应用HD-FLOW技术在11-13^{+6}周筛查帆状脐带胎盘入口的准确性

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摘 要:【目的】探讨超声早孕期筛查帆状脐带胎盘入口的可行性。【方法】收集大连市妇女儿童医疗中心行早孕筛查、中孕系统筛查且在我院分娩的孕妇2 796例，胎儿2998个。早孕期(11~13^{+6}周)筛查脐带胎盘入口位置，将检查结果分成三组，Ⅰ组为：明确显示脐带胎盘入口位于与胎膜上，沿着胎膜走行一段距离后，再进入胎盘，该组诊断为帆状胎盘。Ⅱ组为：脐带胎盘入口位于胎盘边缘，无法区分插入点位于胎盘实质及胎膜上。Ⅲ组为：组明确显示脐带胎盘入口处为胎盘实质，该组诊断为正常胎盘。将每组结果与中孕期(22~26周)筛查结果及产后临床检查结果比较。【结果】①早、中孕期超声检查对脐带附着位置的显示率：早孕期一次检查显示率99.23%(2 975/2 998)。其中单胎显示率99.77%(2 590/2 596)，双胎显示率95.96%(380/396)，三胎显示率83.33%(5/6)。中孕期一次检查显示率86.99%(2 608/2 998)。其中单胎显示：90.99%(2 362/2 596)双胎显示率61.61%(244/396)三胎显示率33.33%(2/6)。早孕与中孕检查脐带胎盘入口一次检查显示率的比较有统计学差异$P < 0.05$($P = 0.00$)。其中单胎、双胎、三胎早孕期一次显示率与中孕期比较均有统计学差异$P < 0.05$(均$P = 0.00$)。②早孕期、中孕、出生后检查结果：早孕期检查结果：Ⅰ组28例、Ⅱ组42例、Ⅲ组2 928例；中孕期：帆状胎盘：37例球拍状胎盘：30例正常胎盘：2931例；出生后检查：帆状胎盘：36例球拍状胎盘：30例正常胎盘：2 932例。③早孕期各组检查结果与中孕及出生后结果的比较：早孕期Ⅰ组中28例中孕及出生后均诊断为帆状胎盘，早孕期Ⅱ组42例中孕期诊断为帆状胎盘7例，球拍状胎盘22例，正常胎盘13例，出生后诊断为帆状胎盘6例，球拍状胎盘23例，正常胎盘13例；早孕期Ⅲ组2 928例，中孕期诊断为帆状胎盘2例，球拍状胎盘8例，正常胎盘2 918例，出生后诊断为帆状胎盘2例，球拍状胎盘7例，正常胎盘2 919例。早孕期诊断的准确率为98.29%。【结论】早孕期应用高分辨率血流成像(HD-FLOW)血流模式可以对部分帆状胎盘做出诊断。

关键词：帆状胎盘；超声；产前诊断；高分辨率血流成像
中图分类号：R445.1 **文献标志码**：A **文章编号**：1672-3554(2017)01-0138-05

Veracity of Umbilical Cord Insertion at 11th-13^{+6} th Gestational Weeks with HD-FLOW

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Abstract:【Objective】To investigate the feasibility of screening for velamentous umbilical cord insertion in early pregnancy by ultrasound.【Methods】A total of 2,796 cases of pregnant women, 2 998 cases of fetuses that underwent prenatal ultrasound screening in the early and middle stage pregnancy and delivered in Dalian Women and Children Healthcare Center were included. The results of ultrasound screening of umbilical cord insertion during early pregnancy (11 ~ 13^{+6} w) were divided into three groups. Group Ⅰ: it is clear that the placenta of the umbilical cord is located in the fetal membranes, and then along with the fetal membranes for a long distance, and then enter the placenta. Group Ⅱ: The placenta of the umbilical cord is located at the edge of the placenta, and then insert point is not distinguished between the placenta and fetal membranes. Group Ⅲ: It is clearly shows that the umbilical cord inserted into the placenta.【Results】1. The display rate of the umbilical cord in early and mid pregnancy ultrasound examinationearly pregnancyan examination showed that the rate of 99.23%(2 975/2 998). The single child display rate of 99.77%(2 590/2 596), twin

