CASE REPORT

A novel treatment for management of a trapped placenta using intracervical nitroglycerin tablets

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Dr Blake Conley Rodgers,
blake.rodgers@us.af.mil**SUMMARY**

A 34-year-old gravida 2, para 1 woman delivered a viable male infant and developed retained placenta due to entrapment. A nitroglycerin tablet was used to relax the lower uterine segment and cervix, which allowed the placenta to pass through the cervix for delivery. The nitroglycerin tablet was placed in the cervix and held in place by the delivering physician as it dissolved. Soon after administration, the intact placenta delivered. The patient did not experience the typical side effects of headache, asymptomatic decrease in blood pressure, hypotension, palpitations or dizziness that can be associated with administration of nitroglycerin. We suspect that this novel localised route of nitroglycerin administration may be an effective management strategy to treat trapped placenta while minimising side effects. However, the outcomes of this treatment would require further study.

BACKGROUND

The use of nitroglycerin to relax the lower uterine segment is an effective method to manage entrapped placenta. However, the use of nitroglycerin has been studied utilising only the sublingual and intravenous routes of administration.^{1–4} Our case utilises a novel route of administering nitroglycerin that, to our knowledge, has not been previously reported. The outcome of our case was adequate treatment with no side effects, which was a desired result.

CASE PRESENTATION

The patient was a 34-year-old gravida 2, para 1 woman at 40–4/7 weeks estimated gestational age who presented to the labour and delivery floor reporting leaking of amniotic fluid. She had no significant medical history, family history or social history. Five years prior, she had an uncomplicated pregnancy that resulted in the spontaneous vaginal delivery of a term infant. Her prenatal labs for this pregnancy were negative. She was not having contractions at time of presentation. Fetal heart tones were reassuring, so an intravenous infusion of oxytocin was started. She began contracting regularly, fetal heart tones remained reassuring and her cervix showed adequate interval change. When her cervix was completely dilated, she began to push and delivered a viable male infant approximately 20 h after initial presentation. The patient then received 20 units of oxytocin that was delivered through intravenous route. Sustained traction was applied to the umbilical cord. The umbilical cord lengthened, the uterus contracted and became firm

to palpation, and there was a small gush of blood, all indicating placental separation from the uterus. The placenta initially began to pass through the cervical os, but, despite active management of the third stage of labour, the placenta became entrapped in the lower uterine segment. A diagnosis of retained placenta due to placental entrapment was performed. Manual extraction was not possible since the cervix had also started to close. The patient did not have significant uterine bleeding during the placental entrapment. A management strategy including nitroglycerin administration was enacted. The patient was educated on the potential side effects of nitroglycerin. A literature search performed by the assisting physician revealed that nitroglycerin was an effective treatment for trapped placenta regardless of the route of administration. Since other medications are absorbed easily from the cervix and vaginal mucosa, an attempt was made to achieve absorption of the nitroglycerin at the cervical os.

INVESTIGATIONS

Prenatal ultrasound showed normal implantation of the placenta on the uterine lining.

DIFFERENTIAL DIAGNOSIS

There are three primary types of retained placenta: placenta adherens, placenta accreta and trapped placenta. In our case, the uterus was firm, a small portion of the placenta was palpable at the cervical os, and the patient did not have significant uterine bleeding while the placenta was entrapped, which made a diagnosis of placenta accreta and placenta adherens less likely.

TREATMENT

Initially, two nitroglycerin 600 µg tablets (total 1.2 mg) were placed in the cervix. There was no response, but both undissolved tablets were noted to have fallen out of position within a few seconds and were no longer in the vagina, likely removed immediately when the delivering physician removed his fingers from the cervix after administering the tablets. A third nitroglycerin 600 µg tablet was placed in the cervix and held in place by the delivering physician during its dissolution.

OUTCOME AND FOLLOW-UP

Within 3 min of placement of the third nitroglycerin tablet in the cervix, the lower uterine segment relaxed allowing the intact placenta to deliver 1 h and 7 min after delivery of the infant. The patient did not experience headache, decrease

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in blood pressure, hypotension, palpitations or dizziness. She remained in the hospital for 2 days and had an insignificant postpartum course.

DISCUSSION

Retained placenta is defined as failure to deliver the placenta in 30 min postpartum and occurs in up to 3% of deliveries.^{5 6} There are three primary causes: placenta adherens, partial accreta and trapped placenta.⁷ A trapped placenta occurs when the lower uterine segment contracts prior to expulsion of the placenta preventing its removal. Some physicians have had concerns that the use of active management of the third stage of labour, which includes use of uterotonics, early cord clamping and cord traction, will result in increased rates of a trapped placenta. However, active management of the third stage of labour does not increase the rate of retained placenta.⁸ Treatment for a trapped placenta typically involves either sustained cord traction, relaxation of the uterus and cervix through nitroglycerin or manual removal of the placenta under general anaesthesia. The typical dose of nitroglycerin studied has been 500 µg–1 mg sublingually or 100–200 µg intravenously.^{1–3} Uterine relaxation occurs 1–3 min after the patient receives the nitroglycerin.^{1 4 7} For all causes of retained placenta, sublingual nitroglycerin after

failed oxytocin resulted in a 96% decrease in manual removal of the placenta.⁹ We presented a novel delivery of nitroglycerin by application in the cervix resulting in local relaxation of the cervix without systemic side effects common with intravenous or sublingual nitroglycerin (asymptomatic decrease in blood pressure, hypotension, headache, dizziness, palpitations).^{1 9 10} To our knowledge this is the first case of nitroglycerin given by dissolution in the cervix resulting in resolution of trapped placenta. We suspect this method of drug delivery would be less effective for the more common forms of retained placenta in which separation of the placenta from the uterine wall has not yet occurred. However, further study of this is warranted.

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Learning points

- Nitroglycerin by any route can be used to treat trapped placenta, including by intracervical route.
- Active management of the third stage of labour does not increase the rate of the retained placenta.
- Systemic effects of nitroglycerin include asymptomatic decrease in blood pressure, hypotension, dizziness, palpitations and headache, which did not occur in our case when given by intracervical route.
- The use of intracervical nitroglycerin to treat trapped placenta would require further study into its efficacy and side effects.

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