

Chorioamnionitis in the Setting of Laminaria and Intra-Amniotic Digoxin: A Case Report

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Abstract

Background: Laminaria placement and digoxin injection for induced abortion are safe procedures. However, there remains a theoretical risk of bacteria ascending into the cervix and uterus, leading to possible infection. Very few studies and case reports exist regarding infection with laminaria placement and digoxin injection and the use of antibiotic prophylaxis for these procedures.

Case: Herein, we present a case of chorioamnionitis after laminaria placement and intra-amniotic digoxin injection in a patient with intact membranes prior to a dilation and evacuation procedure.

Conclusion: Although infection with laminaria placement and digoxin injection is rare, additional research is warranted. The use of prophylactic antibiotics at the time of laminaria placement and digoxin injection should be further explored, especially in patients with risk factors.

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Background

Infection as a complication of induced abortion is rare. Studies have found risk of infection in the setting of induced abortion is approximately 1%, especially in the setting of perioperative prophylaxis [1]. However, there have been no trials looking at the infection risk of osmotic dilators in second trimester termination, and only a few case reports of infection after osmotic dilator placement [2,3]. Infection risk with osmotic dilator placement is low, likely due to sterilization by irradiation or ethylene oxide gas and removal of osmotic dilators within 12 to 48 hours after insertion [4]. However, there remains a theoretical risk of vaginal bacteria ascending into the cervix and uterus, leading to possible infection.

Furthermore, some research has examined risk of infection after intra-amniotic digoxin. One retrospective cohort study compared infection rates among those undergoing termination between 18-24 weeks who received digoxin versus those who did not and found the digoxin cohort had a greater likelihood of signs of infection [5]. Another large case series found infection rates after digoxin to be 0.3%, however all patients with infection had rupture of membranes prior to procedure [6]. One additional study looking at 4,906 dilation and evacuation procedures with digoxin injection reported only two cases with infection, with one post- and one pre-procedure [7]. These studies demonstrate the low infection rate among those who receive digoxin injections, and thus intra-amniotic digoxin is thought to be safe.

Herein, we present a case of chorioamnionitis diagnosed after

laminaria placement and intra-amniotic digoxin injection in a patient with intact membranes prior to a dilation and evacuation procedure.

Case

A 39-year-old gravida four, with a history of fibroids, one prior full-term cesarean section, and two spontaneous abortions, presented to our clinic at 24 weeks and 5 days seeking elective termination of her pregnancy. She had been receiving prenatal care at another facility, and was dated by her last menstrual period that was consistent with an 8-week ultrasound. During her prenatal care her quad screen demonstrated increased risk of Trisomy 18. She underwent an amniocentesis with a fetal microarray that demonstrated a variant of uncertain significance. After further counseling with both maternal fetal medicine and a genetics counselor, the patient elected for termination of pregnancy.

The patient then underwent placement of in-office laminaria. The placement included antiseptic preparation of the cervix with betadine, a paracervical block with 20cc of 1% lidocaine, and placement of four laminaria with one betadine-soaked sponge. The patient tolerated the procedure well and was sent home with instructions to return the following day. At 24 weeks and 6 days the patient returned to the clinic 22 hours after placement of the initial laminaria, for removal and placement of additional laminaria, as well as an intra-amniotic injection of digoxin. Under ultrasound guidance, 2mg of digoxin was injected transabdominally into the amniotic sac. Pelvic exam was then performed and all four laminaria and one sponge were removed from the cervix and vagina. Again, antiseptic preparation of the cervix



with betadine and a paracervical block with 20cc of 1% lidocaine were performed. 17 laminaria were then placed through the cervix and one betadine-soaked sponge placed inside the vaginal vault.

The patient arrived to the pre-operative area of the hospital the following morning, 18 hours after the digoxin injection and second set of laminaria placement. On arrival, she was ill-appearing with a temperature of 102.9 F and heart rate of 112 bpm. Her blood pressure was 137/70 and her oxygen saturation was 100%. On exam, the patient had a 15 cm fundal fibroid, making it difficult to assess for fundal tenderness, however was noted to be tender in the periumbilical area near the presumed fundus. A fever work-up was performed at this time with urinalysis, urine culture, complete blood count, comprehensive metabolic panel, blood culture, COVID-19 and respiratory panel swab, and chest x-ray. Labs were significant only for a leukocytosis ($12.1 \times 10^9/L$) which had not been present three days prior ($6.1 \times 10^9/L$). All other labs were within normal limits, COVID-19 and respiratory swabs were negative, and chest x-ray appeared normal. At this time the patient was presumed to have chorioamnionitis. Intravenous antibiotics were started, including ampicillin, clindamycin, and gentamycin, and the patient was taken to the operating room for evacuation of the uterus by dilation and evacuation.

In the operating room the 17 laminaria and one sponge were removed from the cervix and vagina. Membranes were noted to be intact. The procedure was performed, and all tissue was removed from the uterus under ultrasound guidance and sent to pathology. However, atony of the uterus was noted, and the patient experienced a postpartum hemorrhage with a total estimated blood loss of 1,500 mL. She was given uterotonics including 30 units of intravenous pitocin, 1,000 mcg rectal misoprostol, 0.25 mg intramuscular hemabate, and 0.2 mg intramuscular methergine. An intrauterine balloon was also placed inside the uterus and inflated with 150 mL of normal saline.

Over the next 24 hours the patient continued on intravenous antibiotics and the intrauterine balloon was slowly deflated and removed. Hemoglobin dropped post-procedure to 7.4 g/dL, from a pre-operative hemoglobin of 10.0 g/dL, and the patient was transfused one unit of packed red blood cells. Blood and urine cultures returned with no growth. She remained afebrile, with minimal bleeding, and no fundal tenderness and was discharged home on post-operative day two with no additional antibiotics. Pathology of the tissue returned with the presence of acute chorioamnionitis.

Outcomes and Implications

Infection after laminaria placement and intra-amniotic digoxin injection is rare. Although prior studies have shown the safety and efficacy of laminaria and intra-amniotic digoxin, these procedures are not without risk [4,6, and 7]. Currently, perioperative antibiotic prophylaxis is recommended for dilation and evacuation procedures

[1]. However, there currently are no formal recommendations for prophylaxis at time of laminaria placement or digoxin injection.

Some practitioners may choose to give antibiotics at time of laminaria placement, but there is no consensus on this practice given lack of research regarding the infection risk of laminaria placement. Although studies have shown an infection risk with intra-amniotic digoxin, the rate appears to be <1%, and thus no recommendation for prophylactic antibiotics at time of injection exists [5-7]. Given both procedures have theoretical risk of introducing bacteria into the uterine environment, patients with risk factors for infection, such as abnormal vaginal flora, obesity, diabetes, large uterine fibroids, or rupture of membranes may be good candidates for antibiotic prophylaxis prior to laminaria placement and digoxin injection [8].

Our patient's case is unique in that it is the only reported case of chorioamnionitis in the setting of intact membranes prior to dilation and evacuation. Although we cannot be certain of the source of infection, it can be presumed either the placement of the laminaria or intra-amniotic injection of digoxin led to the infection. Given this case, additional research regarding infection with laminaria placement and intra-amniotic digoxin injection is warranted. Additionally, although the risk of infection secondary to these procedures may be rare, chorioamnionitis is a serious complication with effect on maternal morbidity and mortality, with the possibility of leading to sepsis. Therefore, the use of prophylactic antibiotics at the time of laminaria placement and intra-amniotic digoxin injection should be further explored and considered to help avoid the serious complications of infection.

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