OBSTETRICS

Transvaginal cervical cerclage: evidence for perioperative management strategies

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The objective was to review the evidence supporting various perioperative technical and management strategies for transvaginal cervical cerclage. We performed MEDLINE, PubMed, EMBASE, and COCHRANE searches with the terms, cerclage, cervical cerclage, cervical insufficiency, and randomized trials, plus each technical aspect (eg, suture, amniocentesis, etc) considered. The search spanned 1966 through September 2012 and was not restricted by language. Each retrieved manuscript was carefully evaluated, and any pertinent references from the reports were also obtained and reviewed. All randomized trials covering surgical and selected perioperative, nonsurgical aspects of cerclage were included in the review. The evidence was assessed separately for history-, ultrasound-, and physical examination-indicated cerclage. Evidence levels according to the new method outlined by the US Preventive Services Task Force were assigned based on the evidence. There are no grade A high-certainty recommendations regarding technical aspects of transvaginal cervical cerclage. Grade B moderate-certainty recommendations include performing a fetal ultrasound before cerclage to ensure fetal viability, confirm gestational age, and assess fetal anatomy to rule out clinically significant structural abnormalities; administering spinal, and not general, anesthesia; performing a McDonald cerclage, with 1 stitch, placed as high as possible; and outpatient setting. Unfortunately, no other recommendations can be made regarding the other technical aspects of cerclage.

Key words: cervical cerclage, stitch, technique

Cervical cerclage is the placement of a stitch within and around the perimeter of the cervix, with the aim to reinforce its integrity and keep it closed, to prevent or treat cervical insufficiency and consequent spontaneous preterm birth (PTB). Transvaginal cerclage in pregnancy was first reported in 1955; the case was performed by Dr V. Shirodkar, an Indian obstetrician, in 1951.[1] Many investigators have reported variations on the surgical technique of transvaginal cerclage, and the most common of these is the McDonald procedure.[2,3] A variety of technical aspects of cervical cerclage have been investigated for their efficacy in prolonging gestation.

Safety and effectiveness of technical aspects of cerclage may vary by the indications for this procedure. When first described, cerclage was used for 2 indications: initially for prior second-trimester loss with painless cervical dilation in the current pregnancy (ie, physical examination indicated) and soon after for recurrent second-trimester loss, not attributable to other causes (ie, history indicated).[1,2]

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Contemporary indications and nomenclature are listed in Table 1.[4-9] In women with prior spontaneous preterm birth, singleton gestation, and transvaginal ultrasound (TVU) cervical length of less than 25 mm before 24 weeks, a meta-analysis of randomized trials has shown that ultrasound-indicated cerclage is associated with a significant 30% decrease in preterm birth less than 35 weeks and a significant 36% decrease in perinatal morbidity and mortality.[10] Current guideline statements now support cerclage placement for this indication.[11,12]

These recent efficacy data make a review of the technical aspects of cerclage and their effect on pregnancy outcome timely. An evaluation of the indications, gestational age of placement, contraindications, and complications of cerclage is beyond the scope of this report.[13] Because cerclage placement has not been shown to be beneficial in multiple gestations,[14,15] the assumption in this review is that cerclage is placed in a woman carrying a singleton. Review of technical aspects of old preconception techniques such as Lash or Mann is not planned because these techniques are used rarely, if at all. Additionally, a review of the technical aspects of transabdominal or laparoscopic cerclage is not planned because these are in many ways technically quite different from transvaginal cerclage.

Our objective was to review the evidence for efficacy of various perioperative technical and management strategies associated with transvaginal cerclage placement, as analyzed by the different indications (Table 1) for this surgical procedure. Each strategy will be reviewed separately. Clinical assessment of the published data will follow evidence-based criteria, emphasizing level I evidence (based on randomized clinical trials [RCT] or meta-analyses) when available.

Sources

MEDLINE, PubMed, EMBASE, and COCHRANE searches were performed with the terms, cerclage, cervical cerclage, cervical insufficiency, and ran-

TABLE 1
Nomenclature, indication, and usual gestational age of placement for cervical cerclage[4]

Name	Indication	Usual GA of placement, wks
History indicated	Prior multiple (eg, ≥3) second-trimester losses and/or PTBs[5]	12-14[6]
Ultrasound indicated	Short CL (eg, <25 mm) by TVU[7]	16-23[7]
Physical examination indicated	Dilated cervix on manual or speculum examination[8,9]	16-23[8,9]

CL, cervical length; *GA*, gestational age; *PTB*, preterm birth; *TVU*, transvaginal ultrasound.

