

# INTRAOPERATIVE AMNIOCENTESIS AND INDOMETHACIN TREATMENT IN THE MANAGEMENT OF AN IMMATURE PREGNANCY WITH COMPLETELY DILATED CERVIX

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We performed cervical cerclage on a completely dilated and effaced cervix after decompression of the amniotic sac with intraoperative amniocentesis. Indomethacin was used for tocolysis and to maintain mild oligohydramnios (amniotic fluid index 5-7 cm). The pregnancy was prolonged by 12 days and a viable infant was delivered at 25 weeks' gestation. (*Obstet Gynecol* 1992;79:881-2)

Cerclage for incompetent cervix after 18 weeks' estimated gestational age is usually an emergent procedure performed on a dilated cervix in an attempt to prolong gestation until fetal viability is reached. When contemplating cerclage for a dilated cervix, one must consider many factors, including persistence of uterine contractions, advanced cervical effacement, possible rupture of the fetal membranes, and the presence or introduction of intrauterine infection. Nevertheless, cerclage has been shown to be beneficial in patients with advanced cervical changes and may be the only hope for prolonging gestation until fetal viability is reached.<sup>1,2</sup>

In a woman with bulging fetal membranes and a fully dilated cervix, we performed amniocentesis to decompress the amniotic membranes, placed a McDonald cerclage, and used indomethacin for tocolysis and to maintain mild oligohydramnios postoperatively.

## Case Report

A 24-year-old white woman, gravida 2, para 0-0-1-0, was transferred to York Hospital at 23 weeks and 2 days' estimated gestational age with a history of painless uterine contractions. Gestational age had been determined by ultrasound at 14 weeks. On admission, bulging membranes were palpated in the vagina and no cervix could be identified. There was no clinical evidence of intrauterine infection. Using magnesium sulfate, we achieved tocolysis within 8

hours. A detailed ultrasonographic fetal anatomical survey revealed no congenital malformations and confirmed complete cervical dilation. Gram stain and culture of transabdominally obtained amniotic fluid showed no evidence of intra-amniotic infection. After the woman gave informed written consent, we proceeded with cervical cerclage in an attempt to prolong gestation. Magnesium was discontinued preoperatively, and the woman was given 100 mg of indomethacin rectally as a tocolytic. Examination under general anesthesia revealed tense, bulging membranes filling the vagina and a completely dilated and effaced cervix. Under ultrasound guidance, we removed 250 mL of amniotic fluid transabdominally to decompress the amniotic cavity. With the membranes flaccid, a small rim of cervix could be identified. A 70-mL Foley catheter with the bulb inflated to 15 mL was placed through the cervical os, reducing the membranes into the uterus. The bulb was then inflated to 60 mL. Two McDonald cerclages were placed to close the limited cervical remnant completely around the catheter. The intrauterine Foley bulb was slowly deflated over the next 8 hours, the catheter was removed, and 50 mg of indomethacin was given orally every 6 hours. Ampicillin, gentamicin, and clindamycin were administered prophylactically for 24 hours. A 12.5-mg dose of intramuscular betamethasone was given to enhance fetal lung maturity and was repeated 12 hours later; this regimen was repeated 1 week later.

On the third postoperative day, the patient was found to have membranes bulging through the cervical os for a distance of 3 cm. There was no evidence of fetal or maternal infection. She was taken back to the operating room for amniocentesis of an additional 135 mL of fluid and placement of a third McDonald cerclage. The indomethacin dose was increased to 50 mg orally every 4 hours. The amniotic fluid volume remained at the level of mild oligohydramnios (amniotic fluid index 5-7 cm) from that time until delivery.

Doppler evaluation of the fetal ductus arteriosus was performed daily. On the sixth day of indomethacin administration, the diastolic flow velocity had increased and the pulsatility index dropped to 1.4, indicating ductal constriction. Consequently, we decreased the indomethacin dose to 25 mg orally every 6 hours, which resolved the ductal constriction without changing the amniotic fluid index.

On the 12th day of hospitalization, the woman went into labor. Chorioamnionitis was suspected based on a white blood cell count rising to 18,000/ $\mu$ L, fetal tachycardia of 180 beats per minute, and regular uterine contractions. Subsequent endometrial cultures revealed *Escherichia coli* as the causative organism. Because the presentation was footling breech, we performed a low vertical cesarean. The infant, a 704-g female with Apgar scores of 5 and 7 at 1 and 5 minutes, respectively, and a fetal arterial pH of 7.32, was intubated and taken to the neonatal intensive care unit. She was gradually weaned off supplemental oxygen and ventilatory support. Repeated cranial ultrasound examinations revealed no evidence of intraventricular hemorrhage. She went home 78 days after birth and, to this date, stage II retinopathy is her only sequela.

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## Discussion

Results of cervical cerclage for incompetent cervix have been considered disappointing when cervical dilation exceeds 3 cm.<sup>3</sup> However, Olatunbosun and Dyck<sup>1</sup> and Novy et al<sup>2</sup> have described increasing success with emergency cerclage on a dilated cervix. Numerous types of emergency cerclages have been described, including the McDonald, Wurm, and Shirodkar techniques.<sup>1,4</sup> We found the stay sutures placed in a Wurm configuration invaluable,<sup>1</sup> enabling us to obtain traction and allowing placement of a McDonald cerclage on the limited amount of cervical tissue available. An important adjunct to placement of this cerclage was the use of amniocentesis to decompress the amniotic membranes.<sup>5</sup> We chose indomethacin as a tocolytic because of its effect on amniotic fluid volume. By successfully combining medical and surgical therapies, we prolonged gestation for 12 days, and this may have contributed to the good outcome of this very premature infant.

Indomethacin has been described as an effective tocolytic, presumably because of its anti-prostaglandin action.<sup>6</sup> Although closure of the ductus arteriosus has been of concern, Doppler flow studies can identify constriction,<sup>7</sup> which can then be reversed by decreasing or discontinuing the drug.<sup>8</sup> Indomethacin has also been shown to cause dose-dependent oligohydramnios.<sup>9</sup> Theoretically, oligohydramnios should decrease the intra-amniotic pressure and thus minimize the mechanical effect on the cervix. Therefore, we chose indomethacin not only for its tocolytic value but also for the secondary effect of maintaining a low amniotic fluid volume once oligohydramnios had been established by amniocentesis. Although this effect on amniotic fluid volume has been shown to be dose-dependent, we noted no change in the amniotic fluid volume index after decreasing the dose to relieve constriction of the ductus arteriosus. Presumably, the reduced dose was sufficient to maintain decreased fetal urine output.

The use of prophylactic antibiotics in emergency cerclage has been recommended.<sup>10</sup> We believed that prophylactic antibiotics were indicated to reduce the risk of intra-amniotic infection following manipulation of the cervix and amniotic membranes. Long-term use of antibiotics has not been widely advocated after cerclage placement, and we chose not to use lengthy treatment because our patient maintained a closed cervix and intact amniotic membranes.

By combining previously described surgical techniques with indomethacin treatment, we were able to prolong gestation through this critical period of questionable fetal viability. The outcome of this pregnancy does not allow generalizations, but suggests that in carefully selected cases, the combination of indomethacin and intraoperative amniocentesis may improve survival in the immature pregnancy complicated by severely dilated incompetent cervix.

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