

VACUUM EXTRACTOR IN OBSTETRIC PRACTICE

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The vacuum extractor or ventouse is an important instrument which has established its place in obstetric practice. It has filled the gap between the forceps and caesarean section, more so the gap created by the elimination of the use of difficult forceps in modern obstetrics. Keen interest has been shown and extensive trial has been given to this method of operative delivery in recent years all over the world (Tricomi *et al*, 1961; Parpakham, 1962; Hathout and Tanir, 1963; Chalmers, 1964; Sankari and Wagh, 1964; Buss, 1965; Raju *et al*, 1967; Wider *et al*, 1967). The purpose of the present paper is to evaluate the effectiveness of the ventouse as a simple and safe method of assisted vaginal delivery.

Material and Method

The present study extended from March 1964 to March 1968. During this period, there were 17,000 deliveries in the City Maternity Hospital of Jawaharlal Institute of Post-

graduate Medical Education and Research, Pondicherry. The ventouse was used on 200 cases during the years under study.

There were 109 primiparae (54.5 per cent) and 91 multiparae (45.5 per cent). The ages of the patients ranged from 17 to 40 years. The gestation period was between 35 to 41 weeks.

The ventouse was used only in cases of vertex presentation. The position of the foetus, at the time of application of the vacuum extractor was occipito-anterior in 124 cases (62.0 per cent), occipito-lateral in 61 cases (30.5 per cent) and occipito-posterior in 15 cases (7.5 per cent).

The instrument used was the usual and familiar Malmström vacuum extractor. It is beyond the scope of this present paper to give a description of the extractor and its technique of application. The standard method as suggested by Malmström (1957) was employed. The patients were delivered in the lithotomy position without the use of general anaesthesia. In 42 cases, pudendal block was necessary and local infiltration anaesthesia was used in 38 cases. The remaining 120 cases (60.0 per cent) did not require any form of anaesthesia. The largest cup of 60 mm. was used and the usual vacuum pressure of 0.8 Kg/sq. cm. was created slowly in stages over a period of 10 to 15 minutes.

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Counter-pressure was used whenever considered necessary. All deliveries were completed within 30 minutes. Reapplication, in cases of spontaneous detachment of the cup during traction, was limited to, at the most, three times.

Ventouse in relation to caesarean section and forceps rates

The incidence of caesarean section was rather high before ventouse was practised by us. It may be observed, from Table I, that in 1964-65, the

cent), while in only 2 cases attempts at vacuum extraction were made with the head floating.

Dilatation of the cervix

It is almost impossible to deliver the baby through an undilated cervix without increasing the maternal morbidity. In 188 cases (94.0 per cent) of this series, the cervix was fully dilated at the time of application of the instrument. In 4 cases, a thin cervical rim was palpable below the greatest diameter of the head,

TABLE I
Ventouse in relation to caesarean section and forceps rates

Year	Total No. of deliveries	Caes. section No. (per cent)	Forceps No. (per cent)	Ventouse No. (per cent)
1964-65	5091	287 (5.63%)	111 (2.18%)	15 (0.29%)
1965-66	3387	75 (2.24%)	18 (0.53%)	30 (0.88%)
1966-67	4575	124 (2.71%)	38 (0.83%)	60 (1.31%)
1967-68	3947	88 (2.22%)	55 (1.34%)	95 (2.40%)
Total	17000	574	222	200

caesarean section rate was 5.63 per cent and the forceps rate was 2.18 per cent. After the introduction of ventouse in our hospital practice, the caesarean section and forceps rates came down to 2.22 per cent and 1.34 per cent respectively in 1967-68. The ventouse application rate, on the other hand, showed an upward trend from 0.29 per cent in 1964-65 to 2.40 per cent in 1967-68.

Station of the foetal head

The head was engaged in the pelvis with the lowest bony point either at or just below the level of ischial spines in 100 cases (50.0 per cent). The head was at or near the outlet in 78 cases (39.0 per cent). The foetal head was just above the level of ischial spines in 20 cases (10.0 per

and in the remaining 8 cases the cervix was three-fourths dilated.

