



Prediction of the Second-stage of labor duration Using Pre-labor Ultrasound Markers

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Introduction

Pre-labor intrapartum ultrasound may facilitate appropriate intrapartum decision-making by predicting a short second stage of labor (≤ 1 hour). Although previous studies have evaluated ultrasound markers such as head-perineal distance (HPD), angle of progression (AoP), and head-symphysis distance (HSD) to predict labor progression, this study aimed to identify additional ultrasound markers predictive of a second stage lasting ≤ 1 hour.

Method

- ▶ Single-center observational cohort study (Jan 2022–Aug 2025)
- ▶ Primiparous women at term in the latent phase of labor
- ▶ Baseline characteristics and delivery outcomes
- ▶ Intrapartum ultrasound markers: HPD, AoP, HSD, ACA, and PCA

Result

	$\leq 1\text{ hr (n=34)}$	$> 1\text{ hr (n=52)}$	p-value
Maternal age(years)	31.0 ± 3.7	30.9 ± 4.2	0.937
Gestational age(weeks)	38.2 ± 1.4	38.4 ± 1.4	0.535
Maternal BMI(kg/m ²)	27.6 ± 4.0	27.8 ± 3.7	0.791
Induction(%)	72.7	85.1	0.256
Oxytocin use(%)	45.2	68.9	0.057
Epidural anesthesia(%)	71.4	84.3	0.182
DM (%)	12.1	10.6	1
HTN (%)	9.1	2.1	0.3
Operative delivery(%)	11.4	47.1	0.001
Second stage duration(min)	34.8 ± 14.4	134.7 ± 55.9	<0.001
Birthweight(gram)	3034 ± 411.2	3196 ± 405.8	0.076

Table 1. Patient characteristics and delivery outcomes

	$\leq 1\text{ hr (n=34)}$	$> 1\text{ hr (n=52)}$	p-value
PD	0.86 ± 1.59	0.9 ± 1.5	0.907
AoP	98.9 ± 14.6	98.3 ± 11.8	0.862
HPD	6.0 ± 1.4	6.3 ± 1.7	0.561
HSD	3.9 ± 1.3	3.9 ± 1.2	0.953
Cervical length	2.1 ± 0.9	2.0 ± 0.8	0.876
ACA	121.7 ± 18.2	109.5 ± 23.2	0.025
PCA	97.2 ± 22.8	103.2 ± 25.0	0.323

