

가:

=	=								
:	:	:	:	:	:	:	:	:	:
10			76						, 38
			가						(1-3)
:	76		42 (55.3%)						
38	2 (5.3%)		1						
			26	15 (57.7%)					
	1 3 ,		2가 8 ,	3 4 ,					45 -5
			30	23 (76.7%)					가
	3 12 ,		1-5						1 2 ,
			, 2-4						2가 9
			가						20 4 (20%)
:									

: Uterus, US
 Ultrasound(US), Doppler studies
 Pregnancy, US
 Pregnancy, abnormalities

[1-4].

[5-7].

[8-10].
가

가 가

가

가

가

가

가

가

[3-6, 11-14].

가

가,

(intramural 가

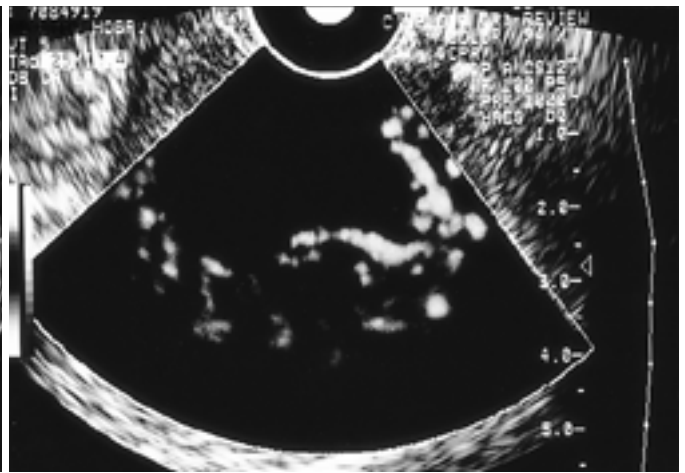
tension),

[1, 12-13].

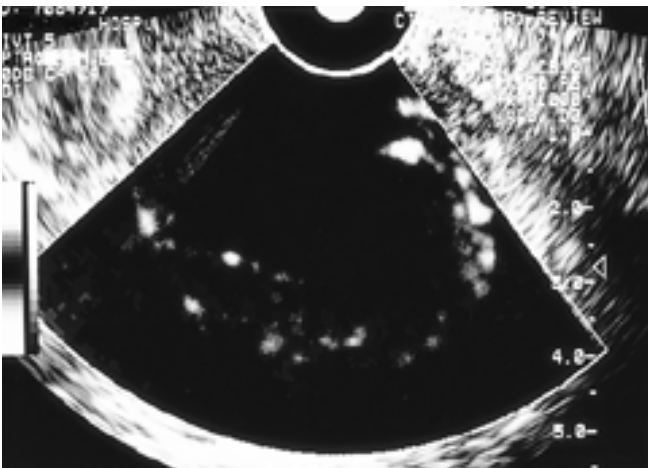
가



A



B



C

Fig. 1. A 25 year-old woman with a missed abortion at 8 week 's gestation. **A.** Longitudinal transvaginal sonogram of the uterus shows a gestational sac(arrow) containing an embryo that had a crown-rump length of 7 mm but no cardiac activity. **B, C.** Grade 2 uterine contractions. Power Doppler US shows flow signals of vessels within myometrium(B) and there is partial disappearance of flow signals(C). Uterine contraction was antegrade and 4 minutes interval. Dilatation and curettage yielded products of conception.

가

KHz, wall filter 50-100 Hz, 4-20 cm/sec,
2-3 cm, 60
78-80%, 90-94%

1996 9 1998 8 2

10

), serum HCG titer

76

(mean sac diameter),
(crown-lump length), (sub-chorionic hematoma)

4 10 38 1

(midsagittal plane)