收稿日期：2016-10-11
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display rate of 95.96%(380/396), three fetal the rate of 83.33%(5/6).In the second trimester of pregnancy (22 ~ 26 w) and examination showed that the rate of 86.99%(2 608/2 998). The single child display rate of 90.99%(2 362/2 596), twin display rate of 61.61%(244/396), three fetal the rate of 33.33 %(2/6). 2. The results of early pregnancy, pregnancy, the examination of after birth Regarding to early pregnancy, 28 cases were included in Group Ⅰ, 42 cases in Group Ⅱ and 2928 cases in Group Ⅲ. Regarding to second pregnancy, 37 cases were evaluated as velamentous umbilical cord insertion, 30 cases were evaluated as battledore placenta and 2931 cases were evaluated as normal placenta. The results of postnatal examination were as follows: 36 cases were identified as velamentous umbilical cord insertion, 30 cases were evaluated as battledore placenta and 2932 cases were evaluated as normal placenta. 3. Comparison of 3 groups, early pregnancy examination results and pregnancy and after the birth. In early pregnancy, 28 cases of Group Ⅰ were diagnosed as velamentous umbilical cord insertion in the examination during the second trimester of pregnancy and after delivery. In the 42 cases of early pregnancy in Group Ⅱ, 7 cases were diagnosed as velamentous umbilical cord insertion, 22 cases were diagnosed as battledore placenta and 13 cases were normal placenta. After birth, 6 cases were diagnosed as diagnosed as velamentous umbilical cord insertion, 23 cases were battledore placenta and 13 cases were normal placenta. In the 2928 cases of early pregnancy of Group Ⅲ, 2 cases were diagnosed as diagnosed as velamentous umbilical cord insertion, 8 cases were battledore placenta and 2918 cases were normal placenta. After birth, 2 cases were diagnosed as diagnosed as velamentous umbilical cord insertion, 7 cases were battledore placenta and 2919 cases were normal placenta.The diagnostic accuracy of early pregnancy was 98.29%.
【Conclusion】Application of HD-Flow blood flow pattern in early pregnancy can make a diagnosis of some of the sail-shaped placenta.

Key words: velamentous; umbilical cord insertion; ultrasound; prenatal diagnosis; high definition-flow

［J SUN Yat-sen Univ(Med Sci), 2017, 38(1): 138-142］

脐带胎盘入口异常尤其是帆状脐带入口异常可能导致胎儿宫内生长受限(fetal growth restriction, FGR)，可合并血管前置[1]，严重时可危及胎儿生命[2]。产前超声诊断有目的地观察胎盘脐带入口，可提高胎盘脐带入口异常的产前超声显示率[3]。但鲜有早孕期观察胎盘脐带入口位置的文章，本研究旨在讨论在孕11 ~ 13^{+6} w筛查帆状脐带胎盘入口的可行性。

1　材料与方法

1.1　研究对象

2014年11月至2016年6月在大连市妇女儿童医疗中心行早孕筛查、中孕系统筛查且在我院分娩的孕妇2 796例，其中单胎2 596例，双胎198例(其中单绒毛膜双羊膜囊双胎24例，双绒毛膜双羊膜囊双胎174例)三胎2例，共2 998个胎儿。年龄23 ~ 45岁。

1.2　仪器与方法

采用GEE8彩色多普勒超声诊断仪，腹部容积探头，超声频率2.0 ~ 6.0 MHZ，电子凸阵探头超声频率2.0 ~ 5.0 MHZ，腔内探头超声频率4.0 ~ 9.0 MHZ。方法对上述孕妇于早孕期(11 - 13^{+6}周)中孕(22 ~ 26周)分别观察脐带胎盘入口位置，与出生后检查结果比较。

