

doi: 10.13241/j.cnki.pmb.2020.16.016

经会阴二维超声对自然分娩女性产后盆底三腔室运动和早期盆底功能的评估价值*

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摘要 目的:探讨经会阴二维超声对自然分娩女性产后盆底三腔室运动和早期盆底功能的评估价值。**方法:**选取 2019 年 2 月~2019 年 7 月于我院进行自然分娩的产妇 284 例作为研究组,另选取同期于我院接受诊治的未育女性 200 例作为对照组。两组均进行经会阴二维超声检查,比较两组静息期、张力期、收缩期的肛管直肠连接部(ARJ)、宫颈外口(CV)、尿道膀胱连接部(UVJ)的位置及运动变化情况,对比两组静息状态下以及最大 Valsalva 动作下盆底超声参数。**结果:**研究组静息期、张力期、收缩期的 CV 距离水平参照线的垂直长度(CV-VD)、UVJ 距离水平参照线的垂直长度(UVJ-VD)均低于对照组(均 $P<0.05$)。研究组张力期对应静息期垂直长度 $\Delta r\text{-sCV-VD}$ 、 $\Delta r\text{-sUVJ-VD}$ 均高于对照组,而收缩期对应静息期垂直长度 $\Delta r\text{-sCV-VD}$ 、 $\Delta r\text{-sUVJ-VD}$ 均低于对照组(均 $P<0.05$)。研究组静息状态下膀胱颈位置(BNP)低于对照组,而膀胱尿道后角(PUA)高于对照组(均 $P<0.05$);研究组最大 Valsalva 动作下膀胱颈移动度(BND)、PUA、尿道旋转角(URA)均高于对照组(均 $P<0.05$)。**结论:**经会阴二维超声可对自然分娩女性产后盆底三腔室运动和早期盆底功能进行有效观察,有助于评估女性盆底结构、功能变化,具有一定的临床推广应用价值。

关键词:自然分娩;二维超声;三腔室;盆底功能;评估

中图分类号:R711.5;R714.3 **文献标识码:**A **文章编号:**1673-6273(2020)16-3078-04

The Evaluation Value of Transperineal Two-dimensional Perineal Ultrasound on Three-compartment Movement and Early Pelvic Floor Function of Postpartum Women with Natural Delivery*

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ABSTRACT Objective: To explore the evaluation value of two-dimensional perineal ultrasound on three-compartment movement and early pelvic floor function of postpartum women with natural delivery. **Methods:** 284 women who gave birth naturally in our hospital from February 2019 to July 2019 were selected as the study group, and 200 women who did not give birth to gynecological diseases during the same period were selected as the control group. Transperineal two-dimensional ultrasound examination was performed between the two groups, the position and movement changes of anorectal junction (ARJ), cervical mouth outside (CV), urethral vesica junction (UVJ) during resting period, tension period and anal contraction period were compared between the two groups. The pelvic floor ultrasound parameters under resting state and maximum Valsalva action were compared between the two groups. **Results:** The vertical length of CV distance from horizontal reference line (CV-VD) and UVJ distance from horizontal reference line (UVJ-VD) in the study group during resting period, tension period and anal contraction period were lower than those in the control group (all $P<0.05$). The vertical lengths of $\Delta r\text{-sCV-VD}$ and $\Delta r\text{-sUVJ-VD}$ in the study group during tension period corresponds to resting period were higher than those in the control group, while the vertical lengths of $\Delta r\text{-sCV-VD}$ and $\Delta r\text{-sUVJ-VD}$ in the study group during anal contraction period corresponds to resting period were lower than those in the control group (all $P<0.05$). The bladder neck position (BNP) in the study group in resting state was lower than that in the control group, but the posterior urethralvesical angel (PUA) was higher than that in the control group (all $P<0.05$). The maximum Valsalva movement of bladder neck descent (BND), PUA and urethral rotation angel (URA) in the study group were all higher than those in the control group (all $P<0.05$). **Conclusion:** Transperineal two-dimensional ultrasound can effectively observe the postpartum pelvic floor movement and early pelvic floor function of women in natural delivery. It is helpful to evaluate the changes of pelvic floor structure and function, and it has certain clinical application value.

