

# Perspectives on the Management of the Short Cervix Identified by Transvaginal Ultrasound During Pregnancy: An Update for Canadian Obstetrical Caregivers

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## Abstract

A shortened cervix is often considered to be equivalent to cervical insufficiency, and a cerclage may be offered as an intervention to prolong pregnancy; however, we may not be differentiating between true cervical insufficiency and intrauterine causes of cervical shortening.

A recent meta-analysis found no significant reduction in preterm birth < 35 weeks' gestation in women with cerclage compared with no cerclage in the total population of women studied. However, there was a potentially significant reduction in preterm birth < 35 weeks among women with a singleton pregnancy (relative risk [RR] 0.74; 95% confidence intervals [CI] 0.57–0.96), with a singleton pregnancy and a previous preterm birth (RR 0.61; 95% CI 0.40–0.92), and with a singleton pregnancy with a previous mid-trimester loss (RR 0.57; 95% CI 0.33–0.99). An increase was found in preterm birth among twin gestations with cerclage placed for a shortened cervix on transvaginal ultrasound (RR 2.15; 95% CI 1.15–4.01). This unexpected finding underscores the possibility of harm with this intervention.

This intervention deserves further study. A national registry or database would allow us to identify women who may benefit more significantly from cerclage by collecting data on possible confounding effects such as concomitant intrauterine infection or placental disease.

cerclage, par comparaison avec les femmes n'en ayant pas bénéficié, au sein de la population totale de femmes étudiée. Cependant, une diminution potentiellement significative du nombre d'accouchements prématurés < 35 semaines chez les femmes connaissant une grossesse monofoetale (risque relatif [RR], 0,74; intervalle de confiance [IC] à 95 %, 0,57–0,96), chez celles qui connaissent une grossesse monofoetale et ont déjà connu un accouchement prématuré (RR, 0,61; IC à 95 %, 0,40–0,92), et chez les femmes connaissant une grossesse monofoetale et ayant déjà connu une mort foetale au cours du deuxième trimestre (RR, 0,57; IC à 95 %, 0,33–0,99) a été constatée. Une hausse du nombre d'accouchements prématurés chez les femmes connaissant une grossesse gémellaire et ayant subi un cerclage en raison d'un raccourcissement du col décelé par échographie transvaginale (RR, 2,15; IC à 95 %, 1,15–4,01) a été constatée. Ce résultat inattendu souligne qu'il est possible que cette intervention s'avère nuisible.

Cette intervention mérite de faire l'objet d'études approfondies. Puisqu'il permettrait la collecte de données sur de possibles effets parasites tels que la présence concomitante d'une infection intra-utérine ou d'une maladie placentaire, un registre (ou une base de données) national nous permettrait d'identifier les femmes chez lesquelles le cerclage entraînerait des avantages accrus.

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## Résumé

Un col raccourci est souvent considéré comme étant l'équivalent d'une insuffisance cervicale et, ainsi, un cerclage peut alors être offert à titre d'intervention visant à prolonger la grossesse. Il est toutefois possible que nous ne fassions pas la différence entre l'insuffisance cervicale réelle et les causes intra-utérines du raccourcissement cervical.

Une méta-analyse récente n'a constaté aucune diminution significative du nombre d'accouchements prématurés < 35 semaines de gestation chez les femmes ayant bénéficié d'un

## COMMENTARY

Preterm birth, with its attendant morbidity and mortality, remains the greatest unsolved problem in obstetrical care today. It is well established that the shorter the cervical length as measured by transvaginal ultrasound (TVUS), the higher the risk of preterm birth. TVUS has become increasingly employed in situations where there is thought to be an increased risk of preterm birth, such as in women with a previous preterm birth, current multiple pregnancy, or symptomatic preterm contractions. In some centres, the cervix is routinely assessed as part of the anatomic scan, either intentionally or as an incidental finding when assessing placental location.