早孕期检查方法：孕妇常规取仰卧位，对胎儿行早孕筛查(包括测量NT、鼻骨、静脉导管血流、三尖瓣频谱，观察子宫及双附件)，然后确定胎盘位置，观察脐带入口与胎盘的关系，开启高分辨率血流成像(high definition-flow HD-FLOW)模式，寻找脐带血流图，判定脐带走行方向和入口处与胎盘的关系。将检查结果分成三组，Ⅰ组：明确显示脐带胎盘入口位于与胎膜上，沿着胎膜走行一段距离后，再进入胎盘(图1)该组诊断为帆状胎盘。Ⅱ组：脐带胎盘入口位于胎盘边缘，无法区分插入点位于胎盘实质及胎膜上(图2)。Ⅲ组明确显示脐带胎盘入口处为胎盘实质，该组诊断为正常胎盘。(图3)。

孕中期检查方法：对胎儿系统筛查后，沿胎盘一侧边缘向另一侧边缘行横 / 纵切面扫查，以寻找胎盘脐带入口，若能显示胎盘脐带入口，则应以胎盘脐带入口为中心旋转360°以评估胎盘脐带入口与胎盘边缘的关系；若不能显示，则采用彩色多普勒检查(方法同上)。若于胎盘胎儿面找到胎盘脐带入口，则可排除帆状脐带入口，但若二维超声和彩色多普勒均未能在胎盘胎儿面找到胎盘脐带入口，则应仔细在胎盘附近胎膜下寻找，观察有无走行于胎膜下的脐带血管。若发现胎膜下血管，行脉冲多普勒检查，则可进一步确定是否与胎心率一致，以证实是否为脐带血管。若证实胎膜下

血管为脐带血管,则应追踪此血管至脐带入口,确定脐带入口的位置及是否有胎膜下血管跨过宫颈内口,以排除血管前置[1]。

中孕期胎盘脐带入口异常产前超声诊断标准[3]:①球拍状胎盘:(边缘性胎盘脐带入口):脐带插入部位距胎盘边缘≤ 2 cm诊断为球拍状胎盘;②帆状胎盘:胎盘表面未见脐带插入脐带分支均走行于胎膜之上诊断为完全性帆状胎盘;脐带插入胎盘表面前呈多个分支,部分分支进入胎盘实质,部分走行于胎膜之上诊断为部分性帆状胎盘。

检查次数:若一次检查清楚记为一次显示。若受胎儿位置影响脐带胎盘入口显示不清,则活动后在检查直至检查清楚,并记录检查次数。

1.3 统计学方法

所有数据分析采用SPSS19.0统计软件。率的检验用χ^2检验,且$P < 0.05$时为差异有统计学意义。

2 结 果

2.1 早、中孕期超声检查对脐带附着位置的显示率

早孕期(11 ~ 13^{+6}周)一次检查显示率99.23%(2 975/2 998)。其中单胎显示率99.77%(2590/2596),双胎显示率95.96%(380/396),三胎显示率83.33%(5/6)。

中孕期(22 ~ 26周)一次检查显示率86.99%(2 608/2 998)。其中单胎显示:90.99%(2 362/2 596)双胎显示率61.61%(244/396)三胎显示率33.33%(2/6)。早孕与中孕检查脐带胎盘入口一次检查显示率的比较有统计学差异$P < 0.05$($P = 0.00$)。其中单胎、双胎、三胎早孕期一次显示率与中孕期比较均有统计学差异$P < 0.05$(均$P = 0.00$)。

2.2 早孕期、中孕、出生后检查结果

早孕期:Ⅰ组28例、Ⅱ组42例、Ⅲ组2 928例;

中孕期:帆状胎盘:37例、球拍状胎盘:30例、正常胎盘:2 931例;

出生后检查:帆状胎盘:36例、球拍状胎盘:30例、正常胎盘:2 932例。

早孕期I组诊断帆状胎盘(28/2 998)与出生后帆状胎盘(36/2 998)比较无统计学差异$P > 0.05$($P = 0.315$)

