

The value of transvaginal ultrasonography in diagnosis and management of cervical incompetence

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Summary

To determine the value of transvaginal sonography in women with a previous history of second trimester miscarriage due to cervical incompetence, 55 patients were subjected to either elective cervical cerclage or follow-up (every second patient) with weekly evaluations of the cervix by transvaginal ultrasonography. Emergency cerclage was applied when significant cervical changes were noted. All patients were evaluated with cervical cultures and ultrasound. Women with infection, fibroids, uterine malformations and multiple pregnancies were excluded from the study.

The study population was divided in two groups. In group I (n=27) elective cerclage was applied during the 14th week. Women in group II (n=28) were subjected to serial weekly evaluations of the cervix by transvaginal ultrasonograms. In 18 cases emergency cerclage was applied due to significant cervical changes. In group I, labor started before the 33rd week in two cases (7.4%), between 33 and 37 weeks in nine (33.3%) and after the 37th week in 16 cases (59.2%). Out of the 18 patients in group II who had cervical cerclage after ultrasonographic evaluation, four (22.2%) delivered before the 33rd week, three (16.6%) between 33 and 37 weeks and 11 (61.1%) after the 37th week. No statistical difference was noted between the two groups referring to pregnancy outcome (p<0.1).

We concluded that ultrasound-guided management despite cervical shortening, does not result in unfavorable pregnancy outcome. A significant number of patients can avoid the operation.

Key words: Miscarriages; Cervical cerclage.

Introduction

Diagnosing cervical incompetence is an often difficult task. Clinical assessment alone is unreliable. Serial digital vaginal examinations of the cervix in pregnancy are of limited value because the changes arise in the internal cervical os [1]. Ultrasonography and especially transvaginal ultrasonographic monitoring helps in early diagnosis of cervical incompetence and timely application of cerclage, especially in cases with silent cervical dilatation [2, 3]. Recently, Heath *et al.* [4] estimated the potential value of routine measurement of the cervical length in singleton pregnancies in predicting the risk for early spontaneous delivery. They found that when the cervical length was ≤ 15 mm at 23 weeks, about 90% of the women delivered at ≤ 28 and 60% at ≤ 32 weeks.

The objective of our study was to observe the outcome of pregnancies in women with a history of mid-trimester miscarriage who were subjected to emergency cervical cerclage after ultrasonographic diagnosis of impending preterm delivery. We also evaluated whether transvaginal ultrasonographic cervical monitoring helped a number of patients to avoid unnecessary cervical cerclage.

Patients and Methods

Patients with a history of previous (one or more) mid-trimester miscarriage (range 1-5) were informed about the cervical incompetence. All women had vaginal and cervical cultures to exclude possible infection, and ultrasound to confirm fetal via-

bility, number of fetuses and uterine anatomy. Women with infection, fibroids, uterine malformations and multiple pregnancies were excluded from the study. Initially, 55 pregnant women were included in the study. The patients were randomized to be treated either by elective cerclage or by weekly serial vaginal ultrasonograms (every second patient), with the possibility of an emergency cerclage and were divided in two groups.

In the first group of 27 patients, elective cerclage was applied during the 14th week. The 28 patients in the second group were offered weekly monitoring of the cervix by transvaginal ultrasonography. The Toshiba Ecosee 340 apparatus with a 6 Mhz transvaginal transducer was used. A normal appearance of the cervix is shown in Figure 1. If the cervix was significantly shortened (≤ 20 mm) and/or funneling was noted, comprising 40-50% of the total cervix, with a functional length of ≤ 15 mm,

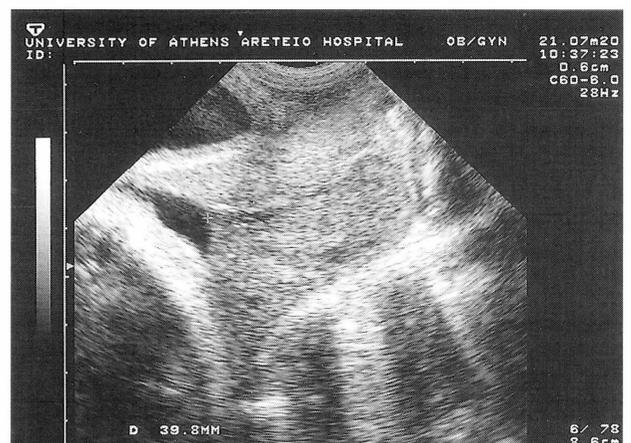


Figure 1. — Pregnancy with normal cervix by transvaginal ultrasound (30th week).

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Figure 2. — Funneling and functional cervical length of 15 mm (22nd week).

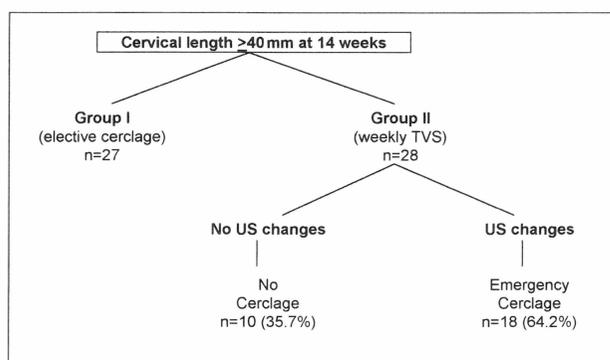


Figure 3. — Patients with a history of one or more mid-trimester miscarriages (n=55).

cerclage was performed (Figure 2). «Funneling», was defined as any dilation of the internal cervical os with protrusion of the amniotic sac into the cervical canal and was measured from the orifice of the internal os to the limit of the functional cervical length. If the changes were moderate (cervix 25-20 mm), the examination was repeated 24 hours later. If the changes were still moderate or severe, cerclage was performed (Figure 3).

