

Undiagnosed Breech in Banbury: A Study of Undiagnosed Breech at a District Hospital Maternity in Banbury, Oxford Radcliffe Hospitals NHS Foundation Trust, Oxfordshire, United Kingdom

Abstract

Aims and Objectives: The aim of this study was to evaluate the prevalence and management of undiagnosed breech, relating our figures with the national statistics, comparing our management with "standard" and to see if there could be any benefit from introducing additional intervention(s) to enhance breech detection. The author was also interested in finding out if there could have been any associated co-morbidity which could have contributed to failure to diagnose breech and whether relevant co-morbidities were born in mind or noted during clinical assessment of these women.

Methods: This is essentially a retrospective study of deliveries at the Horton Hospital Maternity Unit for a 12 month period, covering the period of October 2003 to September 2004. Delivery summaries of all deliveries were systematically studied twice for consistency. Case notes of breech deliveries were also reviewed twice. Cases of undiagnosed breech deliveries were clearly identified and studied in greater detail.

Results/Conclusion: Cases of diagnosed breech were 64, which was 83.1% of the total breech births and 4.12% of the total annual birth. Cases of undiagnosed breech were 13, which was 16.88% of total annual breech deliveries and 0.84% of total annual birth. Interestingly, majority of the diagnoses of undiagnosed breech were made during first stage of labour and most of the women had spent hours with staff and each had 2 or more clinical examinations before discovery was made. There was no diagnosis of undiagnosed breech in women with body mass index (BMI) of 40 kg/m² or higher. As shown in Table 3, contrary to author's expectation, most cases were diagnosed in women with normal BMI (61.54%).

Co-morbidities like uterine anomaly, polyhydramnios, large fibroids and pelvic mass were not apparent from the study. Most cases (61.54%) of undiagnosed breech were made in primigravida and most cases of undiagnosed breech (61.54%) were delivered by emergency caesarean section. There was no significant impact on maternal morbidity and short term neonatal outcomes. The author's view is that this study could rekindle the argument that trends of misdiagnoses should ideally prompt reviews rather than few spikes in misdiagnoses, in some aspects of obstetric care. However, one cannot deny the knowledge and reassurance from such reviews prompted by few spikes in misdiagnoses.

Keywords: Pregnancy; Breech; Undiagnosed breech; Horton hospital maternity

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Introduction

In September 2004, there were three cases of undiagnosed breech which occurred in succession over a few days. These were subsequently highlighted and reviewed at the interdepartmental Clinical Grand Rounds. This prompted a review of the situation which led to this study (audit).

Breech presentation is defined as when the buttock of the fetus occupies the lower uterine segment (or the pelvis) and the head occupies the fundus, when the fetal lie is longitudinal. It is the commonest form of mal-presentation of the fetus [1]. Undiagnosed breech occurs when breech is not diagnosed during the antenatal period. About 40% of babies are breech at 20 weeks gestation,

20% at 28 weeks gestation and 3% at term [1]. At the time of this study, the types of breech were stated as frank or extended, estimated at 6%, mostly in multiples; complete or flexed (10%), mostly in primigravida and footling breech (5-20%), which may be unilateral (25%) or bilateral [1]. Predisposing factors for breech presentation (maternal and fetal) include contracted pelvis, bicornuate uterus, fibroids, placenta previa, polyhydramnios, oligohydramnios, spina bifida and hydrocephalus. Inability or failure to detect breech presentation may be due to maternal obesity, multiple pregnancy, polyhydramnios, late version, obstetric inexperience and less frequent antenatal care. Some factors like fibroid uterus and multiple pregnancy, which predispose to breech presentation may also lead to failure to

detect breech presentation.

Materials and Methods

This is a retrospective study of deliveries at the Horton Hospital Maternity Unit for a 12 month period, covering October 2003 to September 2004. Delivery summaries of all deliveries were systematically studied and reviewed, and case notes reviewed twice in all cases of breech deliveries.

Data from Information Technology Department was requested, reviewed and compared with data from the maternity to ensure consistency and that nothing was missed. There was detailed review of cases identified as undiagnosed breech in discharge summaries and cases. A case report form shown below was prepared to aid the study. More detailed demographic data on cases of undiagnosed breech was collected and analysed. Conversion (feet to centimetre) and calculation of some demographic characteristics like body mass index (BMI) were undertaken. The author had assistance from Horton Hospital Postgraduate Centre on research methodology and data presentation. Data from the National Statistics and Planning Officer, Cherwell District Council, Oxfordshire, United Kingdom, was collected and analysed. Extensive literature search was conducted for comparative analysis and for review of relevant literature. There was liaison with the Clinical Audit Department, John Radcliffe Hospital, Oxford, United Kingdom.

