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Breech deliveries at Hammerfest maternity ward from 2004–2023 – a retrospective study

ORIGINAL ARTICLE

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Background

Breech presentation occurs in 3–4 % of pregnancies at term and is associated with a higher incidence of neonatal mortality and morbidity. We aimed to examine the mode of delivery and outcomes for breech deliveries at Hammerfest Hospital's maternity ward in the period 2004–2023.

Material and method

We conducted a retrospective review of the hospital's electronic birth database and paper-based birth records for women with a singleton breech presentation, delivered from gestational week 35 onwards.

Results

A total of 151 out of 272 (56 %) women in labour with a singleton breech presentation were selected for a planned vaginal delivery in accordance with the national obstetric guidelines. Of these 151 planned vaginal deliveries, 94 (62 %) resulted in an emergency caesarean section. An Apgar score < 7 at 5 minutes was observed in 1 (2 %) newborn after vaginal delivery, in 5 (5 %) after emergency caesarean section and in 1 (1 %) after elective caesarean section. There were no incidences of severe neonatal morbidity or mortality.

Interpretation

Twenty years of data from Hammerfest's maternity ward support the practice of selecting women for planned vaginal breech delivery. However, due to limitations in the dataset, the findings should be interpreted with caution.

Breech presentation is common in the early stages of pregnancy and occurs in about 25 % of pregnancies at gestational week 28 (1). Most fetuses assume a cephalic presentation prior to term (1). At term, breech presentation occurs in 3–4 % of pregnancies and is associated with an increased risk of fetal morbidity and mortality (2).

The preferred mode of delivery for breech presentation has been the subject of much disagreement in the medical community, even after the Term Breech Trial from 2000, which included 2088 pregnant women with a singleton breech presentation at term from 121 birth centres in 26 countries (3). The women in the study were randomised to a planned caesarean section or planned vaginal delivery. Neonatal mortality and severe morbidity were significantly lower in the planned caesarean group: 17 out of 1039 (1.6 %) versus 52 out of 1039 (5.0 %) for planned vaginal delivery (relative risk 0.33, 95 % confidence interval 0.19 to 0.56) (3). Since then, vaginal breech deliveries have been dramatically reduced worldwide. However, criticism has been levelled at the study's design, methodology and conclusion (4–7). No higher-quality randomised studies are currently available or in progress, but cohort studies, including from Norway, suggest that vaginal breech delivery is safe when recommended selection criteria are followed (8, 9).

In its 2003 report, the Centre for Health Technology Assessment concluded that the Term Breech Trial had several weaknesses and that Norwegian data showed only a minimal increased risk of perinatal/neonatal morbidity with a vaginal breech delivery compared to a planned caesarean section, with almost no difference in long-term outcomes (10). However, caesarean section was linked to an increased risk of maternal complications, and the report concluded that 'vaginal breech delivery at term can still be recommended provided there is rigorous patient selection, careful monitoring during labour and a qualified birth attendant present' (10).

In the Norwegian Society for Gynaecology and Obstetrics' 1998 guidelines on obstetric care, the selection criteria for vaginal breech delivery included at least 34 completed weeks of gestation (and an individual assessment earlier in pregnancy), an estimated birth weight of 2000–4500 grams and the absence of serious obstetric complications or maternal illness. There were also requirements concerning the maternity facility and birth attendants (11). In the current obstetric care guidelines, the selection criteria have been somewhat revised. The weight limit is no longer absolute, and amniotomy and labour induction are now permitted based on standard obstetric indications, regardless of fetal presentation (2).

The aim of this study was to examine the mode of delivery and clinical outcomes for breech presentations at a district hospital in Norway.

Material and method

We conducted a retrospective review of singleton breech deliveries at Hammerfest Hospital's maternity ward. Inclusion criteria were: singleton breech presentation, gestational age ≥ 35 weeks, and delivery in the period 1 January 2004 to 31 December 2023. Births in the ward were identified using the electronic birth database (Partus) and paper-based birth records. Study variables are summarised in Table 1.

Table 1

Information on the patient, fetus, delivery and birth outcomes retrospectively retrieved from the Partus birth database and the paper-based birth records at the maternity ward, Hammerfest Hospital, 2004–2023.

