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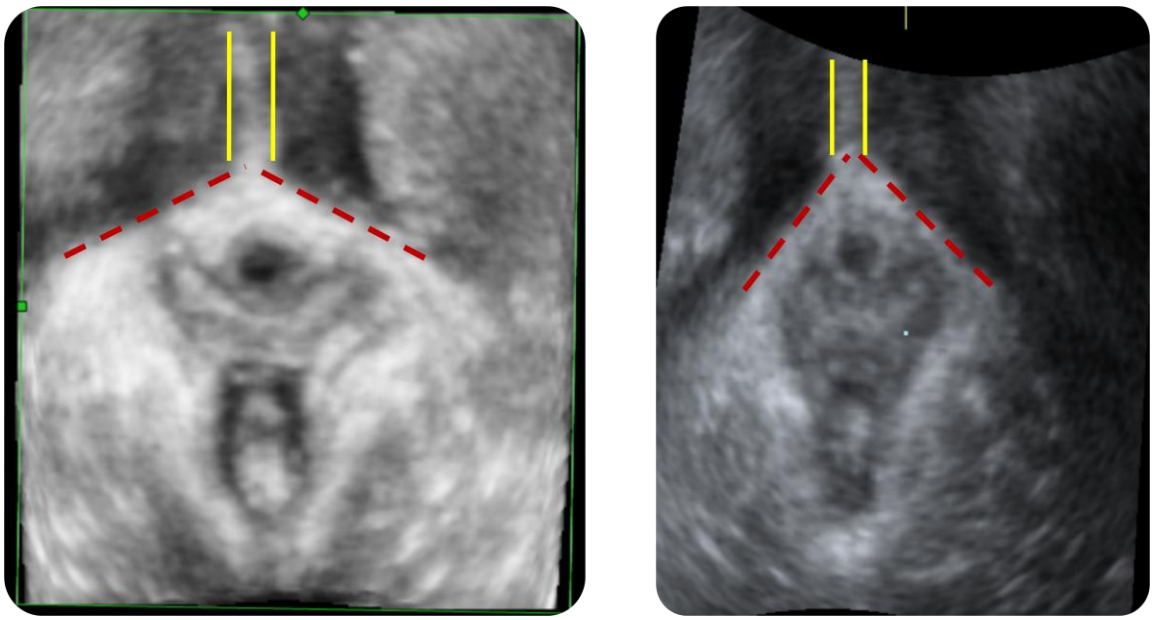
ASSESSMENT OF INFRAPUBIC ARC ANGLE USING 3D PERINEAL ULTRASOUND AND RELATION TO OBSTETRIC PARAMETERS

Hypothesis / aims of study:

Perineal ultrasound has become a fundamental diagnostic tool in urogynecology in recent years. Its broad availability, cost-effectiveness, painless, fast and radiation-free performance are only a few advantages compared to x-ray and MRI-technology. The investigated objects are mostly soft-tissue structures like urethra, bladder neck, bladder, uterus and anal canal. Due to recent advances in 3D ultrasound technology new planes have become accessible for assessment. Using 3D ultrasound in the C-plane we measured the angle between the two inferior rami of the pubic bone and the width of the interpubic gap. The angle of the infrapubic arc possibly enables us to presume the shape of the female pelvis and the possible impact on vaginal birth mechanism.

Study design, materials and methods:

We examined 115 women after delivery at the Department of Obstetrics and Gynecology, University Mainz, Germany between January and May 2009 using 3D perineal ultrasound (Voluson-e, GE Healthcare) on 2nd to 3rd day postpartum.
3D volume data sets were assessed independently by 2 urogynecologists using 4D View-Software (GE Healthcare). Interobserver reliability was calculated using Pearson product moment correlation coefficient.
In addition the correlation between infrapubic arc angle and length of 2nd stage of labour and occurrence of levator avulsion was calculated for women delivered vaginally (n=110)



Variability of width of the infrapubic arc angle evaluated with 3D perineal ultrasound.

Results:

Inter-observer reliability for the assessment of the infrapubic arc angle was very high, with a correlation coefficient r =0.77.
For the measurement of the width of the interpubic gap we found a slightly lower inter-observer reliability of r=0.67.
Concerning the length of 2nd stage of labour we did not find a statistical correlation with the infrapubic arc angle for both observer measurements (r= 0.09955, *P*=0.3195; r=-0.02699, *P* =0.7877, respectively). Also we could not find a correlation between the infrapubic arc angle and the occurrence of levator avulsions (r=0.05, *P* =0.5987; r=0.08, *P* =0.3937, respectively).

Interpretation of results:

To interprete the data we used the following rules given by Colton (1974): correlation between 0 and 0.25 (or -0.25) indicate little or no relationship; from 0.25 to 0.50 (or -0.25 to -0.50) a fair degree of relationship; from 0.50 to 0.75 (or -0.50 to -0.75) a moderate to good relationship; and between 0.75 and 1 (or -0.75 and -1) a very good to excellent relationship.
From our data, either the measurement of infrapubic arc angle, and the width of the interpubic discus are anatomical structures easily evaluable with 3D perineal ultrasound with a good-excellent degree of reproducibility between two different examiners.
Moreover it seems, that the length of 2nd stage of labour and the occurrence of levator trauma are not correlated with the shape of the pelvic bony structures.

Concluding message:

In addition to soft-tissue structures 3D perineal ultrasound enables us to assess in a reproducible way also pelvic bony structures. Infrapubic arc angle seems not to impact the vaginal birth mechanism.

Specify source of funding or grant	**NONE**
Is this a clinical trial?	**Yes**
Is this study registered in a public clinical trials registry?	**No**
Is this a Randomised Controlled Trial (RCT)?	**No**
What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Institutional Review Board**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**