



# Ultrasound evaluation of fetal gender at 12-14 weeks

Lubusky M.<sup>1,2</sup>, Prochazka M.<sup>1</sup>, Studnickova M.<sup>1</sup>, Vomackova K.<sup>3</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, University Hospital, Olomouc, Czech Republic

<sup>2</sup>Department of Medical Genetics and Fetal Medicine, University Hospital, Olomouc, Czech Republic

<sup>3</sup>Department of Surgery I, University Hospital, Olomouc, Czech Republic

## OBJECTIVE

The aim of this work was to assess the feasibility and accuracy of fetal gender assignment by transabdominal ultrasound at 12-14 weeks of gestation.

## METHODS

Fetal gender assessment was performed in **1222** singleton pregnancies. In all fetuses the crown-rump length (CRL) was measured and the genital area of the fetus was examined in the mid-sagittal plane. The result of ultrasound examination was compared to the phenotypic sex of the newborn after delivery.

## RESULTS

Feasibility as well as accuracy in determining gender increased with growing fetal CRL. Fetal gender was reliably determined (feasibility 97.4%, **accuracy 100%**) at **CRL ≥ 60 mm**.

At CRL ≥ 55 mm feasibility was 95.5% and accuracy 99.1% (99.8% in male gender vs 98.4% in female gender).

At CRL ≥ 50 mm the feasibility was 90.4% and accuracy 96.5%.

At CRL ≥ 45 mm feasibility was 83.9% and accuracy 92.5%.

## CONCLUSION

Fetal gender may reliably be determined when CRL ≥ 60 mm (gestational age ≥ 12+2). Male gender may already be reliably determined when CRL ≥ 55 mm (gestational age ≥ 12+0).

If CRL < 50 mm (gestational age < 11+4) gender cannot be reliably predicted.

Table 1 Gender identification according to crown-rump length (CRL)

CRL (mm)	Gestational age (weeks)	Patients (n)	Gender identified by ultrasound (n)	(%)	Gender verified (n)	Lost to follow-up (n)
45.0-49.9	11+1 to 11+4	156	61	39	59	2
50.0-54.9	11+4 to 12+0	170	108	64	100	8
55.0-59.9	12+0 to 12+2	242	219	90	208	11
60.0-64.9	12+2 to 12+5	291	283	97	268	15
65.0-69.9	12+5 to 13+1	238	232	97	222	10
70.0-74.9	13+1 to 13+3	58	57	98	56	1
75.0-79.9	13+3 to 13+5	43	42	98	41	1
80.0-82.4	13+5 to 13+6	24	23	96	20	3
Total		1222	1025		974	51

Table Gender feasibility by ultrasound according to crown-rump length (CRL)

CRL (mm)	Gestational age (weeks)	Feasibility (%)
45.0-49.9	11+1 to 11+4	39.1
50.0-54.9	11+4 to 12+0	63.5
55.0-59.9	12+0 to 12+2	90.5
60.0-64.9	12+2 to 12+5	97.3
65.0-69.9	12+5 to 13+1	97.5
70.0-74.9	13+1 to 13+3	98.3
75.0-79.9	13+3 to 13+5	97.7
80.0-82.4	13+5 to 13+6	95.8

Table 3 Accuracy of sonographic fetal gender assignment according to crown-rump length

CRL (mm)	Gestational age (weeks)	Total accuracy (n)	(%)	Male accuracy (n)	(%)	Female accuracy (n)	(%)
45.0-49.9	11+1 to 11+4	18/59	31	9/22	41	9/37	24
50.0-54.9	11+4 to 12+0	75/100	75	33/37	89	42/63	67
55.0-59.9	12+0 to 12+2	201/208	97	114/115	99	87/93	94
60.0-64.9	12+2 to 12+5	268/268	100	135/135	100	133/133	100
65.0-69.9	12+5 to 13+1	222/222	100	121/121	100	101/101	100
70.0-74.9	13+1 to 13+3	56/56	100	29/29	100	27/27	100
75.0-79.9	13+3 to 13+5	41/41	100	18/18	100	23/23	100
80.0-82.4	13+5 to 13+6	20/20	100	12/12	100	8/8	100
Total		901/974	93	471/489	96	430/489	89

Table 4 Total accuracy of sonographic fetal gender assignment according to crown-rump length

CRL (mm)	Gestational age (weeks)	Total accuracy (%)
45.0-49.9	11+1 to 11+4	30.5
50.0-54.9	11+4 to 12+0	75
55.0-59.9	12+0 to 12+2	96.6
60.0-64.9	12+2 to 12+5	100
65.0-69.9	12+5 to 13+1	100
70.0-74.9	13+1 to 13+3	100
75.0-79.9	13+3 to 13+5	100
80.0-82.4	13+5 to 13+6	100

Table 5 Male accuracy of sonographic fetal gender assignment according to crown-rump length

