CERVICAL LENGTH SCREENING: DO’S AND DON’TS

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APRIL 19, 2019
LECTURE OBJECTIVES

• Why does Cervical Length Matter?
• How to obtain an adequate Cervical Length
• Management options for short cervix (BRIEF)
• Who should be screened, who could be screened, and who shouldn’t be screened?
• Patient Cases
WHY DOES CERVICAL LENGTH MATTER?

• Short Cervical Length is a marker for increased risk for preterm birth (PTB)
  – PTB leading cause of death in children <5yrs
  – PTB ranks ahead of cardiovascular disease as global cause of lost human potential

• History of PTB and short cervix are most consistent risk factors for PTB

• Risk is inversely proportional to cervical length

• Worse prognosis if short cervix AND Funneling

• Amniotic sludge is independent risk factor for PTB

https://www.askideas.com/40-world-prematurity-day-pictures-and-photos/
OBTAINING A CERVICAL LENGTH (CL)

Transvaginal Ultrasound (TVUS)
• Gold Standard
• Most reproducible technique

Transabdominal Imaging may be compromised by:
• Maternal Pubic Symphysis
• Fetal Parts
• Maternal Body Habitus
• Bladder Fullness (may compress lower uterine segment and mimic long, closed cervix)
OBTAINING A CERVICAL LENGTH (CL)

BOX 1
Steps for proper cervical length measurement

1. Ensure patient has emptied her bladder.
2. Prepare the cleaned probe using a probe cover.
3. Gently insert the probe into the patient’s vagina.
4. Guide the probe into the anterior fornix.
5. Obtain a sagittal, long-axis image of the entire cervix.
6. Remove the probe until the image blurs and then reinsert gently until the image clears (this ensures you are not using excessive pressure).
7. Enlarge the image so that the cervix occupies two thirds of the screen.
8. Ensure both the internal and external os are seen clearly.
9. Measure the cervical length along the endocervical canal between the internal and external os.
10. Repeat this process twice to obtain 3 sets of images/measurements.
11. Use the shortest best measurement.

Cervical Length Education and Review (www.perinatalquality.org/CLEAR), a program of training and certification, is offered through the Perinatal Quality Foundation.

OBTAINING A CERVICAL LENGTH (CL)

Other key pointers for adequate Transvaginal Ultrasound CL

• Measure anterior-posterior diameter of Dilated Internal Os

• Check CL at beginning of exam (cervix is dynamic; length shortest in patients who have been upright recently)

• Observe for 3-5 minutes with TV US (r/o dynamic changes)

• Avoid excessive vaginal transducer pressure

• Use fundal pressure to unveil short cervix (15 seconds – r/o dynamic cervix)

• Evaluate for presence of amniotic fluid “sludge” or debris
  – Associated with increased risk for PTB
SMFM: We recommend sonographers and/or practitioners receive specific training in the acquisition and interpretation of cervical imaging during pregnancy (Grade 2B)

Cervical Length Education & Review (CLEAR) (SMFM and Perinatal Quality Foundation)

- Online Training Program
  - CME Credit and satisfies ABOG MOC Part IV requirements for Improvement in Medical Practice
- Online Lectures (4 Total)
- Online Exam
- Image Review Program
  - Participants submit a batch of 5 CL images
  - Images reviewed and graded by experienced reviewers

https://clear.perinatalquality.org/  SMFM Consult Series #40 (smfm.org)
OBTAINING A CERVICAL LENGTH

Normal CL on TVUS

Short CL on TVUS
OBTAINING A CERVICAL LENGTH

Transvaginal Ultrasound (TVUS)
- * Internal Os Diameter
- Blue – Length of Funnel
- White – Functional Cervical Length
- Red – Total Cervical Length
“Normal” CL on TVUS with Excessive transducer pressure

Short CL on TVUS with Normal transducer pressure
OBTAINING A CERVICAL LENGTH
A short cervical length identified on US should be followed up with a clinical evaluation

- Do an exam!
  - Findings may alter your clinical management and counseling
MANAGEMENT OF THE SHORT CERVIX

Medical Approach
Vaginal progesterone

Mechanical Approach
Cervical Cerclage
Cervical Pessary
MANAGEMENT OF THE SHORT CERVIX

Medical Approach
Vaginal progesterone
90mg gel or 200mg suppository qday until 36w gestation

Indicated if short cervix ≤20mm identified in a singleton gestation with no prior PTB at <24w gestation
(Fonseca 2007, Hassan 2011, Romero 2016)
MANAGEMENT OF THE SHORT CERVIX

Mechanical Approach
Cervical Cerclage

Box 1. Indications for Cervical Cerclage in Women With Singleton Pregnancies

**History**
- History of one or more second-trimester pregnancy losses related to painless cervical dilation and in the absence of labor or abruptio placentae
- Prior cerclage due to painless cervical dilation in the second trimester

**Physical Examination**
- Painless cervical dilation in the second trimester

**Ultrasonographic Finding With a History of Prior Preterm Birth**
- Current singleton pregnancy, prior spontaneous preterm birth at less than 34 weeks of gestation, and short cervical length (less than 25 mm) before 24 weeks of gestation

(Pereira 2007, Owen 2009, Berghella 2011)

MANAGEMENT OF THE SHORT CERVIX

Mechanical Approach
Pessary (e.g. Arabin Pessary)
NOT FDA Approved in the US at this time

(Goya 2012, Nicolaides 2016)

https://dr-arabin.de/produkt/arabin-cerclage-pessary-perforated/?lang=en
WHO SHOULD, COULD OR SHOULDN’T BE SCREENED?