Indications

Though the use of ventouse in obstetrics is well established, controversy still exists regarding its field of application and its proper indications. The vacuum extractor was tried in this series for all cases where forceps were indicated. It was also used in a few selected cases where immediate delivery was indicated with either incomplete dilatation of the cervix or a high foetal head. The details of indications may be studied from Table II. The maternal indications were mostly prophylactic, the aim being acceleration of the delivery by instrumental intervention in order to cut short the duration of labour. The five

TABLE II
Indications

Indications	No. of cases
A. Maternal	
(i) Prolonged labour	96
(ii) Uterine inertia with maternal distress	36
(iii) Pre-eclamptic toxæmia	12
(iv) Eclampsia	4
(v) Post-caesarean labour	5
B. Foetal	
Foetal distress	47
Total	200

cases of post-caesarean deliveries were assisted with ventouse to avoid the strain of the last few contractions on the previous scar of the uterus. Foetal distress was a common indication (23.5 per cent) and these cases were delivered under local anaesthesia. In none of the above cases was there any clinical suspicion of cephalo-pelvic disproportion.

Results

The ventouse proved successful in delivering 174 cases (87.0 per cent). The results and mode of delivery are detailed in Table III. The extractor failed to deliver the baby in 26 cases (13.0 per cent). In all these cases, delivery was completed by application of obstetric forceps. The failures were mainly due to leakage of air

into the apparatus leading to detachment of the cup, faulty technique and higher station of the foetal head. None of the failed ventouse cases had to be delivered by caesarean section.

Maternal mortality and morbidity

There was no maternal death in the present series. Only in three cases, minor soft tissue injuries, in the form of perineal, vaginal and cervical tears, were observed. This low gross morbidity rate (1.5 per cent) was an important feature of this series in view of the fact that if delivered by forceps, as many as 22 cases would have been either high or mid-forceps deliveries.

Perinatal mortality and morbidity

The gross perinatal mortality was 7 (3.5 per cent) in this series. Of these, 2 cases of stillbirth and an early neonatal death from thrombocytopenia were unavoidable. So, the corrected perinatal mortality was 2.0 per cent only.

Two patients, one a 6th and the other a 13th gravida, were admitted as emergency cases with evidence of gross foetal distress. In the first case, the foetus was premature (1.7 kg.) with its head lying above the level of the ischial spines. In the second case,

TABLE III
Results

Ventouse successes	No. of cases	Ventouse failures	No. of cases	Total
(i) Successful at 1st attempt ..	154	(i) Delivered by low-mid forceps ..	15	
(ii) Successful at 2nd attempt ..	16	(ii) Delivered by outlet forceps	11	
(iii) Successful at 3rd attempt ..	4			
Total	174		26	200

the cervix was four-fifths dilated. The foetal heart sounds disappeared during extraction in both the cases. It could not be definitely said whether the babies could have been saved by the alternative method of delivery by caesarean section.

Two other neonatal deaths were attributed to intracranial haemorrhage and injury on clinical grounds. Both the cases showed features of foetal distress during labour. It was difficult to decide whether these neonatal deaths were directly related to the ventouse or to intrauterine asphyxia.

The artificial caput or chignon was rather formidable at first, but it disappeared within a few hours. There was a case of cephalhaematoma and one of scalp abrasion which healed in due course. Mild cerebral irritation was noted in one baby and neonatal jaundice was observed in the other two.

Discussion

The ventouse is simple and its application is easy. A notable feature of the vacuum extractor is the ease with which the technique can be learnt (Snoeck, 1960; Chalmers and Fothergill, 1960). The correct technique and proper application of the obstetric forceps, on the other hand, require skill and experience. For its safety and popularity, the ventouse application rate went up to 2.40 per cent, while the caesarean section and forceps rates came down to 2.22 per cent and 1.34 per cent respectively, without any increase in the incidence of operative deliveries. Lange (1961) found there was no increase in the proportion of instrumental deliveries when vacuum extraction replaced

forceps delivery in Copenhagen. Samadder (1967) found a fall in the caesarean section rate from 9.2 per cent to 6.3 per cent in his series, and observed that the free use of the ventouse might have been a factor in reducing the section rate.