The patients in the second group had weekly vaginal cultures, in every examination, for possible bacterial colonization or infection. Transvaginal scans were continued after cerclage for cervical evaluation and detection of the position of the suture. A second suture was inserted if effacement recurred. The results between the two groups were compared using the Fisher exact test.

Results

All women had normal cervical length (≥ 40 mm) at 14 weeks (Figure 3). In patients of group I, labor started before the 33rd week in two cases, between 33 and 37 weeks in nine and after the 37th week in 16 cases (Table 1). In group II, ten out of the 28 patients presented no changes in weekly scans and avoided cerclage. The remaining 18 developed cervical changes and were subjected to cerclage. Fourteen of these patients (14/18) were found to develop shortening together with funneling

(≤ 15 mm) and four (4/18) shortening of the cervix only (< 20 mm). Five out of these 18 patients developed further evidence of effacement after cerclage and a repeat suture was placed. No patient received antibiotic treatment. In group II, labor started before the 33rd week in four cases, between 33 and 37 weeks in seven and after the 37th week in 17 cases (Table 1). Out of the ten patients who were not subjected to cerclage, four delivered between the 33 and 37th week and six after the 37th week. Out of the 18 patients in the second group who had cerclage due to development of cervical changes, four delivered before the 33rd week, three between 33 and 37 weeks and 11 after the 37th week (Table 2). No statistical differences were noted in pregnancy outcome between the two groups concerning the week of delivery ($p=0.31$, $p=0.41$ and $p=0.40$, respectively) (Table 1), nor between the patients in group I and those in group II who had cervical cerclage ($p=0.11$, $p=0.28$ and $p=0.24$, respectively) (Table 2).

Table 1. — Pregnancy outcome in the two groups of patients.

Week of delivery	Group I (n=27) Elective cerclage	Group II (n=28) Cervical monitoring	p
<33	2 (7.4%)	4 (14.2%)	0.31
33-37	9 (33.3%)	7 (25%)	0.41
>37	16 (59.2%)	17 (60.7%)	0.40

Table 2. — Pregnancy outcome in patients with cervical cerclage.

Week of delivery	Group I (n=27) Elective cerclage	Group II (n=18) Cervical monitoring	p
<33	2 (7.4%)	4 (22.2%)	0.11
33-37	9 (33.3%)	3 (16.6%)	0.28
>37	16 (59.2%)	11 (61.1%)	0.24

Discussion

A randomised controlled trial of the MRC/RCOG in 1993 showed that only one in 25 patients who had cervical cerclage appeared to benefit from the procedure [5]. There is need for meticulous selection of the patients who have clear indications demanding this operation. As any operation, the method also has risks of complications, such as amnionitis, rupture of the membranes, maternal septicaemia, etc. Serial ultrasonographic transvaginal monitoring of the cervical length, sagittal diameter or effacement of the cervix may provide valuable information concerning indications for cerclage [6].

The technique is simple and takes only a few minutes. The examination was well tolerated by the patients and none miscarried between the appointments for cervical evaluation. Comparing the pregnancy outcome between the two groups no statistically significant difference was found between the patients. Although all women were questioned closely about their previous mid-trimester miscarriages, we could not be sure about the nature of the

previous abortions, especially in the cases of the elective cerclage group. In these cases we could not be sure if the procedure was helpful or if in some cases it was applied without true indication, as the controlled trial of the MRC/RCOG suggests [5]. Guzman *et al.* [5] reported that the majority of women with a prior mid-trimester loss do not require cerclage. Therefore, successful pregnancy outcome after treatment with elective cerclage is not necessarily attributable to the procedure.

According to our results 35.7% (10/28) of the patients followed-up by ultrasound avoided the operation and all delivered after the 33rd week. Fox *et al.* [8] in their study showed that in patients with previous mid-trimester miscarriages there was improvement in pregnancy outcome in 36.8% of the cases if cerclage was avoided.

In the group of our patients with weekly ultrasound monitoring, where cerclage was performed due to cervical dilatation and effacement, 22.2% delivered before the 33rd week whereas, 77.7% (14/18) delivered after the 33rd week. In five cases a repeat suture was inserted because of evidence of further cervical effacement, observed by ultrasound. These patients also delivered after the 33rd week. Quinn [9] reports that transvaginal ultrasound evaluation of the cervix after cerclage identifies the patients more likely to deliver preterm and repeat cerclage offers an average pregnancy prolongation of seven weeks. This is of value especially in patients with unequivocal signs of dilatation of the internal os and herniation of the sac.

We performed the operation when the cervical length was ≤ 20 mm or ≤ 15 mm and funneling was observed. Iams [10, 11] also reports that the relative risk of spontaneous preterm labor before 35 weeks is very high when the cervical length is ≤ 20 mm.

Guzman *et al.* [12] reported that cerclage was performed when the endocervical canal length was shortened to < 20 mm before the 24th week of gestation either spontaneously or after application of transfundal pressure, without taking into account the presence or absence of funneling. No difference was found in median gestational age at delivery, number of early (< 25 weeks) losses and delivery at 25 to < 37 weeks' gestation between the group of elective cerclage and that of cerclage after ultrasound evaluation.

In our cases no statistical difference was found between the groups or between the patients who had cerclage after ultrasonographic evaluations. Nevertheless, the main value of cervical ultrasonographic evaluation was that ultrasound-guided management, despite cervical shortening, does not result in a worse pregnancy outcome. A significant number of our patients avoided the operation. Thus 35.7% of our cases avoided any possible adverse events attributable to cerclage.

It is well known that complications such as trauma to the cervix, difficulties in removing the suture, rupture of the membranes during the procedure and infections are associated with cervical cerclage.

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