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经会阴实时三维盆底超声评估不同分娩方式对产后女性前腔室结构和盆膈裂孔的影响*

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摘要 目的:探讨经会阴实时三维盆底超声评估不同分娩方式对产后女性前腔室结构和盆膈裂孔的影响。**方法:**回顾性分析 2015 年 1 月至 2019 年 10 月在我院接受检查的 100 例产妇的诊治资料。根据分娩方式的不同,将患者分为经阴道分娩组($n=55$)和剖宫产分娩组($n=45$)。比较两组产妇在静息状态和 Valsalva 状态下的前腔室和盆膈裂孔超声参数。**结果:**在静息状态下,两组的膀胱颈位置、逼尿肌厚度、膀胱后角和尿道倾斜角相比无差异($P>0.05$)。经阴道分娩组在 Valsalva 状态下的膀胱颈移动度和尿道旋转角均大于剖宫产分娩组,尿道内口漏斗形成率和膀胱膨出率均高于剖宫产分娩组($P<0.05$)。在 Valsalva 状态下,经阴道分娩组的盆膈裂孔前后径、左右径、面积和周长均大于剖宫产分娩组($P<0.05$);在静息状态下,两组的上述指标相比,差异均无统计学意义($P>0.05$)。**结论:**应用经会阴实时三维盆底超声技术观察产妇前腔室结构和盆膈裂孔的参数变化,可评估产妇盆底功能受损的程度,经阴道分娩对其影响较大。

关键词:三维盆底超声;产妇;分娩;前腔室;盆膈裂孔

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Real Time Three-dimensional Pelvic Floor Ultrasound Through Perineum to Evaluate the Effect of Different Delivery Methods on the Structure of Anterior Chamber and the Hole of Pelvic Diaphragm in Postpartum Women*

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ABSTRACT Objective: To evaluate the Real time three-dimensional pelvic floor ultrasound through perineum to evaluate the effect of different delivery methods on the structure of anterior chamber and the hole of pelvic diaphragm in postpartum women. **Methods:** The data of diagnosis and treatment of 100 cases of parturient examined in our hospital from January 2015 to October 2019 were analyzed retrospectively. According to different delivery methods, the patients were divided into vaginal delivery group ($n=55$) and cesarean delivery group ($n=45$). The ultrasonic parameters of the anterior chamber and pelvic diaphragm hiatus in resting state and Valsalva state were compared between the two groups. **Result:** There was no significant difference between the two groups in the position of bladder neck, detrusor thickness, posterior angle of bladder and urethra inclination angle in resting state ($P>0.05$). In the vaginal delivery group, the mobility of the cystis neck and the rotation angle of the urethra were higher than those in the cesarean delivery group, and the formation rate of the internal urethra funnel and cystocele were higher than those in the cesarean delivery group ($P<0.05$). In the Valsalva state, the diameter, area and perimeter of the pelvic diaphragmatic hole in the vaginal delivery group were larger than those in the cesarean delivery group ($P<0.05$). In resting state, the difference between the two groups was not statistically significant ($P>0.05$). **Conclusion:** The perineal real-time three-dimensional pelvic floor ultrasound is applied to observe the changes of parameters of the anterior chamber structure and pelvic diaphragm hiatus, and the degree of pelvic floor function damage could be evaluated, the effect of vaginal delivery is greater.

Key words: Three-dimensional pelvic floor ultrasound; Postpartum women; Delivery; Structure of anterior chamber; Hole of pelvic diaphragm

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前言

女性盆底结构包括前、中、后三个腔室,其中前腔室包括阴

道前壁、膀胱和尿道^[1]。研究表明,妊娠和分娩可对女性盆底支持系统产生明显的影响,妊娠和分娩之后的围生期女性,为了维持其盆底结构的完整及功能的完善,盆底组织会发生重塑^[2,3]。

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妊娠和分娩也被认为是引发前腔室功能障碍性疾病的常见原因^[4]。盆膈裂孔中间有尿道、阴道及直肠通过,属于盆底疾病的好发部位,妊娠和分娩同样会对盆膈裂孔及其周围的支持组织产生明显影响^[5-7]。目前临床上对不同分娩方式对女性前腔室和盆膈裂孔解剖结构影响的认识尚无定论^[8,9]。为此,本研究应用经会阴实时三维超声分析不同分娩方式对产后女性的前腔室结构和盆膈裂孔的影响,以期诊断前腔室功能障碍性疾病和盆底功能障碍性疾病提供预防干预和早期治疗的参考依据,现报道如下。

