

剖宫产后阴道试产的产程特点和影响因素分析

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【摘要】 目的 探讨剖宫产后阴道试产(trail of labor after cesarean, TOLAC)的产程特点,为临床安全管理其产程提供依据。**方法** 回顾性分析2016年1月至2018年12月自然临产的246例足月TOLAC孕妇,以及同时期340例自然临产、阴道分娩足月初产妇(SVB组)的临床资料。研究TOLAC的产程特点,以及前次剖宫产时机、既往阴道分娩史、妊娠间隔(1.5~3年、>3年)等对TOLAC产程的影响。**结果** 自然临产的足月TOLAC成功率90.2%。伴有阴道分娩史的自然临产的足月TOLAC产妇的第一、第二、总产程时间较无阴道分娩史的自然临产的足月TOLAC(wTOLAC)缩短($P<0.05$)。前次妊娠临产前和临产后行剖宫产的两组,以及妊娠间隔处于1.5~3年和>3年的两组的第一、第二、总产程时间均无明显差异。wTOLAC组与SVB组比较,两组的产前体质指数、分娩孕周、产程中干预措施、产后出血量、产后出血率、输血治疗率、妊娠合并症发生率、新生儿1 min Apgar评分、产钳助产率均无明显差异。wTOLAC组的年龄、孕前体质指数、新生儿体重较SVB组大($P<0.05$),分娩镇痛率较低($P<0.0001$)。应用协方差分析校正上述4个指标的组间差异:两组的产程进展模式类似,第一、总产程时限无明显差异,但第一产程宫口扩张2 cm后,尤其是宫口扩张6 cm后,wTOLAC组产程进展较快($P<0.01$);wTOLAC组的第二产程短于SVB组($P<0.001$),wTOLAC组内行分娩镇痛的第二产程亦短于SVB组内行分娩镇痛的($P<0.001$);wTOLAC组内行分娩镇痛的第二产程和总产程长于未行分娩镇痛者($P<0.05$)。**结论** 自然临产的足月TOLAC的产程模式与初产妇类似,宫口扩张6 cm后产程进展较快,且整个产程进展较初产妇稍快,分娩镇痛会延长产程。前次剖宫产时机和妊娠间隔对自然临产的足月TOLAC产程的影响较小,既往阴道分娩史是促进TOLAC产程进展的有利因素。

【关键词】 自然临产; 剖宫产后阴道试产(TOLAC); 既往分娩史; 妊娠间隔; 产程模式

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Labor patterns and the influence factors in women undergoing trail of labor after cesarean

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【Abstract】 Objective To investigate the labor patterns of trail of labor after cesarean (TOLAC), and to provide the basis for clinical safety management of labor process in TOLAC. **Methods** Two hundred and forty-six term women undergoing TOLAC and 340 term primiparae with spontaneous onset of vaginal delivery (SVB group), who underwent antenatal care and delivered from Jan 1, 2016 to Dec 31, 2018, were enrolled in this retrospective study. The labor patterns of TOLAC with spontaneous onset of labor were observed, as well as the influence of the timing of prior cesarean section, prior vaginal delivery history, and interpregnancy interval (1.5~3 years, >3 years) on the labor process in TOLAC. **Results** The success rate of term TOLAC with spontaneous onset of labor was 90.2%. Compared to term TOLAC with

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spontaneous onset of labor and no prior vaginal deliveries (wTOLAC), the first stage, the second stage and total labor durations of term TOLAC with spontaneous onset of labor and prior vaginal deliveries were shorter ($P<0.05$). There was no differences in the first stage, the second stage and total labor durations between TOLAC with prior pre-labor cesarean delivery and the ones with prior cesarean delivery in labor, so as the same indexes between the two groups with different interpregnancy intervals (1.5–3 years, >3 years). The admission body mass index, gestational age at delivery, interventions during labor, estimated blood loss, postpartum hemorrhage ratio, infusion therapy ratio, pregnant complication ratio, Apgar score at 1 minute, forceps ratio in wTOLAC group were comparable to those in SVB group. The age, pre-pregnancy body mass index and neonatal birth weight in wTOLAC group were much more than those in SVB group ($P<0.05$). The epidural anesthesia ratio of wTOLAC group was lower than that of SVB group ($P<0.0001$). According to analysis of covariance, adjusted for the four previous different indexes, the labor patterns of the two groups were similar, and there was no difference in the first stage and total labor durations between the two groups. However, the labor process after 2 cm dilatation in the first stage of labor, especially after 6 cm dilatation in wTOLAC group, was faster than that in SVB group ($P<0.01$). The second stage of labor in wTOLAC group was shorter than that in SVB group ($P<0.001$). In the subgroup of women with epidural anesthesia, the second stage of labor in wTOLAC group was also shorter than that in SVB group ($P<0.001$). In wTOLAC group, the second stage and total labor durations of the women with epidural anesthesia were longer than those without epidural anesthesia ($P<0.05$). **Conclusion** The labor pattern of term TOLAC with spontaneous onset of labor was similar to nulliparous labor with faster labor process after 6 cm dilatation. However, compared to nulliparous labor, the labor process was a bit faster in TOLAC. The timing of prior cesarean section and interpregnancy interval had little effect on labor durations in TOLAC. The prior vaginal delivery was a favorable factor to improve labor process in TOLAC, while epidural anesthesia delayed the labor process in TOLAC.

