

# INTRAPARTUM ULTRASOUND – POTENTIAL BENEFIT IN LATE OCCIPUT ROTATION FROM POSTERIOR TO ANTERIOR POSITION

D.G. Iliescu \*, Roxana Cristina Drăgușin\*, Maria Șorop-Florea\*, M.Novac\*\*,  
R. Grigoraș Căpitănescu\*, Ștefania Tudorache\*

\*Department of Obstetrics and Gynecology, University of Medicine and Pharmacy Craiova, University Emergency County Hospital Craiova, Romania.

\*\*Department of Anesthesiology and Intensive Care, University of Medicine and Pharmacy Craiova, University Emergency County Hospital Craiova, Romania.

## Abstract

Recently, intrapartum transperineal ultrasound (TPU) was proposed the method of choice in evaluating fetal head position, station and descent in order to undertake the appropriate intervention at the right time.

We present a case of intrapartum ultrasound assessment of fetal descent in a primiparous woman with late internal head rotation from posterior to anterior. In the first stage of labour, the fetal presented a right posterior occiput position, that persisted in the second stage of labor for two and a half hours, but given the transversal position of the spine and the normal intrapartum cardiotocography (CTG), we opted to wait. The internal rotation from posterior to anterior was recorded when the fetal head reached the pelvic floor. This case confirms previous research regarding the influence of the spine position on the occiput rotation during the second stage of labor.

## Rezumat: Ecografia în travaliu. Potențial beneficiu în cazul rotației interne tardive a occiputului în poziție anterioară

În ultimele decade, ecografia a fost propusă drept metoda optimă de evaluare intrapartum a poziției, stației și progresiei craniului fetal, astfel încât să poată fi luate deciziile corecte la momentul potrivit, cu o tehnică intervențională optimă.

În acest raport, prezentăm monitorizarea progresiei travaliului în condițiile unei rotații interne tardive a occiputului către poziția anterioară. În prima perioadă a travaliului a fost constatată poziția dreaptă posterioară a occiputului, persistentă și asociată cu reducerea progresiunii a travaliului în perioada a doua timp de două ore și jumătate. Date fiind monitorizarea continuă cardiotocografică normală și poziția non-posterioară a coloanei vertebrale, am optat pentru expectativă. Rotația internă anterioară a occiputului a fost în cele din urmă documentată când craniul a coborât pe planșeul pelvin. Acest studiu confirmă datele anterioare din literatură cu privire la importanța prognostică a poziției coloanei vertebrale fetale în cazurile occipito-posterioare din perioada a doua a nașterii.

**Cuvinte cheie:** ecografie intrapartum, ecografie, travaliu, poziția craniului fetal, occiput posterior, rotația internă, progresia craniului fetal

## Introduction

Ultrasound examination in labor has to potential to help obstetricians to make better diagnoses regarding fetuses cardinal movements in different positions<sup>(1)</sup>. Predicting an occiput posterior birth is important as it has been reported to be associated with negative events and frequent operative deliveries<sup>(2)</sup>. The position of the fetal spine offers important information regarding the prognosis

CORRESPONDENȚĂ: Roxana Drăgușin, e-mail: roxy\_dimieru@yahoo.com

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of the head rotation in the clinical situation of an posterior occiput in the second stage of labor<sup>(3)</sup>. In our view, intrapartum ultrasound should be used as a supplement to the clinical practice in borderline intrapartum conditions for a greater diagnostic precision.

## Case Report

A 30-year old, primiparous woman, with no obstetrical history, was admitted in the first stage of labor, in our Clinic of the University Emergency County Hospital of Craiova. The gestational age of 40 weeks and 6 days was documented based on early first trimester dating scan and the pregnancy had a normal, uneventful evolution. The patient attended weekly abdominal and transperineal scan at term in our clinic as part of a research to predict mode of delivery. During these evaluations the fetus presented a persistent right posterior occiput position with a progression angle measurement of 70-80°, far below the 95° cut-off suggested by previous research as predictive for vaginal delivery<sup>(4)</sup>. We therefore classified the patient as at high-risk for labor arrest disorders and operative delivery (instrumental delivery or Cesarean section delivery).

