colorimetric determination of operative bleeding (Baronofsky *et al.*, 1946). Moreover, sponge-weighing and constant reference to the volume of blood in the suction bottles enables progress assessments of blood loss to be made and blood replacement to be geared accurately to the loss.

Routine use of this method improves the surgeon's judgment of the volume of blood being lost. A better surgical technique is likely to be developed as a result of increased attention to measurement of the blood loss.

Blood is a valuable commodity. Accurate measurement of blood loss leads to saving of blood for our community's blood banks. In some patients undergoing major operations the measured blood loss is small and transfusion is clearly unnecessary.

With this simple method geriatric patients can usually be maintained at a normotensive level even during such radical surgery as aortic replacement. Survival rates show gratifying improvement. In view of its many

advantages, this simple method should be a routine part of modern theatre practice.

Summary

A simple gravimetric method for measuring loss of blood during surgery has been discussed.

This method allows of the rational replacement of blood lost and minimizes the risk of over- or under-transfusion.

The use of this procedure is recommended during all major surgical operations.

We are grateful to Mr. G. Logan and Miss M. Simpson for preparation of the illustrations.

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BROW PRESENTATION

BY

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Brow presentation is associated with high mortality and morbidity of both mother and foetus. That it is the rarest of all malpresentations only increases its importance in obstetric practice, for few obstetricians are able to gain sufficient experience of the condition. Many of the papers published show combined statistics of face and brow presentations and deal with series of cases encountered over many years. In this paper 35 consecutive cases of brow presentation that occurred in Chittaranjan Seva Sadan College between April, 1953, and January, 1961, have been analysed in an attempt to show the recent trends in the management of this serious condition.

Incidence.—During the period of review there were 60,130 deliveries, giving an incidence of brow presentation of 1:1,718. The figures reported by different authors varied from 1:667 (Moore and Dennen, 1955) to 1:3,453 (Posner and Buch, 1943). The average incidence was found to be 1:1,804 (Table I).

TABLE I.—Incidence and Foetal Mortality

Authors	Years of Survey	No. of Deliveries	No. of Brow Cases	Incidence	Foetal Mortality
Hellman <i>et al.</i> (1950)	1896–1948	65,930	44	1:1,498	25%
Kenwick (1953)	1930–1952	76,062	26	1:2,941	8.7%
Madden (1956)	1945–1955	13,774	13	1:1,059	—
Magid and Gillespie (1957)	1945–1955	39,371	16	1:2,473	6.25%
Moore and Dennen (1955)	1931–1953	24,030	36	1: 667	8.3%
Morris (1953)	1934–1950	64,817	53	1:1,224	28.3%*
Posner and Buch (1943)	1914–1942	46,058	13	1:3,453	20%
Posner <i>et al.</i> (1957)	1943–1956	50,345	23	1:2,189	6.3%†
Simpson (1950)	1935–1949	31,534	38	1: 829	13.1%
Skalley and Kramer (1960)	1953–1958	63,104	27	1:2,337	7.7%
Tancer and Rosanelli (1957)	1935–1957	27,937	22	1:1,269	—
Present series	April, 1953, to January, 1961	60,130	35	1:1,718	8.5% 25.7%*
Combined Series		563,092	346	1:1,804	

* Uncorrected. † Face and brow.

Aetiological Factors

Many maternal and foetal factors have been said to be the cause of brow presentation. Tancer and Rosanelli (1957), however, failed to discover any important maternal predisposing factor. White (1954) found no cause in 33 out of 100 collected cases. He concluded that most of the brow and face presentations, if not all, were primary in nature and were due to the increased tone of the extensor muscles of the neck of the foetus. Excluding multiparity, no cause was detected in 14 cases (40%) of the present series.

Contracted Pelvis.—According to MacLennan *et al.* (1955) brow presentation is nearly always associated with contracted pelvis. Greenhill (1955) mentioned that it occurred in 53.8% of the cases reported by Hellman *et al.* (1950). Simpson (1950) found the incidence to be 23.7%, whereas Madden (1956) had only one contracted pelvis in 33 cases. In the present series contracted pelvis was noted in 17.1% of cases—a figure in close agreement with those of Kenwick (1953) and Morris (1953) (see Table II).