【Key words】 spontaneous onset; trial of labor after cesarean (TOLAC); previous labor history; interpregnancy interval; labor patterns

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随着国家二胎政策的全面放开以及近年国内的高剖宫产率大环境下,越来越多的剖宫产术后女性再次妊娠^[1-4],分娩方式的选择成为产科医师和孕妇共同面临的问题。国外实施剖宫产术后阴道试产(trial of labor after cesarean, TOLAC)已有30余年历史,对于影响TOLAC成功,即剖宫产术后阴道分娩(vaginal birth after cesarean section, VBAC),及子宫破裂发生风险因素的研究较为深入^[5-9]。但目前缺乏相关指南,因此对TOLAC的产程处理存在许多疑惑。我国从2010年开始鼓励开展TOLAC,虽然TOLAC率在逐年上升^[10],但开展的医疗机构相对有限,临床资料较匮乏^[11-13]。本研究分析了246例自然临产的足月TOLAC产妇和340例自然临产、阴道分娩的足月初产妇的临床资料,探讨自然

临产的TOLAC产程特点,以期建立我国TOLAC产程的安全评估监测体系提供理论依据。

资 料 和 方 法

资料来源 分析2016年1月至2018年12月复旦大学附属妇产科医院规范产检和分娩的单次剖宫产术后再次妊娠、符合本院TOLAC纳入标准、分娩孕周 ≥ 37 周、自然临产的246例TOLAC孕妇的临床资料。其中无阴道分娩史的TOLAC 234例(wTOLAC组),TOLAC成功222例。以1:1.5比例随机(应用excel随机数)选取同时期9196例自然临产、阴道分娩、足月初产妇中的340例作为对照组(SVB组)。定义既往存在 ≥ 28 周的阴道分娩为阴

道分娩史。病例入组流程见图1。我院麻醉医师24h驻守产房,产房具备紧急剖宫产手术能力以及抢救条件,一旦发生急性胎儿宫内窘迫、子宫破裂等

紧急情况能及时有效地处理。本研究经过本院伦理委员会批准(批号:2018-43)。

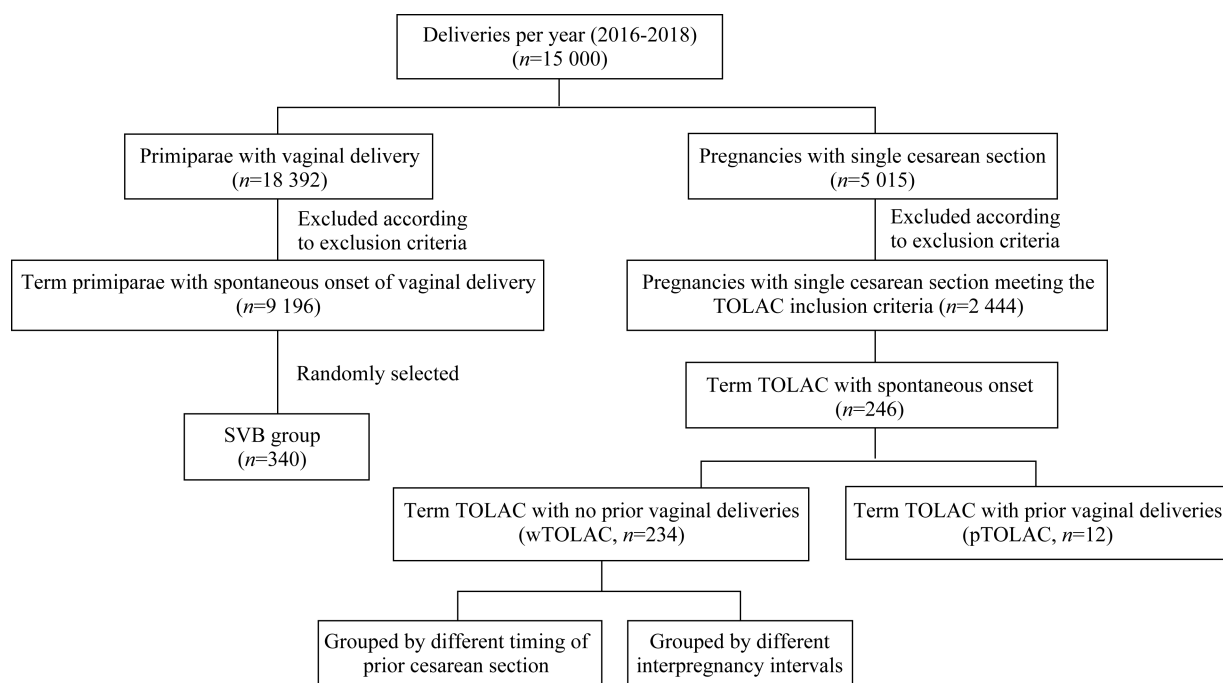


图1 病例入组流程图

Fig 1 Patients flow chart

病例纳入标准 TOLAC组符合以下条件:妊娠间隔(本次妊娠末次月经距离前次剖宫产手术间隔时间) ≥ 18 月;仅有一次子宫下段横切口剖宫产史,无子宫瘢痕;剖宫产子宫切口无延裂,无产褥感染;此次妊娠孕32~34周B超检查子宫前壁下段连续性无缺损;无子宫破裂史;单活胎,头位妊娠;分娩孕周 ≥ 37 周;胎儿估计体重 < 4.0 kg;前次剖宫产指征不存在且未出现新的剖宫产指征;自然临产。