Current Practice

The usual early pregnancy scan and anomaly scan were performed but these are not relevant for breech presentation. The author noted that these scans may reveal known or unknown co-morbidities like large fibroids, pelvic mass, uterine anomaly, polyhydramnios, hydrocephalus, etc. The author also noted that breech presentation is not important before 36 weeks gestation unless the woman is in labour. Antenatal booking data and records may reveal co-morbidities like obesity, nervousness, uterine anomaly, spina bifida. Early third trimester scan was not routine but for cases where there were concerns in the first and second trimesters like twins, growth restriction, etc, and thus breech presentation may be part of other findings in these situations.

Abdominal palpation is usually performed and in cases where there were concerns for instance; not feeling the fetus in the pelvis on abdominal palpation, a presentation scan would be performed. The practice is dependent on skills training, experience of the attending staff and whether during the assessment, the attending staff recognised or realised the interplay of relevant co-morbidities which may be in existence. This is where the undiagnosed breech comes in. Observing current practice was performed retrospectively by collating information from case notes. It is possible there were things that were done but not recorded for which the author recognised as possibility but would not want to speculate.

Standard Practice

From medical literature, our practice appeared to reflected standard practice but the author noted that centres with more skilled staff and who have rigorous screening methods in place are likely to have lower incidence of undiagnosed breech. The author additionally noted that external cephalic version (ECV) in

early labour was stated to have a success rate of 3-40% in earlier literature [1]. However, currently, Collins S et al. [2], stated a success rate of 50%. ECV in early labour was not performed in our unit at the time of the study and no reason was given for this practice.

Results/Findings

The total number of deliveries from October 2003 to September 2004 was 1554. This is consistent with the annual delivery rate at the Horton Hospital Maternity. The total number of women delivered with breech was 72 and a total of 77 babies (4.95%) were breech deliveries (cf 3-4%). Cases of diagnosed breech were 64 (83.1%) of the total breech birth and is 4.12% of the annual birth. Cases of undiagnosed breech were 13 (16.88%) of total annual breech deliveries and 0.84% of total annual birth. The total population of Banbury in 2001 National Census was 41,802 [3]. Males were 20,455 and Females were 21,347 (including female children). However, this hospital serves patients from other communities other than Banbury. The prevalence of undiagnosed breech in women of child bearing age (15-49 years) is therefore a bit difficult to calculate but estimated to be around 6/10000+/-SD.

Additionally in about 3 cases, the diagnoses were not consistent with other details of the management given. There was a case of caesarean section for undiagnosed breech recorded as spontaneous cephalic version in delivery summary, most likely the mistake of a tired staff. 5 cases (38.46%) of breech presentation were simply recorded as mal-presentation. Few surgical notes were only partially completed and in some cases were left blank. In few patients, the height and weight were not recorded. Few records were done retrospectively but still could not be followed by the author for a better understanding of what happened.

There was a case of the diagnosis of undiagnosed breech at second stage of labour, the woman having gone through the first stage of labour in the unit. Other salient or interesting findings include:

- Diagnoses in advanced first stage of labour (cervical dilatation of 7-8cm) in birthing pool involving 2 women (15.38%) and 1 woman (7.69%) at second stage of labour in the birthing pool.
- 3 women (23.08%) were admitted in second phase of first stage of labour, 2 women (15.35%) were at the stage of cervical dilatation of 6-7cm and 1 woman (7.69%) was at cervical dilatation of 4-5cm.
- 2 women (15.38%) were moderately obese and this may or may not have contributed to the missed diagnoses.

Majority of diagnoses were made at first stage of labour and records showed most of the women spent hours with staff and each had 2 or more clinical examinations before the discovery was made. No diagnosis was made in any woman with BMI of 40kg/m² or higher. Co-morbidities which may contribute to late diagnosis like uterine anomaly, polyhydramnios, large fibroids and pelvic mass were not apparent from the study and thus unlikely to have made an impact on the cases of missed diagnoses.

In 1 woman (7.69%), the diagnosis was made during induction of labour. Most of the cases (61.54%), of undiagnosed breech were made in primigravidas. Most cases, 9(69.23%) were delivered

by caesarean section (emergency; 8 cases, 61.54% and elective, 1case, 7.69%).