Ultramark-9 HDI (Advanced Technology Laboratories, Bothell, Washington), 5 MHz

30

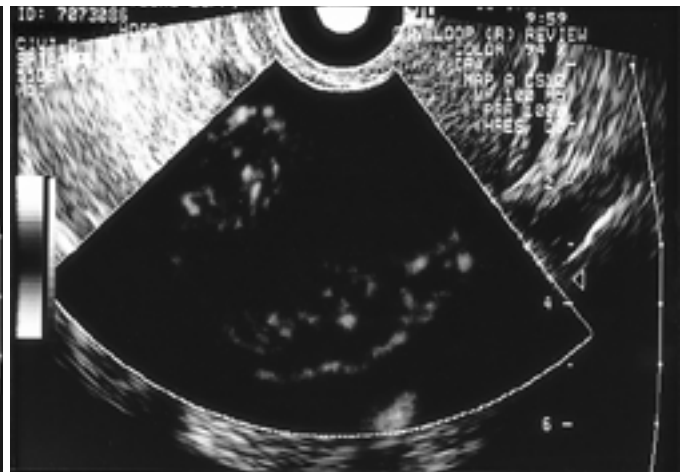
(real time) 10

4 MHz, spatial peak and temporal average intensity 40-92 mW/cm2, (pulse repetition frequency) 2-10

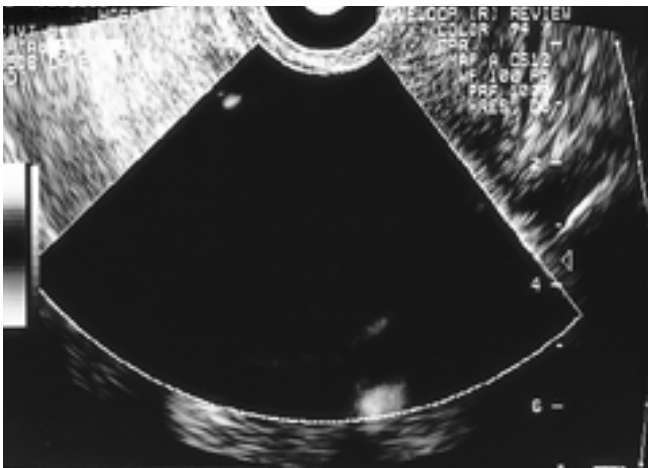
1 , 가



A



B



C

Fig. 2. A 28 year-old woman with a missed abortion at 7.3 week 's gestation. **A.** Longitudinal transvaginal sonogram of the uterus shows a gestational sac (arrow) of 12 mm in diameter without an embryo. Dilatation and curettage yielded products of conception. **B, C.** Grade 3 uterine contractions. Power Doppler US shows flow signals within myometrium (B) and there is complete disappearance of flow signals (C). Uterine contraction was antegrade with 45 seconds interval.

(Fig. 1B, C), 가 2 가) T-test . (,)
 3 (Fig. 2B, C) .
 , (peak systolic velocity)
 (resistive index) 2
 24 56
 SPSS(Window 95, 7.0version)
 , 가 , ,
 가 ANO-
 VA(analysis of variance) chi-square tests, Fisher's exact test

38 22-45 (30.9) ,
 4 10 1
 2 (5.3%)
 4 5 1 1
 1
 76 20-45 (30.6) ,
 5 2 -10 3 76
 42 (55.3%) , 7
 4 (57.1%), 19 11 (57.9%), 가 7
 5 (71.4%), 23 18 (78.3%),
 20 4 (20%) (Table 1).
 , 가 ,
 3 (Table 2).

