Novel prediction method for arrested labor using transperineal ultrasound

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Introduction
TPU has been proposed for evaluating labor compared to the conventional vaginal digital examination(VE) in its objectivity and accuracy. However, no prior study exist that evaluate transition of the parameters in diagnosing arrested labor.

Aim
To establish a novel approach to predict arrested labor based on transition of AoP.

Methods

- Uncomplicated, singleton, primipara pregnancy, cephalic presentation at term
- 2016 – 2018 in Tokyo University Hospital
- Evaluated at least 3 times after by TPU during labor after the onset of labor

Exclude the cases in which CS was performed for NRFS

<table>
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<tr>
<th>VD 52 cases</th>
<th>CS 18 cases</th>
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① Created a sono-partgram based on the transition of AoP
- The point 1 was obtained before onset of labor
- The point 1 was not obtained in AoP between 90-110°

② Evaluated ΔAoP (degree/hr) between point 1 and 2°
  - Point1 : The time that AoP reached 90 to 110°
  - Point2 : 3-4 hours after point 1 or delivery

VD 23 cases
CS 8 cases

Result1 : AoP did not progress before 120° in 83% of CS group.

Result2 : On ROC curve to predict CS due to arrested labor based on the ΔAoP after AoP reached 90°, ΔAoP=6.0°/hr was the cut-off with sensitivity 100% and specificity 69% (AUC 0.82).

Table1. Prediction of CS until 3-4 hours after AoP > 90°

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<thead>
<tr>
<th>Prediction of CS</th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tbody>
<tr>
<td>Result 1</td>
<td>AoP &lt; 120°</td>
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<tr>
<td>Result 2</td>
<td>ΔAoP &lt; 6.0° /hr until 3-4 hours After AoP &gt; 90°</td>
<td>87.5%</td>
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Conclusion
AoP < 120° and ΔAoP<6.0°/hr after AoP reaches 90° are the useful TPU parameters to predict CS due to arrested labor.