OBSTETRICS

Comparison of 2 stitches vs 1 stitch for transvaginal cervical cerclage for preterm birth prevention

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OBJECTIVE: The objective of the study was to compare the efficacy and outcomes of 2 vs 1 stitch at the time of cervical cerclage placement for preterm birth prevention.

STUDY DESIGN: This was a retrospective cohort study of women with singleton gestation undergoing history- or ultrasound-indicated transvaginal cervical cerclage prior to 24 weeks. The primary outcome was delivery at less than 37 weeks. The secondary outcomes included gestational age at delivery at less than 35, less than 34, less than 32, less than 28, and less than 24 weeks, perioperative details at the time of cerclage placement and removal, and maternal and neonatal outcomes. Comparison was made between patients with 2 vs 1 stitch at the time of cerclage placement. History- and ultrasound-indicated cerclages were analyzed separately.

RESULTS: Four hundred forty-four patients met inclusion criteria, 237 being history indicated (2 stitches, n = 86, 1 stitch, n = 151), and 207 ultrasound indicated (2 stitches, n = 117, 1 stitch, n = 90). Gestational age at delivery at less than 37 weeks was not significantly different between the 2 groups for both history- and ultrasound-indicated cerclage, even after adjusting for demographic differences and suture type (39% vs 35%; adjusted odds ratio, 1.38; 95% confidence interval, 0.64–3.01; and 44% vs 49%; adjusted odds ratio, 0.66; 95% confidence interval, 0.27–1.61, respectively).

CONCLUSION: Two stitches at the time of cerclage do not appear to improve pregnancy outcome either in the history- or the ultrasound-indicated procedures, compared with 1 stitch.

Key words: cerclage technique, cervical cerclage, 1 vs 2 stitches, preterm birth prevention

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Cervical cerclage is currently used in about 0.4% of pregnancies in the United States for preterm birth prevention.[1] Cervical cerclage placement indications include a history of cervical insufficiency (recurrent second-trimester losses/preterm births), cervical length less than 25 mm on transvaginal ultrasound, or dilated cervix on physical examination.[2-5] The cerclage is typically placed between 12-23 weeks.

Different surgical techniques for cerclage have been reported. The current methods used are mostly modifications of the original Shirodkar and McDonald techniques. No technique has been shown to be superior in reported studies.[6-15] The most common current technique is the McDonald procedure, in which a purse-string suture of monofilament suture (such as polypropylene) or polyester fiber tape (such as Mersilene) is placed in the cervix "as high as possible to approximate the level of the internal os."[16] Some practitioners have chosen to place an additional stitch at the time of initial cerclage procedure.

Proposed mechanisms for which a second suture might improve the efficacy of cerclage include a greater cervical height and an additional support to the posterior cervix.[17,18] The question as to whether the additional stitch improves the efficacy of the procedure and desired outcome remains incompletely investigated. Limited data show no benefit on placing 2 stitches instead of 1 at the time of initial cerclage placement, but studies had no controls,[17] had a small sample size,[17-20] and/or the analyses grouped together different indications for cerclage.[17-20]

Our study aimed to compare outcomes of 2 vs 1 stitch at the time of transvaginal cervical history-indicated or ultrasound-indicated cerclage placement for preterm birth prevention.

Materials and Methods

We conducted a retrospective cohort study of women with a singleton gestation who underwent transvaginal cervical cerclage and delivered at Thomas Jefferson University (TJUH) and Albert Einstein Medical Center (AEMC; both in Philadelphia, PA, between January 1994 and June 2011. The study was approved by the institutional review board at each institution. Patients who underwent cerclage placement were identified using an existing database at TJUH and a billing code system at AEMC. Women with a singleton gestation who underwent history- or ultrasound-indicated transvagi-