The role of routine cervical length screening in selected high- and low-risk women for preterm birth prevention

Society for Maternal-Fetal Medicine (SMFM); Jennifer McIntosh, MD; Helen Feltovich, MD; Vincenzo Berghella, MD; Tracy Manuck, MD
WHO SHOULD BE SCREENED?

Patients with history of prior spontaneous preterm birth and singleton gestation

(ACOG & SMFM Guidelines)

• Serial TV US every 1-2 weeks per clinical scenario

• Screening should be performed between 16-24w

“We recommend routine transvaginal CL Screening for women with singleton pregnancy and history of prior spontaneous preterm birth (Grade 1A)”
WHO SHOULD BE SCREENED?

Patients with history of prior spontaneous preterm birth with singleton gestation

Patients with history of prior spontaneous preterm birth with singleton gestation should be screened. The current singleton pregnancy with a prior spontaneous preterm birth is described as follows:

Prior Spontaneous Preterm Birth
- Prior singleton live birth 16th-36th weeks gestation due to labor, ruptured membranes, cervical dilation/insufficiency, abruption*

Recommend 250 mg IM weekly 17-alpha hydroxyprogesterone caproate (initiate at 16 weeks, through 36 weeks).

Current singleton pregnancy with a prior spontaneous preterm birth
- Serial Transvaginal Ultrasound for CL*** (first at 16 weeks, until 23-67 weeks)

If CL ≥30 mm:
- <24 weeks: Yes, routine prenatal care, continue 17P
- <24 weeks: No, 1 week

If CL 26-29 mm:
- <24 weeks: Yes, routine prenatal care, continue 17P
- <24 weeks: No

If CL ≤25 mm:
- Sterile speculum examination, Evaluate for labor, intraamniotic infection, etc.
- Offer ultrasound indicated cerclage, continue 17P

* labor, ruptured membranes, cervical dilation/insufficiency, abruption
**<24 weeks
*** ultrashort CL

WHO COULD BE SCREENED?

Universal Cervical Length Screening

“Current SMFM guidelines state CL screening in singleton gestations without prior PTB cannot yet be universally mandated”

“Practitioners who decide to implement universal CL screening should follow strict guidelines (Grade 2B).”
WHO COULD BE SCREENED?

Current singleton pregnancy with a No prior Spontaneous Preterm Birth

Review ALL PTB Risk Factors*

If pos., see appropriate guideline (smoking, etc)

Screen for: Urine Culture; RPR/GC/Chlam

Consider Single Transvaginal CL Ultrasound (at 18-23 weeks of gestation)

Address Barriers:
- Provider knowledge re: importance of TVU, Interpretation of images (CLEAR for Quality)
- Access to TVS by trained clinicians

CL ≤20 mm
Vaginal Progesterone**

CL >20 mm
No intervention

Address Barriers:
- Access to vaginal progesterone

No cerclage, or pessary, for these women

WHO COULD BE SCREENED?

Research

JAMA | Original Investigation

Predictive Accuracy of Serial Transvaginal Cervical Lengths and Quantitative Vaginal Fetal Fibronectin Levels for Spontaneous Preterm Birth Among Nulliparous Women

M. Sean Esplin, MD; Michal A. Elovitz, MD; Jay D. Iams, MD; Corette B. Parker, DrPH; Ronald J. Wapner, MD; William A. Grobman, MD, MBA; Hyagriv N. Simhan, MD; Deborah A. Wing, MD; David M. Haas, MD, MS; Robert M. Silver, MD; Matthew K. Hoffman, MD; Alan M. Peaceman, MD; Steve N. Caritis, MD; Samuel Parry, MD; Pathik Wadhwa, MD, PhD; Tatiana Foroud, PhD; Brian M. Mercer, MD; Shannon M. Hunter, MS; George R. Saade, MD; Uma M. Reddy, MD, MPH; for the nuMoM2b Network

Esplin et al. JAMA 2017
WHO COULD BE SCREENED?

Esplin et al. JAMA 2017
WHO COULD BE SCREENED?