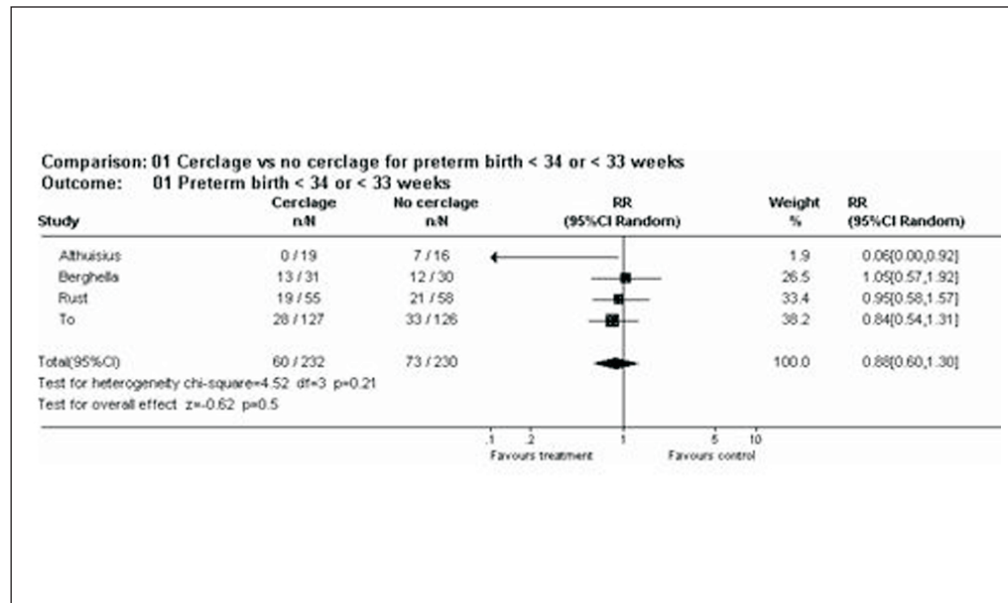
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Figure. Value of cerclage for the shortened cervix identified in transvaginal ultrasound



A cervical length greater than the mean for a given gestational age (3.5 cm at 24 weeks) has an excellent negative predictive value for preterm birth before 35 weeks' gestation.<sup>1</sup> This observation is perhaps the best endorsement for the TVUS measurement: it reassures us that the current risk of preterm birth is very low ( $\leq 2\%$ ). Thus we can avoid interventions such as transfer to tertiary level institutions, corticosteroid therapy, medications to delay birth, or cervical cerclage.

A shortened cervical length ( $< 2.5$  cm in most studies) does increase the risk of preterm birth, with increments proportional to decreasing length. A cervical length of 13 mm ( $\leq 1$ st percentile) on TVUS at 24 weeks increased the risk of preterm birth ( $< 35$  weeks) from a background rate of 4.3% to 60% in one large prospective observational study.<sup>1</sup>

No one would deny that this is important and of concern. The question is, what can be done to reduce this risk once it is found? The evidence to date suggests that we have not identified an effective intervention. It is possible that the ineffectiveness of any intervention is a result of our failure to address the true reason for the cervical shortening.

The finding of a shortened cervix on TVUS has become synonymous with cervical insufficiency or "incompetence" (a less desirable term). We have postulated that a short cervix visualized by ultrasound is inherently weak, as opposed to one that is effacing from the internal os down, perhaps because of another process that is stimulating premature cervical ripening. Particularly if there are no symptomatic contractions or vaginal bleeding, a shortened cervix becomes equivalent to cervical insufficiency, and we are tempted to intervene with a cerclage in an attempt to arrest

this process. We may not be differentiating between true cervical insufficiency and intrauterine causes of cervical shortening, such as evolving chorioamnionitis or placental disease.<sup>2</sup>

Canadian obstetricians have reported in a survey that they are very uncertain about when to use cerclage for the shortened cervix. Many would place a cerclage with a cervical length of  $\leq 1$  cm at 15 to 19 weeks' gestation, either with (89%) or without (74%) risk factors for preterm birth, but 20% were uncertain of their decision to do so. As gestational age and cervical length increased, the likelihood of cerclage placement decreased. The presence of additional risk factors for preterm birth increased the tendency to place a cerclage regardless of cervical length and gestational age; this was true for both singleton and multiple pregnancy. There was no cervical length or gestational age when all obstetricians would or would not place a cerclage. More importantly, the survey indicated that there was very significant uncertainty with any decision to place a cerclage.<sup>3</sup>

Four randomized controlled trials (RCTs) have examined the value of cerclage for the shortened cervix identified on TVUS.<sup>2,4-6</sup> The findings in these four RCTs are summarized in the Figure. Overall, the evidence from RCTs has not demonstrated a benefit from cervical cerclage placement, but these studies are small and an important clinical benefit may well have been missed.