TABLE II.—Aetiological Factors (Percentages)

Authors	Primiparae	Multiparae	Contracted Pelvis	Big Baby (>8 lb.)	Pre-maturity
Hellman <i>et al.</i> (1950)	37.2	62.8	53.8	—	Nil
Kenwick (1953)*	33.3	66.7	15.1	10.9†	12.4
Madden (1956)	55.5	44.5	7.7	30.7	Nil
Morris (1953)	62.2	37.8	15.1	31.3	15.1
Simpson (1950)	—	—	23.7	13.1	8
Skalley and Kramer (1960)	22	78	11	15	18.5
Present series ..	40	60	17.1	11.4	28.5

* Combined figure of face and brow.

† Birth weight 8 lb. 8 oz. (3,858 g.) or above.

Parity.—Hellman *et al.* (1950) observed that 62.8% of their brow presentations occurred in multiparae, in contrast to the average clinic figures of 52.9%. But Morris (1953) and Madden (1956) found 62.2% and 55.5% of their cases respectively to be in primiparae. Out of 35 cases in the present series, 14 (40%) were in

primiparae and 21 (60%) in multiparae. During the period of survey 16,327 primiparae and 43,803 multiparae were confined, with a brow incidence of 1:1,166 and 1:2,086 respectively—brow presentation thus occurring much more often in primiparae.

Prematurity.—The infants weighed 5 lb. 8 oz. (2,495 g.) or less in 28.5% of cases—a figure much below the average hospital figure of 40%. This confirms the findings of Hellman *et al.* (1950) and Madden (1956), who had no premature infants in their series, although Skalley and Kramer (1960) noted a higher prematurity rate in brow cases than in their general obstetric population. Kenwick (1953) and Posner *et al.* (1957), giving combined statistics of face and brow presentations, found prematurity in 12.4% and 25% of their cases respectively.

Big Baby.—While the part played by small infants in the aetiology of brow presentation is controversial, almost all authors have found an increased association of large infants with this condition. In this series eight infants (22.8%) weighed more than 7 lb. (3,175 g.), the corresponding average hospital figure being 9%. In four of these eight infants the birth weight was more than 8 lb. (3,630 g.).

Other Factors.—Analysis of cases by age-group did not show any significant difference from the general pattern of all confinement cases. In one case of compound presentation the vertex was converted to brow during replacement of the prolapsed foot. Foetal ascites was present in one case. Other aetiological factors, such as cord round the neck and multiple pregnancy, were not found.

Diagnosis and Positions

As in all other published series, in most of these cases the diagnosis was made very late in labour. In fact, in two cases it was not made until they were admitted with ruptured uterus.

According to MacLennan *et al.* (1955), there is no mechanism of labour in a brow presentation, and therefore no position of the head to consider. Brews (1957) and Moir (1956), however, described anterior and posterior positions and mentioned that delivery as posterior brow is impossible unless rotation to the anterior position occurs. Greenhill (1955) says that, although six brow positions are theoretically possible, left fronto-anterior and right fronto-posterior positions are more commonly seen. Excepting Hellman *et al.* (1950), who found a preponderance of transverse and posterior positions, most authors agree that anterior brow is commoner and carries with it a better prognosis than posterior brow (Brews, 1957; Kenwick, 1953; Moir, 1956; Posner *et al.*, 1957). As shown in Table III, out of 116 cases where records were available the position was anterior in 45.7%, posterior in 25%, transverse in 26.7%, and direct anterior in 2.6%.

TABLE III.—Positions (No. of Cases)

Authors	Fronto-anterior	Fronto-transverse	Fronto-posterior	Direct Anterior
Hellman <i>et al.</i> (1950)	8	21	11	Nil
Kenwick (1953)	15	Nil	6	"3
Posner <i>et al.</i> (1957)	12	2	Nil	"
Skalley and Kramer (1960)	13	6	3	Nil
Present series	5	2	9	"
Combined series	53 (45.7%)	31 (26.7%)	29 (25%)	3 (2.6%)

Complications

There were five cases of pre-eclamptic toxæmia; the cord was found prolapsed in one case; in four cases labour was prolonged beyond 24 hours, and puerperal sepsis occurred in three cases. One case was admitted after craniotomy had been done outside with no result, the forceps extraction having failed prior to perforation of the head. The perforated head was extracted in the hospital. There was a complete perineal tear and the retained placenta was removed manually. Apart from two cases admitted with obstructed labour and two with ruptured uterus, in one case of maternal death after craniotomy the post-mortem examination revealed uterine rupture. Morris (1953) reported rupture of the uterus in one case, due to attempted internal podalic version, while Hellman *et al.* (1950) found two cases of rupture in their series of 45.

