Introduction

Preterm labor and birth, i.e., birth before the 37th week of gestation, is a major cause of perinatal morbidity and mortality in the developed world (1). Shortening cervical length is identified as a risk factor for preterm birth. Transvaginal measurements of cervix that reveals shortening (below 25 mm) or cervical funneling sign is an important indicator of threatened preterm birth. The management of such cases usually consists of progesterone administration or cervical cerclage with progesterone (2). However, conclusive evidence on the effectiveness of these treatments is lacking. Cervical pessary is a non-invasive alternative to cervical cerclage and it has the advantage of not requiring anesthesia (3). In the late 1970s, Hans Arabin in Germany designed a silicon pessary applied to the cervix and that works by changing the uterocervical angle and displacing it more posteriorly (Cerclage Pessary, Dr. Arabin GmbH and Co. KG; Witten, Germany). Compared with other pessaries, Arabin’s pessary is flexible and more easily applied to the cervix (4).

Case Series

In Ankara University, Department of Obstetrics and Gynecology, between 2007 and 2014, we treated 136 patients for shortened cervix and threatened premature labor with mechanical and invasive methods. In total, 132 of these patients were treated with cervical cerclage and four with cervical pessary. Patients who did not accept cervical cerclage and cervical pessary were treated with medication and bed rest. Pessary application was restricted to patients who did not accept cervical cerclage treatment. We present the cases of the four patients with cervical pessary application for the prevention of preterm birth. The patients had no history of prior preterm birth, and progesterone treatments were withheld. Cervical and vaginal swabs were taken from all patients, and cultures were reported to have normal flora. Written consents were taken prior to treatment. There were no complications related to pessary application, and the patients were not administered tocolytics, progesterone, and antibiotics during pregnancy.

Case 1

A 23-year-old primigravida woman was referred to our clinic for cervical insufficiency. The woman was at her 29th week of gestation, and the amniotic membrane protruded into vaginal vault. Her digital examination showed a cervical dilatation of 3 cm. A pessary was applied. She was re-admitted to the hospital during her 33rd week of gestation due to uterine contractions. The cervical dilatation at the time was 6 cm, and the pessary was removed. A 2110 g female baby was vaginally delivered with Apgar scores of 7 and 9. The time from pessary application to delivery was 28 days (Table 1).

Case 2

A 29-year-old, gravida 2, parity 1 woman was referred to our clinic at the 23rd week of gestation with an initial diagnosis of cervical insufficiency. The woman was at her 29th week of gestation, and the amniotic membrane protruded into vaginal vault. Her digital examination showed a cervical dilatation of 3 cm. A pessary was applied. She was re-admitted to the hospital during her 33rd week of gestation due to uterine contractions. The cervical dilatation at the time was 6 cm, and the pessary was removed. A 2110 g female baby was vaginally delivered with Apgar scores of 7 and 9. The time from pessary application to delivery was 72 days (Table 1).
Cervical pessary in pregnancy

Table 1. Baseline characteristics and delivery data of pessary cases

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Parity</th>
<th>GA at admission (week, day)</th>
<th>Cervical assessment</th>
<th>GA at pessary application</th>
<th>GA at pessary removal</th>
<th>GA at delivery</th>
<th>Time from pessary application to delivery</th>
<th>Birth weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>23</td>
<td>0</td>
<td>29 w, 0 d</td>
<td>Dilatation: 3 cm</td>
<td>29 w, 0 d</td>
<td>33 w, 0 d</td>
<td>33 w</td>
<td>28 days</td>
<td>2110 g</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>1</td>
<td>23 w, 1 d</td>
<td>Cervical length: 14 mm</td>
<td>23 w, 2 d</td>
<td>33 w, 4 d</td>
<td>33 w, 4 d</td>
<td>72 days</td>
<td>1610 g</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>1</td>
<td>27 w, 4 d</td>
<td>Cervical length: 15 mm, funneling sign positive</td>
<td>27 w, 5 d</td>
<td>39 w, 0 d</td>
<td>39 w, 0 d</td>
<td>76 days</td>
<td>3300 g</td>
</tr>
<tr>
<td>4</td>
<td>31</td>
<td>2</td>
<td>23 w, 1 d</td>
<td>Cervical length: 15 mm, Cervical dilatation: 5 cm</td>
<td>23 w, 3 d</td>
<td>37 w, 2 d</td>
<td>37 w, 3 d</td>
<td>98 days</td>
<td>3200 g</td>
</tr>
</tbody>
</table>