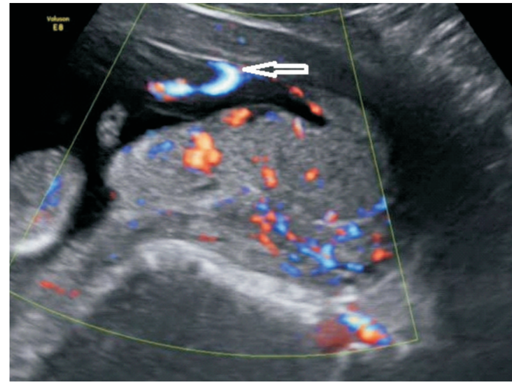

图1 早孕Ⅰ组,脐带插入点位于胎膜

Fig.1 One case in Group Ⅰ of early pregnancy. The ultrasound findings showed that velamentous umbilical cordinsertion

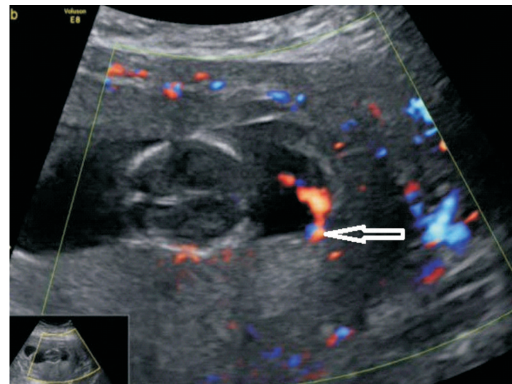

图2 早孕Ⅱ组,脐带胎盘入口位于胎盘边缘

Fig.2 A case in Group Ⅱ of early pregnancy and the umbilical cord is located at the entrance of the placenta

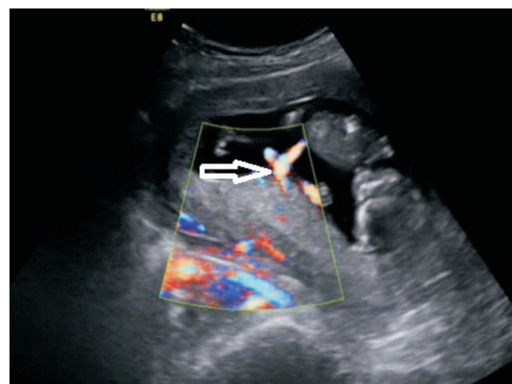

图3 早孕Ⅲ组,脐带胎盘入口位置正常

Fig.3 A case in Group Ⅲ of early pregnancy and the umbilical cord insertion is normal

2.3 早孕期各组检查结果与中孕及出生后结果的比较

早孕期诊断的准确率为98.29%。见表1。

表1　早孕期各组检查结果与中孕及出生后结果的比较

Table 1　Comparison of the results of prenatal ultrasound screening in the early pregnancy with the results of prenatal ultrasound screening in the second trimester pregnancy and after delivery

The ultrasonographic findings of early pregnancy	The ultrasonographic findings of the second trimester	The findings of placenta after delivery
Group Ⅰ(n = 28)	velamentous umbilical cord insertion (n = 28)	velamentous umbilical cord insertion (n = 28)
Group Ⅱ(n = 42)	velamentous umbilical cord insertion (n = 7)	velamentous umbilical cord insertion (n = 6)
	battledore placenta (n = 22)	battledore placenta (n = 23)
	normal placenta (n = 13)	normal placenta (n = 13)
Group Ⅲ(n = 2 928)	velamentous umbilical cord insertion (n = 2)	velamentous umbilical cord insertion (n = 2)
	battledore placenta (n = 8)	battledore placenta (n = 7)
	normal placenta (n = 2 918)	normal placenta (n = 2 919)

