Background

- In the United States, cesarean birth rates are among the highest in the world.
- Recurrent cesarean delivery increases risk of maternal mortality, abnormal placentation, lifelong painful adhesions, unplanned hysterectomy for subsequent pregnancy, NICU admissions, and neonatal death.
- American College of Obstetricians and Gynecologists (ACOG, 2010) support induction of labor (IOL) including mechanical methods in women undergoing a trial of labor after cesarean (TOLAC) with up to two previous cesarean deliveries.
- American College of Nurse-Midwives (ACNM, 2011) has also recommended that TOLAC is an available option for women who desire a vaginal birth after cesarean (VBAC).

Statement of the Problem

- Despite the recommendations from ACOG and ACNM, a trial of labor after cesarean and cervical ripening methods are often not offered to women desiring a TOLAC.
- TOLAC rates have decreased from 28.3% in 1996 to 8.7% in 2010; however, when offered, VBAC success has remained stable at 74%.
- Some providers are concerned about the safety of IOL due to previous adverse reports on pharmacologic methods.
- Some women wish to avoid oxytocin or prostaglandin E2 and are open to a non-pharmacological method to initiate IOL.

Purpose and Methods

- Conduct a literature review using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) framework on the use of the cervical ripening balloon (CRB) for women who desire a TOLAC and require induction of labor:
  - Primary outcome: Uterine rupture rate
  - Secondary outcome: VBAC success rate
- Data bases used: Cochrane, CINAHL, PubMed, Google Scholar with key words: VBAC, induction, balloon, and knowledge, yielded 402 abstracts, which were reviewed.
- A total of 11 English language studies with 1118 patients were included in final review; inclusion of studies was confirmed by two Certified Nurse-Midwife reviewers.

Conceptual Framework

Modalities of Labor Induction in Women Desiring a Trial of Labor After Prior Cesarean Delivery

- Artificial Rupture of Membranes With or Without Oxytocin
- Pharmacological Method of Induction Acceptable to Woman

- Cervical Ripening Balloon with Oxytocin
- Cervical Ripening Balloon

- Primary Outcome: Uterine Rupture Rate
- Secondary Outcome: VBAC Success Rate

Table of Evidence: 11 Studies Identified

<table>
<thead>
<tr>
<th>Study</th>
<th>Cervical Ripening Balloon: Uterine Rupture and VBAC Success Rates</th>
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<tbody>
<tr>
<td>Ashwal et al. (n = 59)</td>
<td>0.5% 0.76% 1.6% 1.7%</td>
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<td>Cheuk et al. (n = 24)</td>
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<td>Ziyuddin et al. (n = 35)</td>
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<td>Jozwiak et al. (n = 208)</td>
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<td>Khotaba et al. (n = 37)</td>
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<td>Ravasia et al. (n = 129)</td>
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<tr>
<td>Ben-Aroya et al. (n = 161)</td>
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<td>Bujold et al. (n = 255)</td>
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<td>Ebeid &amp; Nassif (n = 17)</td>
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<tr>
<td>Voon et al. (n = 58)</td>
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<td>Sananes et al. (n = 135)</td>
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Results

- Of 1118 prior cesarean deliveries with use of CRB for ripening or induction:
  - 0.6% (7/1118) experienced uterine rupture
  - 44%-83% experienced successful VBAC
- These results suggest the maternal safety of TOLAC with the use of cervical balloon, as well as confirming the success of cervical balloon ripening method.

Table of Evidence: 11 Studies Identified

- Foley and Cook’s Double Balloons
  - Foley Balloon
  - Cook’s Double Balloon

Cook’s Double Balloon in Place

Stimulation of the cervix is provided by the pressure of the uterine balloon against the internal cervical os while the vaginal balloon maintains position against the external cervical os.

Conclusion and Recommendations

- Uterine rupture rates with CRB are low and similar to those in women with prior cesarean who have spontaneous labor.
- CRB is a reasonable option and should be offered to women who desire a TOLAC.
- Included studies varied in their methods for inclusion, cervical ripening, and IOL approaches.
- More research is needed and should have strict inclusion criteria, as well as control for parity, methods of ripening, and IOL.

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