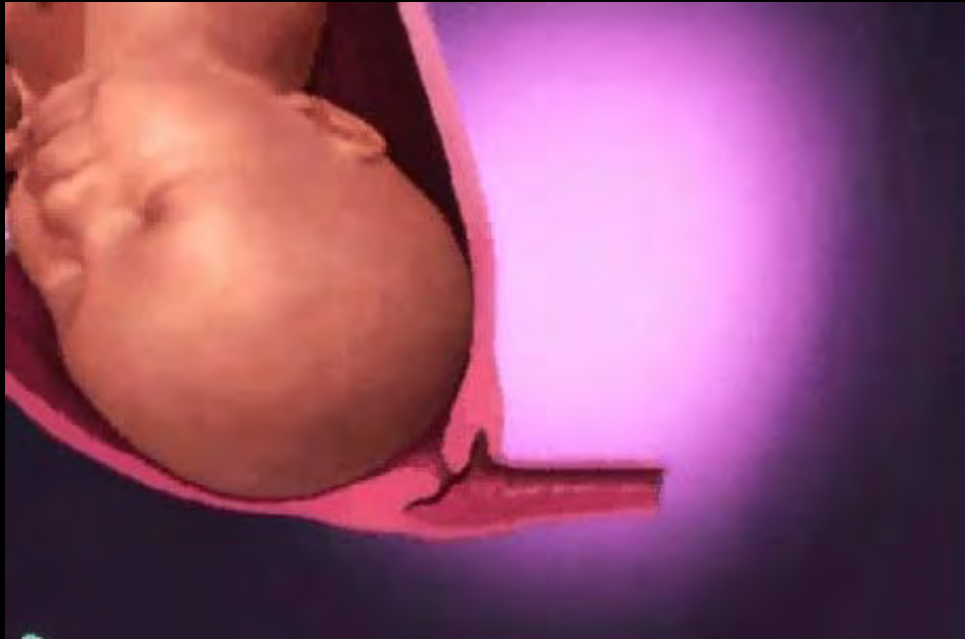




Ecografía en la sala de partos



*Avances
y
puesta al día*

Guillermo Azumendi



C E N T R O
G U T E N B E R G
MALAGA

Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i de Balears

Ecografía en el parto

Consideraciones previas

- Importante número de **partos instrumentales** (aunque en disminución)
- Aumento de **vacuum** sobre forceps
- Aumento de **aplicaciones fallidas**:
 - aplicaciones secuenciales de instrumentos
 - Cesáreas tras intentos de parto vaginal instrumental
- Los **partos instrumentales fallidos** se asocian con gran riesgo de **resultados perinatales adversos**:
 - lesiones fetales
 - Asfixia intraparto .

Trauma fetal en el parto

Hemorragia intracraneal en R.N. a término en relación al tipo de parto

	Incidencia	OR
Parto vaginal	1 : 1900	1,0
Cesárea electiva	1 : 2750	0,7
Cesárea intraparto	1 : 954	2,0
Vacuo	1 : 860	2,7
Forceps	1 : 664	3,4
Intento fallido de Vacuum/Forceps	1 : 334	5,7

*California database of **583.340** nuliparous singletons deliveries 2500 - 4.000 gr*

N Engl J Med. 1999 Dec 2;341(23):1709-14.

Effect of mode of delivery in nulliparous women on neonatal intracranial injury.

Towner D, Castro MA, Eby-Wilkens E, Gilbert WM.

Odds ratio (95% CI)
de
resultado adverso
tras
parto instrumental.

	Hemorragia IC	Convulsiones
Vacuum	3.0 (2.4 - 3,6)	1.7 (1,6 – 1,9)
Forceps	3.9 (3,1 – 4,9)	1.3 (1.2 – 1.4)
Vacuum + Forceps	6,3 (3,9 – 10.0)	4.8 (2.3 – 10.0)

Clin Obstet Gynecol. 2007 Sep;50(3):563-81.

Operative vaginal delivery: a cause of birth injury or is it?

Towner DR, Ciotti MC

Lesiones fetales durante la Cesárea

Estudio multicéntrico sobre **37.110** cesáreas

-Incidencia general de lesiones fetales : **1,1 %**

- La mayoría lesiones cutáneas.

- Fracturas craneales 1: 5000 la mayoría en casos de fallo de forceps /vacuum y seguido de cesárea.

- La incidencia aumenta hasta el **6,9 %** , en casos de intento fallido de forceps /vacuum seguido de cesárea.

Obstet Gynecol. 2006 Oct;108(4):885-90.

Fetal injury associated with cesarean delivery.

Alexander JM, Leveno KJ, Hauth J, Landon MB, Thom E, Spong CY, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ, Sorokin Y, Miodovnik M, O'Sullivan MJ, Sibai BM, Langer O, Gabbe SG;

Ecografía en el parto

Consideraciones previas

- Importante número de partos instrumentales (aunque en disminución)
- Aumento de vacuum sobre forceps
- **Aumento de aplicaciones fallidas:**
 - aplicaciones secuenciales de instrumentos
 - Cesáreas tras intentos de parto vaginal instrumental
- Los partos instrumentales fallidos se asocian con gran riesgo de resultados perinatales adversos :
 - lesiones fetales
 - Asfixia intraparto .

-Para evitar fallos en los partos instrumentales, **es esencial un correcto diagnóstico** de la altura y posición de la cabeza fetal y una **adecuada cualificación y experiencia** del operador.

-La evaluación clínica de la altura y posición de la cabeza fetal está sujeta a un **amplio margen de error**

-La evaluación ecográfica puede disminuir estos errores aportando objetividad a la exploración.

