

# Prenatal Diagnosis of Vasa Praevia: A Case Report and Literature Review

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## Citation

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## Abstract

Vasa praevia occurs when the fetal vessels in the membrane are situated in front of the presenting part of the fetus. Rupture of membranes leads to foetal exsanguination and even neonatal death. The fetal mortality from undiagnosed vasa praevia ranges from 22% to 100%. It is the unexpected manner in which sudden foetal demise occurs that makes this complication one of the most dreaded and challenging events in modern obstetrics.

Case Here we discuss a case of prenatal diagnosis of vasa praevia and outcome. We have also conducted a literature review and highlighted the aspects of management of vasa praevia. Conclusion Ultrasonographic prenatal detection of vasa praevia has made a significant impact in the reduction of perinatal mortality and morbidity from this condition.

## INTRODUCTION

Vasa Praevia is defined as a condition where fetal vessels traverse the membranes in the lower segment below the presenting part unsupported by placental tissue or umbilical cord (1). Rupture of membranes leads to fetal exsanguination and even neonatal death (2). The fetal mortality from undiagnosed vasa praevia ranges from 22% to 100% (1). It is the unexpected manner in which sudden fetal demise occurs that makes this complication one of the most dreaded and challenging events in modern obstetrics.

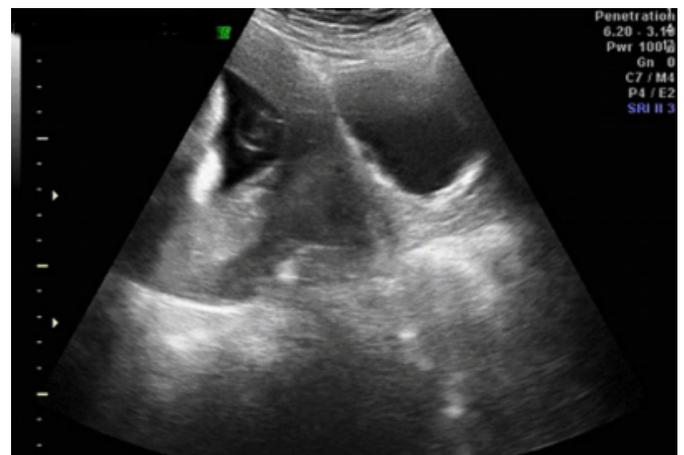
However the advent of ultrasonography in obstetric practice has made a significant contribution in our ability to diagnose this condition prenatally as early as second trimester. <sup>2</sup>

## CASE REPORT

We report a case of a 24 year old woman, G<sub>4</sub> P<sub>1+2</sub> having previously had one spontaneous vaginal delivery and two consecutive surgical terminations of pregnancy. Routine anomaly scan at twenty weeks reported a normal fetal anatomy and a low lying placenta. Repeat scan at 34 weeks revealed appropriate interval growth and placenta was left lateral & posterior covering the internal os. Also noted was the presence of blood vessels of fetal origin, confirmed by Doppler, extending from the lower edge of placenta traversing across the cervical os just below the fetal head. (Fig1 and 2)