Discussion/Conclusion

Articles published after this study had similar statistics on incidence of breech namely that the incidence of breech presentation decreases from about 20% at 28 weeks of gestation to 3-4% at term, as most babies turn spontaneously to the cephalic presentation [4]. Breech presentations are mostly diagnosed during the antenatal period but sometimes they are diagnosed in early or established labour as this study found out. Many Obstetricians clearly disagree on whether a vaginal birth or a caesarean section is most appropriate way to manage a breech presentation. ‘The term breech trial’ by Hannah et al. [5] showed that a surgical delivery by way of caesarean section was less hazardous for the baby compared to vaginal birth for cases of uncomplicated term breech presentation. However, some scholars

claimed the study was flawed and called for its recommendations to be withdrawn [6], despite this study having substantially influenced obstetrics practice and policies according to Steen & Kingdon [7], for over a decade.

Tables 1-8 below, illustrate the main study findings and had been designed for ease of understanding and referencing. In Table 6, it can be seen that most cases of undiagnosed breech (61.54%) were delivered by emergency caesarean section and most cases of breech occurred in primigravidas. In Table 7, maternal morbidity measured by duration of hospital stay, shows that most cases (38.45%) spent 3 days in hospital. When this was compared with the fact that most cases were delivered by emergency caesarean section, then, it became clear that there was no significant deviation from what was expected. Short term neonatal outcomes in Table 8, measured by Apgar scores at 5 minutes, showed that majority of neonates (61.54%) had very good scores of 9 at 5 minutes.

Table 1: Maternal age (in years, top) and parity (0-3, bottom).

Maternal Age					
<20	21-25	26-30	31-35	36-40	>40
2 (15.38%)	3 (23.08%)	5 (38.46%)	0	3 (23.08%)	0
Parity					
0	1	2	3		
8 (61.54%)	5 (38.46%)	0	0		

Table 2: Body Mass Index (kg/m², top) and Gestation (in weeks, bottom).

Body Mass Index						
<20	21-25	26-29	30-39	40+		
0	8(61.54%)	3 (23.08%)	2 (15.38%)	0		
Gestation						
35wks	36wks	37wks	38wks	39wks	40wks	40+wks
0	0	1(7.69%)	3 (23.08%)	4 (30.77%)	4 (30.77%)	1(7.69%)

Table 3: Baby weight (grams).

Baby Weight						
<1500	1501-2000	2001-2500	2501-3000	3001-3500	3501-4000	>4000
0	0	0	3 (23.08%)	7 (53.85%)	1(7.69%)	2 (15.38%)

Table 4: Method of Diagnosis/confirmation.

Vaginal examination	Vaginal examination+Scan	Abdominal palpation+Scan	Scan only	Abdominal palpation+vaginal examination	At caesarean section
3 (23.08%)	5 (38.46%)	3 (23.08%)	1(7.69%)	0	1(7.69%)

Table 5: Stage in labour at the time of diagnosis.

Antenatal period	1 st phase of 1 st stage of labour(cervical dilatation of 0-4cm)	2 nd phase of 1 st stage of labour(cervical dilatation of 5-9cm)	2 nd stage of labour (cervical dilatation of 10cm)	Caesarean section
0	7 (53.85%)	3 (23.08%)	1(7.69%)	1(7.69%)

Table 6: Mode of delivery.

Emergency Caesarean Section	Elective Caesarean Section	Vaginal Delivery	Vaginal Instrumental Delivery
8(61.54%)	1(7.69%)	3 (23.08%)	1(7.69%)

Table 7: Maternal morbidity (duration of hospital stay in days).

Maternal Morbidity				
1	2	3	4	5
2 (15.38%)	1(7.69%)	5 (38.46%)	3 (23.08%)	2 (15.38%)

Table 8: Neonatal outcome (average apgar score at 1 and 5 minutes)

Neonatal Outcome				
<6	7	8	9	10
0	1(7.69%)	2 (15.38%)	8(61.54%)	2 (15.38%)

Table 9: Proforma/Case Report form.

Name	Hospital number	Mother's Age	Gestation In weeks	Birth weight	How diagnosis was made	Stage of labour diagnosis was made	History of breech	BMI	Other factors	Induction of labour	Delivery	Parity	Apgar score	Hospital stay

The fact that majority of cases (53.85%) were diagnosed in the first phase of first stage of labour (Table 5), may have contributed to the less maternal morbidity (Table 7) and good neonatal outcomes, (Table 8). Table 9 above is the pro forma or case report form used to study each case of undiagnosed breech. However, breech detected at 35-37 weeks of gestation allows time for a planned caesarean section or ECV. Undiagnosed breech in labour may therefore suggest unskilled antenatal care; lack of antenatal care especially in cases of concealed pregnancy or other forms of non-attendance for antenatal care. Undiagnosed breech can put unexpected strain on staff and resources, the extent of this strain vary with the skills and abilities of staff, and the available resources in the unit. 53.85% of women were in early labour at the time of diagnosis but none was offered ECV. It is possible that Obstetricians were not aware it was an option or simply did not want to offer it at first stage of labour for no stated reason.