* 基金项目:广东省医学科学技术研究基金项目(B20171487)

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(收稿日期:2019-11-27 接受日期:2019-12-23)

Key words: Natural delivery; Two-dimensional ultrasound; Three-compartment movement; Pelvic floor function; Evaluation

Chinese Library Classification(CLC): R711.5; R714.3 **Document code:** A

Article ID: 1673-6273(2020)16-3078-04

前言

临床上,女性盆底支持系统主要是由外腔室、中腔室与内腔室组成,外腔室指肌肉层和浅层筋膜,中腔室则为泌尿生殖膈,内腔室即盆膈^[1-3]。正常生理状态下,盆底支持系统的肌肉群、神经以及结缔组织发挥相互协调作用,从而保障盆腔脏器的正常运动以及生理功能。相关研究报道显示^[4],盆底三腔室器官的位置以及运动趋势可在一定程度上反映女性的盆底支持系统功能情况。盆底支持系统出现损伤时,系统的力学平衡难以保持,从而使得盆腔器官位置以及运动趋势发生改变,进一步引起生理功能障碍,病情严重甚至可能导致盆底器官脱垂的发生^[5-7]。我国女性盆底功能障碍性疾病的发病率较高,且认知率相对较低,妊娠及分娩是目前临床上所公认的损害盆底功能的重要危险因素^[8]。随着人们生活水平的不断提高,产后盆底功能障碍性疾病的早期诊断治疗以及远期预防受到了广泛的关注。随着近年来影像学技术的不断完善,经会阴二维超声开始被广泛应用于女性多种疾病的诊断、治疗中,具有安全、无创、简便、经济等优势^[9,10]。鉴于此,本文通过探讨了经会阴二维超声对自然分娩女性产后盆底三腔室运动和早期盆底功能的评估价值,现作以下报道。

1 资料与方法

1.1 一般资料

选取 2019 年 2 月~2019 年 7 月于我院进行自然分娩的产妇 284 例作为研究对象,记作研究组。年龄 21~40 岁,平均年龄(28.63 ± 5.02)岁;体重 49~68 kg,平均体重(56.22 ± 5.22)kg;文化程度:初中及以下 92 例,高中及以上 192 例;孕周 37~42 周,平均孕周(39.12 ± 0.35)周。纳入标准:(1)均为初产妇;(2)孕周在 37~42 周,且为单胎;(3)分娩方式为阴道自然分娩;(4)年龄 ≥ 18 周岁。排除标准:(1)合并盆底功能障碍性疾病者;(2)伴有严重妊娠期并发症者;(3)交流沟通障碍或伴有精神疾病者;(4)正参与其他研究者。另选取同期于我院接受诊治的未育女性 200 例作为对照组。年龄 21~38 岁,平均年龄(28.55 ± 5.00)岁;体重 47~69 kg,平均体重(56.10 ± 5.15)kg;文化程度:初中及以下 75 例,高中及以上 125 例。两组年龄、体

重、文化程度比较无差异($P > 0.05$),可比性较佳。已获得纳入对象同意,并得到我院伦理委员会批准。

1.2 方法

采用 GE Voluson S6 和 GE Voluson E10 型超声诊断仪(美国 GE 公司)进行经会阴二维超声检查,仪器探头配备二维腔内探头及凸阵探头,频率分别为 4~8MHz、2~5MHz。检查前让受试者先排尿,取仰卧截石位,并以消毒耦合剂涂抹探头表面,增加避孕套处理。首先将探头置入阴道,观察子宫双附件区情况,随后将凸阵探头置于会阴部位,实施正中矢状切面检测。观察受试者盆底三腔室盆底器官在静息期、张力期、收缩期的位置及运动,其中三腔室节点均选取肛管直肠连接部(Anorectal junction, ARJ)、宫颈外口(Cervical mouth outside, CV)、尿道膀胱连接部(Urethral vesica junction, UVJ)。在超声声像图制作一条上经耻骨联合下缘的参照线,测量 ARJ、CV、UVJ 与水平参照线垂直长度。计算张力期、收缩期对应静息期垂直长度($\Delta r\text{-sARJ-VD}$ 、 $\Delta r\text{-sCV-VD}$ 、 $\Delta r\text{-sUVJ-VD}$),此外,观察静息状态下以及最大 Valsalva 动作下盆腔脏器的位置以及运动情况,包括静息状态下的膀胱颈位置(Bladder neck position, BNP)和膀胱尿道后角(Posterior urethra-vesical angel, PUA)及最大 Valsalva 动作下膀胱颈移动度(Bladder neck descent, BND)、PUA、尿道旋转角(Urethral rotation angel, URA),成像 3 次,取不同状态下清晰的盆底正中矢状面超声二维图像。

