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PLACENTA PRAEVIA: DIAGNOSIS AND MANAGEMENT

1. Aim and introduction

Placenta praevia describes the condition where the placenta precedes the leading pole of the fetus by encroaching to a variable extent on the lower uterine segment. It complicates approximately 1 in 200 pregnancies,[1] is associated with a maternal mortality rate of approximately 0.03% in the developed world[2] and accounted for three maternal deaths in the most recent Confidential Enquiries into Maternal Deaths.[3] Both maternal and fetal morbidity and mortality are much worse in developing countries, largely due to complications of haemorrhage and prematurity,[4,5] demonstrating the high demands placed on health resources by this condition. Consensus views as to how we should manage and audit these cases, especially in the face of a rising incidence of placenta praevia and its complications,[3,6] are therefore considered important. The purpose of this guideline is to address the methods of diagnosing placenta praevia and its clinical management in both the antenatal and peripartum periods.

Placenta praevia exists when the placenta is inserted wholly or in part into the lower segment of the uterus. If it encroaches on the cervical os it is considered a major or complete praevia; if not, then minor or partial praevia exists. This diagnosis has evolved from the original clinical I–IV grading system and is determined by ultrasonic imaging techniques, relating the leading edge of the placenta to the cervical os and the leading fetal pole. Management decisions for women with placenta praevia are based on clinical and ultrasound findings.

2. Identification and assessment of evidence

The Cochrane Library and the Cochrane Register of Controlled Trials were searched for relevant randomised controlled trials (RCTs), systematic reviews and meta-analyses relating to placenta praevia. A Medline search was also carried out. The last search was performed in April 2000. The searches were performed using relevant MeSH terms, including all subheadings. This was combined with a keyword search using: human; female; placenta praevia; placenta accreta; placenta percreta; placental diseases; pregnancy complications; uterine haemorrhage; caesarean section; hysterectomy; embolisation.

The majority of publications on placenta praevia are retrospective studies, case reports and reviews, with a paucity of prospective studies and randomised trials or meta-analyses.

3. Diagnosis

A **Transvaginal ultrasound is the diagnostic technique of choice for placenta praevia. It is safe and is more accurate than transabdominal ultrasound in locating the placenta.**

Numerous prospective observational trials have used transvaginal ultrasound (TVS) to diagnose placenta praevia and none has experienced any haemorrhagic complications, confirming its safety.[7–11] Only one RCT exists[12] comparing transabdominal scan (TAS) and TVS for placenta praevia and supports this safety profile.

Evidence Level Ib

In the second trimester, TAS are associated with very high numbers of false positive diagnoses for placenta praevia, with some series reporting a low-lying placenta in up to 25% of women.[13] Although third trimester scans can improve on this, they are still associated with significant errors.[7] TVS can improve on this diagnosis. In the second trimester, 26–60% of cases diagnosed by TAS are reclassified as not placenta praevia by TVS.[8,10] In the third trimester, TVS changed the TAS diagnosis of placenta praevia in 12.5% of 32 women.[7] Leerentveld *et al.*[9] demonstrated high levels of accuracy of TVS in 100 women suspected of having placenta praevia (sensitivity 87.5%; specificity 98.8%; positive predictive value 93.3%; negative predictive value 97.6%). The only randomised trial of this, which investigated 38 women in total, again demonstrated superior views with TVS compared to TAS, especially for the posteriorly situated placenta, with the additional benefit of reduced scanning time.[12]

Evidence Level 1b

Magnetic resonance imaging (MRI) has been reported in the diagnosis of placenta praevia where TAS images have been unsatisfactory.[14] MRI has the advantage of being possible without a full bladder and, being an objective test, it removes operator error. It is particularly useful in imaging a posterior placenta[14] but has not been subject to comparison with TVS and can only be recommended for use in a research context at this stage.

4. Antenatal management

A **Inpatient management is still appropriate for women with major placenta praevia in the third trimester. Any home-based care for such women should be conducted within the context of a clinical trial.**

A Cochrane systematic review (last updated August 1999)[15] explored RCTs of interventions for placenta praevia. There were only three trials: one compared hospital versus home care[16] and two investigated the use of cervical cerclage.[17,18] The trial by Wing *et al.*[16] compared 26 women allowed home with 27 women kept in hospital and the only significant difference was a reduction in hospital stay. This small study is underpowered to answer any questions on safety.

Evidence Level Ib

Retrospective reviews have been performed demonstrating that the outcomes of women with placenta praevia are variable and not always predicted by antenatal events,[19,20] although women with placenta praevia who have bled tend to deliver earlier.[19,21] Two other retrospective case-note reviews have assessed the outcome of a total of 86 women managed expectantly at home compared with 90 managed as inpatients.[22,23] In both studies, decisions for care in the community were made on clinical grounds (unspecified) and neither study showed a significant difference in clinical outcomes, although outpatient care was associated with reduced hospitalisation and cost.