Case 3
A 29-year-old, gravida 2, parity 0 woman was referred to our clinic for cervical insufficiency at 27 weeks and 4 days. Her initial assessment revealed a shortened cervix of 15 mm with a funneling sign. A cervical pessary was placed on the same day. She remained asymptomatic until term. The pessary was removed at the 39th week of gestation due to the rupture of membranes. The cervical dilatation at admission was 5 cm, and 3300 g female baby was vaginally delivered with Apgar scores of 8 and 9. The time from pessary application to delivery was 76 days (Table 1).

Case 4
A 31-year-old, gravida 3, parity 2 woman was referred to our clinic for cervical insufficiency at 23 weeks and 4 days. Her initial assessment revealed a cervical dilatation of 5 cm and transvaginal measured cervical length of 15 mm. A cervical pessary was placed at 23 weeks and 4 days. She remained symptom free until the 37th week of gestation. She was readmitted at 37 weeks and 3 days due to uterine contractions. The digital examination of her cervix revealed an unchanged dilatation of 5 cm, and the pessary was removed due to regular uterine contraction and also as the patient reached term. A 3200 g female baby was vaginally delivered with Apgar scores 8 and 9. The time from pessary application to delivery was 98 days (Table 1).

Discussion
Preterm birth is a major cause of neonatal mortality and morbidity in developed countries. It is implicated as a cause of both short- and long-term morbidity in infants (1), and the prevention of preterm birth is the most effective way of decreasing morbidity rates. Shortened cervical length is an important predictor of spontaneous preterm birth, and several treatment strategies have been proposed. Alfirevic et al. (5) reported that cervical cerclage, vaginal progesterone, and cervical pessary appear to have a similar effectiveness as management strategies in women with singleton pregnancy, previous spontaneous preterm birth, and short cervix. Cervical cerclage is the most common mechanical prevention method for the prevention of preterm birth. However, the procedure is not without complications (6). Cervical pessaries have been shown to be efficacious in preventing preterm birth, especially in a high-risk population of women with a shortened cervical length (7-10). On the other hand, a randomized controlled trial showed that the prophylactic use of cerclage pessaries did not reduce the rate of preterm delivery before 34 weeks (11). Cervical pessary is an inexpensive and less invasive option to cervical cerclage. Pessary application and removal do not require anesthesia. Pessary use, instead of cervical suturing, can decrease hospital stays and reduce healthcare costs. In low-resource countries, cervical pessaries are an alternative method for the prevention of preterm birth. Few complications arising from pessary use have been reported, including increased vaginal discharge. However, no major infectious morbidity, i.e., chorioamnionitis, has been reported. It appears to be cost effective with minimal side effects, and Quaas et al. (9) recommended the Arabin pessary as a favorable alternative to surgical cerclage with either prophylactic or therapeutic intent.

Pessary use for the treatment of cervical insufficiency is uncommon. A cervical cerclage was used in almost 130 patients in our clinic during the last 10 years, while we applied a cervical pessary to only four patients for the prevention of preterm labor. A cervical pessary resulted in a modest prolongation of pregnancy in all four patients. Although our experience is derived from four cases, cervical pessaries seem to be safe and feasible for the prevention of preterm labor. The efficacy of cervical cerclages in the prevention of preterm birth in women with short cervix is unproven. If the efficacy of pessaries in preventing preterm birth is confirmed, they may become a safe alternative to traditional surgical cerclage when surgery is undesired by the patient or doctor. In the absence of randomized cohorts, the decision regarding which treatment options to choose should take into account the preferences of patients and clinicians.

Ethics Committee Approval: N/A.

Informed Consent: Written informed consent was obtained from patients who participated in this case.

Peer-review: Externally peer-reviewed.

Conflict of Interest: No conflict of interest was declared by the authors.

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5. Alfirevic Z, Owen J, Carreras Moratonas E, Sharp AN, Szczowowski JM, Goya M. Vaginal progesterone, cerclage or cervical pessary for preventing preterm birth in asymptomatic singleton pregnant women with a history of preterm birth and a sonographic short cervix. Ultrasound Obstet Gynecol 2013; 41: 146-51. [CrossRef]