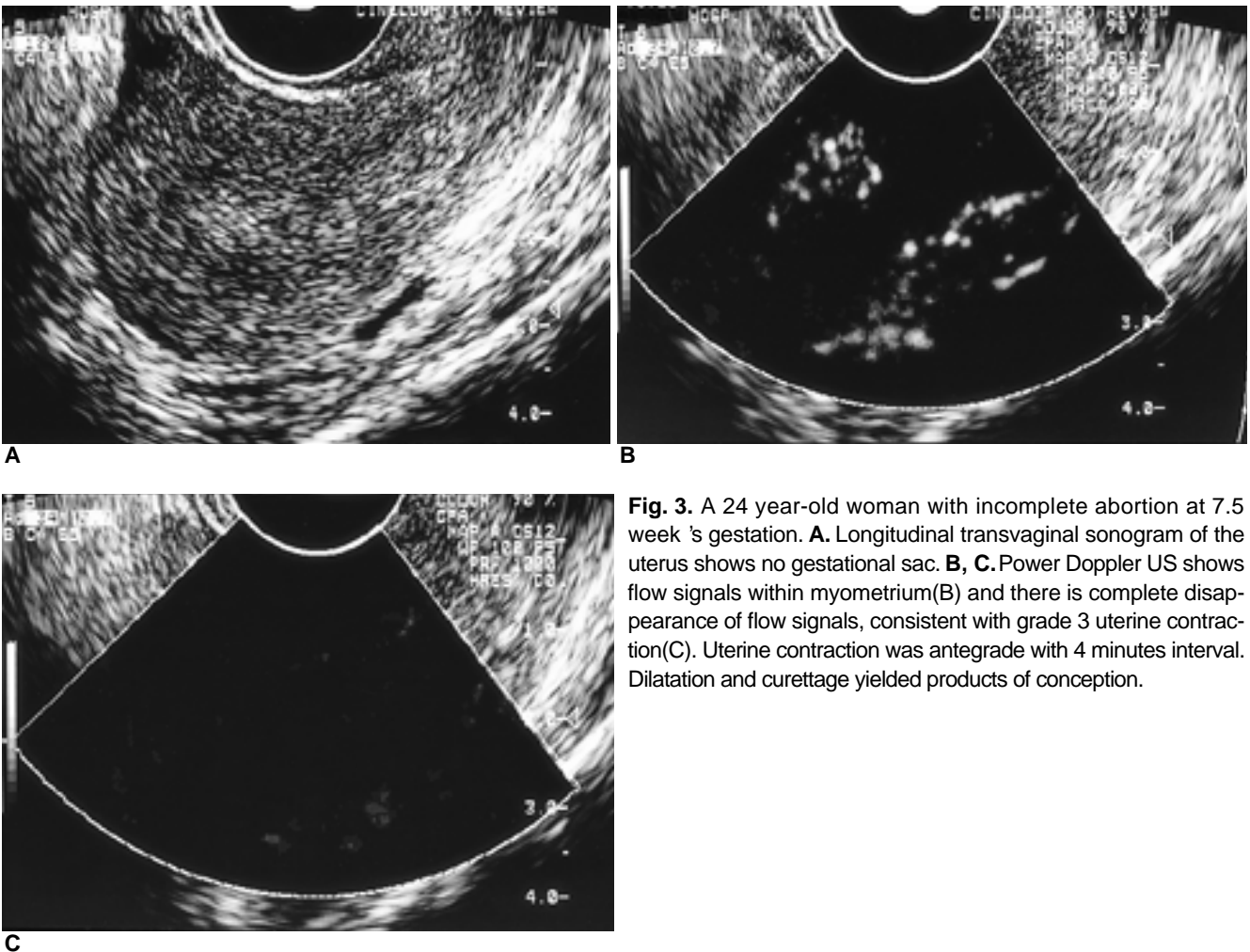


Fig. 3. A 24 year-old woman with incomplete abortion at 7.5 week's gestation. **A.** Longitudinal transvaginal sonogram of the uterus shows no gestational sac. **B, C.** Power Doppler US shows flow signals within myometrium(B) and there is complete disappearance of flow signals, consistent with grade 3 uterine contraction(C). Uterine contraction was antegrade with 4 minutes interval. Dilatation and curettage yielded products of conception.

가

26 15 (57.7%) 5 - 13 mm , 15 5 - 32 mm

3 1, 8 2,

4 3 2.07 0.31 - 0.49(0.41)

45 - 4 (2.8) 10 2 - 16 mm (Fig. 4).

5 3 - 10 3 , 가

11 - 33 mm, 3 - 18 mm (p=0.000),

가

19 17 (89.5%) 가 (p=0.000).

0.27 - 0.40(0.34) (Fig. 1, 2).

가 30 23 (76.7%) (p>0.05).