In cases where the affected unit cannot cope with the pressures, the woman may be transferred to another unit with possible consequent perinatal risks of fetal and maternal morbidity or mortality including poor apgar scores for the newborn and longer hospital stay for the mother. The affected mother also loses the opportunity for and benefits of a planned ECV.

A woman who had been informed that her baby was cephalic presentation, had gone into labour and later told her baby was undiagnosed breech and that she needed delivery by emergency caesarean section, would likely be upset and distressed. Early diagnosis of breech at or after 36 weeks gestation, and opting for an elective caesarean section leads to less maternal and fetal morbidity compared to undiagnosed breech in labour and subsequent emergency caesarean section.

In a more recent literature, Collins S et al. [2], stated that extended breech was 70%, flexed breech, 15% and footling

breech (one leg flexed and one extended), 15%, and that breech presentation was commonly undiagnosed before labour in 30%. However, in 2004, we recorded incidence of 16.88% for undiagnosed breech. At that time, there was "clinical furor", a lot of clinical frenzy and anxieties about the 3 consecutive diagnoses of undiagnosed breech within a week or so. We thought that the incidence of undiagnosed breech was high in our unit and there must be something we could change about our antenatal care to reduce the incidence.

However, other studies have incidence of undiagnosed breech as follows; 21% for Leung et al. [8], 26% for Nwosu et al. [9], 12.9% for Babay et al. [10] and 5.4% for Usta et al. [11]. Another thought-provoking article showed that significant cases of undiagnosed breech were still possible despite rigorous antenatal surveillance, Nwosu et al. [9]. There was no significance difference in maternal and neonatal outcomes and in the incidence of caesarean section [9-11].

Another study, although stating there was no significant difference in maternal outcomes between caesarean section and vaginal delivery, had argued that vaginal delivery was associated with excess neonatal morbidity and mortality [12]. Some risk factors have been noted as purely independent e.g. footling breech, hypertension, or failure to attend antenatal care. This study found out that the stage of diagnosis of undiagnosed breech in labour is influenced by the stage of admission in labour. Undiagnosed breech appears to suggest we need to improve our skills and ability to diagnose breech during the antenatal period or in early labour. Vaginal delivery was more common in cases of undiagnosed breech, 46%, compared with the diagnosed group of breech, 26%, in Leung et al. [8]. The same view was shared by Nwosu et al. [9]. Undiagnosed breech is more likely to deliver vaginally in 42% of cases compared with the diagnosed breech

in 11%, according to Leung et al. [8]. The same view was again shared by Nwosu et al. [9].

The author noted that factors such as large uterine fibroids, uterine anomaly, polyhydramnios, and past history of breech were not observed in the cases reviewed during the study. These factors in the opinion of the author could make diagnosis of undiagnosed breech more difficult. This study though limited by the number of women involved, provided insight to one of the puzzles in obstetric care. For instance, it is commonly for an obstetric team to raise alarm thinking it may not be doing well regarding diagnosis and management of breech presentations, only to discover following audit or review that its practice was not far from acceptable standards. The author's view is that this study could rekindle the argument that trends or patterns of misdiagnoses should ideally prompt a review or audit rather than a few spikes in misdiagnoses. However, one cannot deny the knowledge and reassurance from such reviews or audits prompted by such spikes in misdiagnoses.

Recommendations

- i. Confirmation of presentation by portable scan if available, in women undergoing induction of labour or vaginal birth in the birthing pool, especially when there is doubt of fetal presentation or when co-morbidities co-exist as stated earlier.
- ii. More rigorous emphasis to be placed on antenatal detection so that women can be offered ECV or planned elective caesarean section.
- iii. More emphasis be placed on women with obvious or known co-existing co-morbidity for instance obesity, uterine fibroid, pelvic mass, etc. Legible and clear documentation to be made at all times on management.
- iv. Type of presentation if breech should be clearly stated as "breech" rather than "malpresentation" as the latter is non-specific and does not give a clear understanding of the type of fetal malpresentation.
- v. The type of breech should be clearly stated because the type of breech has clinical significance.
- vi. Documentation audit is strongly recommended to assess whether staff take documentation seriously, because of its clinical and medico-legal significance.
- vii. ECV can be offered in early labour if no contra-indication existed.
- viii. Re-audit in one year to compare this study with the next one and with the possibility of closing the audit loop if appropriate.
- ix. An audit to assess whether what is stated in delivery summaries matches the delivery events in the case notes.

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- d) Cherwell District Council, Oxfordshire, United Kingdom.
- e) Information Technology, Data Analysis Department, John Radcliffe Hospital, Oxford Radcliffe Hospitals NHS Foundation Trust.

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