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产前超声植入评分表在预测瘢痕子宫并前置胎盘 植入程度中的价值

郭俏, 谌奎芳

(中南大学湘雅医院产科, 长沙 410008)

[摘要] 目的: 探讨产前超声在预测瘢痕子宫并前置胎盘患者中胎盘植入程度的临床应用价值。方法: 回顾性分析2018年6月至2019年10月在中南大学湘雅医院进行产前超声检查并分娩的182例有剖宫产病史的瘢痕子宫并前置胎盘病例资料。产前使用超声植入评分表(0~16分)对胎盘植入情况进行评分, 追踪其剖宫产术中情况及术后病理结果, 以手术和/或病理诊断作为金标准判断有无植入及植入程度。分析产前超声诊断植入的准确性, 并通过绘制受试者工作特征(receiver operating characteristic, ROC)曲线确定不同胎盘植入类型间的超声评分截断值。结果: 根据手术及病理诊断, 182例中, 阴性41例, 粘连型70例, 植入型59例, 穿透型12例。术中出血量: 阴性组[300 (200~400) mL]<粘连组[675 (500~900) mL]<植入组[2 050 (1 500~2 500) mL]<穿透组[3 600 (2 700~5 000) mL, $P<0.05$]。阴性组、粘连组均无子宫切除, 子宫切除率: 植入组<穿透组(6.8% vs 16.7%, $P<0.05$)。产前超声植入评分: 阴性组(3.63±0.80)<粘连组(5.23±0.92)<植入组(8.56±1.74)<穿透组(12.83±2.17, $P<0.05$)。阴性与粘连型、粘连型与植入型及植入型与穿透型的超声植入评分ROC曲线下面积分别为: 0.90, 0.96和0.94。当超声评分截断值分别为4.5, 6.5和10.5时, 对应的敏感度分别为: 87.1%, 83.1%和83.3%, 特异度分别为: 87.8%, 91.4%和86.4%, Youden指数为最大值, 分别为: 0.749, 0.745和0.697。因此, 确定实际临床工作中各植入类型超声评分截断值分别为5, 7和11分。结论: 评分表式的产前超声诊断预测疤痕子宫并前置胎盘患者植入程度准确度较高, 临床应用价值较大。

[关键词] 前置胎盘; 胎盘植入; 产前超声; 超声诊断

Value of prenatal ultrasound nographic accreta scoring scale in predicting the accreta degree of scarred uterus with placenta previa

GUO Qiao, SHEN Kuifang

(Department of Obstetrics, Xiangya Hospital, Central South University, Changsha 410008, China)

Abstract **Objective:** To assess the value of prenatal ultrasound in predicting placenta accreta degree in patients with a scarred uterus and placenta previa. **Methods:** Retrospective analysis was performed on 182 cases of scarred uterus with a history of cesarean section and placenta previa who underwent prenatal ultrasound and delivered

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通信作者 (Corresponding author): 谌奎芳, Email: 284271118@qq.com

at Xiangya Hospital of Central South University from June 2018 to October 2019. The prenatal ultrasonographic accreta scoring scale (0–16 points) was used to evaluate the accreta degree, and the intraoperative conditions of cesarean section and postoperative pathological results were reviewed. The surgical and/or pathological diagnostic results were used as a gold standard to judge the accreta status and degree. The accuracy of prenatal ultrasound diagnosis for accreta was analyzed, and the cutoff values of ultrasound scores for different types of placenta accreta were determined by drawing the receiver operating characteristic curve. **Results:** According to the surgical and pathological diagnostic results, among the 182 cases, there were 41 cases of accreta negative, 70 cases of placenta adhesion, 59 cases of placenta increta and 12 cases of placenta percreta. Intraoperative blood loss was: negative group [300 (200–400) mL] < adhesion group [675 (500–900) mL] < increta group [2 050 (1 500–2 500) mL] < percreta group [3 600 (2 700–5 000) mL, $P<0.05$]. The negative group and the adhesion group did not have a hysterectomy, but the hysterectomy rate of the increta group was lower than percreta group (6.8% vs 16.7%, $P<0.05$). Prenatal ultrasonographic accreta scores were: negative group (3.63 ± 0.80) < adhesion group (5.23 ± 0.92) < increta group (8.56 ± 1.74) < percreta group (12.83 ± 2.17 , $P<0.05$). The area under the receiver operating characteristic curve between the negative and adhesion group, adhesion and increta group, increta and percreta group were 0.90, 0.96 and 0.94, respectively. When ultrasonographic cutoff scores were 4.5, 6.5, and 10.5, the corresponding sensitivity was 87.1%, 83.1% and 83.3%, specificity was 87.8%, 91.4% and 86.4%, Youden index were the maximum, which was 0.749, 0.745, and 0.697, respectively. Therefore, the cutoff values of ultrasonographic scores for each accreta type in the actual clinical work were determined to be 5, 7, and 11, respectively. **Conclusion:** The accuracy of prenatal ultrasonography in predicting accreta degree in patients with a scarred uterus and placenta previa is high, and the value of clinical application is great.