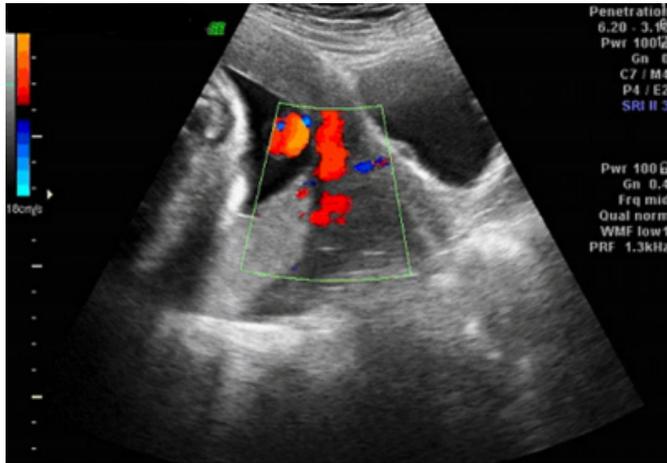
## Figure 1

Figure 1 – Scan showing vessels above cervical os



**Figure 2**

Figure 2 - Colour Doppler and B mode image of the vasa praevia type 1

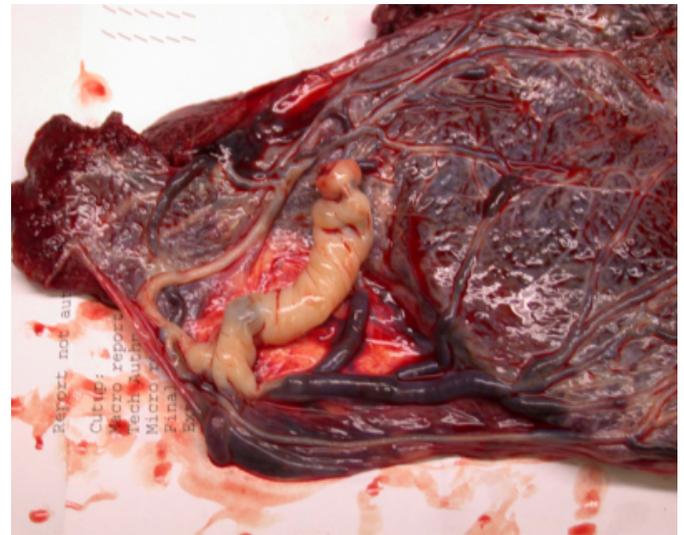


Vasa praevia was thus suspected. Counselling regarding the implications of the prenatal diagnosis, management options and the need for hospital confinement was undertaken with the couple. In view of child care needs, plan for hospital confinement from 36 weeks gestation until elective caesarean section at 38 weeks was agreed upon. The neonatal team was made aware of the situation.

She remained well and an elective Caesarean section was performed at 38 weeks. A female baby weighing 2.39 Kg was delivered with APGARs of 9 at 1 minute and 10 at 5 minutes. Intra operative findings were as suggested on ultrasound antenatally and histopathological examination of the placenta confirmed the findings of vasa praevia with a velamentous cord insertion (Fig 3).

**Figure 3**

Figure 3 – The above demonstrates a velamentous cord insertion, with cord inserting directly to membranes rather than placenta



**COMMENT**

Vasa praevia is a rare condition occurring in 1: 2500-5000 pregnancies (1). The true incidence is difficult to estimate as the diagnosis is often missed on ultrasound, or pathological examination of the placenta. The aetiology is uncertain, but risk factors include bilobed or succenturiate lobed placenta, velamentous insertion of cord, second trimester placenta praevia, pregnancies resulting from in vitro fertilisation and multiple pregnancies (1).

It is classified as Type 1 when fetal blood vessels are seen crossing over the uterine os, this corresponds to a velamentous insertion of the umbilical cord (as seen in the present case). In Type II, fetal blood vessels are seen in the same location as type 1 but they run between lobes of (bilobed or succenturiate lobed) the placenta (3).

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Before the advent of obstetric ultrasound, vasa praevia was seldom detected in asymptomatic women. Often an emergency caesarean section is performed for fetal distress and only then is vasa praevia discovered (3), but prenatal diagnosis has the potential to prevent or minimize morbidity and mortality from this sudden and unexpected obstetric tragedy. A retrospective case series (5) reported 2 perinatal deaths among the 61 cases diagnosed prenatally (3% mortality), compared with 53 perinatal deaths among the 94

cases diagnosed clinically (56% mortality).

Definitive diagnosis of vasa praevia may be made by ultrasonography, MRI, amnioscopy, or by palpation of vessels on digital vaginal examination or by identifying fetal blood in vagina. Sonographic prenatal diagnosis of vasa praevia has high degree of accuracy<sup>1,2</sup> and is advocated. Gray scale ultrasonography and colour Doppler confirmation has improved its detection rate (2).

Sonographic clues include identifying vessels overlying the internal cervical os, although these may be due to cord presentation. Vasa praevia may be differentiated from cord presentation by observing their relative positions on repeated scans. The vessels change in position in a cord presentation, whereas in vasa praevia, the vessels remain on the same site on repeat examinations. Vasa praevia is confirmed if an aberrant vessel is seen to cross the internal cervical os.