3　讨　论

帆状胎盘(velamentouscordinsertion,VCI)是指脐带附着于胎膜,脐血管经胎膜作扇形分布进入胎盘,在妊娠中的发生率为1%～2%[3-4]。近年来超声诊断仪分辨率的提高,彩色多普勒的普遍使用,尤其能量及多种血流显像方法的出现,以及早孕期11-13+6孕周产科超声检查的普及使得部分VCI在早孕期得以诊断[5]。超声HD-flow显像是一种新的血流显像技术,能极大程度改善血流的时间和空间分辨率[6],可以对微小低速血流进行显像它与传统的彩色显像比较,减少血流外溢,能真实的反应微小血管的彩色情况。本研究中帆状胎盘的发生率1.2%。本组中脐带插入点早孕期的一次显示率为99.23%,中孕期一次显示率86.99%,两者有统计学差异($P < 0.05$)。尤其在多胎妊娠中,早孕期相比较中孕期而言,由于胎盘面积小,胎儿小,遮挡不明显,应用HD-flow可以清楚显示脐带胎盘入口位置,可为临床早期提供诊断信息,便于密切观察。

本研究将早孕期脐带胎盘入口位置情况分为3组,Ⅰ组中28例在早孕中均明确显示脐带插入点位于胎膜上,并在胎膜上走行一段后进入胎盘,该组病例在中孕期及出生后均诊断为帆状胎盘。早孕期Ⅰ组诊断帆状胎盘(28/2 998)与出生后帆状胎盘(36/2 998)比较无统计学差异$P > 0.05$($P = 0.315$)。说明早孕期对于明确的帆状胎盘是可以诊断。这与Sepulveda等[7]研究结果一致。早孕期Ⅱ组为脐带胎盘入口位于胎盘边缘,但无法区分插入点位于胎盘实质及胎膜上的共42例,中孕期诊断为帆状胎盘7例,球拍状胎盘22例,正常胎盘13例。这一结果显示早孕期对于脐带插入点位于胎盘边缘的病例诊断帆状胎盘及球拍状胎盘准确性都不高。这主要因为胎盘随着孕周增大、子宫增大发生移位,胎膜、胎盘的生长发育等因素使得本组患者部分发展为帆状胎盘,部分发展为球拍状胎盘,部分为正常胎盘。而本组中孕期诊断为帆状胎盘的7例中,一例出生后诊断为球拍状胎盘。原因主要为脐带插入点靠近胎盘边缘使得区分困难。在本组病例中,虽然早孕期诊断准确率不高,但可以提示插入点位置,便于孕中期及时随诊观察,明确诊断。早孕期Ⅲ组为明确显示脐带胎盘入口处为胎盘实质。其中中孕期8例诊断为球拍状胎盘,可能与胎盘的生长有关,2例诊断为帆状胎盘,目前原因不明。出生后2例诊断帆状胎盘,7例诊断为球拍状胎盘。中孕期的一例球拍状胎盘出生后诊断为正常胎盘,中孕期测量脐带入口距离胎盘边缘1.5 cm,出生后测量> 2 cm,诊断为正常胎盘。本组病例诊断准确率为99.7%(2 919/2 928),因此认为早孕期诊断正常的胎盘脐带入口位置是可行的。这部分病例即使到中、晚孕期由于胎方位、胎盘位置等因素影响,脐带胎盘插入点显示不清,有早孕期的诊断,临床也是可以放心的。

综上所述,早孕期对于明确的帆状胎盘及明

确的插入点位置正常是可以明确诊断的,对这部分病人早期诊断,动态观察胎儿生长发育情况,及时临床干预,改善新生儿不良预后。对于早孕期脐带插入点位于胎盘边缘的病例,需要定期随访期待插入点的位置,以便在尽可能早的时间明确诊断。帆状胎盘是少数只影响胎儿的围产期并发症,与多重不良后果相关,包括宫内死亡[8-9]、小胎龄、早产、产后出血[10]。早期发现,早期诊断以及孕期随访观察有助于确定分娩方式,是预防新生儿不良结局的有效方法[11]。

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(编辑　王晓鹰)