SVB组符合以下条件:自然临产、阴道分娩的初产妇;分娩孕周 ≥ 37 周;单活胎,头位妊娠;无子宫瘢痕;无阴道分娩禁忌证。

病例排除标准 TOLAC组具有下列条件之一:前次剖宫产采用古典式剖宫产切口或倒T形切口或切口有延裂;前次剖宫产有产褥感染、晚期产后出血、产后转经月经淋漓不尽;合并子宫切口憩室或憩室修补术史;子宫破裂史; ≥ 2 次剖宫产史;有严重的妊娠合并症或并发症,不适合阴道分娩;本次妊娠有阴道分娩的绝对禁忌证(如中央型前置胎盘);非自然临产;非阴道分娩。

SVB组具有下列条件之一:经产妇;非自然临

产;合并子宫瘢痕;死胎;有阴道分娩的绝对禁忌证。

评价指标 (1)孕妇一般情况:年龄、产次、妊娠间隔、孕前体重指数(body mass index, BMI)、产前BMI、妊娠合并症或并发症等。(2)母亲结局:分娩孕周、第一、二、总产程时间、分娩方式、产后24h出血量、产妇输血情况、是否子宫破裂等。(3)新生儿结局:出生体重、1 min Apgar评分、是否入住新生儿重症监护室、并发症情况等。

统计学分析 应用SPSS 22统计软件处理数据,计数资料应用Fisher检验,正态分布计量资料应用 t 检验,非正态分布计量资料应用Mann-Whitney U 检验,需控制混杂变量对数据的影响时应用协方差分析, $P < 0.05$ 为差异有统计学意义。

结 果

TOLAC人群的分娩结局 我院年分娩量15 000人次,剖宫产率约40%。研究期间单次剖宫产后再次妊娠、符合我院TOLAC纳入标准的2444例,TOLAC率13.3%(325/2 444),分娩孕周 ≥ 37 周的

自然临产的TOLAC 246例,未发生子宫破裂,其中TOLAC成功者222例(包括产钳助产13例),成功率90.2%(222/246)。自然临产的足月TOLAC失败24例,均为无阴道分娩史的TOLAC。其中胎儿宫内窘迫15例(潜伏期14例,活跃期1例),产程进展不顺利3例(潜伏期2例,第二产程1例),绒毛膜羊膜炎4例(潜伏期4例),先兆子宫破裂2例(潜伏期2例,急诊剖宫产术中未见子宫破裂征象)。

既往分娩史对TOLAC产程时限的影响 自然临产的246例足月TOLAC,根据是否有阴道分娩史(无论是上次剖宫产前,或上次剖宫产后)、前次剖宫产时机(临产前/临产后)、妊娠间隔时间(1.5~3年、>3年)等3个因素分为亚组,分析上述3个因素对自然临产的足月TOLAC产程的影响。

不伴和伴阴道分娩史的自然临产的足月TOLAC产妇分别是234和12例,两亚组的年龄、分娩孕周、妊娠合并症发生率、分娩镇痛率、产程中干预措施(催产素静滴、人工破膜)、新生儿体重、产钳助产率差异无统计学意义(表1),但不伴阴道分娩

史的TOLAC产妇(wTOLAC)的孕前和产前BMI较伴有阴道分娩史的产妇(pTOLAC)分别降低2.5($P=0.002$)和2.2($P=0.008$)。应用协方差分析校正两组产妇的孕前和产前BMI差异:与wTOLAC产妇比较,pTOLAC产妇的第一、二、总产程时间分别缩短1.94($P=0.037$)、0.41($P=0.001$)和2.58 h($P=0.015$)。根据是否进行分娩镇痛划分亚组,进行和未进行分娩镇痛的pTOLAC产妇的第二产程较wTOLAC产妇分别缩短0.47 h($P=0.011$, $P=0.02$),进行分娩镇痛的pTOLAC产妇的总产程时间缩短更为明显,减少3.06 h($P=0.02$)。

将234例wTOLAC足月产妇按照既往剖宫产是否临产划分亚组(表2),196例产妇的首次剖宫产是临产前进行的(83.7%,196/234)。两组产妇的年龄、孕前/产前BMI、妊娠合并症发生率、分娩孕周、分娩镇痛率、产程中干预措施、新生儿体重差异无统计学意义,前次妊娠临产后行剖宫产的wTOLAC产妇的产钳助产率高于择期剖宫产史的产妇(15.8% vs. 3.5%, $P=0.009$)。但产钳病例共计

表1 伴或不伴阴道分娩史的TOLAC产妇的产程时间

Tab 1 Duration of labor in TOLAC group with or without prior vaginal deliveries

[$\bar{x} \pm s$ or n (%)]