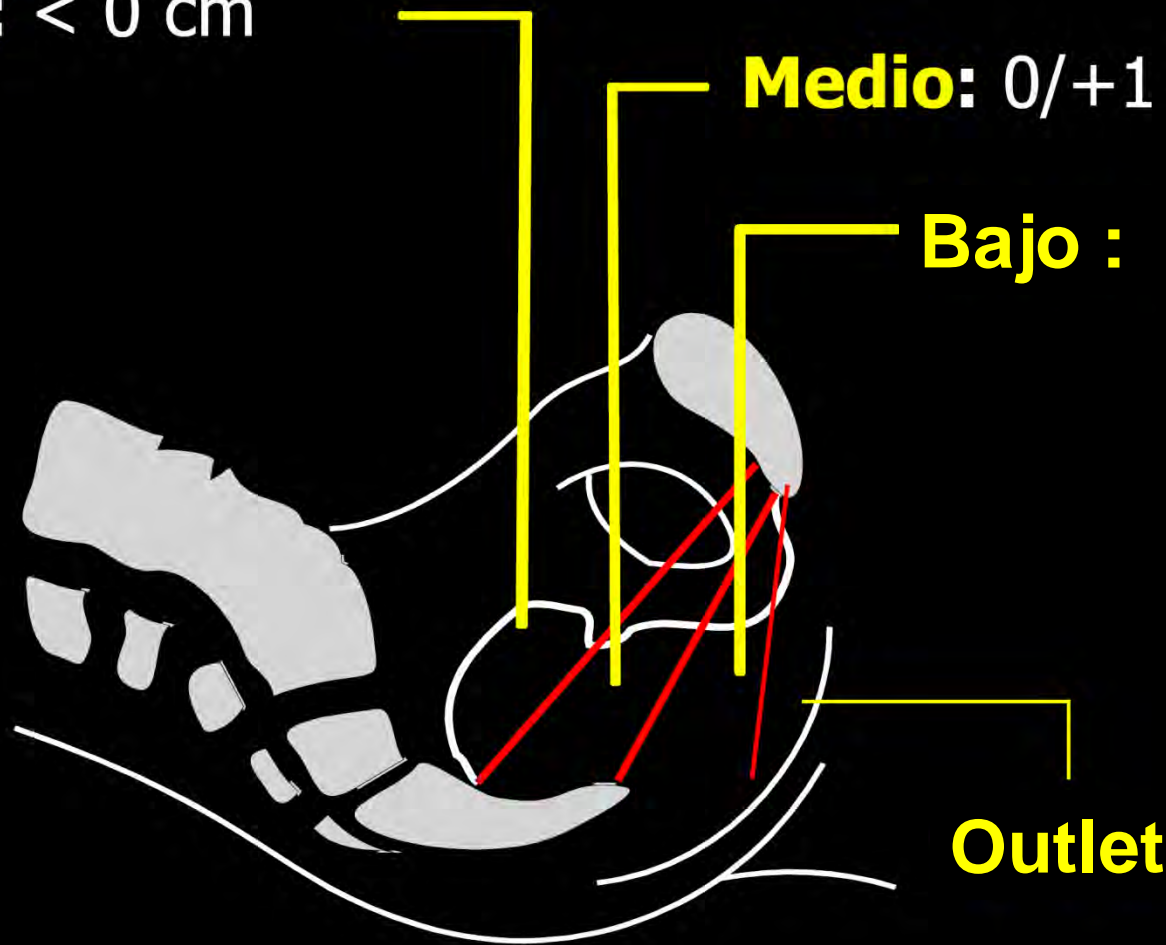
El éxito y seguridad del parto instrumental depende del plano de aplicación.

Clasificación del ACOG del parto instrumental.

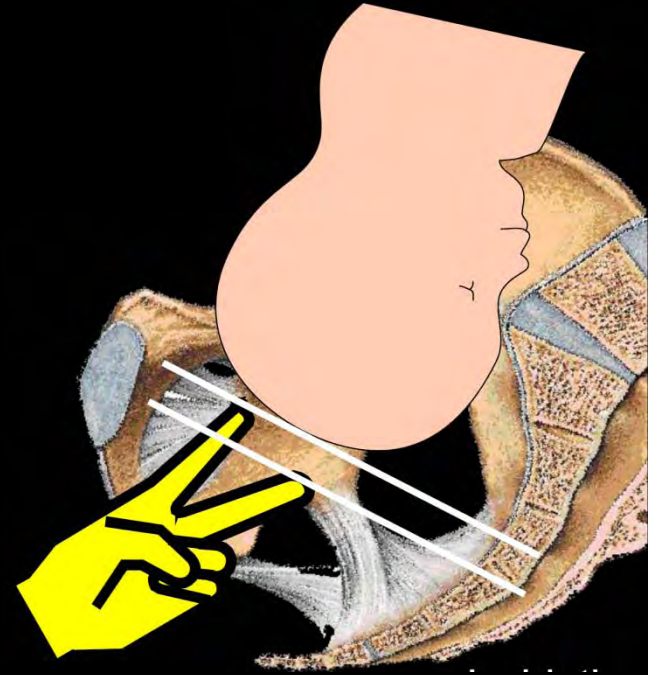
Alto: < 0 cm

Medio: $0/+1$ cm

Bajo : $\geq + 2$ cm



Evaluación Clínica



La evaluación clínica es *imprecisa* y tiene *baja reproducibilidad*

La evaluación clínica *NO es adecuada* en casos de Occipito-Posterior

Fiabilidad de la evaluación clínica usando un *simulador*

	Residentes	Adjuntos
Total errors	32 %	25%
High mistaken for low-outlet	22%	16%
Mid-low mistaken for high	16%	16%
Encajamiento	12%	12 %

Conclusión:

la evaluación clínica transvaginal de la altura de la presentación es poco fiable.

Birth simulator: Reliability of transvaginal assessment of fetal head station as defined by the ACOG classification

Dupuis et al: AJOG:(2005) 192, 868-74



Fiabilidad de la **evaluación clínica vs ecográfica** durante la fase de **dilatación**.

