

The Place of Amniotomy in Labour

by
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Traditional teaching has always stressed on the unfavourable results of ruptured membranes. Rupture of membranes before viability results in heavy loss of foetal life which rupture in labour may be attended by complications such as cord or arm prolapse, uterine inertia and dry labour, with undesirable consequences.

Rupture of the membranes in labour has acquired a bad reputation from the experiences of obstetricians in bygone generations who were obliged to conduct prolonged trials of labour before obstetric surgery was made safe by the advent of antibiotics and safe anaesthesia. This fear of ruptured membranes has been handed down and accepted by practitioners of the present, often without serious question or critical examination. The case is ably put forth by Donald (1964) in page 420 of "Practical Obstetric Problems". He says: "the evil significance of prolonged labour is directly proportional to the time which has elapsed since rupture of the membranes. This is the most important landmark in the first stage. With very few exceptions, intact membranes mean an intact mother and an intact baby though labour may last many days".

In recent years there has been a changing attitude towards prolonged labour especially with ruptured membranes. Most centres now adopt 24 hours as the upper limit for the normal duration of labour instead of 36 or 48 hours. This is because in labours lasting over 24 hours there is a steep rise in perinatal mortality and maternal morbidity. Any operative procedure also carries a high risk of anaesthetic mishaps and post-operative infection. For these reasons, one would hesitate to allow labour to exceed 24 hours without good reason, and those few that do exceed 24 hours are provided with antibiotic cover. Under these circumstances, the risk of infection from

prolonged rupture of the membranes is largely eliminated. Therefore the need for conservation of the membranes in labour loses much of its former significance.

Our impression, from clinical experience at the Kandang Kerbau Hospital, Singapore, was that artificial rupture of the membranes in labour tended to speed up the course of labour. In the absence of a specific contraindication, the procedure appeared to be safe and had been adopted as a routine labour ward procedure largely with the objective of expediting the rapid turnover of women occupying labour beds.

Whether our clinical impression and practice had a sound and scientific basis, however, had never been put to the test. It was therefore decided to conduct a study on a series of patients admitted to the Normal Labour Ward and examine the soundness of our clinical impression in the light of the results obtained.

Method of Study:

During a 6-week period from 9th March to 19th April, 1965, all mothers admitted to the Normal Labour Ward between the hours of 9 a.m. and 4 p.m. from Monday to Friday, and between 9 a.m. and 1 p.m. on Saturday, were used for this study. All these mothers, as far as could be ascertained at the time of examination, had no abnormality and were expected to have a sound vaginal delivery. Those who subsequently developed any complication necessitating transfer to the Abnormal Labour Ward, or ended in Caesarean section, were excluded from the study. Those not in labour and cases where delivery was imminent, for obvious reasons, were also excluded from the study.

Each patient was interviewed and examined by a Final Year Medical Student. Each Student

set out with these objectives:—

1. To ascertain the time of onset of labour, i.e. from the time of the first painful uterine contraction.
2. To confirm that the patient was in labour, i.e. having rhythmic uterine contractions at intervals of not more than 10 minutes.
3. To ascertain the state of the membranes. Those already spontaneously ruptured formed one group. Those with intact membranes were subdivided into 2 groups:
 - (a) Odd admission numbers — the membranes were artificially ruptured (ARM).
 - (b) Even admission numbers — the membranes were left alone (Controls).

TOTAL NUMBER OF CASES = 427

	No. of Cases	Primip	Para 2—4	Para 5+
Control Group	110	17	57	36
Artificial Rupture Group	168	60	57	51
Spontaneous Rupture Group	140	34	65	41

9 cases not included:

- 1 undiagnosed twin
- 1 Caesarean section
- 7 case sheets no detail available

Results:

(a) Parity Distribution:

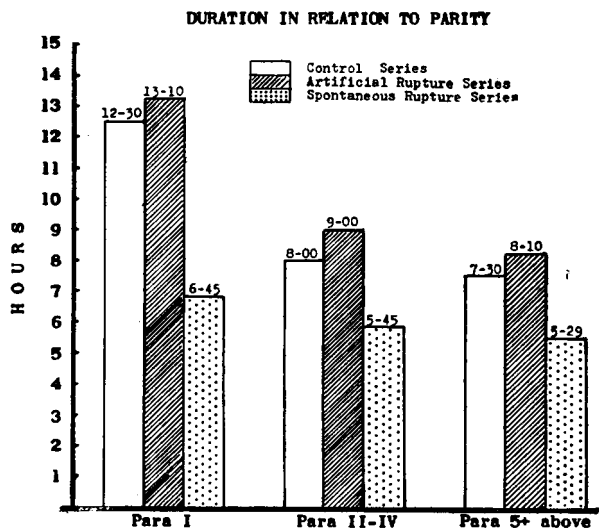
A total of 418 cases were obtained in the 3 groups. Since the duration of labour is influenced by parity, the 3 groups were further analysed according to parity so as to allow fair comparison of the duration of labour in each sub-group. This analysis is shown below:—

	No. of cases	Para 1	Para 2—4	Para 5+
Group 1 Controls	110	17	57	36
Group 2 ARM	168	60	57	51
Group 3 Spontaneous Rupture	140	34	65	41

(b) Duration of Labour in relation to Parity

The result of this analysis is shown in Figure 1. The duration of labour in Group 3 (Spontaneous Rupture) was considerably shorter than in Group 1 (Controls) and Group 2 (A.R.M.) This shortening effect of spontaneous rupture was seen in all parity groups.