Characteristic	wTOLAC (n=234)	pTOLAC (n=12)	U/F	P
Age (y)	32.4 \pm 4.1	32.5 \pm 6.9	1 174	0.623 ^a
Pre-pregnancy BMI (kg/m ²)	20.6 \pm 2.4	23.1 \pm 2.1	55.5	0.002^a
Admission BMI (kg/m ²)	26.1 \pm 3.0	28.3 \pm 2.9	687.5	0.008^a
Gestational age at delivery (wk)	39.4 \pm 1.0	39.5 \pm 0.8	1 199	0.456 ^a
Pregnant complication	23 (9.8)	1 (8.3)	—	1.000 ^b
Interventions during labor				
Oxytocin	19 (8.1)	0	—	0.607 ^b
AROM	36 (15.3)	0	—	0.223 ^b
Epidural anesthesia	115 (49.1)	6 (50.0)	—	1.000 ^b
Newborn weight (g)	3 370 \pm 345	3 390 \pm 357	1 027	0.540 ^a
Forceps delivery	13 (5.5)	0	—	1.000 ^b
First stage (h)	6.61 (17.09)	4.67 (8.00)	4.391	0.037^c
Second stage (h)	0.63 (2.02)	0.22 (0.46)	10.633	0.001^c
With epidural anesthesia (h)	0.75 (1.83)	0.28 (0.50)	6.657	0.011^c
Without epidural anesthesia (h)	0.57 (2.06)	0.10 (0.4)	5.622	0.020^c
Total stage (h)	7.54 (18.31)	4.96 (8.48)	6.006	0.015^c
With epidural anesthesia (h)	9.17 (19.17)	6.11 (8.59)	5.548	0.020^c
Without epidural anesthesia (h)	5.58 (16.87)	4.96 (7.38)	0.807	0.371 ^c

^aMann-Whitney U test. ^bFisher's exact test. ^cAnalysis of covariance, adjusted for pre-pregnancy and admission BMI. Data was presented as mean \pm SD, (number, %), or median (95th percentile). There were 24 cases with TOLAC failure, one had cesarean section in the second labor stage, the other 23 cases underwent cesarean section in the first labor stage. Then there were 211 cases with first stage, 210 cases with second and total stage. Pregnant complication including gestational diabetes mellitus, pre-pregnancy gestational diabetes mellitus, hypertension disease during pregnancy, intrahepatic cholestasis during pregnancy and *in vitro* fertilization and embryo transfer. TOLAC: Trail of labor after cesarean; BMI: Body mass index; AROM: Artificial rupture of fetal membrane. wTOLAC: TOLAC without prior vaginal deliveries; pTOLAC: TOLAC with prior vaginal deliveries.

表2 不同的前次剖宫产时机对无阴道分娩史的足月wTOLAC产妇的产程影响

Tab 2 Duration of labor in wTOLAC group with no prior vaginal deliveries and different timing of prior cesarean section

[$\bar{x} \pm s$ or $n(\%)$]

Characteristic	With prior pre-labor cesarean delivery ($n=196$)	With prior cesarean delivery in labor ($n=38$)	U/F	P
Age (y)	32.7 \pm 4.2	32.1 \pm 3.0	3 057	0.442 ^a
Pre-pregnancy BMI (kg/m ²)	20.9 \pm 2.4	20.8 \pm 2.0	3 047	0.775 ^a
Admission BMI (kg/m ²)	26.0 \pm 3.2	26.0 \pm 2.7	3 300	0.985 ^a
Gestational age at delivery (wk)	39.3 \pm 1.0	39.3 \pm 1.0	3 220	0.935 ^a
Pregnant complication	21 (10.7)	2 (5.3)	—	0.387 ^b
Interventions during labor				
Oxytocin	14 (9.7)	5 (13.2)	—	0.206 ^b
AROM	29 (14.8)	7 (18.4)	—	0.623 ^b
Epidural anesthesia	98 (50.0)	17 (44.7)	—	0.598 ^b
Newborn weight (g)	3386 \pm 342	3 299 \pm 381	2 868	0.205 ^a
Forceps delivery	7 (3.5)	6 (15.8)	—	0.009^b
First stage (h)	6.75 (17.54)	5.50 (12.53)	2 850	0.218 ^c
Second stage (h)	0.65 (1.96)	0.58 (2.05)	2.256	0.135 ^c
With epidural anesthesia (h)	0.79 (1.82)	0.60 (1.21)	2.139	0.147 ^c
Without epidural anesthesia (h)	0.58 (1.99)	0.50 (2.17)	0.550	0.460 ^c
Total stage (h)	7.63 (18.79)	7.30 (16.89)	1.269	0.261 ^c
With epidural anesthesia (h)	9.54 (19.94)	7.42 (13.50)	5.146	0.025^c
Without epidural anesthesia (h)	5.38 (15.32)	7.17 (17.25)	0.753	0.387 ^c

^aMann-Whitney *U* test; ^bFisher's exact test; ^canalysis of covariance, adjusted for forceps use. Data were presented as $\bar{x} \pm s$, $n(\%)$, or median (95th percentile). There were 21 cases and 3 cases with TOLAC failure in wTOLAC with prior pre-labor cesarean delivery group and wTOLAC with prior cesarean delivery in labor group, respectively. One of them had cesarean section in the second stage of labor in wTOLAC with prior pre-labor cesarean delivery group. Pregnant complication including gestational diabetes mellitus, pre-pregnancy gestational diabetes mellitus, hypertension disease during pregnancy, intrahepatic cholestasis during pregnancy and *in vitro* fertilization and embryo transfer. TOLAC: Trial of labor after cesarean; BMI: Body mass index; AROM: Artificial rupture of fetal membrane.