Mode of Delivery

Spontaneous delivery without any intervention occurred in 6 out of 35 cases (17.1%), including one case where a dead baby weighing 5 lb. 13 oz. (2,636 g.) was delivered naturally as a brow presentation (Table IV). Of the remaining five cases, spontaneous conversion to vertex and face presentation occurred in two and three respectively. In another case, although the head was delivered spontaneously as anterior brow, evisceration was done for obstruction due to foetal ascites.

TABLE IV.—Mode of Delivery (In Percentage)

Authors	Spontaneous Delivery and Low Forceps	Manual Conversion	I.P.V. and Breech Extraction	Cranio-tomy	Caesarean Section
Hellman <i>et al.</i> (1950)†	31.1	17.8*	17.8*	6.8*	33.3
Madden (1956)†	35.8	15.5	46		Nil
Magid and Gillespie (1957)	50	6.25	6.25		37.5
Moore and Dennen (1955)	11†	41	25		22
Morris (1953)	13.2†	34*	11.3*	3.4*	35.8
Posner <i>et al.</i> (1957)	74	4.35*	8.7*		13*
Simpson (1950)	21*	60.5*	13.2*		Nil
Skalley and Kramer (1960)	29.6 (18.5†)	22.2	Nil		48.2
Tancer and Rosanelli (1957)	9.1†	36.4*	13.6*		41*
Present series	17.1†	25.7	5.6	2.8	37.1

* Percentages calculated from figures given in the article.

† Spontaneous delivery only.

‡ Mature infant only.

Brow position was converted manually to vertex in seven cases and to face in two. Out of these nine cases (25.7%) of conversion, spontaneous delivery occurred in two—one as vertex and the other as face. Forceps extraction was done in six cases of vertex and one case of face presentation, with one neonatal death in a multipara in the former group.

Lower-segment caesarean section was performed in 13 cases (37.1%), including a case of failed forceps. There was only one stillbirth—in a case of obstructed labour admitted with inaudible foetal heart sounds.

Internal podalic version and breech extraction was performed in two cases and one infant died during delivery. Craniotomy was done in one case only. As already mentioned, extraction of the perforated head was carried out in one case. In two cases admitted with ruptured uterus subtotal hysterectomy was performed with good result.

Mortality

Two maternal deaths occurred in this series (5.7%). One multipara died after craniotomy, the post-mortem examination revealing rupture of the lower uterine segment. In the other case sudden death occurred in a primigravida on the third day of unaided vaginal delivery as a brow presentation. No necropsy was done in this case.

There were eight stillbirths and one neonatal death, the uncorrected perinatal mortality being 25.7% (Table I). If, however, five cases admitted with a dead foetus and one case of congenital foetal anomaly are excluded the corrected perinatal mortality becomes 8.5%.

Discussion

Antenatal diagnosis of brow presentation is rare and is possible only by radiograph, which is usually taken for some other reason. When diagnosed, correction by posture and pad (Titus, 1950) and by Thorn's manoeuvre has been suggested even in early labour (Moir, 1956). But I have had no experience of these measures, and in none of the papers studied is there any mention of personal experience of them. It appears, however, that they are unlikely to be successful in primary brow presentation. In these cases exclusion of contracted pelvis is essential, especially in primigravidae, and in multigravidae with a bad obstetric history. They should be admitted at least two weeks before term and elective caesarean section should be done even in suspected cases of contracted pelvis. In others, waiting for spontaneous onset of labour pains, under close observation, seems justified.