Keywords placenta previa; placenta accreta; prenatal ultrasound; ultrasonic diagnosis

胎盘植入是指滋养层细胞异常侵及子宫壁部分或全部肌层, 是一种潜在的危及生命的妊娠并发症, 需要多学科协作救治以改善围生期结局。在过去的40年里, 随着世界各地的剖宫产率从不足10%上升到30%以上, 胎盘植入性疾病谱(placenta accreta spectrum, PAS)的发病率增加了10倍^[1]。PAS包括异常黏附及侵袭性胎盘, 依据侵入程度分为3个类别: 1)粘连性胎盘, 绒毛单纯附着于子宫肌层; 2)胎盘植入, 绒毛侵犯肌层; 3)胎盘穿透, 绒毛侵犯整个子宫肌层, 包括子宫浆膜及邻近的盆腔器官。依据美国妇产科医师协会与母胎医学会胎盘植入性疾病指南(2018年)^[2], 超声被推荐作为PAS的首选检测方法, 但超声在准确评估PAS的类型和植入程度方面的研究较少。笔者回顾性分析中南大学湘雅医院进行产前超声检查并分娩的凶险性前置胎盘病例资料, 旨在评估产前超声对胎盘植入程度的诊断价值。

1 对象与方法

1.1 对象

回顾性分析2018年6月至2019年10月在中南

大学湘雅医院进行产前超声检查并分娩的182例有剖宫产病史的瘢痕子宫并前置胎盘患者的临床资料, 包括产前超声图像、报告及手术记录、病理结果, 记录术中出血量及子宫切除情况。患者年龄为(31.3 ± 4.3)岁, 终止妊娠孕周为(34.5 ± 2.9)周。有1次剖宫产病史者141例(77.5%), 有2次及以上者1例(22.5%), 完全性前置胎盘128例(70.3%), 边缘或低置胎盘54例(29.7%)。本研究经湘雅医院医学伦理委员会批准(伦审第201912532号)。

1.2 方法

使用GE Voluson E8, GE Voluson E10, Philips EPIQ7和Philips IU22彩色多普勒超声诊断仪, 经腹凸阵探头, 探头频率为3.0~5.0 MHz; 经阴道腔内探头, 探头频率为5.0~8.0 MHz。检查前嘱患者适度充盈膀胱(200~300 mL), 采用经腹部与经阴道联合检查的方法, 仔细观察胎盘位置、胎盘厚度、内部回声、胎盘与子宫壁肌层的界限、与膀胱及其他毗邻结构的关系及彩色多普勒血流情况。参照欧洲异常侵袭性胎盘工作组(European Working Group on Abnormally Invasive Placenta, EW-AIP)2016年提出的用于PAS异常诊断的超声征

象, 主要包括: 1) 二维灰阶超声成像示胎盘后低回声带消失, 异常胎盘漩涡(图1A), 膀胱壁回声中断, 子宫肌层变薄等; 2) 彩色多普勒超声成像示子宫与膀胱壁间血流丰富(图1B), 桥血管, 胎盘漩涡内高速血流并紊乱等^[3]。综合剖宫产次数、前置类型、有无膀胱及宫颈侵犯等情况, 并参考国内外文献报道^[4-7]的各个超声植入评分系统, 自行制订新的超声植入评分表(每条0~2分, 合计0~16分, 表1), 根据超声检查所见逐一进行评分, 记录总评分数目。以术中临床诊断和/或术后送检病理结果为金标准(图1C), 对每个病例进行产前超声与产后诊断结果对照。