At the Maternal, Infant and Reproductive Health Research Unit (MIRU) of the Centre for Research in Women's Health, we felt that this question might be answered in a larger RCT. To that end we hosted a workshop sponsored by the Canadian Institutes for Health Research (CIHR),

with geographical representation from across Canada. We formed a steering committee and submitted a proposed RCT outline (the initial process of a full proposal) to the CIHR for a study of cerclage for the short cervix in pregnancy (SCIP). We calculated that to demonstrate a reduction in the risk of preterm birth (< 34 weeks) from a conservative value of 30% in women without cerclage to 22% with cerclage in women with a cervix length < 2 cm between 16 weeks and 23 weeks and six days of gestation, a sample size of 1118 women would be needed to have  $\geq 80\%$  power to show statistical significance. On the basis of other multicentre studies and our calculation of the background incidence of women with a cervical length < 2 cm (approximately 0.5% of all pregnancies), we calculated that 70 to 80 centres would be needed to recruit eligible women over the course of six years. We were aware that this was an ambitious proposal.

While awaiting the response from CIHR, we initiated a small pilot study to determine women's views on participation in the proposed study. Preliminary data (as yet unpublished) suggested that approximately 50% of respondents would have considered participation in this trial, 30% would not, and 20% were not sure. However, on the basis of the RCT outline submitted to CIHR, we were not invited to submit a full proposal. All reviewers of the RCT outline expressed concern about the feasibility of performing such a difficult study.

The SCIP steering committee has fully explored the possibility of answering this difficult question in the context of a large RCT. We have concluded that the likelihood of being able to determine the effectiveness of cerclage in this format, with this sample size, is not high, and that our attempting to do so may not warrant the expenditure of millions of dollars from public funds.

Berghella et al. have recently published a "patient-level" meta-analysis based on a total of 600 women (including some additional women randomized after the original trials were published).<sup>6</sup> The authors re-analyzed the trials by entering each patient into a new database as if they were in one single trial, allowing sub-grouping into potentially clinically meaningful groups (albeit lacking significant power to draw absolute conclusions). They found no significant reduction in preterm birth < 35 weeks' gestation in women with cerclage compared with no cerclage in the total population of women studied. This was consistent with the findings of other meta-analyses. However, they found a potentially significant reduction in preterm birth < 35 weeks among women with a singleton pregnancy (relative risk [RR] 0.74; 95% confidence intervals [CI] 0.57–0.96), with a singleton pregnancy and a previous preterm birth (RR 0.61;

95% CI 0.40–0.92), and with a singleton pregnancy with a previous mid-trimester loss (RR 0.57; 95% CI 0.33–0.99). They found an increase in preterm birth among twin gestations with cerclage placed for a shortened cervix on TVUS (RR 2.15; 95% CI 1.15–4.01). This unexpected finding underscores the possibility of harm with this intervention. Berghella et al. suggest "properly powered" studies be undertaken to further explore these findings.<sup>6</sup>

We are aware of one other ongoing multicentre RCT among a consortium of centres in the United States (personal communication: John Owen, September 2005). The investigators for this study plan to randomize approximately 300 women with a previous preterm birth and a cervical length < 2.5 cm by TVUS to undergo cerclage or no cerclage. We hope this RCT will provide a more definitive conclusion on the effectiveness of cerclage or will add the numbers required to the randomized data of previous investigators to allow a more conclusive meta-analysis.

We continue to believe that this intervention deserves further study, even if not in the form of an RCT. It is possible that the appropriate selection criteria for performing cerclage have yet to be elucidated. We are considering the merits of developing a national registry or database that would allow us to identify women who may benefit more significantly from cerclage by collecting data on possible confounding effects such as concomitant intrauterine infection or placental disease.

The steering committee for the SCIP wishes to thank the Canadian obstetrical community for their support and encouragement in this endeavour, and we encourage this co-operative community to maintain its enthusiasm for further study of this significant clinical problem.

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