Ultrasound Obstet Gynecol 2002; 19: 258–263

Intrapartum fetal head position **I**: comparison between transvaginal digital examination and transabdominal ultrasound assessment during the **active stage of labor**

D. M. SHERER*, M. MIODOVNIK*, K. S. BRADLEY* and O. LANGER*

In summary, our data demonstrate an overall high rate of error in fetal head position determinations by transvaginal digital examination. These data support the idea that intrapartum application of transabdominal ultrasound may significantly enhance correct determination of fetal head position during active labor. Intrapartum ultrasound may therefore potentially be utilized as an educational tool to assist physicians in training.

Fiabilidad de la evaluación clínica vs ecográfica durante el expulsivo

Ultrasound Obstet Gynecol 2002; 19: 264–268

Intrapartum fetal head position **II** comparison between transvaginal digital examination and transabdominal ultrasound assessment during the **second stage of labor**

D. M. SHERER*, M. MIODOVNIK*, K. S. BRADLEY* and O. LANGER*

In summary, our data demonstrate an overall high rate of error in fetal head position determinations by transvaginal digital examination. Although the error is less than that observed in the active (first) stage of labor, these data support that intrapartum application of transabdominal ultrasound may significantly enhance correct determination of fetal head position during the second stage of labor. Intrapartum ultrasound may therefore potentially be utilized as an educational tool to assist physicians-in-training. Furthermore, we speculate that application of intrapartum ultrasound to depict precisely fetal head position may assist the performance of instrumental deliveries in cases of obstructed labor. Accordingly, we are in the process of obtaining data pertaining to the performance of intrapartum ultrasound in cases of arrest of labor leading

Fiabilidad de la evaluación clínica vs ecográfica durante el expulsivo

(n=110)

CONCLUSION:

En el 20% hubo una significativa discrepancia entre eval. clínica y ecografía (>45°).

La discrepancia fué del 50% de los casos en occipito-posterior y transversas

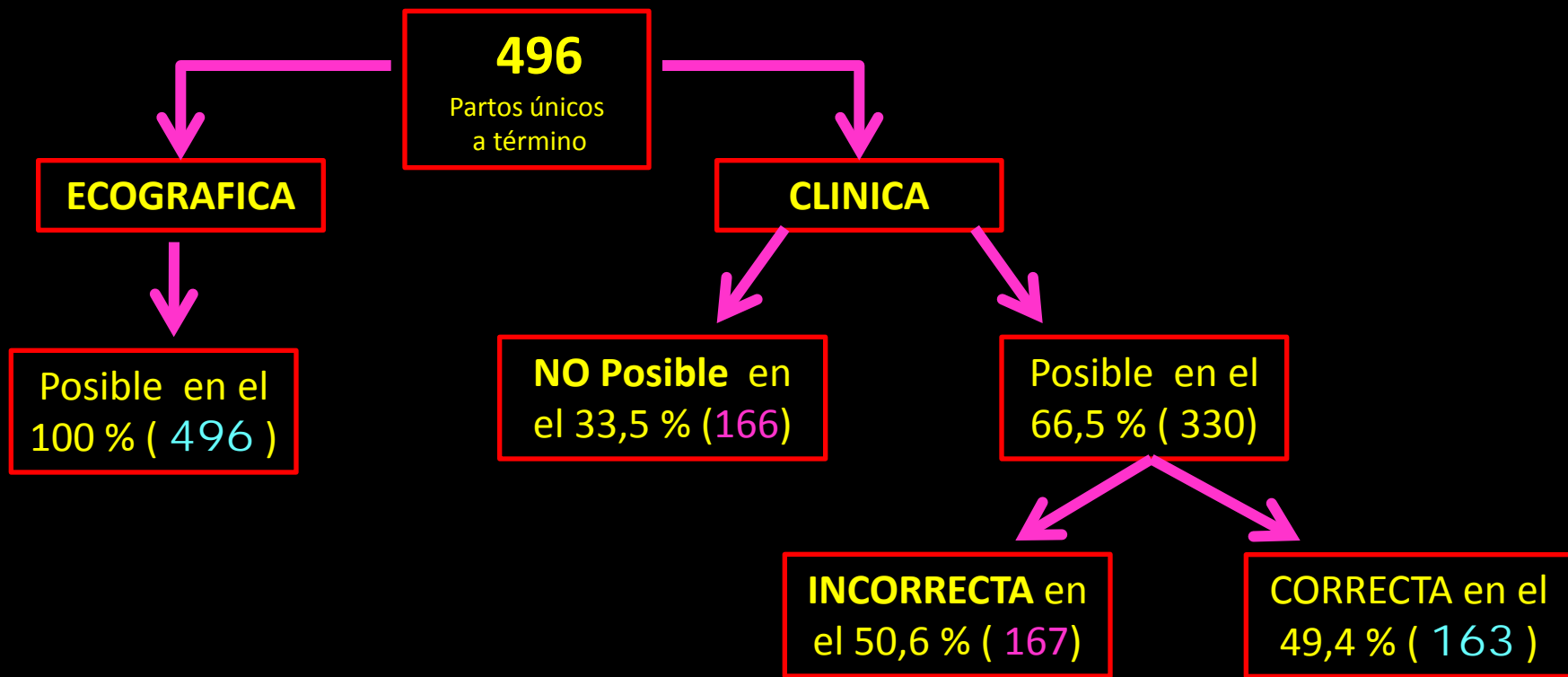
La **ecografía** transabdominal es una forma simple, rápida y eficiente de **aumentar la seguridad en el diagnóstico de posición de la cabeza fetal** durante el expulsivo

Eur J Obstet Gynecol Reprod Biol. 2005 Dec 1;123(2):193-7. Epub 2005 May 31.

Fetal head position during the second stage of labor: comparison of digital vaginal examination and transabdominal ultrasonographic examination.