CRL (mm)	Gestational age (weeks)	Male accuracy (%)
45.0-49.9	11+1 to 11+4	40.9
50.0-54.9	11+4 to 12+0	89.1
55.0-59.9	12+0 to 12+2	99.1
60.0-64.9	12+2 to 12+5	100
65.0-69.9	12+5 to 13+1	100
70.0-74.9	13+1 to 13+3	100
75.0-79.9	13+3 to 13+5	100
80.0-82.4	13+5 to 13+6	100

Table 6 Female accuracy of sonographic fetal gender assignment according to crown-rump length

CRL (mm)	Gestational age (weeks)	Female accuracy (%)
45.0-49.9	11+1 to 11+4	24.3
50.0-54.9	11+4 to 12+0	66.7
55.0-59.9	12+0 to 12+2	93.5
60.0-64.9	12+2 to 12+5	100
65.0-69.9	12+5 to 13+1	100
70.0-74.9	13+1 to 13+3	100
75.0-79.9	13+3 to 13+5	100
80.0-82.4	13+5 to 13+6	100

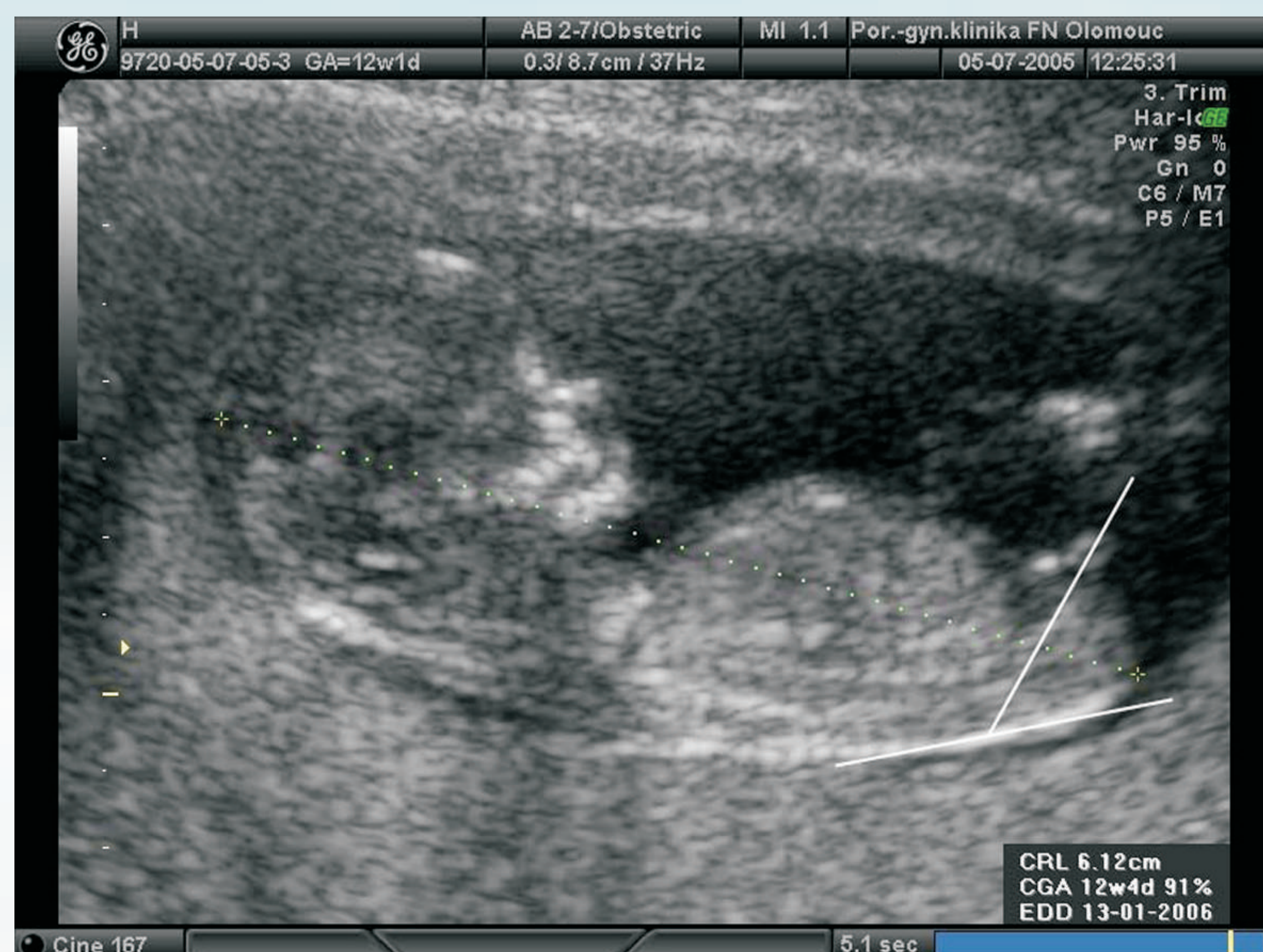


Figure 1 Ultrasound examination established gender to be **male** if the angle between the genital tubercle axis and a horizontal line through the lumbosacral skin surface was >30°.



Figure 2 Ultrasound examination established gender to be **female** if the axis of the genital tubercle ran parallel (<10°) or convergent to the horizontal line.