Fig. 1.



There was no significant difference in the duration of labour between groups 1 and 2.

(c) Duration of labour in relation to Cervical Dilatation and Parity

The duration of labour in each parity group was analysed in relation to the dilatation of the cervical os at the time of examination and/or amniotomy. The results are shown in Figures 2—4, from which it may be observed that amniotomy in labour at any stage of cervical dilatation had no visible effect in shortening the overall duration of labour.

Fig. 2.

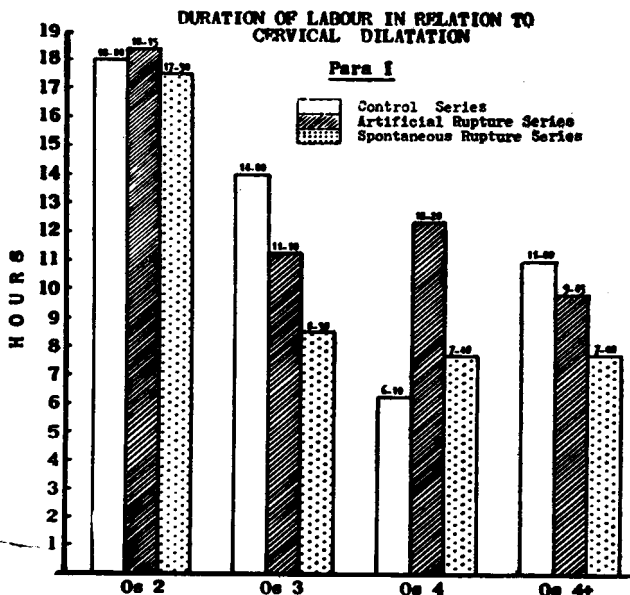


Fig 3.

DURATION OF LABOUR IN RELATION TO CERVICAL DILATATION

Para II - IV

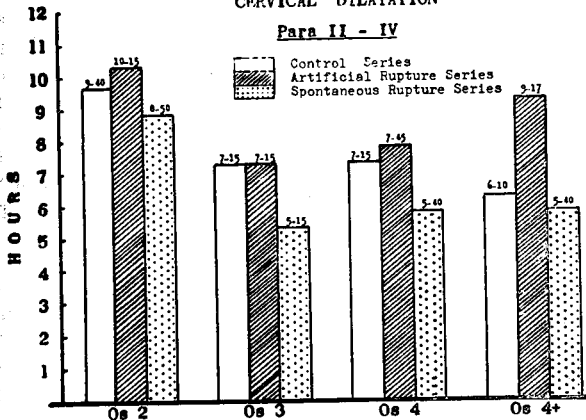
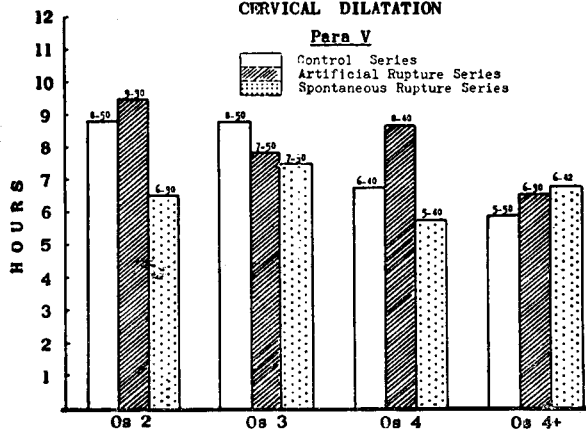


Fig. 4.

DURATION OF LABOUR IN RELATION TO CERVICAL DILATATION

Para V



(d) Duration of labour following Examination/ ARM related to Parity

Since the timing of the onset of labour is liable to some uncertainty and subjectivity, it was decided to study the effect of Vaginal Examination, with and without A.R.M., on the subsequent duration of labour. The results are shown in Table 2. From it, one may conclude that in primiparas the subsequent course was lengthened by A.R.M. while in multiparas there was no effect.