1.3 观察指标

比较两组盆底器官位置、运动情况,比较静息状态下及最大 Valsalva 动作下的盆底超声测量参数。

1.4 统计学方法

采用 SPSS24.0 软件实施数据的分析,计数资料以[n(%)]表示,予以 χ^2 检验;计量资料以($\bar{x} \pm s$)表示,予以 t 检验。检验水准为 $\alpha=0.05$ 。

2 结果

2.1 两组盆底器官位置对比

研究组静息期、张力期、收缩期的 CV-VD、UVJ-VD 均低于对照组(均 $P < 0.05$),见表 1。

表 1 两组盆底器官位置对比($\bar{x} \pm s$)

Table 1 Position comparison of pelvic floor organs between the two groups($\bar{x} \pm s$)

Groups	n	Resting period			Tension period			Anal contraction period		
		ARJ-VD	CV-VD	UVJ-VD	ARJ-VD	CV-VD	UVJ-VD	ARJ-VD	CV-VD	UVJ-VD
Study group	284	3.07 $\pm$ 0.54	4.02 $\pm$ 0.61	2.60 $\pm$ 0.49	2.29 $\pm$ 0.38	3.05 $\pm$ 0.57	1.60 $\pm$ 0.74	3.70 $\pm$ 0.47	4.40 $\pm$ 0.59	3.09 $\pm$ 0.32
Control group	200	3.09 $\pm$ 0.50	4.30 $\pm$ 0.65	3.02 $\pm$ 0.41	2.30 $\pm$ 0.34	3.51 $\pm$ 0.72	2.10 $\pm$ 0.60	3.74 $\pm$ 0.50	5.02 $\pm$ 0.53	3.71 $\pm$ 0.44
t	-	0.414	4.839	9.920	0.298	7.832	7.900	0.898	11.867	17.947
P	-	0.679	0.000	0.000	0.766	0.000	0.000	0.370	0.000	0.000

2.2 两组盆底器官运动情况对比

研究组张力期 $\Delta r\text{-sCV-VD}$ 、 $\Delta r\text{-sUVJ-VD}$ 均高于对照组,

而收缩期 $\Delta r\text{-sCV-VD}$ 、 $\Delta r\text{-sUVJ-VD}$ 均低于对照组(均 $P < 0.05$),见表 2。

表 2 两组盆底器官运动情况对比($\bar{x} \pm s$)

Table 2 Comparison of pelvic floor organ movement between the two groups($\bar{x} \pm s$)

Groups	n	Tension period			Anal contraction period		
		Δ r-sARJ-VD	Δ r-sCV-VD	Δ r-sUVJ-VD	Δ r-sARJ-VD	Δ r-sCV-VD	Δ r-sUVJ-VD
Study group	284	0.76 $\pm$ 0.52	1.01 $\pm$ 0.59	1.19 $\pm$ 0.50	0.68 $\pm$ 0.40	0.46 $\pm$ 0.32	0.50 $\pm$ 0.41
Control group	200	0.71 $\pm$ 0.44	0.82 $\pm$ 0.60	0.86 $\pm$ 0.41	0.70 $\pm$ 0.37	0.72 $\pm$ 0.38	0.77 $\pm$ 0.44
t	-	1.109	3.464	7.689	0.559	8.140	6.921
P	-	0.268	0.001	0.000	0.577	0.000	0.000

2.3 两组静息状态下盆底超声测量参数对比 (均 $P < 0.05$), 见表 3。

研究组静息状态下 BNP 低于对照组, 而 PUA 高于对照组

表 3 两组静息状态下盆底超声测量参数对比($\bar{x} \pm s$)

Table 3 Comparison of measurement parameters of pelvic floor ultrasound in resting state between the two groups($\bar{x} \pm s$)

Groups	n	BNP	PUA
Study group	284	24.32 $\pm$ 5.12	120.32 $\pm$ 15.29
Control group	200	26.57 $\pm$ 5.36	113.22 $\pm$ 10.61
t	-	4.669	5.674
P	-	0.000	0.000