Variables	Registered as
Mother	
Age	Years
Parity	0, 1+
Planned mode of delivery	Vaginal delivery, caesarean section
Attempted external cephalic version	Yes/no
Postpartum bleeding	1000–1500 ml, > 1500 ml, transfusion needed
Injury to the genital tract	T-incision in the uterus, cervical tear, tear with sphincter injury
Evacuated haematoma in the vulva/perineum	Yes/no
Postpartum fever	Yes/no
Postpartum antibiotic treatment	Yes/no
Abscess/haematoma in caesarean section scar	Yes/no

Variables	Registered as
Hospital stay after delivery	Bed days
Fetus/neonate	
Undiagnosed breech presentation	Yes/no
Intrauterine growth restriction	Yes/no
Stillbirth	Yes/no
Neonatal death	Yes/no
Birth weight	< 2500 g, > 4000 g
Small for gestational age	Yes/no
Transferred to neonatal unit	Yes/no
Apgar score < 7 at 5 minutes	Yes/no
Intracerebral or intraventricular haemorrhage	Yes/no
Basilar skull fracture	Yes/no
Fracture of long bones or the clavicle	Yes/no
Brachial plexus injury	Yes/no
Spinal cord injury	Yes/no
Neonatal seizures	Yes/no
Other abnormalities	Yes/no

Data were stored anonymously in the hospital's research database. The results are presented descriptively, with categorical variables shown as absolute numbers and percentages, and continuous variables as a mean value with standard deviation.

The data review was approved as a quality improvement project endorsed by clinical management and recommended by the data protection officer at Finnmark Hospital Trust (2023/0207). It was not submitted to the Regional Committee for Medical and Health Research Ethics.

Results

A total of 281 women in labour were registered with a singleton breech presentation at the maternity ward at Hammerfest Hospital during the study period. Five were not registered as breech in the electronic database, only in the paper-based birth records. Of the 281, we excluded two stillbirths due to other serious causes unrelated to fetal presentation, as well as seven births that took place before week 35.

Of the 272 women included, 156 (57 %) were first-time mothers, while 116 (43 %) had previously given birth to at least one child (see Table 2).

Table 2

Characteristics of women with a singleton breech presentation delivered from 35 weeks' gestation with planned caesarean section or planned vaginal delivery at the maternity ward, Hammerfest Hospital, 2004–23.

	Planned caesarean section *n* = 121 Number (%)	Planned vaginal delivery *n* = 151 Number (%)
Mother's age (years)		
> 30	66 (55)	78 (52)
< 30	55 (45)	73 (48)
Parity		
0	70 (58)	86 (57)
> 1	51 (42)	65 (43)
Attempted external cephalic version	28 (23)	17 (11)

A total of 247 (91 %) women were delivered at term, and 25 (9 %) were delivered between 35 weeks + 0 days and 36 weeks + 6 days. Twenty-one (8 %) breech presentations were undiagnosed before delivery, and 12 (57 %) of these resulted in a vaginal delivery. Figure 1 summarises the planned and actual modes of delivery. A total of 215 (79 %) were delivered by caesarean section and 57 (21 %) by vaginal delivery. A total of 121 (44 %) were delivered by elective caesarean section. The indication for the procedure was maternal request in 55 (45 %) cases, while 60 (50 %) had obstetric indications and 6 (5 %) had other medical indications.