V.E./A.R.M. INTERVAL IN HOURS

	Control V.E. del.	A.R.M. A.R.M. del.
All Parity	0-59	1-29
Primip	1-47	2-37
Para 2-4	1-00	-59
Para 5+	1-06	-50

(e) Maternal and Foetal Complications

The foetal complications which may result from A.R.M. are prolapse of the cord, conversion of an unstable or oblique lie into a case of obstructed transverse lie with possible prolapse of the arm and introduction of infection into the amniotic cavity. Total loss of liquor amnii may result in dry labour and foetal distress.

The maternal complications which may be encountered are trauma to the cervix, lower uterine segment or vagina resulting from misuse of the amniotomy instrument (e.g. Kocher's forceps), and maternal infection and morbidity in the early puerperium.

None of the theoretical foetal complications were encountered in any of the 3 groups. Prolapse of the cord was seen only once, in a case of spontaneous rupture of the membranes. No instance of maternal trauma was encountered.

Since 80 per cent of mothers and babies in this Hospital are discharged within 48 hours of delivery, it was not possible to make a valid study of the incidence of maternal and foetal morbidity.

Discussion:

It is commonly taught that the normal time for membranes to rupture is when labour has been well established, usually in the latter part of the first stage, and sometimes in the second stage. Rupture before the onset of labour is regarded as an abnormal event with an unfavourable omen. It is commonly referred to as premature rupture of the membranes. This attitude toward spontaneous premature rupture of the membranes is more traditional than rational, and represents a "hangover" from the days of protracted trials of labour attended by high foetal and maternal casualty, before antibiotics and safe obstetric surgery were readily available.

The old observers were correct, of course, in their observations that prolonged rupture of the membranes was a highly undesirable event. But what was not clearly appreciated was the fact that eventually in all labours, the membranes must rupture and naturally the residue of undelivered cases with liquor drained dry presented highly unfavourable results. The question which had not been answered was: "Does premature rupture of the membranes in fact predispose to prolonged labour, with its attendant ill effects on mother and child?"

In recent years various attempts have been made to answer the question. King (1940) sur-

veyed about 15,000 cases from 34 papers and concluded that the duration of labour was shorter in cases where the membranes ruptured early. This conclusion was not based on any controlled study nor was there any differentiation between spontaneous and artificial rupture of the membranes. Embrey (1953) in a study of 1,052 cases found that labour which followed within 24 hours of spontaneous premature rupture of the membranes was shortened, but if it failed to do so until after 24 hours, then it tended to be prolonged. Other investigators, notably Calkins (1952) and Nixon et al (1958) have also found that spontaneous premature rupture of the membranes is associated with a marked shortening of labour.

The next question to be answered is "Does artificial rupture of the membranes in labour materially shorten its subsequent course?" Using tokographic techniques, Murphy, Zimmer and Reynolds (1954) could demonstrate no significant effect. Somewhat contradictory evidence was found by Caldeyro-Barcia and Alvarez (1961) studying oxytocin induced labours. In these, labour was definitely shortened by artificial rupture of the membranes.

The present investigation, involving a small series of 168 cases of artificial rupture of the

membranes in labour with a control series of 110 cases with membranes left intact, has brought to light certain useful information. Where membranes are found to be intact in labour, artificial rupture had no demonstrable effect in shortening its subsequent course. In a parallel series of 140 cases with spontaneous premature rupture, labour was shortest in duration. The effect of artificial rupture was not influenced by the state of cervical dilatation. In primiparas, labour tended to be lengthened rather than hastened by artificial rupture of membranes.

From these observations it may be concluded that if the aim is to shorten labour, then artificial rupture of the membranes in established labour fails to fulfil that aim. Its routine use for this purpose is therefore not based on scientific evidence. However in the particular case of delay in the first stage due to uterine inefficiency, timely amniotomy is likely to result in acceleration of labour and also permit examination of the quantity and quality of the liquor amnii especially in cases of suspected foetal distress. These latter advantages have profound practical value which are known to every practitioner of obstetrics and require no large-scale controlled studies to verify. The risks of amniotomy can be eliminated by careful attention to asepsis and selection of each case, excluding those not in labour and those with an unengaged presenting part.

SUMMARY:

1. The traditional attitude of overstressing the value of intact membranes and the need for their preservation, even in labour, is discussed.
2. In a series of labours studied at the Kangang Kerbau Hospital it was found that those cases with spontaneous premature rupture of the membranes had the shortest duration of labour, while those with intact membranes did not have their labour shortened by artificial rupture of the membranes. On the contrary, the procedure appeared to lengthen slightly the duration of labour among primiparas.
3. Although amniotomy in labour does not reduce its overall duration, nevertheless it may be useful in expediting delivery in selected cases of inefficient uterine action.
4. Amniotomy allows the examination of the liquor amnii and is of great practical value in the management of cases of suspected placental insufficiency.
5. No serious maternal or foetal complications resulted from amniotomy done in 168 cases. This shows that the procedure can be performed with complete safety under supervision.

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