Predictors of Outcomes of Non-Elective Cervical Cerclages

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Abstract

Background: Non-elective cervical cerclages are associated with significant perinatal complications. There is scant available information about what the predictors of these outcomes are, thus making counselling difficult.

Objective: To identify which factors predict delivery at or beyond 28, 34, and 37 weeks' gestation in women with emergency/rescue cervical cerclage.

Methods: We conducted a retrospective cohort study of nonelective cerclages over 10 years in our centre. We included women with singleton pregnancies, morphologically normal fetuses, and a cervix dilated to at least 1 cm. Our primary outcome was delivery at or beyond 28 weeks' gestation, and secondary outcomes consisted of delivery at or beyond 34 and 37 weeks' gestation. Descriptive statistical and logistic regression analyses were performed.

Results: We identified a total of 69 cases, and 47 met the inclusion criteria; 44.6% of these women delivered at or beyond 28 weeks' gestation. Membranes seen in the vagina on ultrasound and postcerclage preterm premature rupture of membranes decreased the chance of delivery at or beyond 28 weeks by 81.7% (OR 0.183; 95% CI 0.048 to 0.703) and 95% (OR 0.050; 95% CI 0.006 to 0.429), respectively. The same factors were predictive of deliveries at or beyond 34 and 37 weeks' gestation.

Conclusion: Membranes seen in the vagina on ultrasound and postcerclage pre-labour premature rupture of membranes were the strongest predictors of failure to reach 28 weeks' gestation. This information is of critical importance when counselling patients about non-elective cervical cerclage.

Résumé

Contexte : Les cerclages cervicaux non facultatifs sont associés à des complications périnatales significatives. Nous ne disposons que de peu de données quant à la nature des facteurs qui nous permettraient de prédire de telles issues, ce qui complique le counseling.

Objectif : Identifier les facteurs qui nous permettraient de prédire la tenue d'un accouchement à 28, à 34 et à 37 semaines (ou au-delà) chez les femmes ayant fait l'objet d'un cerclage cervical d'urgence / de sauvetage.

Méthodes : Nous avons mené une étude de cohorte rétrospective portant sur les cerclages non facultatifs effectués sur une période de 10 ans au sein de notre centre. Nous avons inclus les femmes qui avaient connu une grossesse monofœtale, dont le fœtus était morphologiquement normal et qui avaient présenté une dilatation du col d'au moins 1 cm. Notre critère d'évaluation principal a été l'accouchement à 28 semaines de gestation ou au-delà, tandis que les critères d'évaluation secondaires ont été les accouchements à 34 et à 37 semaines ou au-delà. Des analyses statistiques descriptives et de régression logistique ont été menées.

Résultats : Au total, nous avons identifié 69 cas, dont 47 ont satisfait aux critères d'inclusion; 44,6 % de ces femmes ont accouché à 28 semaines ou au-delà. La présence de membranes constatée dans le vagin par échographie et la rupture prématurée des membranes préterme (RPMP) post-cerclage entraînaient une baisse de la probabilité d'obtenir un accouchement à 28 semaines ou au-delà de l'ordre de 81,7 % (RC, 0,183; IC à 95 %, 0,048 à 0,703) et de l'ordre de 95 % (RC 0,050; IC à 95 %, 0,006 à 0,429), respectivement. Les mêmes facteurs permettaient de prédire les accouchements à 34 et à 37 semaines ou au-delà.

Conclusion : La présence de membranes constatée dans le vagin par échographie et la RPMP post-cerclage ont constitué les facteurs prédictifs les plus solides en ce qui concerne l'incapacité d'atteindre 28 semaines de gestation. Cette information est d'une importance cruciale lorsque vient le temps de conseiller les patientes au sujet du cerclage cervical non facultatif.