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FIGURE
Study population

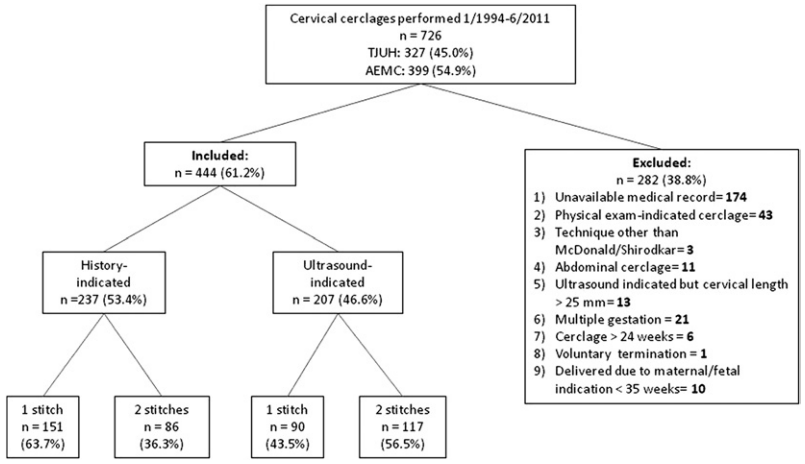

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TABLE 1
Demographic and obstetric characteristics: history indicated (n = 237)

	2 stitches (n = 86)		1 stitch (n = 151)		
Variable	**n**	**%**	**n**	**%**	***P* value**
Age[a]	29.0 ± 6.0		30.6 ± 5.6		.048
Race					< .001
African American	60	71	102	68	
White	8[b]	9[b]	38[b]	25[b]	
Hispanic	15[b]	18[b]	7[b]	5[b]	
Others (Asians, others)	2	2	4	3	
Gravity[a]	4.6 ± 1.9		4.9 ± 2.2		.236
Parity[a]	0.7 ± 1.0		0.6 ± 0.9		.808
BMI, kg/m^2[a]	31.3 ± 8.0		30.7 ± 8.1		.582
Smoking	11	13	21	14	.846
Prior preterm birth					
14-24 wks	55[b]	64[b]	117[b]	77[b]	.034[b]
24-36 6/7 wks	53	62	77	51	.136
GA earliest preterm birth[a]	24.5 ± 4.9		23.3 ± 4.3		.078
Prior preterm births (20-36 wk), n[a]	1.3 ± 1.0		1.4 ± 1.1		.632
Second-trimester losses (14-24 wk), n[a]	1.0 ± 1.1		1.2 ± 0.9		.214
Prior cone/LEEP	3[b]	3[b]	19[b]	13[b]	.020[b]
More than 1 D&C	24	28	49	32	.559
Uterine anomalies	1	1	0	0	.363
DES exposure	1	1	8	5	.161
Previous cerclage	58	67	97	64	.671
Use of progesterone	30[b]	35[b]	21[b]	14[b]	< .001[b]

BMI, body mass index; *D&C,* dilation and curettage; *DES,* diethylstilbestrol; *GA,* gestational age; *LEEP,* loop electrosurgical excision procedure.

[a] Mean ± SD; [b] Variables that reach statistical significance.

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nal cerclage placement prior to 24 weeks were included for study.

Patients included in the history-indicated cerclage group had cerclage placed based on their poor obstetrical history and/or risk factors as determined by their obstetrical provider, which in general were a history of multiple prior preterm births and/or second-trimester losses**.** Patients were allocated to the ultrasound-indicated cerclage group when the indication for the cervical cerclage was a transvaginal cervical length less than 25 mm before 24 weeks. Starting in 2003, singleton gestations with prior spontaneous preterm birth received 17-hydroxy progesterone caproate starting at 16-20 weeks.

The patient population of both hospitals that participated in the study is similar, with both hospitals serving the inner-city women of the city of Philadelphia. The number of sutures placed and the suture material used was chosen by the operating surgeon. At TJUH, cervical cerclages were usually performed using the McDonald technique, with 1 stitch of Mersilene 5 mm tape (Ethicon, Inc, Somerville, NJ), placed in a purse string fashion. At AEMC, the McDonald technique using a nonabsorbable braided polyester suture (silky II Polydek; Deknatel, Cambridge, MA) was performed. This technique was frequently modified at AEMC by the placement of 2 stitches at the time of initial cerclage. After the first stitch was placed and tied, a second stitch, usually of the same suture, was placed in a similar fashion proximal to the first suture, closer to the internal os.

Women who underwent a transabdominal cerclage, a surgical technique different from McDonald and Shirodkar, physical examination-indicated cerclage, multiple gestations, cerclage placement after 24 weeks, ultrasound-indicated cerclage with cervical length larger than 25 mm, and no medical records available to extract the data were excluded from this analysis. Patients who underwent voluntary termination of pregnancy or medically indicated delivery prior to 35 weeks' gestation for preeclampsia, intrauterine fetal demise, and/or nonreassuring fetal status were also excluded from the analysis.