13例,病例数较少,可能统计学差异没有意义。应用协方差分析校正两组产钳助产差异后发现,两组的第一、二、总产程时间无明显差异($P>0.05$),但是根据是否进行分娩镇痛分亚组发现,上胎临产后行剖宫产、本次妊娠进行分娩镇痛的产妇,总产程时间较择期剖宫产史的产妇缩短2.12 h($P=0.025$)。

将234例wTOLAC足月产妇妊娠间隔时间(1.5~3年、>3年)划分亚组(表3),两组产妇的孕前/产前BMI、妊娠合并症发生率、分娩孕周、分娩镇痛率、产程中干预措施、产钳助产率、新生儿体重无明显差异,妊娠间隔超过3年wTOLAC产妇较妊娠间隔 ≤ 3 年产妇的年龄大[(33.1 \pm 4.1) y *vs.* (30.4 \pm 3.4) y, $P<0.0001$]。应用协方差分析校正两组年龄差异发现,两组的第一、二、总产程时间无明显差异。

wTOLAC和SVB组产妇的一般临床情况和分娩结局比较 wTOLAC和SVB组两组产妇的产前

BMI、分娩孕周、产程中干预措施、产后出血量、产后出血率、输血治疗率、子宫破裂率、妊娠合并症发生率(妊娠期糖尿病/孕前糖尿病、妊娠期高血压疾病、妊娠期肝内胆汁淤积症、辅助生殖技术)、新生儿1 min Apgar评分、新生儿并发症发生率(呼吸窘迫综合症、败血症、缺血缺氧性脑病、围产儿死亡)、产钳助产率无明显差异(表4)。wTOLAC组产妇年龄较SVB组大[(32.4 \pm 4.1) y *vs.* (29.9 \pm 3.7) y, $P<0.0001$];前者的孕前BMI亦较后者大(20.6 \pm 2.4 *vs.* 20.2 \pm 2.5, $P=0.002$),但产前BMI无明显差异。wTOLAC组新生儿体重较SVB组大[(3 371 \pm 354) g *vs.* (3 304 \pm 359) g, $P=0.035$],但两组巨大儿发生率差异无统计学意义。SVB组的分娩镇痛率高于wTOLAC组(65.9% *vs.* 49.1%, $P<0.0001$)。

wTOLAC和SVB组产妇的产程时限比较 应用协方差分析校正两组年龄、孕前BMI、是否分娩镇痛、新生儿体重的差异:wTOLAC和SVB组产妇

表3 不同的妊娠间隔对无阴道分娩史的足月wTOLAC产妇的产程影响

Tab 3 Duration of labor in wTOLAC group with no prior vaginal deliveries and different interpregnancy intervals [$\bar{x} \pm s$ or $n(\%)$]

Characteristic	wTOLAC with interpregnancy interval between 1.5 and 3 years (n=48)	wTOLAC with interpregnancy interval more than 3 years (n=186)	U/F	P
Age (y)	30.4 ± 3.4	33.1 ± 4.1	2 382	<0.000 1 ^a
Pre-pregnancy BMI (kg/m ²)	20.6 ± 2.3	20.8 ± 2.5	3 502	0.608 ^a
Admission BMI (kg/m ²)	25.6 ± 2.5	26.1 ± 3.1	3 431	0.305 ^a
Gestational age at delivery (wk)	39.2 ± 0.9	39.2 ± 1.0	3 842	0.684 ^a
Pregnant complication	1 (2.1)	22 (11.8)	—	0.054 ^b
Interventions during labor				
Oxytocin	5 (10.4)	14 (7.5)	—	0.548 ^b
AROM	6 (12.5)	30 (16.1)	—	0.652 ^b
Epidural anesthesia	19 (39.6)	96 (51.6)	—	0.148 ^b
Newborn weight (g)	3 381 ± 357	3 367 ± 350	1.019	0.805 ^c
Forceps delivery	5 (10.4)	8 (4.3)	—	0.148 ^b
First stage (h)	6.00 (13.95)	6.92 (17.95)	2.854	0.093 ^d
Second stage (h)	0.64 (2.05)	0.62 (2.00)	0.123	0.726 ^d
With epidural anesthesia (h)	0.66 (1.52)	0.79 (1.99)	0.188	0.666 ^d
Without epidural anesthesia (h)	0.50 (2.19)	0.58 (1.94)	1.283	0.260 ^d
Total stage (h)	6.83 (16.78)	7.92 (19.21)	1.904	0.169 ^d
With epidural anesthesia (h)	7.08 (13.14)	10.35 (19.96)	3.647	0.059 ^d
Without epidural anesthesia (h)	6.17 (17.50)	5.42 (15.27)	0.108	0.743 ^d

^aMann-Whitney *U* test; ^bAccording to Fisher's exact test; ^c*t* test; ^dAnalysis of covariance, adjusted for maternal age. Data was presented as mean ± SD, (number, %) or median (95th percentile). There were 20 cases and 4 cases with TOLAC failure in wTOLAC with interpregnancy interval more than 3 years group and wTOLAC with interpregnancy interval between 1.5 and 3 years group, respectively. One of them had cesarean section in the second stage of labor in wTOLAC with interpregnancy interval between 1.5 and 3 years group. TOLAC, trial of labor after cesarean; BMI, body mass index; AROM, artificial rupture of fetal membrane. Pregnant complication including gestational diabetes mellitus, pre-pregnancy gestational diabetes mellitus, hypertension disease during pregnancy, intrahepatic cholestasis during pregnancy and in vitro fertilization and embryo transfer.

