

CASE REPORT

# Association of Progesterone, Pessary, and Antibiotic for Treating Pregnant Woman with Short Cervix Syndrome: Importance of Magnetic Resonance Imaging in the Assessment of Pessary Position

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## ABSTRACT

Preterm delivery (PD) is the most important cause of neonatal mortality, particularly before the 32<sup>nd</sup> week of pregnancy. A short cervix is the most important quantitative marker for predicting PD. However, there are other qualitative markers such as cervical gland area, cervical funneling, and sludge. We present the case of a pregnant woman who was diagnosed with a short cervix at 14-weeks and demonstrate the use of triple therapy, which helped to achieve a good perinatal result. A 37-year-old pregnant woman (G3P0) was referred to our service at 14-weeks of pregnancy presenting with a short cervix (20 mm) and a positive sludge sign. She was hospitalized; a pessary was inserted, and started on antibiotic therapy (clindamycin and cefalotin for 10 days). At 20 weeks, she was again admitted to the hospital, and this time presented with a further shortened cervix (9 mm), cervical funneling, and a positive sludge sign, with the pessary in position. The following procedures were performed: Amniocentesis on the sludge (negative bacterioscopy), another cycle of antibiotics, administration of oral progesterone, and imaging to determine retention of pessary position. The patient was placed in the Trendelenburg position and remained hospitalized for 82 days. At 32 + 1 weeks, the fetus presented distress (tachycardia). C-section

was performed, producing a live female newborn weighing 2,180 g and presenting Apgar indexes of 8/8. This case report demonstrates the importance of magnetic resonance imaging to assess the position of pessary in a pregnant woman with short cervix.

**Key words:** Magnetic resonance imaging, pessary, preterm delivery, progesterone, short cervix syndrome, ultrasound

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## INTRODUCTION

Preterm delivery (PD) is one of the most serious public health problems and an important morbidity and mortality factor during the neonatal period. It is defined as interruption of pregnancy before 37 weeks have been completed, and the morbidity and mortality become significantly higher when delivery takes place before the 32<sup>nd</sup> week.<sup>[1]</sup> Its incidence rate is variable: In Europe, it ranges from 6% to 10%, while in the United States, it increased from 9.5% in 1981 to 12-13% in 2005.<sup>[2]</sup>

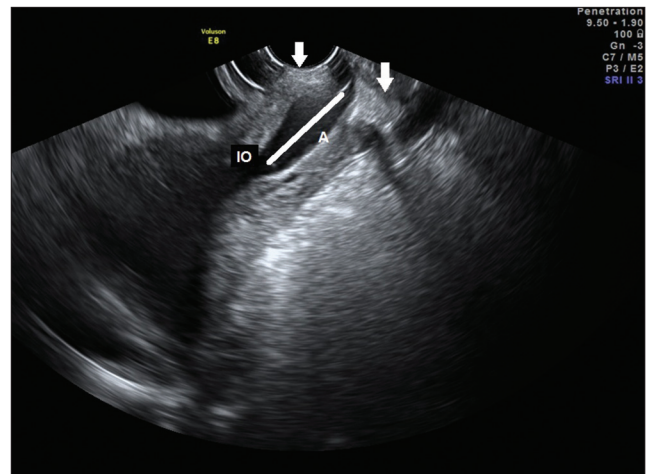
Etiology of PD often cannot be defined and idiopathic causes account for 20% to 40% of the cases.<sup>[3]</sup> It is now understood that the process should be interpreted as a multifactorial syndrome, in which several excitatory mechanisms are involved. Studies conducted around 15 years ago found a correlation between shortening of the cervix, as detected using transvaginal ultrasonography (TVUS) and PD.<sup>[4]</sup> Recently, some trials have confirmed that progesterone and a pessary are effective in preventing PD among high-risk women.<sup>[5,6]</sup> Because of a hypothesis that early shortening of the cervix results from intra-amniotic infection,<sup>[7]</sup> and that its ultrasonographic representation is the sludge sign,<sup>[8]</sup> use of antibiotics might become a new form of therapy for short cervix syndrome. On the other hand, there have not yet been any trials confirming their efficacy.

We present a case of a pregnant woman who was diagnosed with the short cervix syndrome in the 14<sup>th</sup> week, in which use of progesterone, pessary, and antibiotic changed the natural history of fetal viability. We emphasize the importance of magnetic resonance imaging (MRI) in the assessment of pessary position.