Dupuis O, Ruimark S, Corinne D, Simone T, André D, René-Charles R

Dco. de la posición de la cabeza fetal intraparto. Evaluación **clínica** vs **ecográfica**



Conclusión:

La evaluación clínica (digital) falló / erró en el **67,13 %**

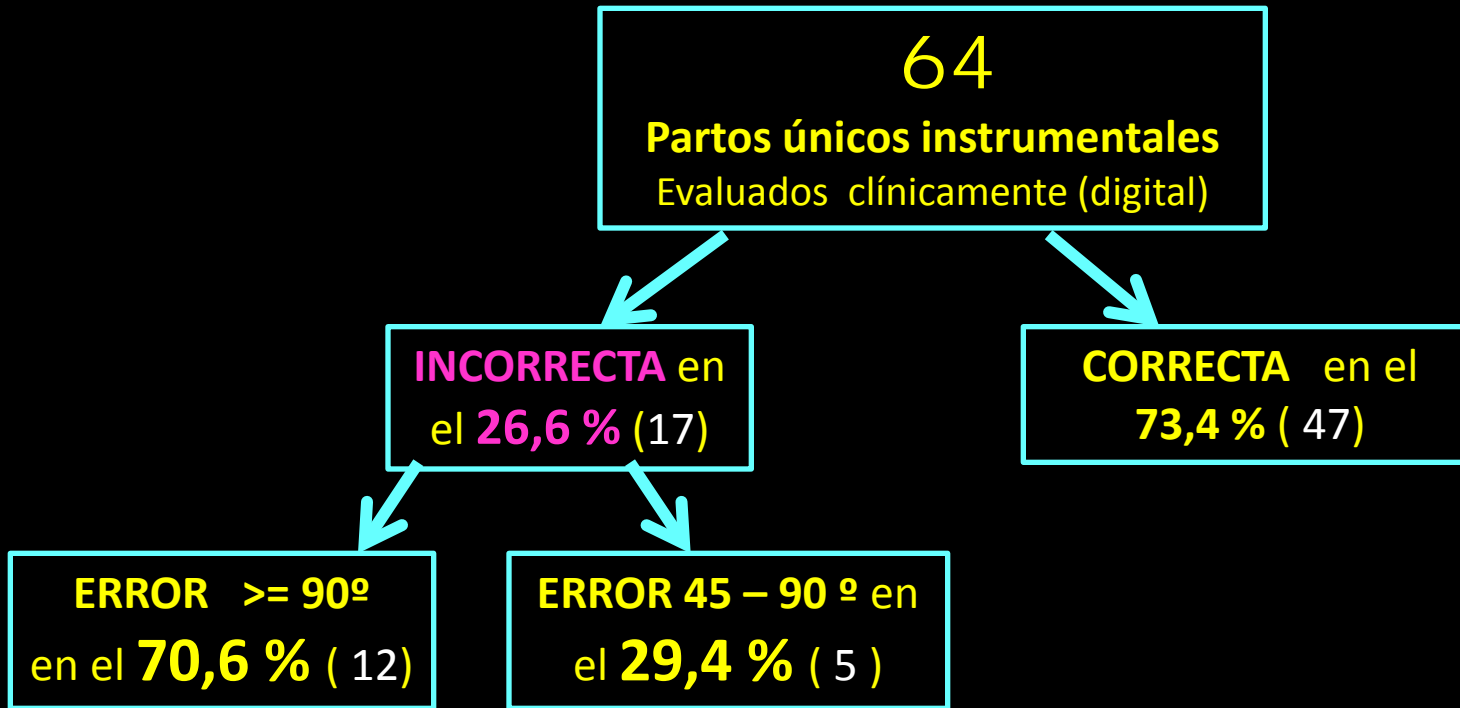
J Matern Fetal Neonatal Med. 2002 Sep;12(3):172-7.

Intrapartum sonography to determine fetal head position.

Akmal S, Tsoi E, Kametas N, Howard R, Nicolaides KH

Doc. de la posición de la cabeza fetal antes de parto instrumental.

Evaluación clínica vs ecográfica



Conclusión: La evaluación clínica (digital) falló en 1/4 (26,6 %) del TOTAL

Erró en el 17 % de las Occipito – Anterior.

Erró en el 46 % de las Occipito – Posterior / Lateral.

Ultrasound Obstet Gynecol. 2003 May;21(5):437-40.

Comparison of transvaginal digital examination with intrapartum sonography to determine fetal head position before instrumental delivery.

Akmal S, Kametas N, Tsoi E, Hargreaves C, Nicolaides KH

Diagnóstico de la posición de la cabeza fetal

Evaluación clínica vs ecográfica

110

Partos únicos

Evaluados clínicamente (digital)