1.3 统计学处理

采用SPSS 25.0统计学软件进行统计学处理。先进行正态性检验, 符合正态分布的计量资料用均数±标准差($\bar{x}\pm s$)表示, 组间比较采用多个样本比较的方差分析; 不符合正态分布的计量资料用中位数(四分位间距)[median (interquartile range), M (QR)]表示, 组间比较采用秩和检验; 计数资料用率(%)表示, 两组间比较采用 χ^2 检验。采用受试者工作特征(receiver operating characteristic, ROC)曲线选择各植入类型间的评分截断值, 计算对应的灵敏度、特异度及综合评价指标Youden指数。 $P<0.05$ 为差异有统计学意义。

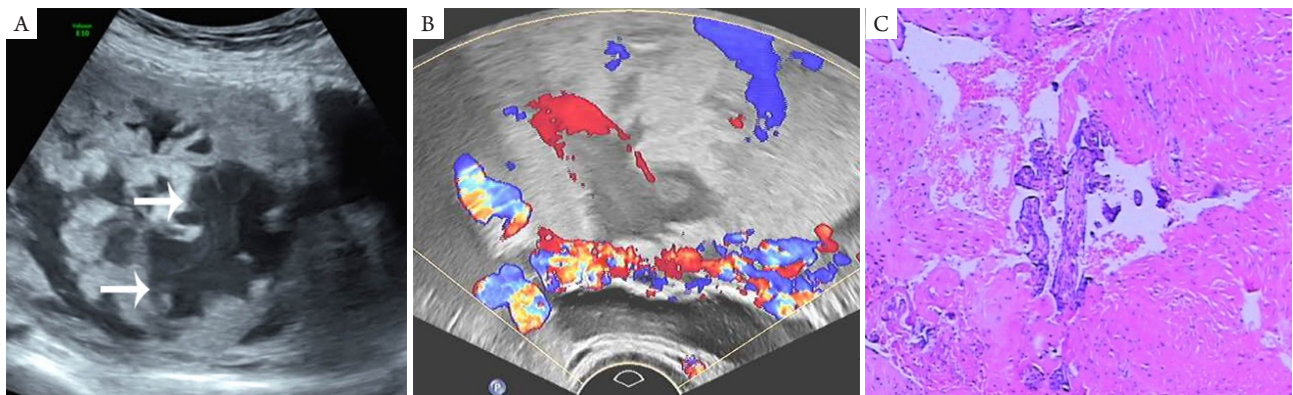


图1 胎盘植入的超声表现及病理诊断

Figure 1 Ultrasonographic manifestations and pathological diagnosis of placental increta

(A) 经腹部二维灰阶超声成像显示胎盘内漩涡(箭头示), 内可见“沸水滚动征”; (B) 经阴道彩色多普勒超声显示胎盘与膀胱壁间丰富血流信号; (C) 病理检查示子宫平滑肌中可见绒毛结构, 证实胎盘植入(HE, $\times 100$)。

(A) Transabdominal two-dimensional grey-scale ultrasound shows placenta lacuna (arrows), with “boiling water rolling sign” inside; (B) Transvaginal Color Doppler ultrasonography shows abundant blood flow signals between the placenta and the bladder wall; (C) Pathological examination reveals villous structure in the uterine smooth muscle, confirming placental implantation (HE, $\times 100$).

表1 胎盘植入超声评分量表(0~16分)

Table 1 Ultrasonic scoring scale for placenta accreta (0–16 points)

项目	0分	1分	2分
剖宫产次数	无	1	≥ 2
胎盘位置	正常	边缘或低置	完全前置
胎盘厚度/mm	<30	30~50	>50
胎盘后子宫肌层	>1 mm	变薄, ≤ 1 mm	消失
异常胎盘漩涡	无	局灶性, ≤ 2 个且最大尺寸 ≤ 20 mm	广泛性, >2 个且最大尺寸 >20 mm伴湍流
胎盘后血流	规则	丰富	桥血管
膀胱壁回声	连续	中断	消失
宫颈侵犯	形态完整, 无血窦, 完整长度 ≥ 25 mm	形态不完整, 有血窦, 完整长度 <25 mm	形态消失, 丰富血窦, 完整长度 <25 mm

2 结果

2.1 不同胎盘植入类型间出血量及子宫切除率比较

共182例有剖宫产病史的瘢痕子宫并前置胎盘病例纳入分析(表2), 根据术中临床和/或术后病理诊断, 阴性41例, 粘连型70例, 植入型59例, 穿透型12例。各组间术中出血量比较, 差异有统计学意义($P<0.05$); 阴性组<粘连组<植入组<穿透组。阴性组及粘连组均未行子宫切除, 植入组及穿透组间子宫切除率比较, 差异有统计学意义($P<0.05$); 植入组<穿透组。