2.4 两组最大 Valsaval 动作下的盆底超声测量参数对比 (均 $P < 0.05$), 见表 4。

研究组最大 Valsaval 动作下 BND、PUA、URA 均高于对照

表 4 两组最大 Valsaval 动作下的盆底超声测量参数对比($\bar{x} \pm s$)

Table 4 Comparison of pelvic floor ultrasonic measurement parameters in the two groups under the maximum Valsaval movement($\bar{x} \pm s$)

Groups	n	BND	PUA	URA
Study group	284	25.61 $\pm$ 10.47	138.61 $\pm$ 24.98	40.22 $\pm$ 13.11
Control group	200	17.46 $\pm$ 8.22	126.72 $\pm$ 16.29	25.91 $\pm$ 12.48
t	-	9.192	5.904	11.218
P	-	0.000	0.000	0.000

3 讨论

盆底支持组织松弛导致的盆腔脏器位置变化以及功能异常是盆底功能障碍性疾病的重要发病机制^[11-13]。盆腔支持系统属于一个紧密联系的整体,其正常生理功能需各器官保持正常的解剖位置以及运动功能,一旦相关组织、器官发生松弛、退化或受损均会打破上述整体平衡状态,进一步导致盆底功能性障碍^[14-16]。有研究报道显示,盆底三腔室器官不同时期的未知变化以及运动幅度可在一定程度上反映盆底支持系统强度及完整性^[17,18]。临床工作中可通过对上述相关指标进行检测,继而达到早期诊断盆底功能障碍的目的,继而为临床治疗方案的制定提供指导。迄今为止,临床上诊断盆底功能障碍性疾病主要是通过问卷调查以及妇科查体实现,常规检查由于对盆底结构的了解有限,因此缺乏客观准确的诊断方式^[19-21]。相较于 CT 以及磁共振成像等手段,超声具有无创、无辐射、费用较低以及重复性较好等优势,患者的依从性较高,且无明显禁忌症,在盆底影像学中具有良好的应用前景^[22-24]。有相关研究报道显示,经会阴超声扫查时,声束可顺利进入,有效避免阴道及直肠气体的影响,受检者不适感较弱^[25]。

本文结果发现不同时期两组 ARJ-VD 对比无差异,究其原因,笔者认为经阴道自然分娩对于女性的盆底器官影响不大,加上盆腔并无显著的组织缺陷,且与耻骨直肠肌紧密相连,固定作用较强^[26,27]。研究组静息期、张力期、收缩期的 CV-VD、UVJ-VD 均低于对照组,这表明自然分娩女性的盆底外、中腔室相较于未育女性存在明显的扩大,其中主要原因在于自然分娩时胎儿直接经由盆腔外、中室,从而促使其受到巨大的牵引及压迫,进一步可能导致盆底外、中腔室结构以及功能发生改变^[28]。此外,在张力期 Δ r-sCV-VD 和 Δ r-sUVJ-VD 方面对比,研究组高于对照组,而在收缩期 Δ r-sCV-VD 与 Δ r-sUVJ-VD 方面比较,研究组低于对照组,这提示了自然分娩女性收缩期的盆底器官朝头腹侧运动的幅度相对未育女性较小,而张力期朝足背侧运动的幅度相较未育女性较大,即自然分娩女性产后盆底支持系统功能状态存在一定程度的降低,这可能是自然分娩女性在分娩后盆底结构发生了明显的松弛,肌肉收缩力降低,于收缩期无法有力提升盆底组织,从而使得盆底结构抗腹压能力降低,最终促使盆底结构于张力期易朝足背侧过度移动^[29]。另外,研究组静息状态下 BNP 低于对照组,而 PUA 高于对照组,研究组最大 Valsaval 动作下 BND、PUA、URA 均高于对照组,这提示了顺产对盆底功能的影响较大,临床可通过经会阴二维超

声观察女性上述相关指标变化情况,继而准确评估女性盆底功能变化,从而有利于早期发现盆底功能异常,并为积极干预措施的制定提供参考依据,以降低女性盆底功能障碍的发生风险^[30]。

综上所述,经会阴二维超声有助于明确自然分娩女性产后盆底三腔室运动和早期盆底功能变化情况,有助于女性盆底结构、功能变化的评估,可能成为产后女性盆底功能常规筛查项目之一。

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