Evidence Level III

In terms of the timing of antenatal admission during the third trimester for those women with major placenta praevia who have not bled, there is no evidence to dictate at what gestation this should occur, if at all. Current practice is variable, with conservative policies admitting women at around 34 weeks of gestation, while others are left till much later and some units only admit for delivery. The current view from the Royal College of Obstetricians and Gynaecologists is that managing such women at home for the entire pregnancy should be carefully monitored within the context of a clinical trial.

✓ **Prior to delivery, all women with placenta praevia and their partners should have had antenatal discussions regarding delivery and possible blood transfusion requirements and any objections or queries dealt with effectively.[3]**

✓ **Decisions regarding blood availability during in-patient antenatal care should be based on clinical factors relating to individual cases as well as local blood bank services.**

A **The use of cervical cerclage to reduce bleeding and prolong pregnancy is not backed up by sufficient evidence to recommend this practice outside of a clinical trial.**

The two studies on cervical cerclage randomised 64 women between them and only one of these[17] showed a possible benefit. Arias[17] demonstrated a reduction in the number of babies born before 34 weeks or less than 2 kg, although randomisation was by birth date and analysis was by treatment received, not intention to treat.

Evidence Level Ib

B **Tocolysis for treatment of uterine activity in the presence of bleeding due to placenta praevia can be useful.**

The aetiology of bleeding in placenta praevia is thought to be due to the dynamics of the development of the lower uterine segment but may also be triggered by uterine activity. This was tested on 22 women with central placenta praevia in a community setting in Australia, where they underwent one hour of uterine monitoring twice daily.[24] There was no significant change in uterine activity prior to vaginal bleeding and prophylactic terbutaline appeared to offer no protection. However, these numbers are small and selective use of tocolysis forms part of previously standard 'conservative aggressive management of placenta praevia'.[25,26] More recently, Besinger *et al.*[27] conducted a prospective study on 112 women with acute vaginal bleeding and known placenta praevia and gave tocolysis to 72 who had significant uterine activity (85%). This group of patients had a prolongation from admission to delivery interval (39.2 vs 26.9 days, $P<0.02$) and an increase in birth weight (2.520 kg vs 2.124 kg; $P<0.03$) compared with the 40 women who were not given tocolysis. The largest series of cases where tocolysis has been used for bleeding in the third trimester, including 76 of 105 women with placenta praevia, is reported in a retrospective review by Towers *et al.*[28] This has suggested no increased morbidity or mortality associated with such use in a tertiary setting.

Evidence Level IIb

5. Delivery

B **The mode of delivery should be based on clinical judgement in each situation, but a placenta encroaching within 2 cm of the internal os is a relative contraindication to vaginal delivery.**

Oppenheimer *et al.*[11] performed TVS in the third trimester on 127 women and 52 were shown to have placenta praevia. In 31 cases there was complete or major placenta praevia. Of the 21 partial praevias, the mean distance of the leading placental edge to the cervical os was significantly different in those who required caesarean section than those achieving vaginal delivery with a cut-off distance of 2 cm ($P = 0.0004$).

Evidence Level III

There is no evidence to lend support to, or refute, the traditional teaching that vaginal delivery is less likely to be successful when the placenta is posterior. The basis for this belief may relate to the relative disproportion produced by the placenta occupying the sacral hollow.

✓ **Blood should be available for the peripartum period – the amount required will depend on the clinical features of each individual case.**

B **There is no evidence to support the use of autologous blood transfusion for placenta praevia.**

Dinsmoor *et al.*[29] retrospectively reviewed 88 women who had placenta praevia and only 12 (14%) would have been eligible for autologous blood donation/transfusion. Of the 12, only 2 were transfused at delivery but required a total of 12 and 18 units, respectively.

Evidence Level III

✓ **Any woman going to theatre with known placenta praevia should be delivered by the most experienced obstetrician available. As a minimum requirement, a consultant should be readily available. An inexperienced obstetrician should not be left unsupervised when caring for these women. This is especially important in those women with higher risks of complications, namely previous uterine scars, anterior placenta praevia or associated placenta accreta and emergency procedures.**

✓ **The choice of anaesthetic technique for caesarean sections for placenta praevia must be made by the anaesthetist conducting the procedure.**

The data available on choice of technique for these cases demonstrate differing opinions from UK obstetric anaesthetists.[30] While evidence from the USA suggests that regional anaesthesia can be safe,[6] the decision will be for the obstetrician, anaesthetist and patient together, while responsibility must remain with the anaesthetist, who needs to exercise judgement on the relative risks of regional and general anaesthesia for each particular patient.

6. Placenta accreta, increta and percreta

B **Women who have had a caesarean section in a previous pregnancy and who have a placenta praevia subsequently should be considered at high risk of having a morbidly adherent placenta. In such cases, particular attention should be focused on clarifying this diagnosis using ultrasound imaging. When present, consultant anaesthetic and obstetric input is vital in planning the delivery.**

The association between placenta praevia and placenta accreta is strong, with a relative risk of 2065, compared with women with a normally sited placenta.[31] This is also associated with scarring of the lower segment of the uterus and the risk of placenta accreta in the presence of placenta praevia rises relative to the number of previous uterine incisions.[31–33] Ultrasound imaging,[34] colour Doppler, power amplitude ultrasonic angiography[35] and MRI[36] have all been shown to be valuable in the diagnosis of placenta accreta, increta and percreta.