2.2 不同胎盘植入类型间产前超声评分比较及截断值选择

各组间产前超声评分比较, 差异有统计学意义($P<0.05$); 阴性组<粘连组<植入组<穿透组(表2)。

阴性组与粘连组不同评分截断值的ROC曲

线下面积为0.90, 当评分截断值为4.5分时, 即评分 ≥ 4.5 判断为粘连, 敏感度为87.1%, 特异度为87.8%, Youden指数最大, 为0.749(图2)。因此, 确定实际工作中阴性和粘连型的截断值为5分, 即 ≥ 5 考虑为粘连型, <5 考虑为阴性。

粘连组与植入组不同评分截断值的ROC曲线下面积为0.96, 当评分截断值为6.5时, 即评分 ≥ 6.5 判断为植入, 敏感度为83.1%, 特异度为91.4%, Youden指数最大, 为0.745(图3)。因此, 确定实际工作中粘连型与植入型的截断值为7分, 即 ≥ 7 考虑为植入, 结合图2所得结果, 5~6分考虑为粘连。

植入组与穿透组不同评分截断值的ROC曲线下面积为0.94, 当评分截断值为10.5分时, 即评分 ≥ 10.5 判断为穿透, 敏感度为83.3%, 特异度为86.4%, Youden指数最大, 为0.697(图4)。因此, 确定实际工作中植入型与穿透型的截断值为11分, 即 ≥ 11 分考虑为穿透, 结合图3所得结果, 7~10分考虑为植入。

表2 各组产前超声植入评分、术中出血量及子宫切除率比较

Table 2 Comparison of accreta scores of prenatal ultrasound, intraoperative blood loss and hysterectomy rate of each group

术后诊断	n	超声评分	出血量/mL	子宫切除/[例(%)]
阴性	41	3.63 ± 0.80*	300 (200~400)*	0
粘连	70	5.23 ± 0.92*	675 (500~900)*	0
植入	59	8.56 ± 1.74*	2 050 (1 500~2 500)*	4 (6.8) [‡]
穿透	12	12.83 ± 2.17*	3 600 (2 700~5 000)*	2 (16.7)

组间两两比较, * $P<0.05$; 与穿透组比较, [‡] $P<0.05$ 。出血量以M (QR)表示。

Pairwise comparison between groups, * $P<0.05$; Compared with the percreta group, [‡] $P<0.05$.

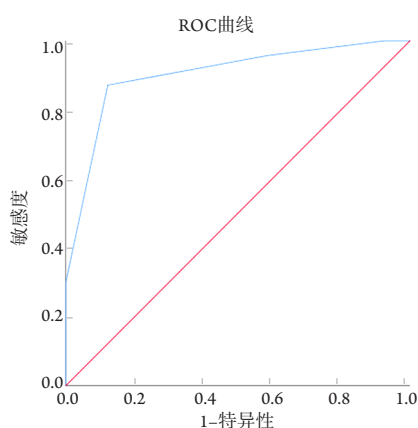


图2 阴性组与粘连组间不同超声评分截断值的ROC曲线
Figure 2 ROC curve of different ultrasonographic cutoff scores between the negative group and the adhesion group

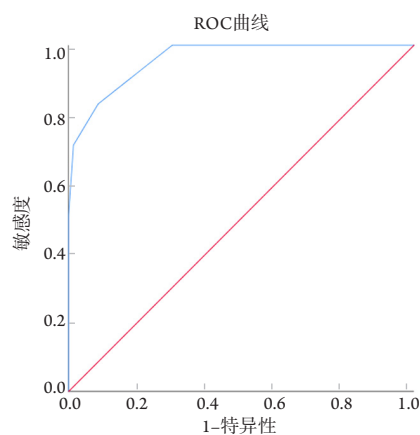


图3 粘连组与植入组不同超声评分截断值的ROC曲线
Figure 3 ROC curve of different ultrasonographic cutoff scores between the adhesion group and the increta group

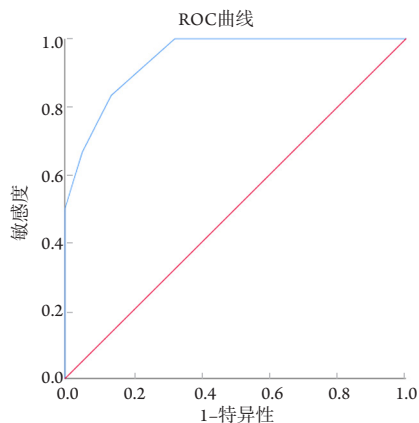


图4 植入组与穿透组不同超声评分截断值的ROC曲线

Figure 4 ROC curve of different ultrasonographic cutoff scores between the increta group and percreta group