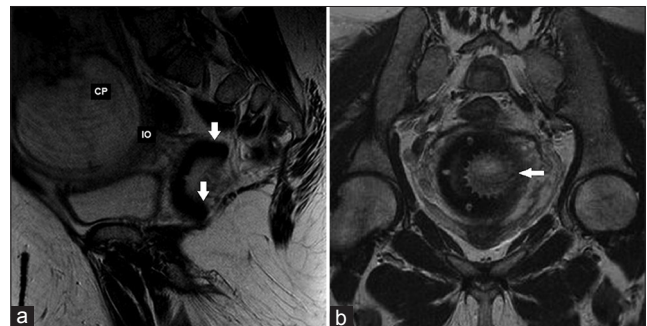
## CASE REPORT

A married white pregnant woman who was nulliparous, and in her third pregnancy, was referred to our service at the gestational age of 14 weeks and 4 days due to shortening of the cervix (20 mm) and the presence of a positive sludge sign. Among her obstetric antecedents, she said that she had two early spontaneous abortions (8 weeks). The patient was hospitalized at our institute. A pessary was placed in the cervix, and antibiotic therapy consisting of clindamycin (600 mg IV, every 8 h) and cefalotin (1 g IV, every 6 h) was administered for 10 days. The patient was then released from hospital, but returned in the 20<sup>th</sup> week presenting a cervical length of 9 mm, cervical funneling, positive sludge sign, and absence of cervical gland area (CGA) as seen on Transvaginal ultrasonography (TVUS) that was performed. TVUS confirmed that the pessary was in position [Figure 1]. It was decided to hospitalize

the patient again, and amniocentesis was performed on the sludge, which gave negative bacterioscopy results. A new cycle of antibiotic therapy consisting of clindamycin and cefalotin was instituted, and natural progesterone was administered orally (200 mg every 12 h). The patient was placed in the Trendelenburg posture, and the vaginal pessary was maintained in position. During this hospital stay, the patient was also treated for two urinary tract infections: First with cefalexin (500 mg orally every 8 h for 10 days); and the second with ceftriaxone (1 g IV every 12 h for 10 days). Enoxaparin (40 mg/day IM) was introduced, along with two cycles of corticoid induction consisting of betamethasone (12 mg/day IM for two days). During the hospital stay, because of the difficulty in assessing the pessary by means of TVUS, it was decided to perform MRI on the pelvis, which proved that the pessary was in the normal position [Figure 2]. The patient remained hospitalized for 82 days and, in the 32<sup>nd</sup> week of the pregnancy, she developed a condition of maternal and fetal tachycardia. Resolution of the gestation was thus indicated due to acute



**Figure 1:** Caucasian female at 20 weeks of pregnancy with short cervix (9.0 mm). Transvaginal ultrasonography in the sagittal plane, shows the funneling sign (A), absence of cervical gland area, and presence of normally positioned pessary (white arrows). IO: Internal orifice.



**Figure 2:** Caucasian female with short cervix (9.0 mm). Magnetic resonance imaging on the pelvis. (a) T2 view in the sagittal plane shows the normally positioned pessary (white arrows). (b) T2 view in the axial plane, shows the pessary with its classical circular shape with serrated edges (white arrows). IO: Internal orifice. CP: Cephalic pole.

fetal distress. A transverse segmental cesarean delivery was then performed, which produced a live female newborn weighing 2,180 g and presenting Apgar scores of 8/8 in the first and fifth minutes, respectively. The mother progressed well during the puerperium period and was released from hospital 72 hours after the delivery. The newborn presented slight respiratory discomfort but did not require orotracheal intubation or vasoactive drugs. The infant was kept in the neonatal intensive care unit for 75 days and did not present any serious complications. Currently, the infant is in a good general condition, without any neuropsychomotor sequelae.

## DISCUSSION

We present a case in which triple therapy consisting of progesterone, pessary, and antibiotic turned an unviable pregnancy into a good perinatal result.

Preterm delivery (PD) is the main cause of perinatal morbidity and mortality worldwide, particularly when this occurs before the 32<sup>nd</sup> week of pregnancy. The etiology is multifactorial, but all such conditions progress with dilatation and disappearance of the cervix. A clinical history of previous PD, together with a short cervix (usually less than 25 mm, as measured on TVUS between the 20<sup>th</sup> and 24<sup>th</sup> weeks), is the main method of identifying women who are at high risk of PD. However, some authors have advocated that measurements of the cervix should be made universally between the 20<sup>th</sup> and 24<sup>th</sup> weeks, because 85% of PDs occur in women without risk factors.<sup>[9]</sup>

In this study, the woman presented with a short cervix at 14 weeks of pregnancy; we needed to repeat the antibiotic therapy at 20 weeks because the cervix had further shortened (20 mm at 14 weeks to 9 mm at 20 weeks). The next set of antibiotics was used only to treat the urinary tract infection that the patient developed and they were not part of triple treatment protocol.