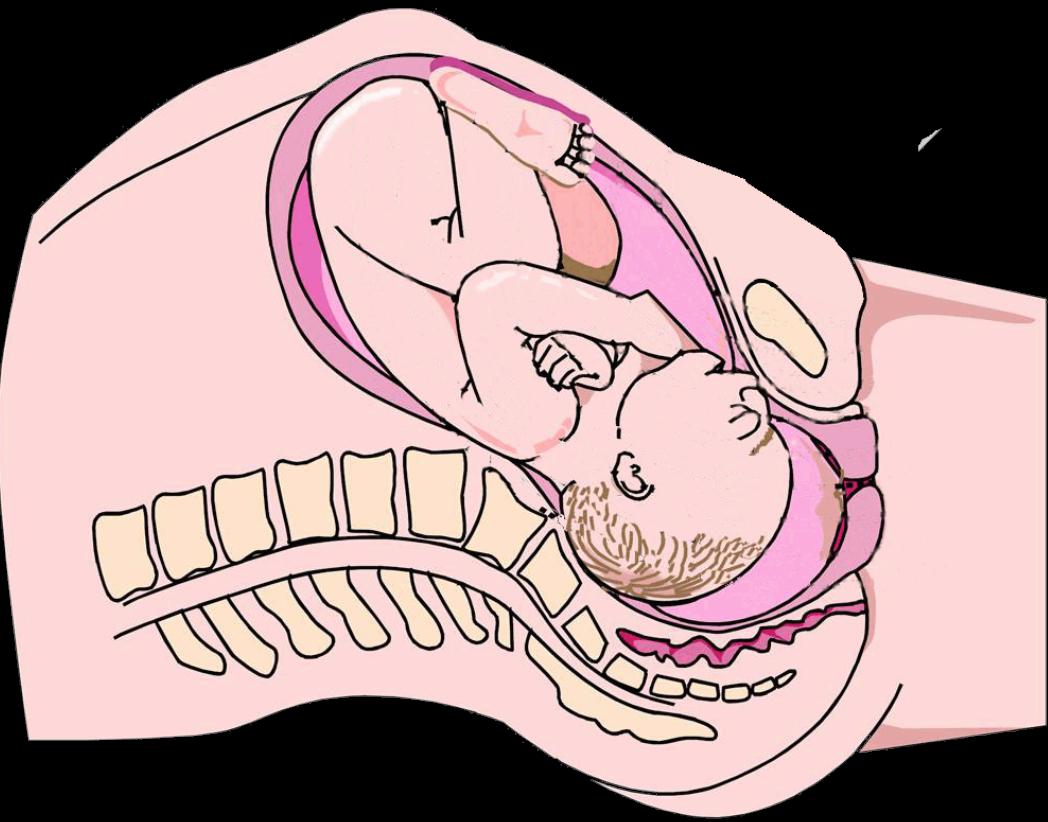
Conclusión: La evaluación clínica (digital) **falló en 1/5 (20 %)** del TOTAL de casos

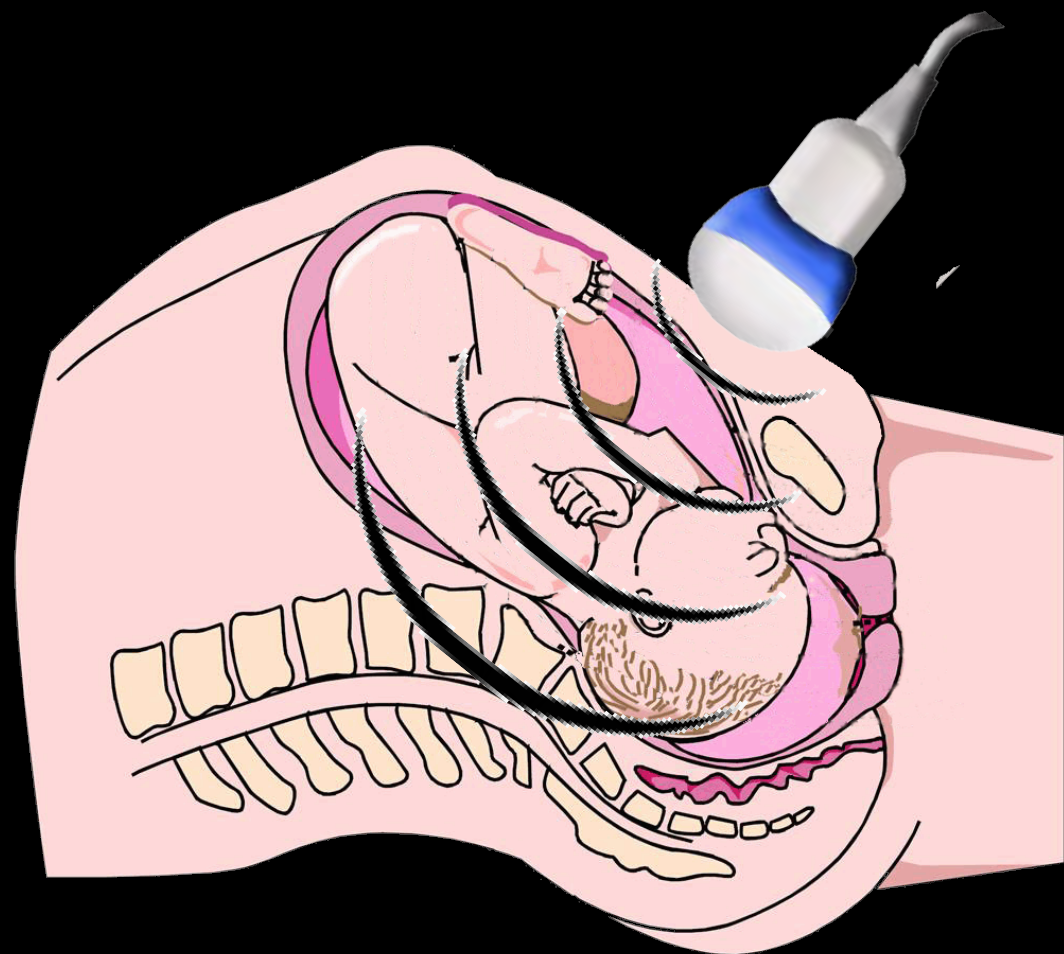
Erró en el **50 %** de las **Occipito – Posterior / Lateral.**

Eur J Obstet Gynecol Reprod Biol. 2005 Dec 1;123(2):193-7. Epub 2005 May 31.

Fetal head position during the second stage of labor: comparison of digital vaginal examination and transabdominal ultrasonographic examination.

