

How can we improve the outcome of emergency cerclage?

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Cervical insufficiency is a well-recognized cause of preterm birth in the second or early third trimester of pregnancy, and therefore it is very important topics related to preterm birth. Cervical insufficiency with bulging fetal membranes during the second trimester is a serious complication, often leading to still birth or preterm delivery. [1] Emergency cerclage is recognized as an essential procedure for prolonging gestation in women with advanced cervical changes and/or prolapsed membranes in the second trimester. Many studies report that women presenting with advanced cervical dilation may benefit from emergency cerclage [2–8]. Namouz et al. [9] reviewed 34 studies in literature and found that, in observational and limited randomized control trials, the cerclage groups did significantly better than the bed-rest groups in terms of mean randomization-to-delivery interval, preterm delivery before 34 weeks, and compound morbidity. Hashim et al. [10] retrieved 141 articles related to emergency cerclage and also found current evidence to show the benefits of emergency cerclage. It may prolong pregnancy by an average 4–5 weeks, with a two-fold reduction in the possibility of preterm birth before 34 weeks of pregnancy.

The rate of emergency cerclage success is relatively low, however, certainly compared with elective cerclage. Membranes are easily ruptured intraoperatively, especially when the cervix is widely dilated and the fetal membranes are prolapsed beyond the cervix [5, 6]. Pushing bulging fetal membranes back into the uterine cavity during cerclage with a sponge swab or Foley catheter is difficult. Overfilling the urinary bladder to reduce

prolapsed fetal membranes without direct mechanical contact is often insufficient as a single method [11]. Other less utilized techniques include inflatable devices, such as a metreurynter or a rubber balloon, although no studies of their use have as yet appeared [12–13]. Recently, Son et al. [14] have developed a new uniconcave balloon device for repositioning, fetal membranes into the uterus during emergency cerclage and reported its use in 103 patients who underwent emergency cerclage. This device has a shape similar to that of a red blood cell, or a donut, providing maximum surface area to allow the force exerted on the membranes to push them back into the uterus safely and effectively. Cerclage was technically successful in all cases. There were no rupture of membranes in any patients, and no operative or anesthetic complications. Son et al. [14] concluded that obstetricians could perform emergency cerclage with this uniconcave balloon easily and safely with few complications.

The recommended gestational age for emergency cerclage is less than 24 weeks, the threshold of fetal viability (that is, more than 24 weeks' gestation), because the potential for harm likely outweighs the potential benefit [15, 16]. All contraindications to emergency cervical cerclage should be excluded—preterm labor, evidence of intraamniotic infection, unexplained vaginal bleeding (abruption), preterm premature rupture of membrane, fetal demise and major fetal anomalies [17, 18]. Amniocentesis before emergency cerclage is not obligatory, but has two important benefits. One is the decompression of amniotic fluid to place a satisfactory cerclage, especially for hourglassing bulging membranes and the other is the detection of intraamniotic infection. Data from uncontrolled retrospective studies [19–22] has suggested the perioperative use of tocolytics and broad spectrum antibiotics. There are no studies of emergency cerclage comparing general with regional anesthesia, but in the writer's experience general anesthesia is better for performing cerclage with marked membrane bulging [17]. A single course of corticosteroids is recommended in women with pregnancy duration of 24 weeks or more, to enhance fetal lung maturation [22]. Deb et al. [20] suggested the routine prescription of supplemental progesterone for postoperative care, but their study was not RCT.

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Several predictors for emergency cerclage success have been reported, such as intra-amniotic markers of infection, systemic markers of infection, prolapsed membranes, cervical dilatation, and sonography of the cervix. [9] Among these, intra-amniotic markers show high sensitivity and specificity. Lee et al. [23] reported that elevated amniotic IL-6 predicts a cerclage short-interval latency. Linear regression analysis with latency as the independent variable revealed a significant relationship ($r = -0.62$; $p < 0.001$). The median survival analysis in patients with preoperative IL-6 levels >1700 pg/mL was two days, which was significantly shorter than in patients with preoperative IL-6 levels <1700 pg/mL whose median latency interval was 35 days ($p = 0.0003$). Weiner et al. [24] utilized a proteomic strategy to investigate the role of biomarkers as potential predictors. Among the patients who underwent emergency cerclage, women with high inflammatory scores had shorter cerclage-to-delivery intervals and delivered earlier; women with MR scores less than 3 and no hemoglobin had a median latency period of 40.5 days (range 1–148 days), compared with women with both MR scores of 3 to 4 and hemoglobin scores of 1 whose median latency period was three days (range 0–43 days).

Emergency cerclage in twin pregnancy with membrane bulging had not appeared useful, and has not been studied in a dictated RCT. Recently, however, Rebarber et al. [25] performed emergency cerclage on 12 women with twin gestation and cervical dilation, and showed that emergency cerclage can be associated with favorable outcomes, including a high likelihood of delivery at >32 weeks and high likelihood of survival. Levin et al. [26], and Zanardini et al. [27] also found favorable outcomes. Cases with bulging membranes following prior cerclage are also surgically challenging, as there are no relevant guidelines. Song et al. [28] evaluated 22 women with bulging membranes after primary cerclage, comparing 11 women with repeat cerclage and 11 with bed rest. After repeat cerclage, the median gestational age at delivery ($p = 0.004$), average birth weight ($p < 0.01$), and median prolongation of pregnancy (<0.01) were higher, and the neonatal survival rate was also significantly higher ($p < 0.009$).

Emergency cerclage may be the best hope for rescuing pregnancy in women with advanced cervical changes and prolapsed membranes in the mid trimester. The operative risk is surgically challenging. However the recently reported uniconcave cerclage balloon technique may be a great help to the patient with cervical insufficiency and bulging membranes. Amniocentesis before emergency cerclage is not obligatory, but is useful in extreme cases of membrane bulging, and for detection of intraamniotic infection. We need to identify some highly sensitive biomarkers as predictors of emergency cerclage success. The role of emergency cerclage in twin pregnancy with membrane bulging should be also studied more. Repeat cerclage after prior cerclage failure should be considered [29].

Keywords: Bulging membranes, Emergency cerclage, Fetal membranes

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Conflict of Interest

Authors declare no conflict of interest.

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