的第一产程、总产程时间差异无统计学意义(表5),但第一产程宫口扩张2 cm后(尤其是6 cm后),wTOLAC组产妇产程进展较SVB组快($P<0.01$,表6,图2);wTOLAC组产妇的第二产程较SVB组缩短0.2 h($P<0.001$),行分娩镇痛的wTOLAC产妇的第二产程亦短于SVB组,减少0.21 h($P<0.001$);未行分娩镇痛的wTOLAC产妇的总产程较SVB组延长0.41 h($P=0.017$)。图2可以看出两组产妇宫口扩张6 cm后,产程进展均加快。

wTOLAC组115例行分娩镇痛,分娩镇痛率为49.1%。wTOLAC组内行分娩镇痛的第二产程和总产程较未行分娩镇痛者分别延长0.18 ($P=0.013$)和3.59 h($P<0.000 1$)。SVB组内行分娩镇痛的第二产程和总产程较未行分娩镇痛者分别延

长0.46 ($P<0.000 1$)和5.56 h ($P<0.000 1$)。

讨 论

国内关于TOLAC产程的研究以产程时限的研究为主。但产程进展是一个动态变化过程。我们分析了246例TOLAC(包括24例TOLAC失败病例)的产程各阶段进展发现:无阴道分娩史、自然临产的足月TOLAC(wTOLAC)产妇,宫口扩张6 cm后产程进展较前迅速;wTOLAC第一产程宫口扩张2 cm后(尤其是6 cm后),产程进展较自然临产的初产妇快,且第二产程时间明显缩短。本研究还发现:前次剖宫产时机和妊娠间隔不影响自然临产的足月TOLAC产妇的产程时限;阴道分娩史可缩短

表4 wTOLAC和SVB组产妇一般临床资料的比较

Tab 4 Maternal and obstetrical characteristics in wTOLAC and SVB group

[$\bar{x} \pm s$ or $n(\%)$]

Characteristic	wTOLAC ($n=234$)	SVB ($n=340$)	U/F	P
Age (y)	32.4 \pm 4.1	29.9 \pm 3.7	22 430	<0.000 1 ^a
Pre-pregnancy BMI (kg/m ²)	20.6 \pm 2.4	20.2 \pm 2.5	29 480	0.002 ^a
Admission BMI (kg/m ²)	26.1 \pm 3.0	26.2 \pm 2.9	34 270	0.598 ^a
Gestational age at delivery (wk)	39.4 \pm 1.0	39.4 \pm 1.0	32 390	0.065 ^a
Intervention during labor				
Oxytocin	19 (8.1)	28 (8.2)	—	1.000 ^b
AROM	36 (15.3)	45 (13.2)	—	0.467 ^b
Estimated blood loss (mL)	275 \pm 121	272 \pm 99	35 370	0.968 ^a
Postpartum hemorrhage	7 (3.0)	9 (2.6)	—	0.802 ^b
Transfusion	1 (0.4)	1 (0.3)	—	1.000 ^b
Uterine rupture	0	0	—	—
Pregnant complication	23 (9.8)	45 (13.2)	—	0.238 ^b
GDM/PGDM	18 (7.7)	25 (7.4)	—	0.873 ^b
Hypertension disease during pregnancy	2 (0.9)	11 (3.2)	—	0.085 ^b
ICP	1 (0.4)	0	—	0.408 ^b
IVF-ET	2 (0.9)	9 (2.6)	—	0.214 ^b
Epidural anesthesia	115 (49.1)	224 (65.9)	—	<0.000 1 ^b
Newborn weight (g)	3 371 \pm 354	3 304 \pm 359	1.025	0.035 ^c
Macrosomia	8 (3.4)	9 (2.6)	—	0.623 ^b
Apgar score at 1 min	9.0 \pm 0.1	8.9 \pm 0.5	34 910	0.064 ^a
Newborns admitted to the NICU	6 (2.6)	10 (2.9)	—	1.000 ^b
Neonatal tracheal intubation	3 (1.3)	5 (1.5)	—	1.000 ^b
NRDS	2 (0.9)	4 (1.2)	—	1.000 ^b
Neonatal septicemia	0	0	—	—
Neonatal HIE	0	0	—	—
Neonatal perinatal death	0	0	—	—
Forceps delivery	13 (5.6)	28 (8.2)	—	0.251 ^b

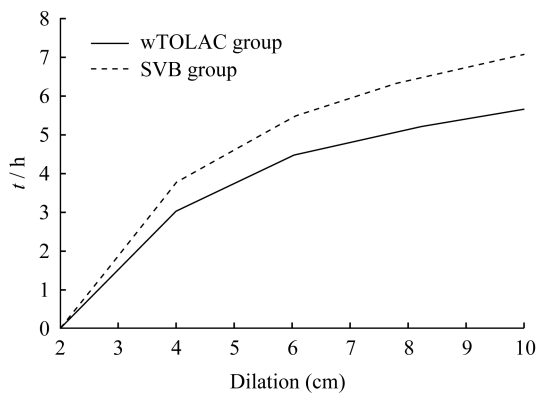
^aMann-Whitney U test; ^bFisher's exact test; ^c t test. wTOLAC group: Trail of labor after cesarean with spontaneous onset of labor and 1 prior cesarean delivery and no prior vaginal deliveries; SVB group: Nulliparous women with spontaneous vaginal delivery. Postpartum blood loss was the volume of blood loss within 24 h after delivery. BMI: Body mass index; AROM: Artificial rupture of fetal membrane; GDM: Gestational diabetes mellitus; PGDM: Pre-pregnancy gestational diabetes mellitus; ICP: Intrahepatic cholestasis during pregnancy; IVF-ET: *In vitro* fertilization and embryo transfer; NICU: Neonatal intensive care unit; NRDS: Neonatal respiratory distress syndrome; HIE: Hypoxic ischemic encephalopathy.