The amniocentesis of sludge was performed at 20 weeks of pregnancy, because of high risk of pregnancy loss when it is done before 16 weeks. The sludge is a sign seen in an ultrasound scan that demonstrates a thick material with particles in suspension. The negative bacterioscopy does not necessarily exclude the presence of infection. It would be necessary to perform polymerase chain reaction (PCR) to identify the microorganisms involved in the infection, but this process is very expensive and it is not performed in our routine protocol. Previous study has demonstrated that sludge is associated with positive amniotic fluid cultures and histological chorioamnionitis.<sup>[9]</sup> The antibiotic protocol of our Department to prevent the preterm delivery in pregnant women with short cervix is a combination of

clindamic and cefalotin an approach to combat all possible microorganisms. We carried out bacterioscopy at 20 weeks to find possible resistant strains of microorganisms, but this result was negative; we decided to repeat the same combination of antibiotics.

In addition to measurements of the cervix, which is a quantitative parameter, there are qualitative parameters such as the funneling sign, sludge sign, and absence of the CGA.<sup>[8,10]</sup> The funneling sign represents early opening of the internal orifice of the cervix, with protrusion of the membranes, at rest or with abdominal pressure. However, much controversy surrounds this sign in the literature. Absence of the CGA, which was studied in Brazil by Pires et al.,<sup>[10]</sup> corresponds to absence of the cervical gland area around the cervical canal and, according to these authors, is more associated with the risk of PD than with a short cervix and the funneling sign. When the CGA is associated with a short cervix of 9.0 mm as in this pregnant woman, the risk of PD is higher. The sludge corresponds to an agglomeration of hyperechogenic particles located between the internal orifice and the fetal presentation, and which are deposited on the posterior wall of the cervix. An association between sludge and a short cervix confers greater risk of PD than does a short cervix alone.<sup>[8]</sup>

Progesterone and, more recently, pessaries are among the methods used for preventing PD.<sup>[5,6]</sup> Progesterone relaxes the musculature of the myometrium and blocks the action of oxytocin. Vaginal administration provides greater concentrations in the endometrium, but in women at high risk of PD, systemic administration is preferred. With regard to pessaries, in a recent randomized clinical study on 393 women with a short cervix, of whom 192 had a pessary out of 193 who were expectant, giving birth before the 34<sup>th</sup> week occurred significantly less frequently in the group with a pessary (6% vs. 27%).<sup>[6]</sup> Use of antibiotic therapy has been based on the fact that the sludge is associated with clinical and histological chorioamnionitis and with positive cultures from the amniotic fluid.<sup>[8]</sup> However, no randomized clinical trials proving the efficacy of antibiotic therapy among women at high risk of PD have yet been produced.

In this case, we presented images of the pessary obtained by means of TVUS and MRI. TVUS is the routine method for assessing the position of the pessary, since clinical examination presents a high risk of triggering PD. However, in some situations, it is difficult to prove the diagnosis using TVUS. In such cases, MRI is indicated. This is a harmless examination during pregnancy, and its only contraindications are claustrophobia and presence of metallic implants. The image of the pessary that we presented here is a novel feature in the literature. It allowed

us to prove that the pessary was in the normal position, which in turn was fundamental for the good perinatal result.

In patients with high risk preterm deliveries as the patient of case report, the digital exam of cervix is dangerous. The MRI is an innocuous and safe exam to these patients; moreover, it permits to identify the correct position of pessary. The digital exam should only to be realized in patients with active preterm delivery.

In summary, we presented a case of a pregnant woman with short cervix syndrome who was treated using a triple regimen (progesterone, pessary, and antibiotic). The good perinatal result obtained in this case opens up the prospect of future randomized clinical trials that might be capable of proving what the real efficacy of this regimen is, in relation to single-track regimens. MRI was shown to be an effective imaging method for evaluating the position of the pessary, and it can be chosen as the method for cases, in which TVUS is seen to be inconclusive.

## CONCLUSION

We believe that the association of progesterone, antibiotic, and pessary may change the concept of fetal viability among women who are at high risk of PD, when instituted early on during the pregnancy. The MRI showed to be an effective imaging method to assess the pessary position in a pregnant woman with short cervix.

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