Key Words: Cervical cerclage, prognosis, pregnancy outcome, treatment outcome, patient outcome assessment, emergency treatment

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INTRODUCTION

Despite recent significant advances in obstetric and neonatal care, the rate of preterm birth in Canada has remained stable at 7.5% in 2001 and 7.7% in 2010.[1] Consequently, the Canadian infant mortality rate due to

prematurity was 1.55 per 1000 live births in 2005 and 1.38 per 1000 live births in 2009.[1] In addition, the proportion of live births $\geq$ 500 g but $<$ 2500 g has followed a parallel trend.[2]

Although multiple etiologies may account for such early losses, a significant number are believed to be related to cervical insufficiency. The management of this multifactorial complication may include performing cervical cerclage. This procedure has been used prophylactically, mostly in women with a history consistent with cervical insufficiency (i.e., prophylactic cerclage). It also has been applied to emergency situations in which either ultrasound assessment has revealed a short cervix or a clinical examination has shown premature dilatation of the cervix with or without bulging membranes (i.e., rescue cerclage). Although these non-elective cerclages are a standard management option, pregnancies managed in this way are associated with significant perinatal complications. In particular, there is very little information about possible predictors of these outcomes, and this makes counselling of patients difficult. In this study we aimed to identify factors predicting the outcome of emergency cerclages (indicated by ultrasound demonstration of cervical dilatation of at least 1 cm) and rescue cerclages to assist clinicians with patient selection and counselling.

METHODS

We performed a retrospective cohort study of all cases of ultrasound-indicated emergency and rescue cerclages performed at The Ottawa Hospital (General Campus, a tertiary care centre) between September 1, 2000, and December 5, 2010. We included only singleton pregnancies with no fetal morphological abnormalities that had ultrasound-indicated cerclages or rescue cerclages performed because of findings on ultrasound or physical examination. Ultrasound-indicated cerclage was defined as the insertion of cerclage as a therapeutic measure when shortening of cervical length was seen on transvaginal ultrasound.[3] Ultrasound-indicated cerclage procedures were performed on asymptomatic women who did not have exposed fetal membranes in the vagina.[3] Rescue cerclage was defined as the insertion of cerclage as a salvage measure in the case of premature cervical dilatation with exposed fetal membranes in the vagina.[3] This could be diagnosed using ultrasound examination of the cervix or by a speculum/physical examination performed for symptoms such as vaginal discharge, bleeding, or "sensation of pressure."[3]

We further validated our study population by excluding patients whose cervical dilatation in the operating room was $<$ 1 cm. We excluded patients with incomplete data (antenatal or delivery records), with a multiple gestation, and those in whom cerclages were attempted but not completed. Our primary study outcome was delivery at or beyond 28 weeks' gestation, and the secondary outcome was delivery at or beyond 34 and 37 weeks' gestation.

Inpatients who underwent emergency or rescue cervical cerclage were identified through medical records for the study interval. Those patients who were scheduled for emergency or rescue cerclages were admitted to the hospital for observation.

All the emergency/rescue cerclages were performed by a maternal-fetal medicine specialist using McDonald's technique.[4] The surgical techniques varied according to the intraoperative findings. If membranes were bulging, inserting a Foley catheter in the cervix, filling the bladder with normal saline, or placing the patient in the Trendelenburg position may have been used. Amniocentesis was not performed on any patients.

The duration of hospitalization included the time from hospital admission to discharge after the performance of cerclage.

We evaluated antenatal clinical and sonographic predictors of outcomes. Descriptive statistical analysis and logistic regression analysis were performed to identify antenatal factors associated with the outcomes of interest. We examined the predictive value of symptoms; the number of prior term and preterm deliveries, prior abortions, and prior cervical procedures; gestational age at presentation; funnelling of the cervix seen on ultrasound; the presence of bulging membranes on ultrasound and on physical examination; cervical dilatation; use of indomethacin and antibiotics; postoperative cervical length on ultrasound; preterm premature rupture of membranes (PPROM); the interval between cerclage and delivery; and duration of hospitalization.

We obtained ethics approval for the study from the Ottawa Hospital Research Ethics Review Board.

RESULTS

A total of 69 cases of emergency and rescue cerclage were identified from medical records. Of these, eight were excluded because of multiple gestation and four because cerclage was attempted but not completed. Five further cases were excluded because of incomplete data, and another five cases were excluded because cervical dilatation