At admittance in the laborward, the patient presented with regular uterine contractions, 3 centimeters cervical dilatation and intact amniotic membranes. The initial TPU evaluation, in the first stage of labor, noted a right occiput posterior position (Figure 1b) with a transversal position of the spine (Figure 1c). In the second stage of labor, after artificial rupture of membranes, the fetus remained in a right occiput posterior position, with a similar spine

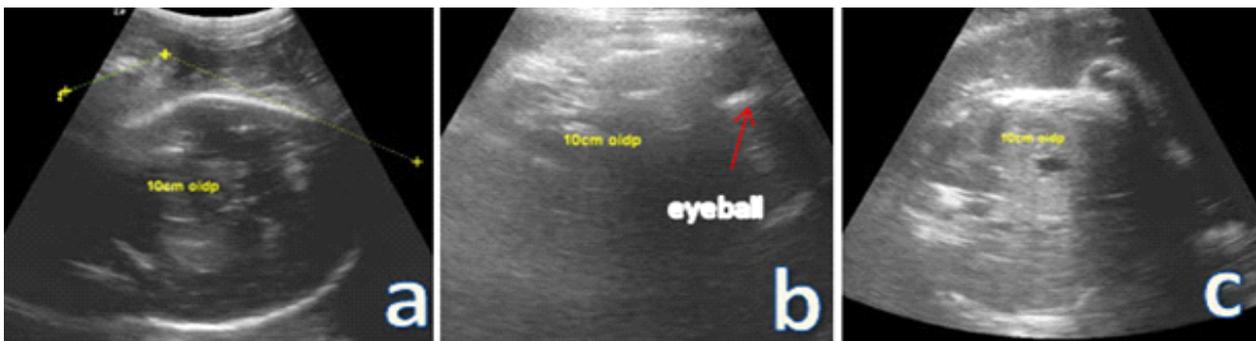
position. All transperineal progression measurements (progression angle, progression distance, direction angle and fetal head to perineum distance) showed increasing values (Figure 1a) but we were aware of the fact that the cut-offs for these parameters does not apply for posterior occiput position of the fetal head, because this clinical situation leads to an elongation of the fetal head and consecutively artificially increased progression markers.

The fetal head remained to station +3 for 2 and a half hours with optimal uterine contractions and a normal fetal CTG. The medical staff was prepared for an unfavourable outcome of spontaneously vaginal delivery, taking into consideration the event of an instrumental or operative delivery with consequently perineal trauma of the mother or birth trauma of the infant. Fortunately, a late internal rotation from posterior to anterior occiput of the fetus occurred, followed by spontaneous vaginal delivery (Figure 2). A male infant was delivered spontaneously, weighing 3560 grams and with an Apgar score of 9 at 1, 5 and 10 minutes respectively. The mother and the baby were discharged day 3 in very good health.