Berghella. Technique of cervical cerclage. Am J Obstet Gynecol 2013.

domized trials, plus each technical aspect (eg, suture, amniocentesis, etc) considered. The search spanned 1966 through September 2012 and was not restricted by language.

Study selection

Each retrieved manuscript was carefully evaluated, and any pertinent references from the reports were also obtained and reviewed. All randomized trials covering surgical and selected perioperative, nonsurgical aspects of cerclage were included in the review. In the absence of randomized trials adequately covering the intervention or related strategy, analytical data were reviewed. In the absence of experimental or analytical data, observational data were evaluated.

Exclusion criteria included cerclage in multiple gestations, Lash or Mann procedures, cervical occlusion, and open or laparoscopic transabdominal cerclage.

Each aspect of the cerclage technique was reviewed separately. These included preoperative, intraoperative, and postoperative strategies. Preoperative considerations were fetal ultrasound; amniocentesis; screening for infection; and the use of prophylactic antibiotics, tocolytics, and progesterone. Intraoperative considerations included anesthesia method, cervicovaginal preparations, cerclage type (Shirodkar, McDonald), choice of suture, needle and number of stitches, cerclage height, and techniques for reducing prolapsed membranes. Postoperative considerations included outpatient vs inpatient cerclage, activity restriction, and use of reinforcing cerclage.

After each strategy was reviewed, evidence levels were assigned based on the evidence according to the new method outlined by the US Preventive Services Task Force (Table 2).[16]

Results

Preoperative considerations

Fetal ultrasound. There are no specific randomized trials assessing the effectiveness of performing an ultrasound before a cerclage (Table 3). Based on indirect evidence and clinical common sense, an ultrasound should be performed before every cerclage placement to ensure fetal viability, confirm gestational age, and assess fetal anatomy to rule out clinically significant structural abnormalities.[13] At least a crown-rump length and some method of aneuploidy screening or testing should be offered when cerclage is performed before 18 weeks (eg, history indicated), and an anatomic survey performed when cerclage is planned later (eg, ultrasound or physical exam indicated) (recommendation B; level: low; Table 3).

Amniocentesis. We could identify no RCT assessing the effectiveness of performing a precerclage amniocentesis. Placing a cerclage in a woman with overt, clinical intraamniotic infection (IAI) places both fetus and mother at great morbidity and even mortality risks and is considered an absolute contraindication.[17,18] The prevalence of subclinical IAI depends on the clinical circumstance and cerclage indication.

We could identify no published report investigating the prevalence of subclinical IAI in women undergoing history-indicated cerclage, but it is probably present in less than 1% of these women because their cervix is typically closed and long. Therefore, amniocentesis is not indicated before history-indicated cerclage.

Subclinical IAI complicates about 1-2% of pregnancies in women undergoing ultrasound-indicated cerclage.[19] The prevalence can be as high as 4-9% if the fluid is also cultured for Ureaplasma and Mycoplasma species[20,21]; however, the clinical significance of colonization with these microbes is unclear. In general, shorter cervical length (CL) is associated with higher rates of IAI.[21] In approximately 75% of cases, women screened with TVU and found to have a short CL will have a closed and long cervix when examined by speculum and/or manual examination,[22] and their rate of IAI is extremely low. The presence of sludge as detected by ultrasound has been associated with IAI in asymptomatic patients with a short cervix.[23] Nonetheless, we could find no report that suggests improved pregnancy outcomes result from using amniocentesis, and thus, it is not recommended.

Subclinical IAI is discovered in approximately 13-28% of women with acute cervical insufficiency (mostly asymptomatic cervical dilatation on digital examination) in the second trimester and who may be considered candidates for physical examination-indicated cerclage.[18,24] Amniotic fluid harvested from women with cervical dilatation of 2 cm or more, and cultured for Ureoplasma and Mycoplasma, reveals an approximately 50% incidence of IAI.[17]

We could find no RCT evaluating the safety and efficacy of amniocentesis for women with cervical changes prior to physical examination-indicated cerclage, but an ongoing RCT may help address this important clinical issue.[25] Amniocentesis to rule out infection in women with second-trimester cervical dilatation up to 4 cm has not been associated with higher PTB or preterm premature rupture of membranes rates.[24]