Threatened Preterm Labor – CL as adjunct to SVE to predict PTB

TVCL may aid in assessment and management in women with symptoms of PTL

• CL ≥30mm (NPV 96-100% for PTB)

• CL <20mm -> warrants PTL treatment based on CL alone

• CL 20-29mm (Grey zone) +/- Fetal Fibronectin (FFN) — CONTROVERSY ALERT
  
  – FFN Screening NPV >90%, PPV 9-46%
  
  – (Berghella & Saccone 2016) Systematic Review of 6 RCTs evaluating clinical outcomes and management in the setting of physician knowledge of FFN results or no knowledge of FFN results
    
    • Knowledge of FFN results did NOT reduce rates of PTB compared with control group
    
    • Knowledge of FFN result group resulted in similar rates of hospitalization, tocolytics and BMZ compared to control group
    
    • Hospital costs were higher in knowledge of FFN group

SMFM Consult Series #40 (smfm.org), SMFM Guideline: When to use fetal fibronectin (2016)
WHO SHOULDN’T BE SCREENED?

- Women with hx of treatment for cervical dysplasia (e.g. LEEP, CKC)
- Routine screening after cerclage placement
- Women with multiple gestations
  - NO CERCLAGE for short cervix (may be harmful!)
  - Intervention for identified short cervix is active area of investigation
- Women with PPROM
- Women with Placenta Previa

“We recommend routine transvaginal CL screening not be performed for women with cervical cerclage, multiple gestation, PPROM or placenta previa. (Grade 2B)”
## Active Areas of Research

### Maternal-Fetal Medicine Units Network

**Eunice Kennedy Shriver National Institute of Child Health and Human Development**

### Randomized Clinical Trials

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<th>PROJECT NAME</th>
<th>TRIAL/STUDY NAME</th>
<th>TIMEFRAME</th>
<th>CLINICALTRIALS.GOV / PMID</th>
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<td>RCT of Continuous Positive Airway Pressure (CPAP) for Sleep Apnea in Pregnancy</td>
<td>2018-ongoing</td>
<td>NCT03487185</td>
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<td>TXA</td>
<td>Tranexamic Acid for the Prevention of Obstetrical Hemorrhage After Cesarean Delivery: Randomized Controlled Trial</td>
<td>2018-ongoing</td>
<td>NCT03364491</td>
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<td>RCT of Pessary in Singleton Pregnancies with a Short Cervix</td>
<td>2017-ongoing</td>
<td>NCT02901626</td>
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<td>PROSPECT</td>
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<td>2015-ongoing</td>
<td>NCT02518594</td>
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<td>CMV</td>
<td>RCT to Prevent Congenital Cytomegalovirus</td>
<td>2012-ongoing</td>
<td>NCT01376778</td>
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<td>ARRIVE</td>
<td>Induction in Nulliparous Women at 39 Weeks to Prevent Adverse Outcomes: Randomized Controlled Trial</td>
<td>2014-2017</td>
<td>NCT01990612</td>
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<td>STAN RCT</td>
<td>RCT of Fetal ECG ST-Segment and T-Wave Analysis as an Adjunct to Electronic Fetal Heart Rate Monitoring</td>
<td>2010-2014</td>
<td>NCT0134269</td>
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[https://mfmunetwork.bsc.gwu.edu/PublicBSC/MFMU/MFMUPublic/research-projects/](https://mfmunetwork.bsc.gwu.edu/PublicBSC/MFMU/MFMUPublic/research-projects/)
PATIENT CASE

A nulliparous patient at 22 weeks of gestation undergoes transabdominal ultrasonography that indicates a cervical length of 2.0cm. No dynamic changes are observed and the fetal size is consistent with dates.

The best next step in management is:

(a) Fetal fibronectin  
(b) Uterine tocodynamometry  
(c) Digital cervical examination  
(d) Review of preterm labor symptoms  
(e) Transvaginal ultrasonography
A repeat US 2 weeks later revealed a cervical length of 15mm. She has experienced no contractions, vaginal bleeding or leakage of vaginal fluid. Speculum exam was negative for membrane rupture or prolapsed membranes. Her cervix is soft and closed on pelvic exam.

The best next step in management is:

(a) Bed rest
(b) Cerclage placement
(c) Intramuscular progesterone
(d) Repeat cervical length in 1 week
(e) Vaginal progesterone
CONCLUSION

• Short Cervical Length is a marker for increased risk for preterm birth
• Technical Considerations for Proper Cervical Length Screening (e.g. CLEAR)
• DO SCREEN women with history of prior spontaneous preterm birth <37w
• Universal Screening for low risk, asymptomatic women is not currently mandated but reasonable (institution dependent)
• Serial CL Screening is not warranted
  – Hx Cervical dysplasia s/p excision
  – Multiple gestations (Cerclage may be harmful in short cervix)
  – Patients s/p cerclage placement
  – PPROM
  – Placenta Previa
• Consider enrolling eligible patients in MFMU Network Studies!
  – PROSPECT (multiple gestation with short cervix <3cm)
  – TOPS (singleton gestation with short cervix <2cm)
REFERENCES

SMFM Consult series #40, The role of routine cervical length screening in selected high-and low-risk women for preterm birth prevention AJOG 2016


Prolog Obstetrics 7th Edition Critique Book
QUESTIONS