Delivery as brow presentation is seldom possible according to MacLennan *et al.* (1955), and there is no difference of opinion on this point. Moir (1956) states that posterior brow delivery is impossible, whereas in anterior brow it is rarely possible when the baby is small, where the pelvis is big, or where there is a congenital deformity of the infant. In this series one baby weighing 5 lb. 13 oz. (2,636 g.) was delivered spontaneously as anterior brow in a primigravida. Morris (1953) noted two such cases, the birth weight of the babies being 5 lb. 8 oz. (2,495 g.) and 7 lb. 10 oz. (3,458 g.). No other author specified delivery as brow amongst cases delivered spontaneously.

Vaginal delivery after spontaneous conversion is, however, not so rare. Table IV shows the reported incidence, varying from 9.1% (Tancer and Rosanelli, 1957) to 74% (Posner *et al.*, 1957). Eastman (1956) quotes Fink's figure of 43%, while Greenhill (1955) mentions that in 30 to 40% of cases spontaneous conversion to vertex or face is possible. Posner *et al.* (1957) noted that three infants who weighed more than 9 lb. (4,082 g.) were all delivered naturally. In the present series five infants, including two premature, were delivered unaided—four within 19 hours of onset of labour pains and one within 28 hours. Although Arthure (1957) reported a case where the brow presentation underwent conversion within the pelvis—a similar occurrence was noted in one case of this series—in almost all cases it occurs at or above the pelvic brim. Therefore, even if spontaneous correction does not occur in the majority of cases, it appears worth while to adopt an attitude of watchful expectancy for the first 24 hours of labour in a case where the pelvis is normal and the head is not engaged.

There is an increasing tendency to ignore the place of manual conversion in the treatment of brow presenta-

tion mainly because it is a difficult manoeuvre and is often unsuccessful. Posner *et al.* (1957) decided against manual conversion because its occasional success is outweighed by the high rate of unaided vaginal delivery and by the complications that may arise in the attempt, although they do not mention what these complications might be. Morris (1953) prefers caesarean section, especially in primigravidae, because of the high rate of failure in conversion. Arthure (1957) considers manual conversion above the brim inadvisable because it is often unsuccessful and is associated with a high rate of foetal mortality.

The conclusions drawn from the present analysis, however, do not support the above views. Conversion was successful in all the nine cases where it was attempted. There was no stillbirth, although one mature infant died after a mid-forceps delivery. According to the results of this series, therefore, manual conversion seems to be a safe manoeuvre in cases where spontaneous correction does not occur within 24 hours of labour and where the pelvis is normal and the head is not engaged.

All authors, with the exception of Madden (1956) and Posner *et al.* (1957), have reported a high rate of caesarean section in brow presentation, but only Skalley and Kramer (1960) have given definite indications for the operation. In the present series, out of 13 cases of caesarean section, brow presentation itself was the indication in two only. In the remainder there were other reasons, such as contracted pelvis, foetal distress, and obstructed labour. Only one stillbirth occurred in a case admitted with obstructed labour and a dead foetus. In spite of this satisfactory result from a foetal point of view, the treatment of brow presentation by caesarean section is not justified in all cases. Waiting for spontaneous conversion and manual conversion with or without forceps delivery in selected cases is likely to give a satisfactory overall foetal salvage rate without further increasing the caesarean section rate. If, however, spontaneous correction does not occur within 24 hours of onset of labour pains and manual conversion fails, caesarean section should not be withheld. Caesarean section is also indicated in a case where the brow is engaged, because the chances of natural delivery are remote and manual conversion in the pelvis is unlikely to be successful.

In this series craniotomy has not given satisfactory results. One multigravida died owing to rupture of the lower uterine segment after craniotomy. This indicates that, while the value of craniotomy in selected cases of brow presentation cannot be contested, caesarean section is often a safer procedure even when the foetus is dead. Internal podalic version and breech extraction should have no place in the management of brow presentation. This is so not only because of the associated high rate of foetal wastage and risk of uterine rupture but also because in cases where internal podalic version seems possible manual conversion would be a safer and easier procedure.

Summary

Thirty-five consecutive cases of brow presentation that occurred in Chittaranjan Seva Sadan College between April, 1953, and January, 1961, have been analysed. The incidence was 1:1,718.

Excluding multiparity, no cause was found in 40% of cases. Primiparity, contracted pelvis, and big infants were thought to be significant causes.