1 资料与方法

1.1 一般资料

回顾性分析 2015 年 1 月至 2019 年 10 月在我院接受检查的 100 例产妇的诊治资料。纳入标准:①初次单胎足月分娩;②阴道分娩者未使用器械助产;③产后配合检查;④孕前未进行盆底康复训练和治疗。排除标准:①有盆腔手术史者;②有泌尿系统疾病者;③伴有严重内、外科疾病者;④临床资料不全者。根据分娩方式的不同,将患者分为经阴道分娩组($n=55$)和剖宫产分娩组($n=45$)。经阴道分娩组年龄 21~31 岁,平均(27.04 ± 3.94)岁;产妇分娩前平均体质质量指数(Body mass index, BMI)为(27.31 ± 3.15) kg/m^2 ;新生儿平均体重为(3.75 ± 1.01) kg 。剖宫产分娩组年龄 21~32 岁,平均(26.79 ± 3.36)岁;产妇分娩前平均 BMI 为(26.98 ± 3.26) kg/m^2 ;新生儿平均体重为(3.58 ± 1.12) kg 。两组的年龄、BMI、新生儿体重等一般资料相比,差异无统计学

意义($P>0.05$),临床资料均衡可比。

1.2 方法

两组产妇于产后 6~8 周时,采用盆底三维超声进行观察,使用彩色多普勒超声诊断仪(GE voluson E8, 美国),RAB 5-9-D 实时三维腔内探头,5~9MHz 频率。产妇取截石卧位,将探头置于会阴部尿道外口与阴道口间,先行二维成像,显示尿道全长的最大冠状切面,测量其膀胱颈最大移动度,之后分别采集产妇在静息和 Valsalva 动作下的图像。容积扫描从一个边缘扫到另一个边缘,采集矢、冠、横三个切面的图像。

1.3 观察指标

(1)观察两组产妇静息状态下的膀胱颈位置、逼尿肌厚度,对膀胱顶部肌层测量三次取均值,以及膀胱后角和尿道倾斜角。(2)观察两组产妇 Valsalva 状态下的膀胱颈移动度、尿道旋转角;比较两组尿道内口漏斗形成、膀胱膨出等情况。(3)观察两组产妇静息状态和 Valsalva 状态下的盆膈裂孔前后径、左右径、面积和周长。

1.4 统计学方法

采用 SPSS24.0 进行分析,计量资料以($\bar{x} \pm s$)表示,采用 t 检验;计数资料以 $[n(\%)]$ 表示,行 χ^2 检验;检验水准为 $\alpha=0.05$ 。

2 结果

2.1 静息状态下前腔室超声参数的比较

在静息状态下,两组的膀胱颈位置、逼尿肌厚度、膀胱后角和尿道倾斜角相比无差异($P>0.05$)。见表 1。

表 1 两组产妇静息状态下前腔室超声参数($\bar{x} \pm s$)

Table 1 Ultrasonic parameters of the anterior chamber in resting state of the two groups of postpartum women($\bar{x} \pm s$)

Groups	n	Bladder neck position (mm)	Detrusor thickness (mm)	Posterior horn of bladder($^{\circ}$)	Angle of inclination of urethra($^{\circ}$)
Vaginal delivery group	55	28.08 ± 3.60	2.69 ± 0.71	112.88 ± 15.74	27.98 ± 10.46
Cesarean delivery group	45	27.52 ± 3.32	2.55 ± 0.59	113.46 ± 13.11	28.14 ± 9.61
t		0.775	1.625	1.761	0.969
P		0.439	0.106	0.081	0.334

2.2 Valsalva 状态下前腔室盆底超声参数的比较

在 Valsalva 状态下经阴道分娩组膀胱颈移动度和尿道旋

转角均大于剖宫产分娩组,尿道内口漏斗形成率和膀胱膨出率均高于剖宫产分娩组,差异均有统计学意义($P<0.05$)。见表 2。

表 2 两组产妇 Valsalva 状态下前腔室超声参数

Table 2 Ultrasound parameters of anterior chamber of two groups of parturients in Valsalva state

Groups	n	Bladder neck mobility(mm)	Angle of rotation of urethra($^{\circ}$)	Infundibulum formation of urethra [$n(\%)$]	Cystocele [$n(\%)$]
Vaginal delivery group	55	24.35 ± 9.20	45.18 ± 17.42	23(41.82)	17(30.91)
Cesarean delivery group	45	18.30 ± 8.07	35.03 ± 16.56	10(22.22)	6(13.33)
t/ χ^2		3.455	2.963	5.657	4.317
P		0.001	0.004	0.017	0.038

2.3 静息状态和 Valsalva 状态下的盆膈裂孔超声参数的比较

在 Valsalva 状态下,经阴道分娩组的盆膈裂孔前后径、左右径、面积和周长均大于剖宫产分娩组($P<0.05$);在静息状态下,两组的上述指标相比,差异均无统计学意义($P>0$ 。

