

## Intrapartum Ultrasound- The Nexus between the Traditional and Contemporary Management of Labor

Svigos JM<sup>1\*</sup>, Gopinathan B<sup>1</sup> and Moffat A<sup>2</sup>

<sup>1</sup>Gawler Health Service, South Australia

<sup>2</sup>Australian Institute of Ultrasound, Queensland, Australia.

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As Intrapartum Ultrasound becomes more established as a legitimate mode of assistance in the clinical management of labor, particularly with delayed progress in the Second Stage, its non-invasive character makes it an attractive option for midwives and obstetricians to consider as it will comply with a number of women and their request for “non-intervention” in their labor management particularly in those women with a fear of childbirth, with a previous traumatic birth, with vaginismus and psychosexual suffering.

It may also serve to assist in informing women in labor, in a very visual manner, of their progress in labor and allow them to be involved more productively in decisions made in their obstetric management previously based on “non-visualized” clinical findings determined by their respective midwife and/or obstetrician thereby facilitating an atmosphere of trust and collaborative consensus.

The findings of Akmal [1] and Sherer [2] confirmed experienced and discerning clinicians’ personal observations that the accuracy in the clinical determination of position/presentation of the fetal head may vary 30% - 34% between observers and this was confirmed by subsequent investigators Souka [3], Chou [4], Dupois [5] and Krieser [6].

Transabdominal ultrasound in the transverse plane, utilizing fetal midbrain parameters and the ‘arrow sign’ along with identification of the fetal spine in the longitudinal plane will enable the fetal occiput to be identified accurately and in particular the occiput transverse and posterior positions which are more frequently associated with operative delivery and its potential consequences of increased maternal and perinatal morbidity.

The more acceptable non-invasive trans-perineal scanning of the woman in labor has been found to more accurately identify fetal head station, using the parameters of Angle of Progression (AoP) [7], Head Perineum Distance (HPD) [8] and Fetal Head Direction [9], than traditional digital clinical

examination of fetal head descent which similarly demonstrate a 30% inaccuracy and inter-observer variability.

Not only is trans-perineal scanning a graphic and reproducible method of measuring progress in the late First Stage and during the Second Stage of labor Kahrs [10] but it also can be used to predict the likelihood of successful operative/ instrumental vaginal delivery [11-13].

The ease of learning this procedure using relatively unsophisticated 2D ultrasound equipment enhances its adoption as a valuable supplement to clinical practice not only in tertiary centers but even more so in regional and rural centers with their inherent limitations in resources and staffing.

While accurate assessment of cervical dilation is also important in determining the progress of labor and mode of delivery, the less invasive trans-perineal ultrasound method of has proven to be more problematic in cervical assessment particularly in the face of ruptured membranes and full cervical dilatation [14].

However, despite this potential limitation, using trans-perineal scanning for serial determination of fetal head station in the Second stage of labor may reduce the number of digital vaginal examinations considerably after full cervical dilatation has been determined.

As more experience is obtained with all facets of Intrapartum Ultrasound it may lend itself to the application

**Corresponding author:** Svigos JM, Gawler Health Service, South Australia, Tel: 61 412 830 320; E-mail: john@svigos.com.au

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of narrow Artificial Intelligence (which is already being used with fetal biometrics [15] and in the ultrasound diagnosis of endometriosis [16]) which in turn may project its use into a new dimension in the evolving contemporary management of labor.

Randomized controlled trials, with sufficient power and proven methodology, are required urgently to demonstrate the benefits of Intrapartum Ultrasound but preliminary studies coordinated by Nicolaides and Papageorghiou in the UK and by Eggebo, Ghi, Rizzo, Tutschek and Henrich in Europe show considerable promise 2020 [17].

A pilot study to determine the feasibility of Intrapartum Ultrasound is currently being performed by Svigos, Gopinathan and Moffat in a predominantly midwifery led obstetric service at Gawler Hospital in rural South Australia in consultation with the Australian Institute of Ultrasound, Broadbeach Waters, Queensland which provides appropriate tuition and validation.

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