare well with other series in the literature.

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