05)。见表 3。

3 讨论

女性盆底的构成复杂,各层次相互影响,在妊娠和分娩过

表 3 两组产妇静息状态和 Valsalva 状态下的盆膈裂孔超声参数($\bar{x} \pm s$)Table 3 Ultrasonic parameters of pelvic diaphragm hole in resting state and Valsalva state of two groups of parturients($\bar{x} \pm s$)

Groups	n	Anteroposterior diameter (mm)		Transverse diameter(mm)		Area(cm ²)		Perimeter(mm)	
		Resting state	Valsalva state	Resting state	Valsalva state	Resting state	Valsalva state	Resting state	Valsalva state
Vaginal delivery group	55	3.64±0.51	4.61±0.55	4.40±0.44	6.49±0.79	13.25±2.40	22.26±3.01	13.14±1.66	18.44±2.39
Cesarean delivery group	45	3.57±0.50	4.03±0.42	4.32±0.50	6.12±0.66	12.71±2.19	20.94±2.86	13.27±2.18	17.12±2.05
t		0.689	5.819	0.734	4.072	0.702	5.052	0.615	6.069
P		0.492	0.000	0.418	0.005	0.459	0.000	0.507	0.000

程中,常会引发盆底功能障碍性疾病,如压力性尿失禁、子宫或穹隆脱垂、膀胱膨出、直肠膨出等^[10,11]。在分娩过程中,会阴神经、肛提肌及盆内筋膜等盆腔支持组织也可能受到影响^[12]。经会阴的三维盆底超声检查可获得清晰的盆底横断面图像,动态显示盆底结构,具有简便、经济、重复性好等优势^[13],且在观察和测量盆膈裂孔时有较高的可靠性^[14],常用于评估女性盆底结构和功能检查。

本研究利用三维盆底超声技术,选取产后 6~8 周盆腔各器官位置已恢复的产妇,比较了经阴道分娩和剖宫产两种方式对其前腔室结构的影响。在静息状态下,两组产妇的前腔室超声参数无明显差异。肌肉、韧带和筋膜发挥协同作用,组成盆底肌性-弹力系统,维持其正常功能,前腔室结构的改变极易影响前腔室功能^[15,16]。正常的生理状况下,在盆底肌性-弹力系统的支持下,膀胱颈部、膀胱后角及尿道倾斜角均处于相对稳定的位置^[17]。对孕妇而言,体内激素水平的变化、体重的改变等多种内外部因素均可能影响盆底支持结构,进而使尿动力学及尿道长度也随之变化,膀胱颈移动度增加,位置改变^[18,19]。而产妇在分娩过程中,尿道支持结构、盆底肌肉组织等易受损伤,改变盆底组织结构^[20]。本研究中两组静息状态下的各项参数没有明显差异,推测原因为肛提肌未发生断裂,盆底肌性-弹力系统均可承托前腔室。

在本研究中,与剖宫产分娩组相比,在 Valsalva 状态下,经阴道分娩组尿道旋转角、膀胱颈移动度均更大,膀胱膨出率、尿道内口漏斗形成率均更高。此结果表明经阴道分娩的产妇,其盆底肌肉及筋膜组织更容易受到损伤,盆腔器官难以受到良好的支撑,膀胱颈移动度和尿道旋转角度均明显变大,并形成尿道漏斗。有研究发现经阴道分娩和与膀胱颈移动度增加有明显的相关性^[21],与本文结果一致。另有研究提出,相较于剖宫产,经阴道分娩因盆底肌松弛,压力性尿失禁的风险增大,而产后尿失禁的本质即膀胱颈位置及移动度的改变^[22-24]。因而,本研究结果与上述研究的结果基本一致,均表明剖宫产对盆底组织损伤的影响相对更小。

本研究还显示,在 Valsalva 状态下,经阴道分娩组的盆膈裂孔更大,而在静息状态下,两组的上述指标则无明显差异。经阴道分娩的产妇,由于用力不当或过度,其筋膜、盆底肌肉等可能受到扩张或者牵拉,盆底肌肉神经受损,发生盆膈裂孔损伤,表现出盆底神经受损、盆底肌肉的撕裂等^[25,26]。严重的情况下,

例如产程较长者,盆腔器官的支持组织可能变薄弱,盆膈裂孔扩大,还可引发膀胱颈位置移动^[27,28]。剖宫产分娩的产妇,由于激素、胎儿及附属物的重力作用等因素也会造成盆底支持系统变的薄弱,表现为产妇在 Valsalva 动作后,盆膈裂孔也会出现增大,但该方式不经软产道分娩,对产妇的盆底结构损伤相对较轻,较少出现肛提肌及盆膈裂孔损伤^[29,30]。

综上所述,应用经会阴实时三维盆底超声技术观察 Valsalva 状态下前腔室结构和盆膈裂孔的参数变化,可评估产妇盆底功能受损的程度,经阴道分娩对产后女性前腔室结构和盆膈裂孔的影响大于剖宫产。

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