

EP17.24. Intrapartum ultrasound for vacuum cup placement: proposal of the novel Ultrasound Flexion Point (UFP) method

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Objectives

Incorrect vacuum cup placement over the fetal flexion point is the primary cause of cup detachment, failed operative vaginal delivery, and neonatal trauma. Digital examination (DE) fails to identify correct head position in ~25% of cases, dropping to 54% in occiput-lateral and posterior positions. We propose a novel intrapartum ultrasound (IU)-based method — the Ultrasound Flexion Point (UFP) — to provide objective spatial guidance for cup application.

Methods

We reviewed literature on vacuum extraction biomechanics, IU parameters (Angle of Progression [AoP], Midline Angle [MLA], Head-Symphysis Distance [HSD]), and cup placement accuracy. The UFP is defined as the intersection of the fetal midline and biparietal diameter on the frozen transverse translabial view, a sonographic proxy for the classic flexion point when DE is unreliable due to caput succedaneum or molding. The cup notch is aligned with the sonographic MLA, with biofeedback from notch dynamics monitoring cup slippage in real time.

Results

IU-guided placement reduces the distance between cup center and optimal flexion point vs. DE (2.1 vs. 2.8 cm, $p=0.039$). Incorrect placement accounts for up to 40% of failed extractions. The UFP integrates AoP, MLA, HSD, and asynclitism degree into a structured pre-application workflow, bridging the diagnostic-to-procedural gap identified in prior systematic reviews.

Conclusion

The UFP method offers a practical, reproducible, low-cost approach to reduce paramedian and deflexing applications, potentially lowering detachment rates and neonatal trauma. Prospective RCT validation is warranted.



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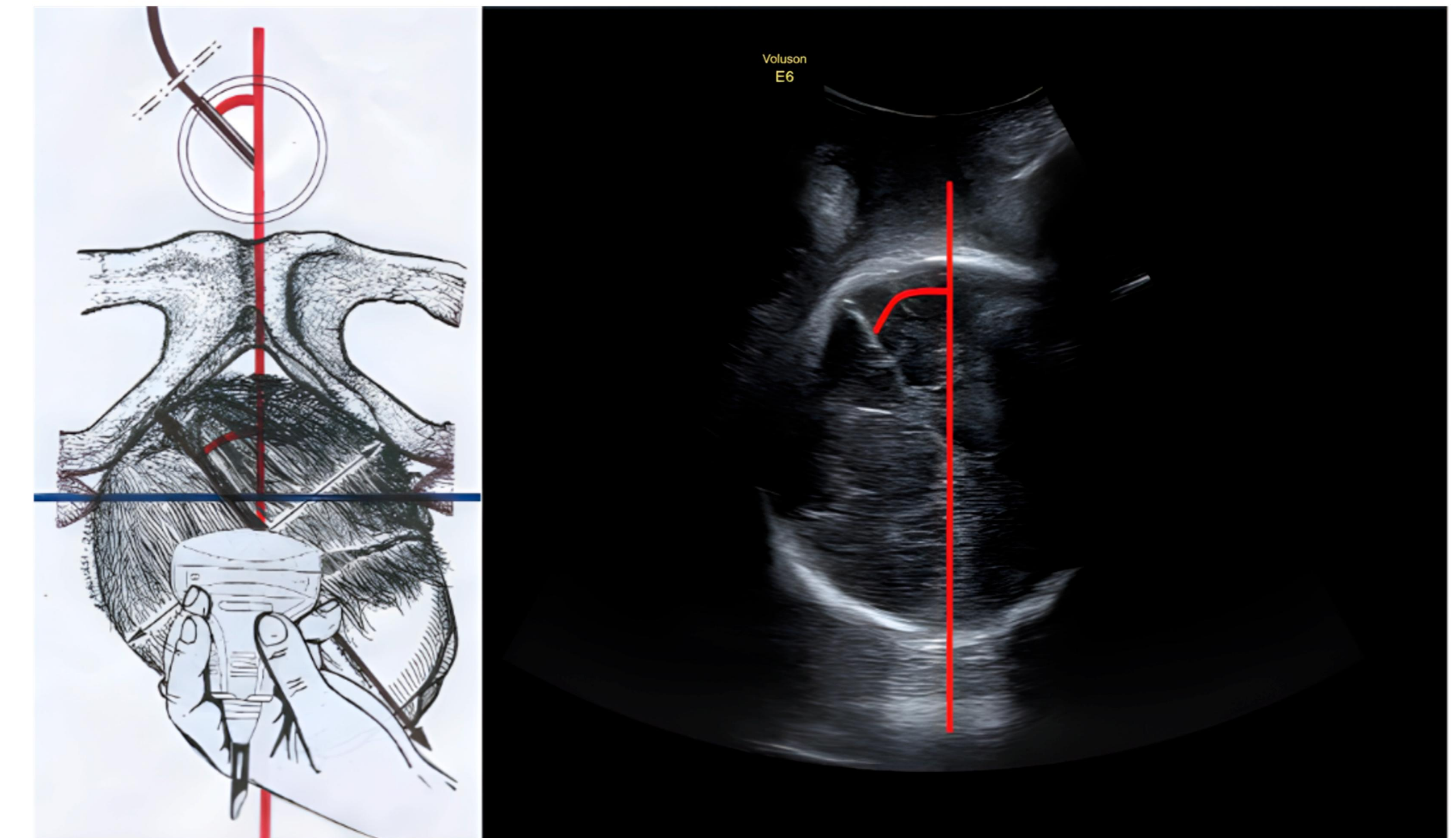


Figure: Intrapartum Ultrasound Flexion Point: Correct Application.

(Left) Schematic representation of a translabial ultrasound scan in the transverse plane (parallel to the interspinous line/bi-ischiatic line, represented as the transverse blue line) of a fetal head in Right Occiput Anterior position. The Midline Angle (MLA) is measured (red arc), which is the angle between the infrapubic line (red vertical line) and the fetal midline (black line). The “Ultrasound Flexion Point” is identified as the intersection of the fetal midline (sagittal suture, black line) and the Biparietal Diameter (BPD, black arrow). In the upper panel, the vacuum extractor cup (Kiwi OmniCup) is shown correctly applied along the sagittal suture, centering on the flexion point.

(Right) The corresponding ultrasound image demonstrating the sonographic midline and the correct alignment