Evidence Level IIb

7. Massive haemorrhage

The Confidential Enquiries into Maternal Deaths have, over many years, highlighted the dangers associated with massive haemorrhage in general and placenta praevia in particular.[3,37,38] Many points are made concerning what constitutes both substandard care and good practice, including the following.

C **Massive haemorrhage should be dealt with in accordance with the recommendations of the Confidential Enquiries into Maternal Deaths reports.[3,37,38]**

✓ **The surgical manoeuvres required in the face of massive haemorrhage associated with caesarean section for placenta praevia should be performed by appropriately experienced surgeons. Calling for extra help early should be encouraged and not seen as 'losing face'.**

Uterotonic agents, administered systemically or infiltrated locally, may help in reducing the blood loss associated with bleeding from the relatively atonic lower uterine segment,[39] together with bimanual compression, packing[40] or even aortic compression, and can buy time while senior help arrives. Additional surgical manoeuvres which may be considered include the B-Lynch suture,[41] uterine[42] or internal iliac artery ligation,[43] or hysterectomy. Arterial embolisation has been reported[44] and is useful in selected cases, as long as the iliac vessels have not been tied off.

✓ **Emergency clinical scenarios/fire drills surrounding issues of massive obstetric haemorrhage and obtaining blood products urgently should be incorporated into local units.**

8. Related issues

Risk factors for placenta praevia include previous uterine infection and/or surgery. This opportunity is taken to reiterate previous College recommendations:

- screening for infection before termination of pregnancy and antibiotic prophylaxis to minimise the risk of post abortion infective morbidity[45]
- prophylactic antibiotics should be used for emergency caesarean section and considered for elective procedures[46] and manual removal of the placenta
- use of antenatal corticosteroids in threatened preterm delivery[47]
- anti-D immunoglobulin for rhesus-negative women who bleed[48]
- thromboprophylaxis for any woman at increased risk of thromboembolism.[49]

9. Auditable standards

Surgical support at caesarean sections on women with placenta praevia has been addressed in the reports of the Confidential Enquiries into Maternal Deaths. The substandard care associated with all cases of major haemorrhage in these reports focuses on areas which may be suitable for audit in everyday working practice, with care given being compared to those standards identified in these reports.[3,37,38]

All women with massive haemorrhages, with or without placenta praevia, should be subjected to clinical audit.

- Could the haemorrhage have been anticipated? If so, was there:
  – adequate work-up (e.g. avoiding/treating anaemia)?
  – appropriate prophylactic measures (e.g. active third stage)?
- Were sufficiently experienced personnel present?
- Was resuscitation quick and effective?
- Were appropriate fluids infused?
- Was appropriate monitoring instituted?
- Number of women transfused on the postnatal wards (suggesting inadequate blood estimation on delivery suite).
- Women discharged with haemoglobin levels <9 g/dl.

In addition, care of woman with placenta praevia can be assessed in terms of the accuracy of antenatal diagnosis.

10. Risk management

As in all cases of high risk, particular attention should be paid to careful documentation of all issues surrounding clinical discussion and decisions. Names of all clinical staff involved should be recorded legibly and signed in the notes, together with the content of any discussions, advanced directives and decisions.

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APPENDIX

Clinical guidelines are: 'systematically developed statements which assist clinicians and patients in making decisions about appropriate treatment for specific conditions'. Each guideline is systematically developed using a standardised methodology. Exact details of this process can be found in *Clinical Governance Advice No 1: Guidance for the Development of RCOG Green-top Guidelines* (available on the RCOG website (www.rcog.org.uk). These recommendations are not intended to dictate an exclusive course of management or treatment. They must be evaluated with reference to individual patient needs, resources and limitations unique to the institution and variations in local populations. It is hoped that this process of local ownership will help to incorporate these guidelines into routine practice. Attention is drawn to areas of clinical uncertainty where further research may be indicated.

The evidence used in this guideline was graded using the scheme below and the recommendations formulated in a similar fashion with a standardised grading scheme.

Classification of evidence levels

Ia	Evidence obtained from meta-analysis of randomised controlled trials.
Ib	Evidence obtained from at least one randomised controlled trial.
IIa	Evidence obtained from at least one well-designed controlled study without randomisation.
IIb	Evidence obtained from at least one other type of well-designed quasi-experimental study.
III	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.
IV	Evidence obtained from expert committee reports or opinions and/or clinical experience of respected authorities.

Grades of recommendations

A Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib)

B Requires the availability of well-controlled clinical studies but no randomised clinical trials on the topic of recommendations. (Evidence levels IIa, IIb, III)

C Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV)

Good Practice Point

✓ Recommended best practice based on the clinical experience of the guideline development group.

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