1 2 , 27+9 ,

3 12 2.43 ,

1 - 5 (2.7) (Fig. 3). 5

2 - 10 , 가

7 11 - 36 mm, 3

- 18 mm 1

가 5 (71.4%), 11 (47.8%) 가 [1]. 27+9

0.21 - 0.47(0.36) 9

20 4 (20%) 2 1 1-3 ,

2 - 4 (3.3) 8 , 2

5 1 - 10 , 5 가

[2].

Table 1. Uterine Contractions in the Normal and Abnormal Early Pregnancies

Pregnancies	Women(n)	Uterine contractions	
		n	%
Normal pregnancies	38	2	5.3
Abnormal pregnancies	76	42	55.3
Blighted ovum	7	4	57.1
Missed abortion	19	11	57.9
Inevitable abortion	7	5	71.4
Incomplete abortion	23	18	78.3
Threatened abortion	20	4	20
Total	114	44	38.6

p=0.000, Chi-square test, Fisher's exact test.

Table 2. Uterine Contractions and Subtrophoblastic Flows in the Abnormal Pregnancies

Pregnancies(n)	GA (wks)	Uterine contractions			Trophoblastic flow(RI)
		F(%)	A	I(min)	
Blighted ovum/missed A(26)	5.3-10.3	57.7	2.07	2.8	0.34
Inevitable/incomplete A(30)	5.2-10	76.7	2.43	2.7	0.36
ThreatenedA(20)	5.1-10	20	2	3.3	0.41