Spontaneous vaginal delivery without any intervention occurred in six cases (17.1%), with one stillbirth. Brow presentation was converted manually in nine cases (25.7%), and one early neonatal death occurred after a mid-forceps delivery. Lower-segment caesarean section was performed in 13 cases (37.1%). There was no foetal loss in 12 cases admitted with audible foetal heart sounds.

Maternal mortality and corrected perinatal mortality were 5.7% and 8.5% respectively.

Management of brow presentation has been discussed.

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ABO GROUPS AND RH GENOTYPES IN THE ELDERLY

BY

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The following series is reported in the hope that it will contribute something to the present picture about blood groups and disease associations, and perhaps help towards planning further work.

The study was started after a survey of ABO groups and Rh genotypes in paternal grandparents in cases of haemolytic disease of the newborn, a specially selected group of people in whom certain deviations in the proportions of ABO groups and Rh genotypes were expected. The differences which occurred, however, could not all be explained on this score, and it seemed desirable to investigate whether age selection was having an effect. Hence this study of other elderly persons was undertaken; but as certain disease associations with ABO groups had been reported it was decided to compare a group of in-patients in geriatric units with a healthy elderly group.

Material

In all, 633 persons over 64 years of age were tested. Investigations of 497 samples were made between April and July, 1958, and all patients available in the wards at the time of testing were used to form a "geriatric group" representative of the usual diseases of the elderly. The "healthy group" were mainly active members of "Over 60s" clubs, but a few were healthy donors who had been "retired" because they had reached the age of 65 years. An additional 136 persons were tested in July, 1959, to confirm the findings or otherwise, and as the same difference in blood-group proportions was apparent the results have been pooled.

The sex, age ranges, and mean ages were as follows:

Geriatric patients	{ 184 males ..	65-93 years.	Mean age 75.1 years
	{ 168 females ..	65-104 ..	" " 76.4 "
Healthy elderly persons	{ 125 males ..	65-89 ..	" " 71.6 "
	{ 156 females ..	65-82 ..	" " 70.7 "

The geriatric cases were placed rather arbitrarily into broad categories according to the recorded diagnoses, the miscellaneous group comprising all

conditions with fewer than three cases. Table I shows the wide range of illnesses, and the similarity in this respect between the male and female patients.

TABLE I.—Recorded Diagnoses and ABO Groups of 352 "Geriatric Cases"

	Male	Female	O	A	B	AB
Carcinoma	21	16	22	12	3	—
Congestive cardiac failure ..	16	16	17	11	3	1
Anaemia and blood diseases ..	7	12	11	6	2	—
Fractures	4	11	10	4	1	—
Coronary thrombosis	14	9	12	9	2	—
Cerebral thrombosis and hemiplegias ..	19	19	17	14	4	3
Bronchitis, pneumonia, etc. ..	16	8	9	11	2	2
Arteriosclerosis	4	12	10	3	2	1
Pernicious anaemia	—	6	4	2	—	—
Gall-bladder conditions	3	6	5	3	1	—
Arthritis	4	3	1	5	1	—
Diabetes	6	5	5	5	1	—
Haematemesis	7	4	5	4	2	—
Genito-urinary conditions ..	27	4	14	10	6	1
Miscellaneous (including disseminated sclerosis, senility, etc.)	32	36	37	22	6	3
Not recorded	4	1	1	4	—	—
Totals	184	168	180	125	36	11

The Rh genotype tests were performed using the four more common anti-Rh sera, and anti-e where necessary. Certain "expected errors" occur within different Rh genotype groups owing to the absence of anti-d serum, and these are dealt with later. As regards technical errors, identical Rh testing-sera, carefully checked for specificity, were used in the two groups of cases.

Results

ABO Groups

Among the group A and AB individuals the proportion belonging to the subgroup A₂, 22% in the geriatric group and 19% in the healthy group, was as expected. Table II shows the ABO distribution. There are no real differences between females in the geriatric and healthy groups. Among the males, however, there is a decrease in group O and an increase in group A in the healthy group compared with the geriatric group which is significant ($\chi^2_{(1)} = 5.165$, $P < 0.025$).