表5 wTOLAC和SVB组产妇的产程时间

Tab 5 Duration of labor in wTOLAC and SVB group

Interval	wTOLAC ($n=234$, h)	SVB ($n=340$, h)	F	P^a
First stage	6.61 (17.09)	7.58 (14.33)	1.326	0.250
Second stage	0.63 (2.02)	0.83 (2.37)	14.906	<0.001
With epidural anesthesia	0.75 (1.83)	0.96 (2.40)	14.320	<0.001
Without epidural anesthesia	0.57 (2.06)	0.50 (1.95)	2.640	0.106
Total stage	7.54 (18.31)	8.75 (16.00)	0.433	0.511
With epidural anesthesia	9.17 (19.17)	10.73 (16.38)	1.601	0.207
Without epidural anesthesia	5.58 (16.87)	5.17 (12.08)	5.810	0.017

^aAnalysis of covariance, adjusted for maternal age, pre-pregnancy body mass index, epidural anesthesia use, and newborn weight. Data was presented as median (95th percentile). wTOLAC group: Trail of labor after cesarean with spontaneous onset of labor and 1 prior cesarean delivery and no prior vaginal deliveries; SVB group: Nulliparous women with spontaneous vaginal delivery. There were 24 cases with TOLAC failure, one had cesarean section in the second labor stage, the other 23 cases underwent cesarean section in the first labor stage. Then there were 211 cases with first stage, 210 cases with second and total stage.



Mean labor curves in singleton term pregnancies with spontaneous vaginal delivery for women (parity=1) with 1 prior cesarean and trail of labor after cesarean (wTOLAC) and nulliparous women (SVB).

图2 自然临产产妇的产程曲线

Fig 2 Mean labor curves for spontaneous onset of labor

表6 wTOLAC和SVB组产妇的详细产程时间

Tab 6 Detailed duration of labor in wTOLAC and SVB group

Interval, cm (n)	wTOLAC (n=234, h)	SVB (n=340, h)	F	P ^a
2-4 (n=234)	3.10 (6.04)	3.42 (8.31)	10.010	0.003
4-6 (n=214)	1.01 (4.05)	1.00 (4.00)	3.315	0.072
6-8 (n=212)	0.50 (2.00)	0.71 (3.00)	10.829	0.001
8-10 (n=211)	0.33 (1.25)	0.50 (1.99)	3.790	0.052
2-10 (n=211)	5.25 (11.00)	6.42 (14.00)	15.717	<0.001
4-10 (n=211)	2.25 (6.00)	2.75 (7.74)	8.933	0.003
6-10 (n=211)	1.00 (3.00)	1.25 (4.00)	10.066	0.002

^aAnalysis of covariance, adjusted for maternal age, pre-pregnancy body mass index, epidural anesthesia use, and newborn weight. Data was presented as median (95th percentile). wTOLAC group: Trail of labor after cesarean with spontaneous onset of labor and 1 prior cesarean delivery and no prior vaginal deliveries; SVB group: nulliparous women with spontaneous vaginal delivery. There were 24 cases with TOLAC failure, one had cesarean section in the second labor stage, the other 23 cases underwent cesarean section in the first labor stage.

其产程时限;wTOLAC产妇的母婴预后与初产妇类似。这些能为临床医师处理TOLAC产程提供帮助信息。

TOLAC产程时限的影响因素 TOLAC产妇的产程可能有其自身特点,哪些因素影响其产程时限是临床医师关注的焦点。我们的研究认为既往阴道分娩史是缩短TOLAC产程时限的有利因素,分娩镇痛可延长TOLAC产程时限,与Netanella等的研究结果一致^[14]。Netanella等对以色列424例无阴道分娩史的TOLAC和357例伴有阴道分娩史的

TOLAC的研究也发现,与无阴道分娩史的TOLAC比较,伴有阴道分娩史的TOLAC产程时间明显缩短,分娩镇痛组TOLAC的第二产程和总产程时限增加。国内的回顾性研究对70例VBAC产妇(VBAC率93.3%)分析发现,前次剖宫产是否临产后手术,对VBAC的产程时限和妊娠结局无影响^[15],与我们的研究结果基本相符。我们根据是否进行分娩镇痛分亚组发现,上胎临产后行剖宫产、本次妊娠进行分娩镇痛的产妇,总产程时间较择期剖宫产史的产妇缩短。提示上胎临产后行剖宫产的产妇,急诊手术时宫口开大的程度可能影响TOLAC的产程进展,需扩大样本量,根据宫口大小进一步分亚组分析。屈在卿等^[16]研究发现,妊娠间隔对TOLAC成功率的影响较小,但并未研究妊娠间隔对TOLAC产程的影响。本研究认为妊娠间隔对自然临产的足月TOLAC的产程时限影响较小。

TOLAC的产程特点 本研究认为,wTOLAC产妇的产程特点与自然临产阴道分娩的初产妇相似,宫口扩张6 cm后,产程进展较前快速,与Zhang等^[17]在初产妇中的发现一致。Netanella等^[14]的研究也发现,TOLAC孕妇宫口扩张6 cm后产程进展较前快速。这符合新产程的有关潜伏期、活跃期的划分,提示我们可以参照新产程的划分判断产程进展情况。Grantz等^[18]研究了12个医疗机构的2 892例足月TOLAC和56 301例足月初产妇发现,自然临产的TOLAC的产程模式类似于初产妇,但前者产程进展较后者稍慢。Graseck等^[19]也有类似的发现,但研究没有区分初产妇和经产妇。本研究Grantz等^[17,20]的研究对象仅包含初产妇,因为初产妇作为对照组更具有可比性。经产妇的产程与初产妇不同,经产妇宫口扩张6 cm后产程进展较初产妇快。