3 讨论

胎盘植入是近年来导致孕产妇产后出血、子宫切除甚至死亡的重要原因。随着我国二胎政策全面放开,有剖宫产病史的瘢痕子宫再次妊娠人数急剧增长,而瘢痕子宫并前置胎盘是胎盘植入的最常见的高危因素。据报道^[8-9],随着剖宫产次数增加,胎盘植入风险明显增加,有1~5次剖宫产病史并前置胎盘的胎盘植入率达3.3%~67.0%。胎盘植入的程度与手术风险、手术治疗方法及妊娠结局密切相关^[2,10-11]。本研究也发现:阴性组、粘连组、植入组及穿透组在术中出血量及子宫切除率方面有明显差异,因此对胎盘植入程度的产前超声评估临床意义重大。

胎盘植入患者的阳性临床症状和体征较为少见,临床医生无法通过患者症状与体征直接判断是否存在PAS,而经腹部和/或经阴道二维灰阶并彩色多普勒超声检查是预测胎盘植入的最常用方法。经腹部超声扫查范围大,能观察到远离子宫下段及宫颈的胎盘,而经阴道超声分辨力高,对子宫前壁下段及宫颈口上方胎盘、膀胱及宫颈的侵犯显示有优势,故本研究使用经腹部联合经阴道超声的方法。超声的各种异常图像提示可能的PAS,EW-AIP提出了用于PAS异常诊断的超声征象的标准化描述,被纳入2018年国际妇产科联盟(International Federation of Gynecology and Obstetrics, FIGO)发布的胎盘植入指南^[12]。国内有研究^[13]发现:胎盘后方间隙消失、胎盘内广泛腔隙、胎盘内局灶腔隙、胎盘后方血流丰富、子宫膀胱壁界面毛糙预测胎盘植入的灵敏度(特异度)分别为71.2%(18.2%),35.6%(100%),

33.9%(36.4%),42.4%(81.8%)和18.6%(90.9%)。国外一项荟萃分析^[14]显示:针对3707次妊娠检查,产前超声诊断PAS的总体敏感度为90.72%,特异度为96.94%,诊断比值比(diagnostic odds ratio, DOR)为98.59。然而,超声在准确评估PAS的类型和植入的程度方面价值有限,研究^[15]表明没有哪种超声征象是胎盘植入深度的特异性征象。

本研究通过182例有剖宫产病史的前置胎盘病例研究发现:使用量化的超声评分表进行产前诊断,不同植入类型组间的超声评分有显著差异,以4.5,6.5和10.5分分别作为阴性与粘连型、粘连型与植入型和植入型与穿透型的截断值,敏感度、特异度、Youden指数均较高,ROC曲线下面积均大于或等于0.9,能较为准确区分植入的不同程度。因量化的评分表综合考量了高危病史(剖宫产次数)、前置胎盘类型、超声二维及彩色多普勒超声多种典型异常征象的影响以及关注了手术中最为棘手的膀胱和宫颈侵犯的超声特征,并按严重程度赋分,以分数高低对植入程度进行评估,较单纯的主观定性诊断更全面、规范,排除了不同超声医师根据个人经验选择不同超声征象并赋予不同重要性进行植入判断的可能,降低了漏诊及误诊率。临床医师可根据不同的评分,进行植入类型及程度的预判,选择不同的终止妊娠孕周,有目的地进行转诊,做好充足的术前准备,包括多学科协作及合理的手术方式选择,并且提前告知患者及家属可能的手术风险及临床结局。

本研究的局限性在于仅对有剖宫产病史的前置胎盘病例进行了研究,评分表也只适用于此种情况,没有分析其他高危因素如清宫史、肌瘤剔除史、宫腔镜操作史、宫角胎盘等导致的非剖宫产疤痕部位的胎盘植入情况。鉴于此,可纳入相关病例进行研究并改善评分量表,以全面评价产前超声检查对各种高危因素导致的不同部位的胎盘植入的诊断价值。

综上所述,对于有剖宫产病史的瘢痕子宫并前置胎盘患者,使用评分表式的产前超声诊断方法能较为准确地预测有无胎盘植入性疾病及植入程度,临床应用价值较大,值得推广。

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