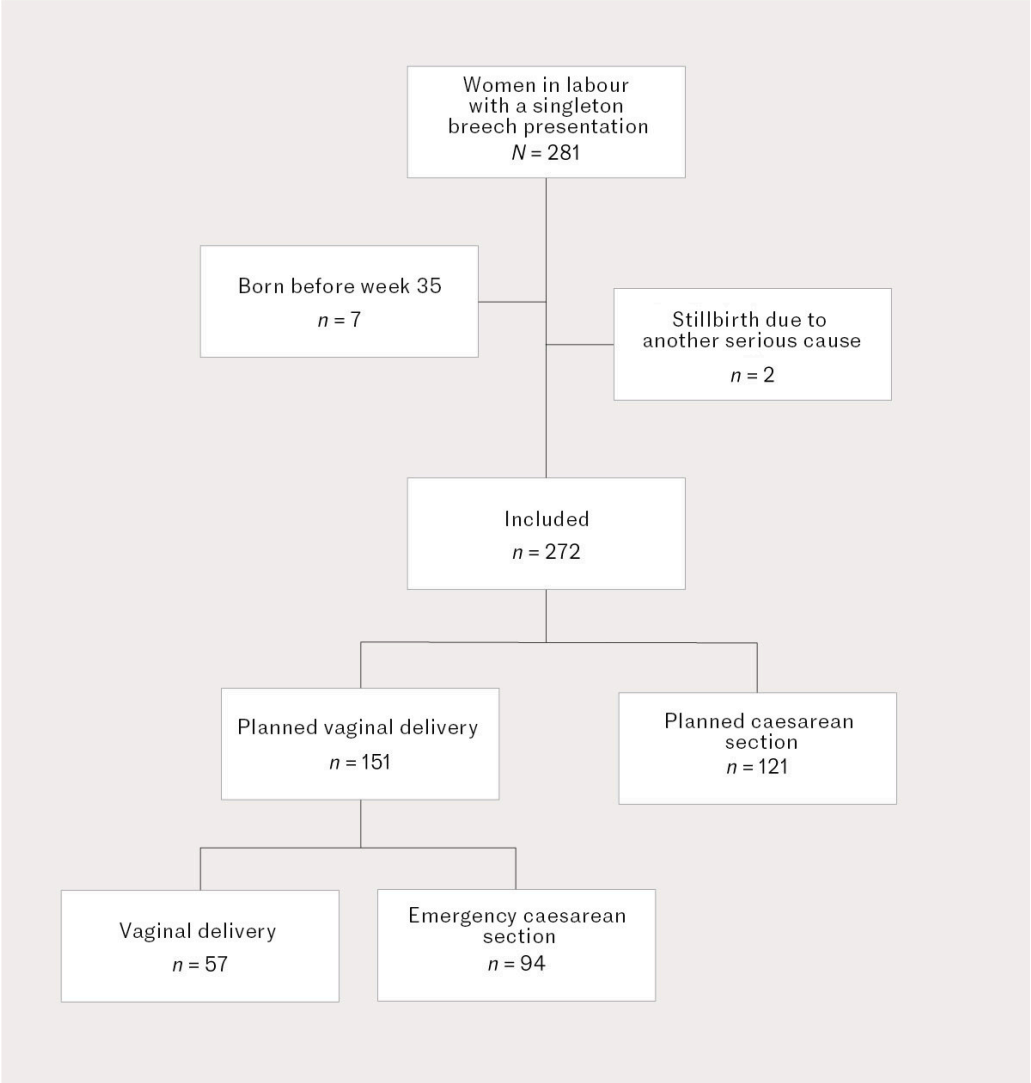

Figure 1 Singleton breech presentation deliveries at the maternity ward, Hammerfest Hospital, in the period 2004–23.

There was no neonatal mortality or severe neonatal morbidity, defined as intracerebral or intraventricular haemorrhage, spinal cord injury, basilar skull fracture, fracture of long bones or the clavicle, brachial plexus injury, or neonatal seizures. Pregnancy and birth complications by mode of delivery are summarised in Table 3. Maternal complications and length of hospital stay by mode of delivery are summarised in Table 4.

Table 3

Pregnancy and birth complications in children born in breech presentation from gestational week 35 at the maternity ward, Hammerfest Hospital, 2004–23, by mode of delivery.

	Elective caesarean section *n* = 121 Number (%)	Emergency caesarean section *n* = 94 Number (%)	Vaginal delivery *n* = 57 Number (%)
Transferred to neonatal unit	5 (4)	10 (11)	5 (9)
Apgar score < 7 at 5 minutes	1 (1)	5 (5)	1 (2)
Intrauterine growth restriction	2 (2)	4 (4)	2 (4)

	Elective caesarean section *n* = 121 Number (%)	Emergency caesarean section *n* = 94 Number (%)	Vaginal delivery *n* = 57 Number (%)
Small for gestational age	0	0	1 (2)
Birth weight			
> 4000 g	12 (10)	13 (14)	3 (5)
< 2500 g	3 (3)	12 (13)	3 (5)

Table 4

Number of bed days, need for antibiotics and peri- and postpartum complications in singleton breech presentation from gestational week 35 at the maternity ward, Hammerfest Hospital, 2004–23, by mode of delivery.

	Elective caesarean section *n* = 121 Number (%)	Emergency caesarean section *n* = 94 Number (%)	Vaginal delivery *n* = 57 Number (%)
Bleeding			
1000–1500 ml	2 (2)	5 (5)	2 (4)
> 1500 ml, transfusion not needed	2 (2)	0	0
Blood transfusion	1 (1)	2 (2)	1 (2)
Injury to the genital tract	0	2 (2)	0
Evacuated haematoma in the vulva/perineum	0	0	1 (2)
Fever	1 (1)	1 (1)	0
Antibiotics	1 (1)	2 (2)	1 (2)
Abscess/haematoma in caesarean section scar	1 (1)	2 (2)	NA
Average number of bed days after delivery (standard deviation)	3.8 (1.5)	4.8 (4.0)	3.0 (1.4)

Discussion

Over a 20-year period, 151 out of 272 (56 %) pregnant women with a singleton breech presentation were selected for vaginal delivery at Hammerfest Hospital, in accordance with Norwegian guidelines, but only 57 (21 %) of the total number of pregnant women with a singleton breech presentation ended up with a vaginal delivery. During the same period, 31 % of all breech presentations in Norway were delivered vaginally, according to data from the

Medical Birth Registry (12). We also found that 121 of the women with a breach presentation (44 %) underwent a planned caesarean section, which is slightly lower than national figures from Bjellmo et al., where 53 % were selected for a planned caesarean section (8).