The instrument is not only safe for both the mother and infant, but also helpful in avoiding caesarean section in some cases and difficult mid-forceps delivery in others. In cases where the head is high and the cervix is not fully dilated, with evidence of maternal or foetal distress, successful vacuum extraction may avoid the alternative treatment by caesarean section. This is a very important factor which demands special consideration as regards the patients in our country. Most of the patients are poor and illiterate. They are ignorant about the importance of regular antenatal care and the subsequent hazards following caesarean section or difficult forceps delivery. The ventouse might be of distinct advantage in some selected cases and thus caesarean section can be avoided (Grossbard and Cohn, 1962), especially in those cases where immediate delivery is to be completed while the condition of the cervix and position of the head do not favour the application of forceps.

With the forceps, under general anaesthesia, the baby can be delivered more quickly than with the ventouse, but the risks of general anaesthesia and the possible associated conditions like incompletely dilated cervix, high or malposition of the head, can be overcome by the use of vacuum extractor. Moreover, some patients are admitted as emergency

with a large caput succedaneum, requiring immediate delivery. In such cases, provided the head is low and cervix is fully dilated, the ventouse proves to be a simple and safe procedure in spite of the difficulty of finding out the correct position of the head.

Most authorities agree about the safety of the ventouse so far as the mother and her baby are concerned. A failed vacuum extractor is much less traumatising and demoralising than a failed forceps. In the present series, there was no maternal death and the maternal morbidity was negligible. Similar were the experiences of other authors (Mukerji *et al*, 1967; Raju *et al*, 1967). In the reports of Lange (1961), Bergman *et al* (1961) and Samadder (1967), the perinatal mortality was 3.8 per cent, 1.9 per cent and 2.75 per cent respectively, which was less than the mortality due to forceps. In our series, the corrected perinatal mortality was 2.0 per cent.

The indications for ventouse are similar to those for which the obstetric forceps are generally used. In our series, the instrument was used only when there was a definite indication, as has also been suggested by Heiss (1962). Buss (1965) gave an account of the vacuum extractor being used in the first stage of labour. Malmström (1957) advised the use of the ventouse for stimulating uterine contractions in hypotonic inertia through pressure of the foetal head on the cervix. In the present series, the extractor was used in the second stage in all but 8 cases wherein it was applied in the first stage.

The use of vacuum extractor in foetal distress is controversial. Many

believe that foetal distress is a doubtful indication for using ventouse because of the length of time taken over the application and delivery (Chalmers and Fothergill, 1960). We agree with Samadder (1967) that the extractor should better be avoided in the presence of gross foetal distress.

The ventouse, of course, has its own limitations and may give rise to certain complications. There is much dispute about the rise of intracranial tension with vacuum extractor as compared to the forceps. Opinions differ over the question of use of ventouse on premature babies. Abnormal EEG recordings of newborn were found by Heiss (1962) in 5.5 per cent of normal deliveries, in 27.0 per cent of breech and caesarean sections, in 44.6 per cent of forceps deliveries and in 58.9 per cent of vacuum extractor series. Neuweiler and Onwudiwe (1967) reported an incidence of 72.4% of retinal haemorrhages in the newborn delivered with the ventouse, whereas the same were observed in 42.8 per cent of cases of forceps delivery and only in 3.0 per cent cases of caesarean section. Thus, it is felt that cases should be carefully selected before the ventouse application and the instrument should be used only for strict obstetrical indications.

Summary and Conclusions

1. Two hundred cases of vacuum extraction in different states of vertex presentation have been studied.
2. A significant fall in the incidence of caesarean section and forceps deliveries has been observed since the introduction of ventouse.
3. The indications were mostly

maternal, including prophylactic, in 76.5 per cent cases. Foetal distress was responsible for 23.5 per cent extractions.

4. Delivery was successfully completed by ventouse in 87.0 per cent cases. The failure cases were all terminated by subsequent and easy application of forceps.

5. There was no case of maternal mortality in this series and morbidity was significantly low. The corrected perinatal mortality was only 2.0 per cent.

6. The vacuum extractor is an important addition to modern obstetric armamentarium and it has rightly established its claim in obstetric practice. Ventouse is technically easier to apply and it is safe for both the mother and infant in properly selected cases. It has got a few distinct advantages over the forceps though it cannot substitute the forceps in all circumstances. With the judicious use of vacuum extractor, it is possible to avoid caesarean section as well as difficult mid-forceps delivery in some cases.

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