Table 2. Pre-labor ultrasound markers

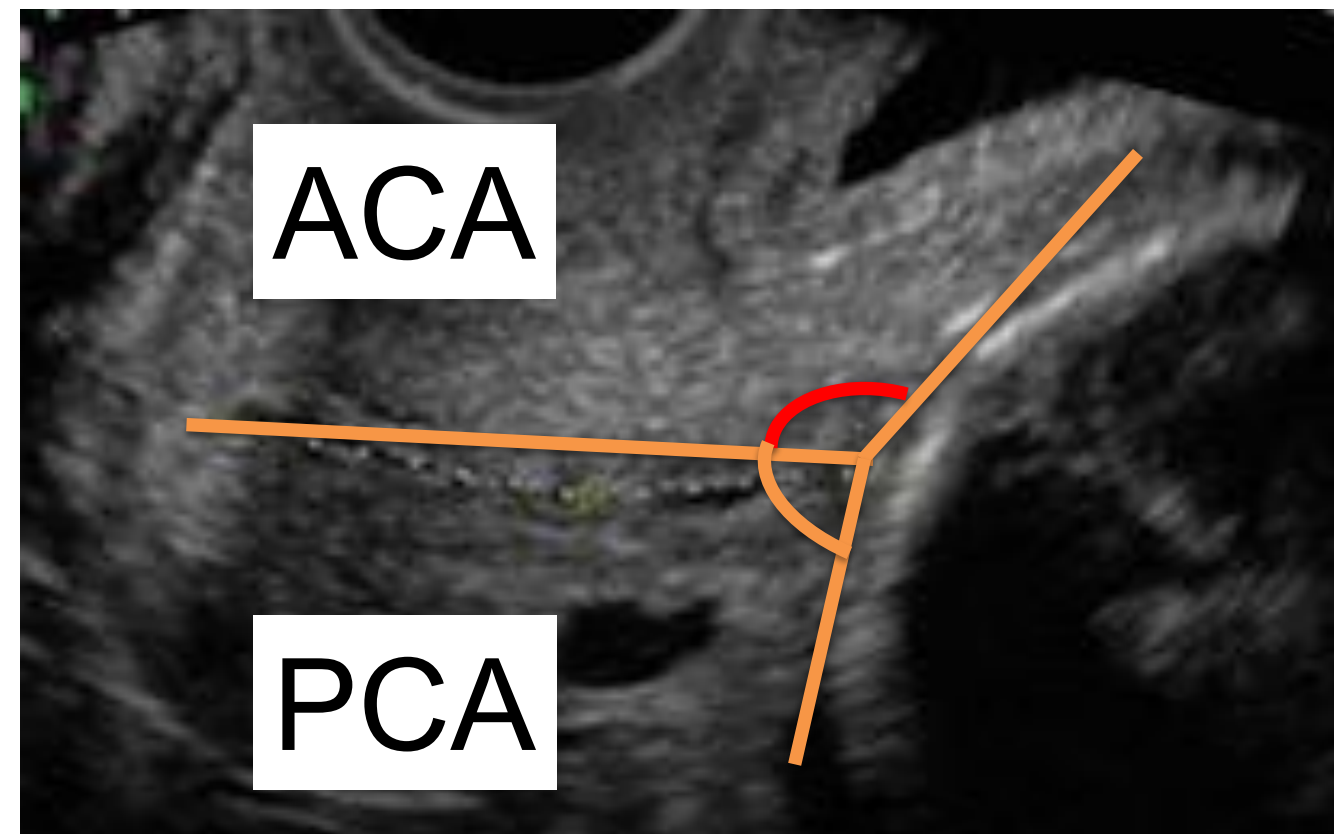


Figure 1. Anterior cervical angle (ACA), Posterior cervical angle(PCA)

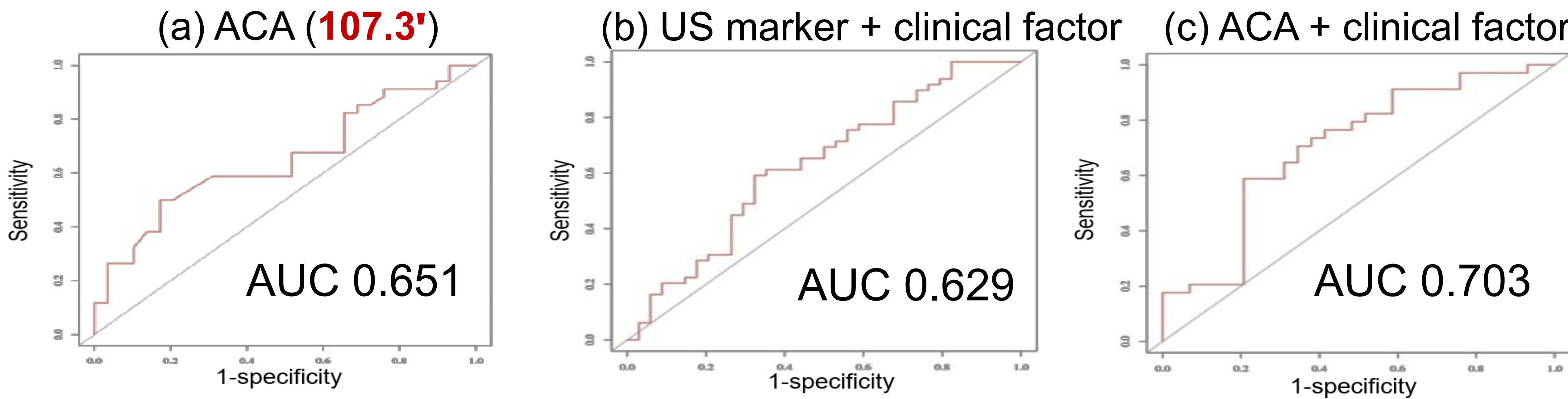


Figure 2 Receiver Operating Characteristic (ROC) curve

Conclusion

A wider ACA measured before labor is an independent predictor of a short second stage (≤ 1 h). Mechanistically, this association may reflect an axis-alignment effect where a more anteriorly open cervix better aligns with the direction of expulsive forces, facilitating fetal descent.