ISUOG Basic Training
Imaging, Measurement and Assessment of the Cervix
Learning objectives

Upon completion of this activity, you should be able to better:

- Visualize and measure the cervix in pregnant patients with vaginal sonography
- Identify and manage pregnant patients with short cervix
- Manage patients with threatened preterm labour
Cervix can be visualized transabdominally but poorly.
Vaginal sonography of the cervix

- Internal os
- External os

Basic Training
Normal cervix and short cervix
Normal cervical length

Risk of premature delivery

Salomon et al: UOG 2009; 33: 459
Protocol for cervical assessment

- Patient in gynecological position, empty bladder
- Vaginal probe ≥ 5 MHz in a lubricated disposable sheath
- Gently place the probe in the anterior vaginal fornix to ensure a sagittal view of the cervix is obtained
- Large image (> 75% of screen)
- Identify the internal os, external os, cervical canal and endocervical mucosa. Beware segmental contractions of the lower uterus
- Avoid undue pressure with the probe because this will falsely elongate the cervix
Segmental thickening of the lower uterus: be careful not to overestimate the cervical length

Placenta

6.7 cm

Placenta

3.7 cm
Visualizing the cervical mucosa
Segmental contractions of the lower uterus
Patient rushed in at night for an emergency cerclage

Outpatient scan: ? funneling

Upon admission
Cervix is soft, avoid undue pressure
The proper technique to visualize and measure the cervix with vaginal sonography

1. Exert some pressure to identify cervix and cervical canal

2. Release completely the pressure to measure cervical length
Consider at increased risk anyone with a cervical length < 25 mm at 18-23 weeks.
Vaginal progesterone in women with an asymptomatic sonographic short cervix in the midtrimester

<table>
<thead>
<tr>
<th>Study</th>
<th>Relative risk (fixed) (95% CI)</th>
<th>Vaginal progesterone n/N</th>
<th>Placebo n/N</th>
<th>Weight (%)</th>
<th>Relative risk (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fonseca 2007</td>
<td></td>
<td>22/125</td>
<td>38/125</td>
<td>45.4</td>
<td>0.58 (0.36-0.92)</td>
</tr>
<tr>
<td>O’Brien 2007</td>
<td></td>
<td>1/12</td>
<td>4/19</td>
<td>3.7</td>
<td>0.40 (0.05-3.13)</td>
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<tr>
<td>Rode 2011</td>
<td></td>
<td>3/7</td>
<td>5/14</td>
<td>4.0</td>
<td>1.20 (0.40-3.63)</td>
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<tr>
<td>Hassan 2011</td>
<td></td>
<td>21/235</td>
<td>36/223</td>
<td>44.1</td>
<td>0.55 (0.33-0.92)</td>
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<tr>
<td>Cetingoz 2011</td>
<td></td>
<td>1/9</td>
<td>2/6</td>
<td>2.9</td>
<td>0.33 (0.04-2.91)</td>
</tr>
<tr>
<td>Combined</td>
<td></td>
<td>48/388</td>
<td>85/387</td>
<td>100.0</td>
<td>0.58 (0.42-0.80)</td>
</tr>
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</table>

Cervical length (CL) and threatened preterm labor

Delivery < 7 days and CL

<table>
<thead>
<tr>
<th>Cervical length (mm)</th>
<th>Rate of delivery within 7 days (%)</th>
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<tbody>
<tr>
<td>1-5</td>
<td>60</td>
</tr>
<tr>
<td>6-10</td>
<td>50</td>
</tr>
<tr>
<td>11-14</td>
<td>30</td>
</tr>
<tr>
<td>15-20</td>
<td>20</td>
</tr>
<tr>
<td>21-25</td>
<td>10</td>
</tr>
<tr>
<td>26-30</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 30</td>
<td>10</td>
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</tbody>
</table>

RCT of CL (cutoff 15 mm, n = 41)

<table>
<thead>
<tr>
<th></th>
<th>CL</th>
<th>controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delivery ≤ 34 wks</td>
<td>9.5 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Inappropriate treatment</td>
<td>3 %</td>
<td>18 %</td>
</tr>
<tr>
<td>Delivery &lt; 35 wks without steroids</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Tsoi et al: UOG 2003, 21:552
Alfirevic et al: UOG 2007, 29:47
**Short term prediction of preterm birth**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Probability of delivery &lt; 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-test</td>
</tr>
<tr>
<td>No fetal breathing</td>
<td></td>
</tr>
<tr>
<td>Positive fibronectin</td>
<td>10 %</td>
</tr>
<tr>
<td>Short cervix on ultrasound</td>
<td></td>
</tr>
</tbody>
</table>

Boots et al: AJOG 2014;210:54.e1-10
Contingent use of fetal fibronectin and CL in preterm labour

Threatened preterm labor

Cervical length

- < 15 mm: Fibronectin +, High risk
- 15-30 mm: Fibronectin -, Low risk
- > 30 mm

To summarize:

- The technique for assessing the cervical length with vaginal ultrasound and potential pitfalls has been described.

- Cervical measurements is particularly useful:
  - To assess the risk of preterm delivery in asymptomatic patients, both high and low risk.
  - In the management of patients with threatened preterm labor.
MCQ # 1

Segmental contractions of the lower uterus:

a. Do not interfere with sonographic transvaginal measurement of the cervix
b. May lead to underestimation of the cervical length
c. May lead to overestimation of the cervical length
MCQ # 2

Which of the following should be avoided when assessing the cervix with vaginal sonography in pregnancy

a. Full urinary bladder
b. Empty urinary bladder
c. Lubrication of the sheath containing the probe
MCQ # 3

What is the normal cervical length at 18-23 weeks' gestation:

a. About 3 cm and more than 2.5
b. About 2.5 cm and more than 2 cm
c. About 2 cm and more than 1.5 cm
MCQ # 4

In which of the following cases there evidence of benefit from vaginal progesterone:

a. Singleton pregnancy 22 weeks' gestation, cervical length 2.9 cm
b. Singleton pregnancy 22 weeks gestation, cervical length < 1.9 cm
c. Singleton pregnancy 22 weeks gestation with funneling of the cervix
MCQ # 5

In patients with threatened preterm labor:

a. Vaginal fibronectin predicts preterm birth significantly better than sonographic cervical length

b. Sonographic cervical length predicts preterm birth significantly better than vaginal fibronectin

c. Sonography of the cervix and fibronectin perform similarly
MCQ # 1

Segmental contractions of the lower uterus:

a. Do not interfere with sonographic transvaginal measurement of the cervix
b. May lead to underestimation of the cervical length
c. May lead to overestimation of the cervical length
Which of the following should be avoided when assessing the cervix with vaginal sonography in pregnancy

a. Full urinary bladder
b. Empty urinary bladder
c. Lubrication of the sheath containing the probe
MCQ # 3

What is the normal cervical length at 18-23 weeks' gestation:

a. About 3 cm and more than 2.5
b. About 2.5 cm and more than 2 cm
c. About 2 cm and more than 1.5 cm
MCQ # 4

In which of the following cases is there evidence of benefit from vaginal progesterone:

a. Singleton pregnancy 22 weeks' gestation, cervical length 2.9 cm

b. Singleton pregnancy 22 weeks gestation, cervical length < 1.9 cm

c. Singleton pregnancy 22 weeks gestation with funnelling of the cervix
MCQ # 5

In patients with threatened preterm labor:

a. Vaginal fibronectin predicts preterm birth significantly better than sonographic cervical length

b. Sonographic cervical length predicts preterm birth significantly better than vaginal fibronectin

c. Sonography of the cervix and fibronectin perform similarly