Dupuis O, Ruimark S, Corinne D, Simone T, André D, René-Charles R



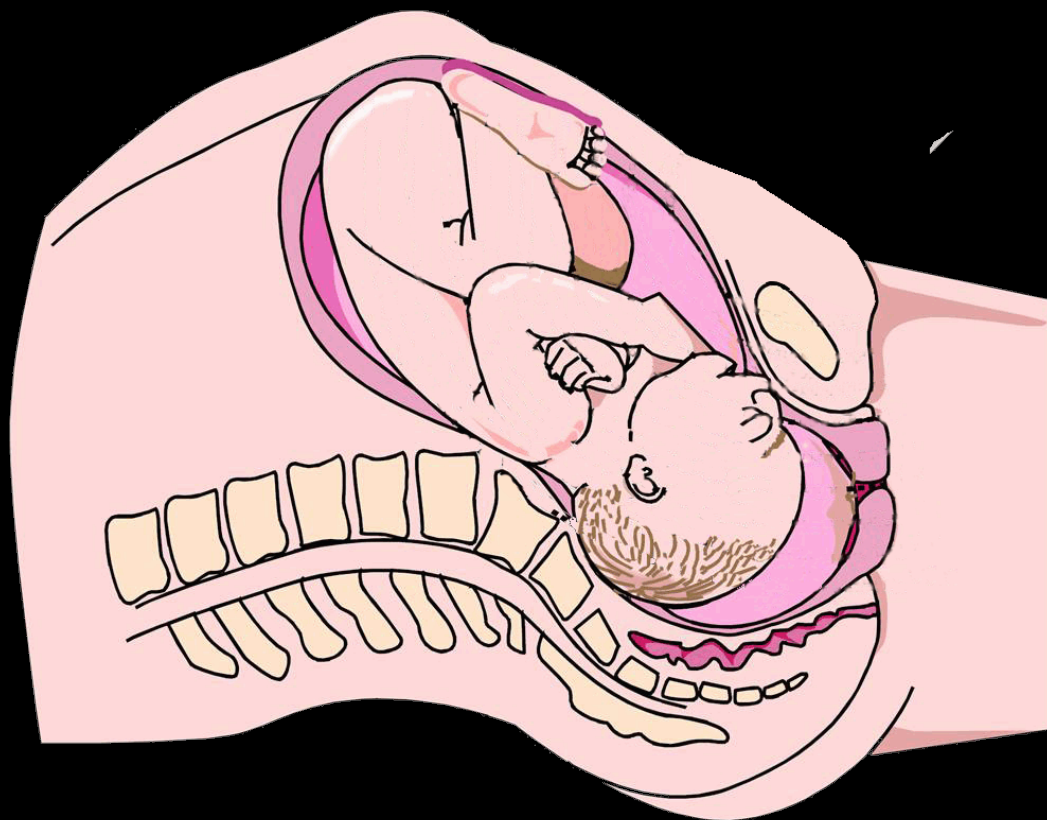


órbitas



El reto...

Occipito - Posterior



Frecuencia de Occipito - Posterior

Dilatación cervical	OP (%)	Probabilidad de PERSISTENCIA al parto
3-5 cm	33 %	21%
6-9 cm	34 %	32 %
10 cm	19 %	44 %
Parto	7 %	

Ultrasound Obstet Gynecol. 2004 Sep;24(4):425-8.

Investigation of occiput posterior delivery by intrapartum sonography.

Akmal S, Tsoi E, Howard R, Osei E, Nicolaides KH.

Frecuencia de Occipito – Posterior persistente

Global	5,5 %
--------	-------

Para 0	7,2%
--------	------

Para 1 +	4,0 %
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Obstet Gynecol. 2003 May;101(5 Pt 1):915-20.

Persistent fetal occiput posterior position: obstetric outcomes.

Ponkey SE, Cohen AP, Heffner LJ, Lieberman E.

Probabilidad de parto espontáneo en Occipito – Posterior persistente

Autor	Para 0 (%)	Para 1+ (%)
Floberg et al , 1987	27	-
Fitzpatrick et al, 2001	29	55
Ponkey et al, 2003	26	57

Complicaciones maternas y fetales asociadas a Occipito – Posterior

	OR (95% CI)
Desgarro periné III-IV grado ¹	1.9 (1.4 – 2.7)
Desgarro esfinter anal tras forceps ²	3.1 (1.6 – 6.2)
Acidemia ³	2.9 (1.8 – 4.6)
Encefalopatía⁴	4.3 (1.7 – 10.54)
Trauma fetal ³	1.8 (1.2 – 2.6)

¹ Ponkey et al. Obstet Gynecol 2003. 101:915

² Benavides et al Am J Obst Gynecol 2005 192, 1702

³ Cheng et al. Obstet Gynecol 2006. 107: 837-44

⁴ Badawi. BMJ 1998, 317 : 1154

Occipito-posterior : La columna es la clave !!