Ultrasonographic prenatal detection of vasa praevia has made a significant impact in the reduction of perinatal mortality and morbidity from this condition (5, 6). It has been diagnosed as early as 15 weeks. It has been suggested that because of the association of vasa praevia with placental abnormalities or Velamentous cord insertion, bilobed and marginal placentas, an attempt must be made to look for umbilical cord insertion<sup>5,7</sup>. Anomaly scans performed at 20 weeks may identify low placenta. This is an important risk factor for vasa praevia (8) and an attempt should be made to rule out vasa praevia.

Vasa praevia may clinically present as vaginal bleeding at rupture of membranes spontaneously or artificially and may be misinterpreted as heavy show. However associated fetal heart abnormalities should raise the suspicion of vasa praevia. Vessel compression resulting from labour, digital pressure or pressure of the presenting part may lead to several CTG abnormalities described as fetal heart decelerations, bradycardia, and a sinusoidal heart rate pattern usually signifying fetal haemorrhage which may be a preterminal event (2, 4). As the fetal blood volume is only 250 ml at term, a loss of 60 ml or more is sufficient to cause fetal exsanguination and demise<sup>1</sup>. Prenatal diagnosis allows us to monitor bleeding symptom more closely; facilitates elective caesarean section under more controlled circumstances and rapid volume replacement of the exsanguinated fetus (4). However infant death can still occur as preterm delivery may be associated with extended neonatal hospital stay or from other complications of prematurity (2).

A prenatal diagnosis also implicates prolonged in-patient hospital admissions in the hope of optimising fetal outcome. Thus the optimum timing of admission while minimizing the hospital stay and its consequences remains by far the chief medical dilemma. To date there is no current agreed standard of care for prenatally diagnosed cases. However once diagnosed it is considered reasonable to admit in hospital as early in third trimester, with a view to prompt caesarean section and access to neonatal care should membranes rupture. The cost effectiveness of this approach is debatable. It is recommended that women should be offered elective delivery at 35 weeks or earlier (2). In one series (5) 28% of elective admissions had emergency CS indicated for bleeding, rupture of membranes or labour. These authors believe that the mild risk associated with prematurity at 35 weeks is outweighed by risk of dismal outcome should membranes rupture, as in 8% of women membranes ruptured before labour. Women admitted electively must be made aware of the adverse outcome of unplanned emergency preterm delivery with significant morbidity and mortality, which in a minority may occur even under closed hospital based surveillance (4). However prolonged hospitalisation may disrupt family life and hence not acceptable to some women and may strain resources. Antenatal corticosteroids should be considered at admission, the timing of which remains undetermined. The cost of prolonged in patient stay to the health service would be enormous however no study has addressed this.

Planned care includes close surveillance and timed delivery. Once the diagnosis of vasa praevia is made it is proposed that increased surveillance should begin after period of viability (4). No cases have been managed expectantly with labour occurring as these vessels are liable to compression by the presenting part in labour or may tear when membranes rupture leading to fetal exsanguination and neonatal death.

An innovative treatment has been reported by Ruben et al (3) who could avoid these complications by obliterating these vessels in-utero by laser ablation. However this treatment has potential limitations. Accurate diagnosis is essential, as laser ablation of type one vasa praevia may result in immediate fetal demise. Their successful management of the case highlights a potential role in optimising management of Type 2 vasa praevia while decreasing hospital stay and the resource expenditures.

It is estimated that routine screening would identify 1-2 cases of vas praevia in an average maternity unit in the UK

each year (4). Sonographic prenatal diagnoses has the potential to dramatically improve perinatal outcome. Many authors recommend that standard obstetrical protocol should include screening for vasa praevia and that an attempt should be made to identify umbilical cord insertion (1, 5, 8). The examination is not time consuming and is often accomplished in less than 1 minute (8). However, evidence to support the introduction of routine screening for vasa praevia is currently limited (4).

## **CONCLUSION**

Vasa praevia is a rare but potentially fatal and unpredictable obstetrical disaster. Prenatal sonographic diagnosis has the potential to improve or prevent the poor obstetric and neonatal outcome associated with it. Therefore clinicians caring for pregnant women should have a high index of suspicion as not all cases are diagnosed before onset of labour.

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