Elective caesarean sections were almost evenly split between those performed for obstetric reasons and those based on maternal request. A significant number of women were selected for an elective caesarean section based on obstetric indications that no longer apply in the latest obstetrics guidelines, such as narrow pelvis measurements and a reluctance to induce labour in breech presentations. Breech deliveries accounted for 3.4 % of births at Hammerfest Hospital (data not shown), which is in line with the national average in the Medical Birth Registry.

Over the years, the guidelines for obstetric care have become less restrictive regarding vaginal breech delivery, including no longer recommending pelvimetry.

Since 1998, the recommendation has been for childbirth to take place in a maternity ward or women's clinic. In 2014, the guidelines were updated with a recommendation that maternity facilities should have the capability to perform emergency caesarean sections and ensure a paediatrician is readily available. The availability of adequate anaesthesia/analgesia, such as an epidural, pudendal block and preparedness for general anaesthesia, remains mandatory. In 2022, a new point was introduced concerning systematic training of doctors in vaginal breech delivery. (2, 11, 13–16).

In accordance with the guidelines, Hammerfest Hospital has seen a shift toward a higher proportion of vaginal deliveries since 2019. Over the past two years, the proportion of vaginal breech deliveries has been around 50 % (17). Since 2020, the department has sought to ensure a second specialist is present at breech deliveries in addition to the senior consultant on duty, with the aim of enhancing specialists' practical experience. The department provides practical training in breech delivery, including the implementation of the 'Safe Hands' programme by the Norwegian Society for Gynaecology and Obstetrics', for both specialty registrars and senior consultants. We believe this has yielded positive results. In the period 2004–23, only 21 % of all breech presentations ended in a vaginal delivery, and 62 % of those with a planned vaginal delivery resulted in an emergency caesarean section. We interpret this to mean that the threshold was previously lower for converting a planned vaginal delivery into an emergency caesarean section and/or for planning an elective caesarean section.

Adverse outcomes in our study included an Apgar score < 7 at 5 minutes. This was found in six infants (4 %) planned for vaginal delivery. One infant (0.8 %) had an Apgar score < 7 at 5 minutes after elective caesarean section. These figures are in line with international data (3.0 % and 0.9 %) (3) and with a similar study from Nordland Hospital in Bodø (2.8 % and 0 %) (9). During the same period (2004–23), a total of 1.8 % of all children born in Norway had an Apgar score < 7 at 5 minutes (12). There does not therefore appear to be a significantly higher risk of a low Apgar score with a vaginal delivery or planned

caesarean section for breech presentation at Hammerfest Hospital's maternity ward. However, for emergency caesarean sections, the numbers may indicate a potentially higher risk.

No mortality or severe birth-related morbidity was recorded for the newborns, either after caesarean section or vaginal delivery. Nationally, just over 10 % of newborns are admitted to a neonatal unit on average (18). In our data, 4 % of babies born by elective caesarean section, 11 % by emergency caesarean section and 9 % by vaginal delivery were admitted to a neonatal unit. Criteria for transfer to a neonatal unit likely vary between hospitals. Regardless of mode of delivery, breech deliveries at Hammerfest Hospital remain at or below the national average for neonatal unit admissions.

In a recently published study from Södersjukhuset in Stockholm, outcomes were examined for 1067 women with a singleton breech presentation at term (19). They found that infants in the group with a planned vaginal delivery had significantly higher neonatal morbidity based on a composite outcome measure compared to the group with a planned caesarean section (3.1 % vs. 0.7%; odds ratio 4.44, 95 % confidence interval 1.48 to 13.34). There was no difference in the number of infants transferred to a neonatal unit or in the mortality rate. Twenty-one per cent were selected for vaginal delivery, compared to 56 % in our data. Since the Term Breech Trial, the number of vaginal breech deliveries has also seen a substantial decrease in Sweden. The study itself suggests that the historically low number of breech deliveries in Sweden may have impacted on outcomes.

From 2024, the national clinical guidelines for maternity care (20) strongly recommend that vaginal breech deliveries take place at a women's clinic. Hammerfest Hospital has a paediatric department with a neonatal unit and a paediatrician on duty who attends breech deliveries, while the nearest women's clinic is the University Hospital of North Norway in Tromsø. The guidelines permit maternity wards that consider themselves competent to manage conditions normally handled by a women's clinic to confirm this with the obstetrician with clinical responsibility at the women's clinic. Hammerfest Hospital documented and formalised this in a regional selection procedure during the study period.

Although our study population is small, the data span a long period of time. The absence of severe adverse neonatal outcomes in our study does not rule out a potential risk. The weakness of the study is the limited dataset, while the strength is the comprehensive data available for each case.

The national obstetrics guidelines recommend vaginal breech delivery if the selection criteria are met. Our results from the maternity ward at a Norwegian district hospital support this approach but must be interpreted with caution due to the limitations of the data.

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