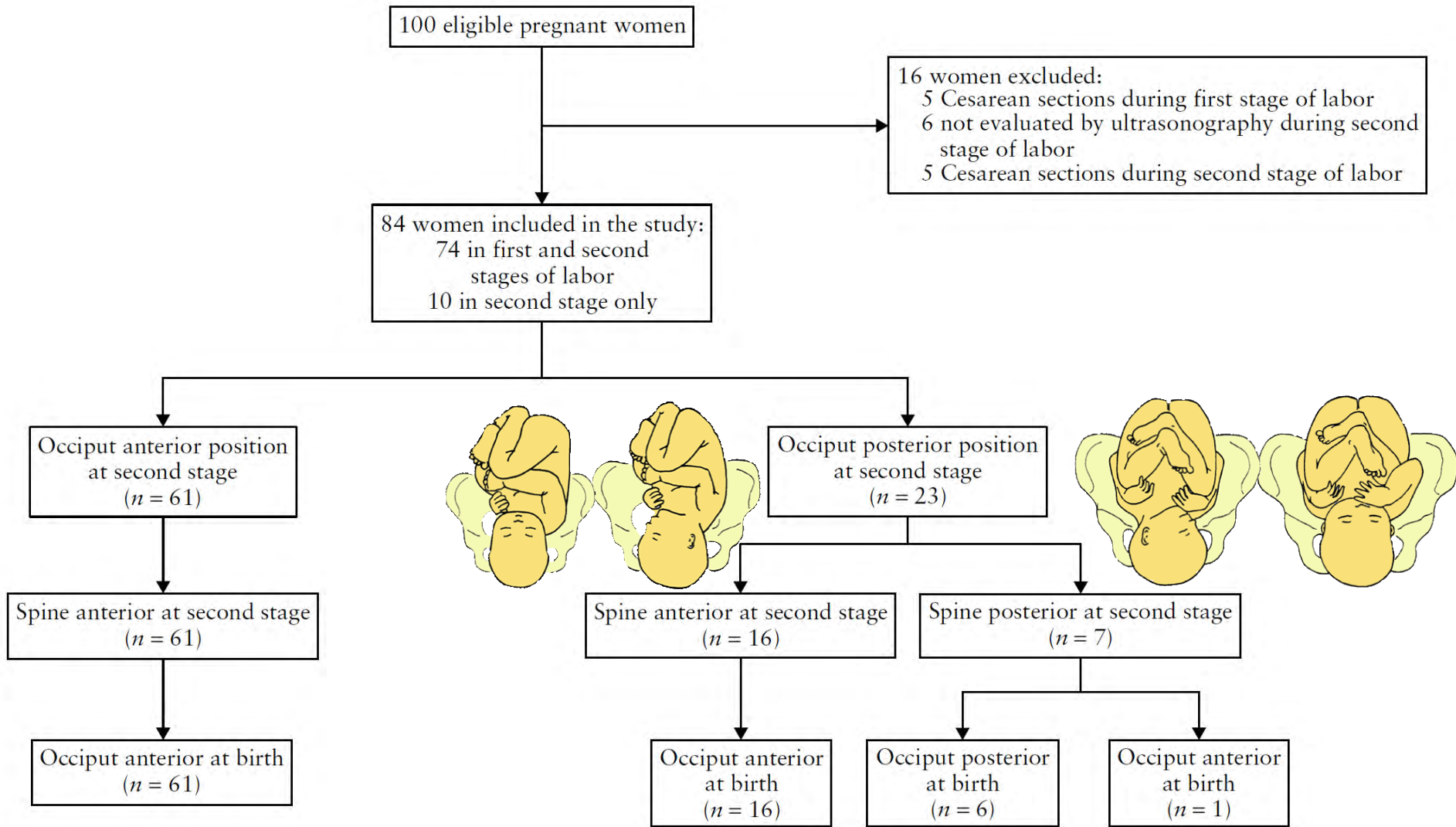


Ultrasound Obstet Gynecol. 2010 Feb;35(2):210-5.

Sonographic assessment of fetal spine and head position during the first and second stages of labor for the diagnosis of persistent occiput posterior position: a pilot study.

Blasi I, D'Amico R, Fenu V, Volpe A, Fuchs I, Henrich W, Mazza V.

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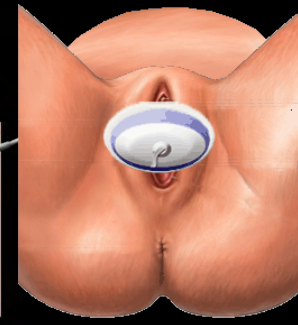
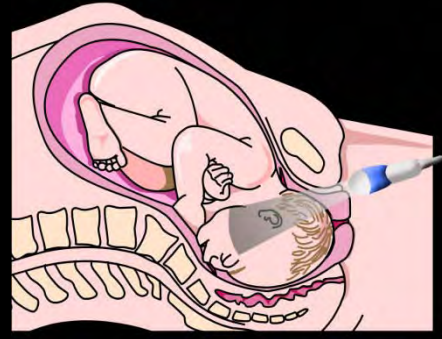
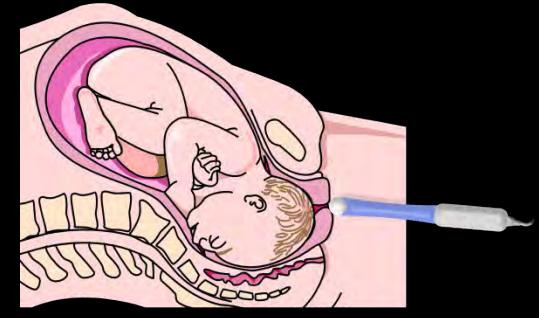
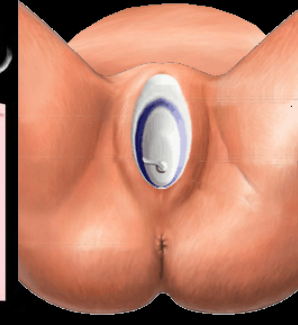
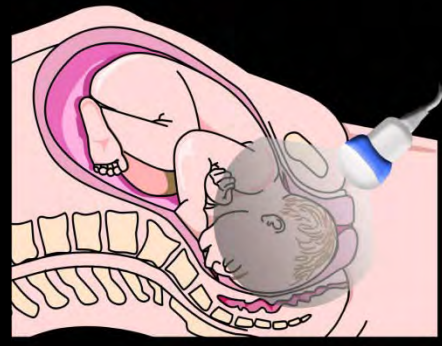
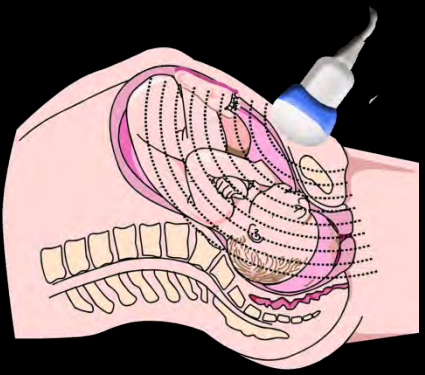
Ecografía en el parto