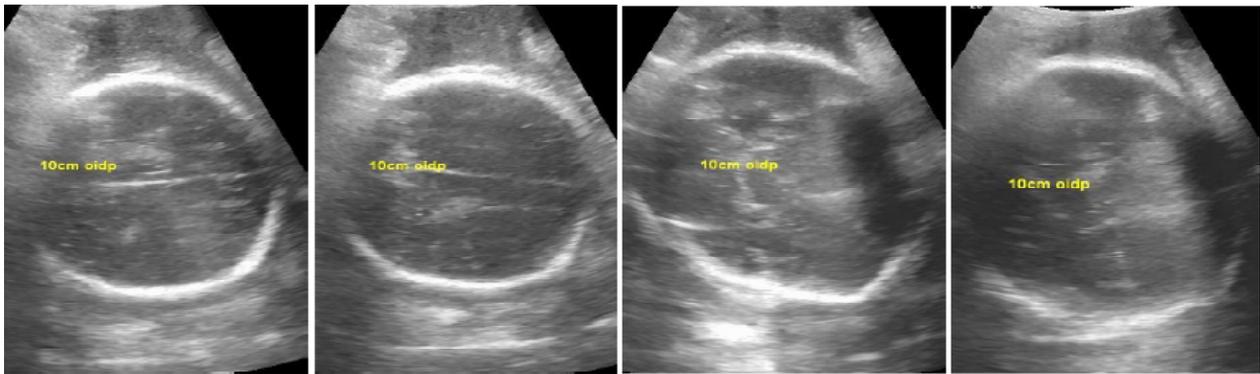
## Discussion

Ultrasound assessment in labor was introduced to achieve greater diagnostic objectivity, helping obstetrician in decision-making and avoiding mistakes and litigation<sup>(1)</sup>.

An additional advantage of transperineal ultrasound in labor would be less vaginal examination, uncomfortable for delivering women, and safer after the rupture of amniotic membranes because of the reduced risk of intrauterine infections<sup>(5)</sup>.



**Figure 1.** Second stage of labor intrapartum assessment. Favourable angle of progression, of 133°(a), in the presence of occiput posterior (b) and transversal fetal spine position (c).



**Figure 2.** Occiput rotation in late second stage of labor. The evolution of the falx cerebri and midline angle indicate the anterior rotation of the fetal head.

The intrapartum measurements in our case initially indicated an unfavourable prognosis of spontaneous uncomplicated vaginal delivery, both in prelabor and also during labor because of high fetal head and persistent posterior occiput position. Many studies proved that clinical assessment of the fetal occiput can be inaccurate both in the first and second stage of labor, even for very experienced medical staff<sup>(6)</sup>. This was the case in our case, however, the objective intrapartum sonographic assessment indicated the correct position of the fetal head.

In the second stage of labor, a persistent occiput posterior (OP) was proved to decrease the chance for vaginal delivery and to increase maternal and perinatal events<sup>(7)</sup>. In approximately 10-20% cases, the fetal head lie in an occiput posterior position, that usually rotate to the anterior position<sup>(8,9)</sup>. In 1998, Gardberg et al. stated that in most cases, persistent occiput posterior position develops more as a malrotation than a failure of rotation from an initially posterior position<sup>(10)</sup>. On the contrary, in 2004, Akmal et al. found that the vast majority of occiput posterior positions are a consequence of persistence of this position rather than a malrotation from an initial occiput anterior<sup>(11)</sup>. In our case, the occiput persisted in a posterior position from the first stage of labor until close to expulsion.

In 2010, Blasi et al. described, for the first time, the implications of the spine position in the second stage of labor, besides the occiput position, in a safer and improved management of labor and delivery<sup>(2)</sup>. Gizzo et al. found that the anterior or transverse spine position in the second stage of labor has a very high sensitivity and specificity to predict the anterior rotation of the occiput and vaginal

delivery<sup>(3)</sup>. In our case, the fetal well-being during labor allowed us to wait even if there was an arrested labor in the second stage. The fetal spine was positioned transversal and slightly anterior in the second stage of labor, indicating a highly possible rotation of the occiput from posterior to anterior position.

This case shows that prelabor and labor transperineal ultrasound evaluation can be used and interpreted in a judicial way and should be applied from one case to another. The published cut-offs should be taken into consideration with caution as further research is necessary for confirmation. We must not forget that TPU is still considered a research area and did not gain yet acceptance as general medical practice. A difficult situation with contradictory prognostic factors as presented here can occur in real practice. We must be aware of the fact that even if the studied studies have been published more than 20 years ago, the intrapartum ultrasound is yet a field of pioneering and research. So, every case should be managed individually, considering all clinical information.

## Conclusion

The ultrasound evaluation of the fetal occiput position is the most accurate, easy and reproducible tool in predicting the risks and the benefits of a vaginal delivery. Still a higher accuracy in estimating the labor trend, is obtained by the concomitant evaluation of the spine and the occiput position.

Occiput rotation toward anterior position may happen during apparently arrested labor just before the fetal head expulsion.

## **Consent**

*Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.*

## **Conflict of interest**

*The authors declare that they have no conflict of interest.*

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