一些研究虽然没有涉及TOLAC的产程模式,但发现无阴道分娩史的TOLAC产程时限与初产妇相似或更长^[21-22]。但是,余琳等^[13]的多中心研究认为VBAC产妇的第一、二产程时限与非瘢痕子宫产妇比较,无明显差异。该研究未分析TOLAC失败病例的产程,且未依据是否有既往阴道分娩史对研究对象进行分组比较。本研究认为,与足月初产妇比较,无阴道分娩史的足月TOLAC的第一产程和总产程时间无明显差异,但是宫口扩张2 cm后产程进展较足月初产妇迅速,尤其是宫口扩张6 cm后。

有研究认为无阴道分娩史的TOLAC的第二产程时限较初产妇短^[21,23],与我们的发现一致。

上述研究跟我们的发现不太一致,考虑可能的原因:(1)本研究中TOLAC成功率高达90.2%。严格的TOLAC纳入标准和孕期多次评估,且研究对象均为自然临产的TOLAC,提高了TOLAC成功率。TOLAC失败病例24例,其中22例在潜伏期中转剖宫产。TOLAC失败病例的产程对所有TOLAC病例的产程统计影响较小。(2)在我们院绝大部分产程进展缓慢的TOLAC产妇中转剖宫产终止妊娠。由于TOLAC本身存在子宫破裂风险,产程进展不顺利的TOLAC,产程中会再次评估分娩方式,多数产妇选择剖宫产终止妊娠。本研究中,3例因产程进展不顺利中转剖宫产。(3)TOLAC产妇的产程处理相对积极。(4)根据本院诊疗常规,需缩短TOLAC产妇的第二产程。本研究中缩短第二产程的产钳助产3例,第二产程时间分别是2.18、2.03和1.13 h。文中无阴道分娩史的210例VBAC第二产程中位数为0.63 h,第95百分位数为2.02 h。据此考虑,第二产程的比较应该具有可比性。

年龄、BMI、是否分娩镇痛、新生儿体重、产程中的干预措施如人工破膜、静滴催产素等均会影响产程的进展^[14,24-27]。本研究中wTOLAC和SVB组产程中干预措施(人工破膜、静滴催产素)无组间差异。应用协方差分析校正了组间的年龄、BMI、是否分娩镇痛、新生儿体重的差异。我院严格掌握对TOLAC患者应用催产素静滴加速产程的指征。在排除头盆不称的前提下,潜伏期4 h或活跃期2 h产程无进展,可考虑小剂量催产素静滴加速产程。本研究中TOLAC病例产程中干预措施较少,催产素静滴加速产程的病例仅7.7%(19/246),人工破膜加速产程的病例占14.6%(36/246)。根据诊疗规范,我们在潜伏期里常规间隔4 h阴道检查,活跃期间隔2~4 h阴道检查,宫口开全1 h未分娩会再次阴道检查评估。同时根据患者临床表现,比如大便感强烈、阴道见红偏多、胎心减速等,提前行阴道检查^[28]。因此会出现距离上次阴道检查仅间隔1~2 h,甚至仅间隔0.5 h。我们对进入产程的TOLAC实施一对一的产程管理,及时发现异常情况,及时评估和处理。

TOLAC的母婴预后 我们的研究中,wTOLAC产妇的母婴预后良好,与初产妇的母婴

预后类似。我们的前期研究发现,TOLAC的母婴并发症主要发生于TOLAC失败病例(子宫破裂均发生于TOLAC失败病例),TOLAC成功病例的母婴并发症发生率较低^[28]。本研究中TOLAC失败病例中2例先兆子宫破裂,行急诊剖宫产终止妊娠,术中探查未见明显子宫破裂征象。余琳等^[13]进行的多中心研究发现,TOLAC产妇的子宫破裂率、产后出血率高于非瘢痕子宫,但两组的新生儿重度窒息率无明显差异。该研究对象包括分娩孕周>28周的所有TOLAC病例,未区分是否是自然临产、是否有阴道分娩史。自然临产、有阴道分娩史的TOLAC成功率增加,并发症相对减少^[5-8],但产程中仍需严密监测产程进展,持续胎心监护,充分评估阴道试产的条件,警惕子宫破裂的发生。

本研究存在一定的局限性。首先,本研究是单中心的回顾性病例分析,存在偏移,但遵循统一的产程处理常规。其次,研究样本量相对偏少,尤其是有阴道分娩史的TOLAC和上胎临产后行剖宫产的TOLAC病例数较少。再次,研究对象是自然临产的TOLAC,TOLAC成功率达90.2%,高于文献报道,产程中的干预措施较少。因此,我们的产程曲线更适合自然临产的TOLAC。

综上所述,自然临产的TOLAC产程模式与初产妇类似,宫口扩张6 cm后产程进展加快,且产程进展较初产妇稍快。上胎剖宫产时机和妊娠间隔时间对自然临产的TOLAC的产程时限影响较小,既往阴道分娩史是促进TOLAC产程进展的有利因素,分娩镇痛延缓TOLAC的产程进展。可应用类似于无子宫瘢痕孕妇的新产程标准管理TOLAC孕妇的第一产程,但产程进展缓慢时需再次评估阴道试产的条件,放宽剖宫产指征,同时严密监测子宫破裂征象。

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