p>0.05, Anova test

A: abortion, GA: gestational age

F: frequency, A: amplitude, I: interval, RI :mean resistive index,

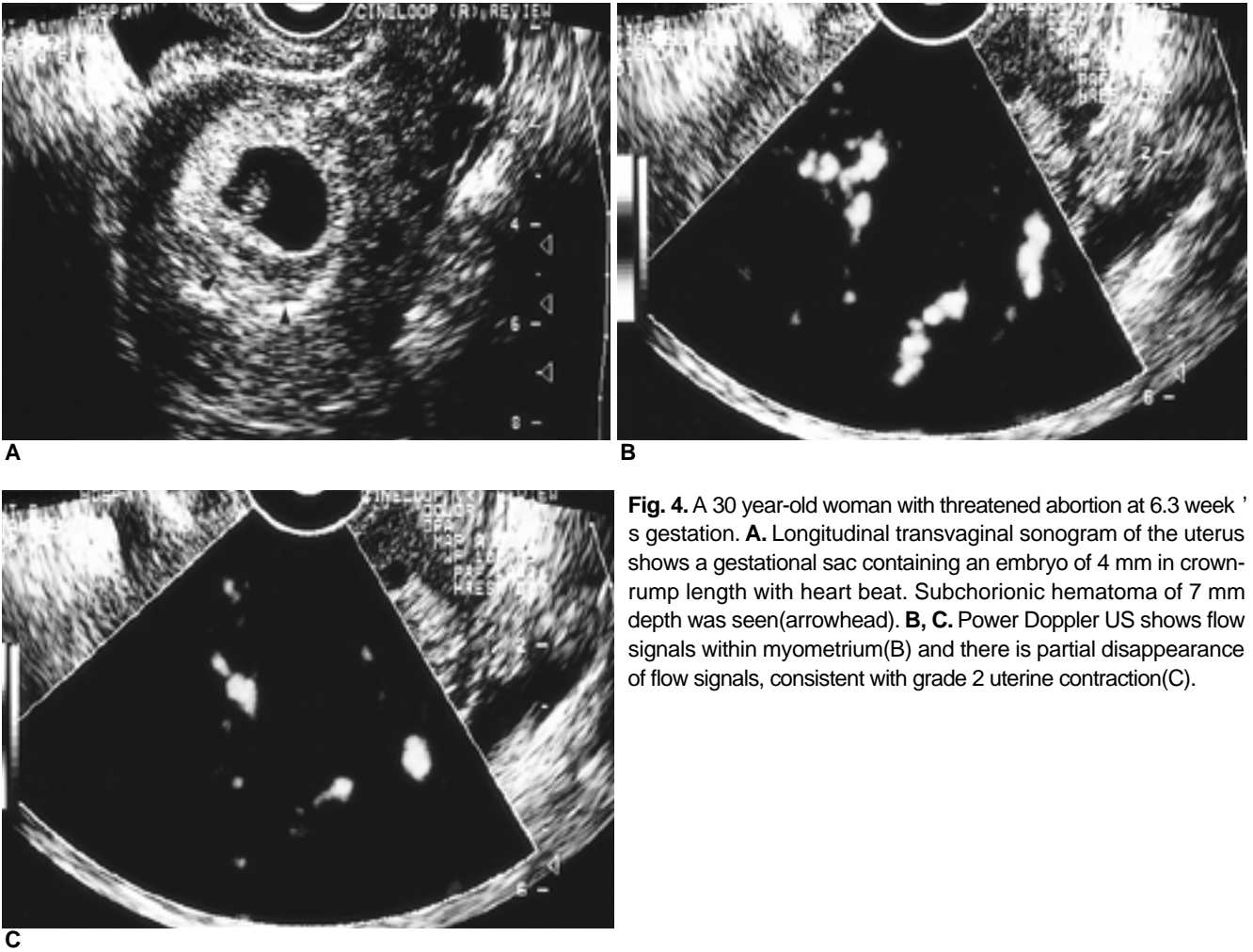


Fig. 4. A 30 year-old woman with threatened abortion at 6.3 week 's gestation. **A.** Longitudinal transvaginal sonogram of the uterus shows a gestational sac containing an embryo of 4 mm in crown-rump length with heart beat. Subchorionic hematoma of 7 mm depth was seen (arrowhead). **B, C.** Power Doppler US shows flow signals within myometrium (B) and there is partial disappearance of flow signals, consistent with grade 2 uterine contraction (C).

가 [5]. 1.3%

[6], 30-40

[7],

가

가

[1, 8-

9]. (prostaglandin) (progesterone)

[8]. (withdrawal)가

가 (decidual tissue rejection)

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[9]. 가

가 [10].

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2

6

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가

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가

[5-6].

[3, 4, 11-14].

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Braxton-Hicks

[12],

가

19-71% (35%),

60%

가 가

[13-14].

가,

(intramural tension),

[1, 12-

13].

가

[7].

[14].

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가

6

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J Korean Soc Med Ultrasound 1999; 18:117-124

= Abstract =

Transvaginal Color Doppler Imaging of Uterine Contractions in Early Pregnancies: Significance of Uterine Contractions in Early Pregnancy Failure

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PURPOSE: To assess uterine contractions in early pregnancies using transvaginal color Doppler sonography(TVCDS) and to determine the role of uterine contractions in the diagnosis of early pregnancy failure.

MATERIALS and METHODS: 76 patients with abnormal pregnancy diagnosed by sonography or histopathology up to 10 weeks of gestation and 38 normal pregnant women as the control group were examined with TVCDS. The presence of uterine contractions was determined by complete or partial disappearance of the color flow signals of vessels within myometrium, and the direction, amplitude(grade 1-3), and interval of uterine contractions were also evaluated.

RESULTS: Uterine contractions were identified in 42(55.3%) of 76 patients with abnormal pregnancy, whereas they were detected only in 2(5.3%) of 38 normal pregnant women who had initial grade 1 contraction but disappeared in the follow-up study. In 26 patients with blighted ovum or missed abortion, 15 patients(57.7%) showed uterine contraction of grade 1 in 3 cases, grade 2 in 8 cases, and grade 3 in 4 cases and interval from 45 seconds to 5 minutes. In 30 patients with inevitable or incomplete abortion, 23 patients(76.7%) showed uterine contraction of grade 1 in 2 cases, grade 2 in 9 cases, and grade 3 in 12 cases and interval from 1 to 5 minutes. 4(20%) of 20 patients with threatened abortion had uterine contraction of grade 2 and interval from 2 to 4 minutes. The presence of uterine contractions was significantly different in abnormal pregnancies compared with that of normal and also among the three different groups of abnormal pregnancies, but the amplitude did not differ.

CONCLUSION: It is suggested that uterine contractions in early pregnancy are related to the cause of early pregnancy failure or the evacuation of products of conception, and the presence of uterine contractions on TVCDS may be

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