Vías de abordaje

Abdominal

Perineal

Vaginal



- Situación
- Presentación
- Posición

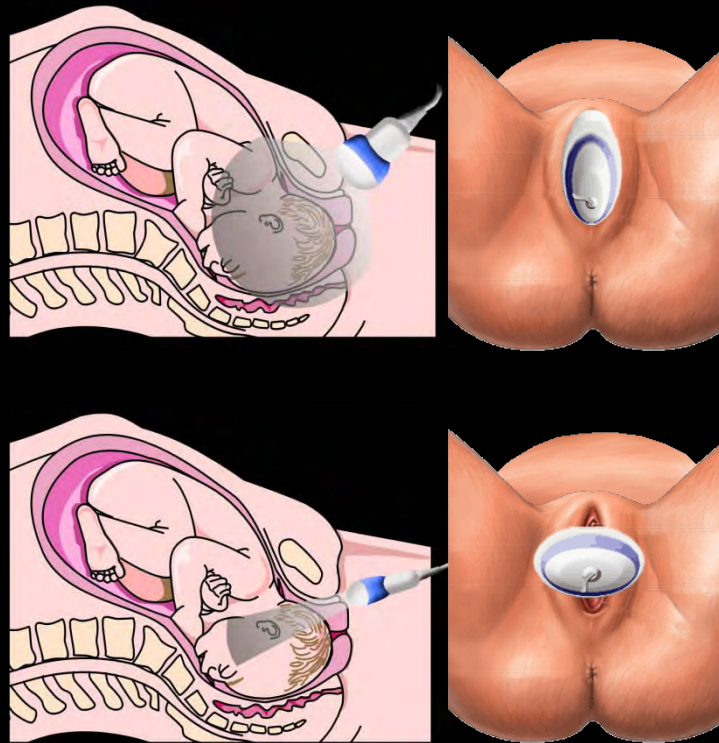
- Descenso
- Posición

- Longitud cervical
- Angulo post. Cx.
- Dilatación

Ecografía en el parto

Vías de abordaje

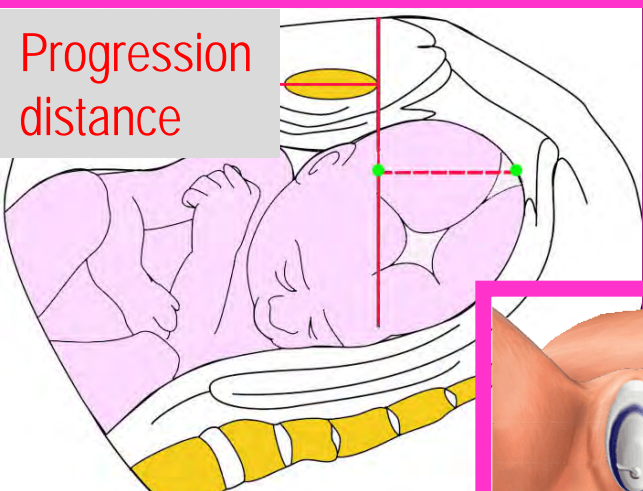
Perineal



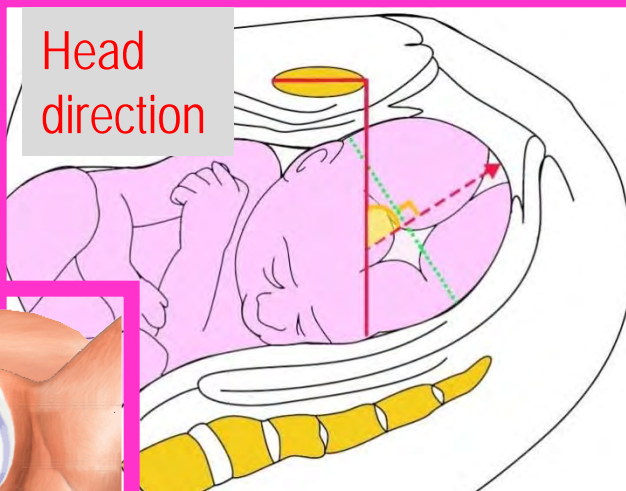
-Descenso

-Posición

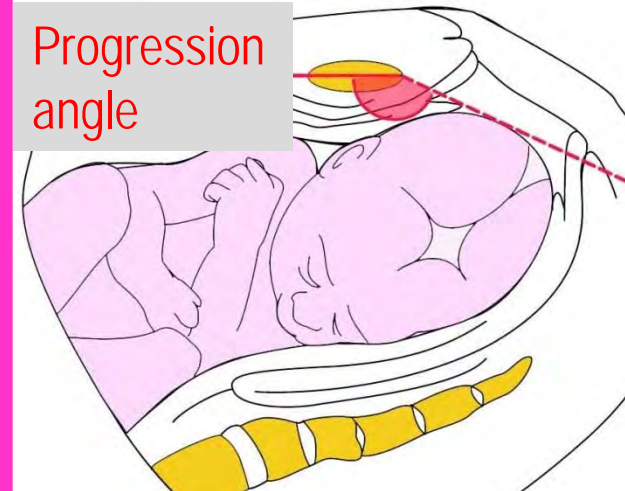
Ecografía Trans-PERINEAL en 2ª fase del parto



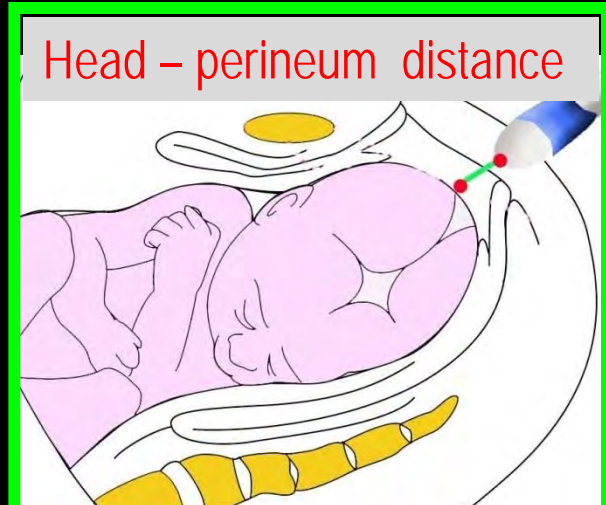
DIETZ et al 2005



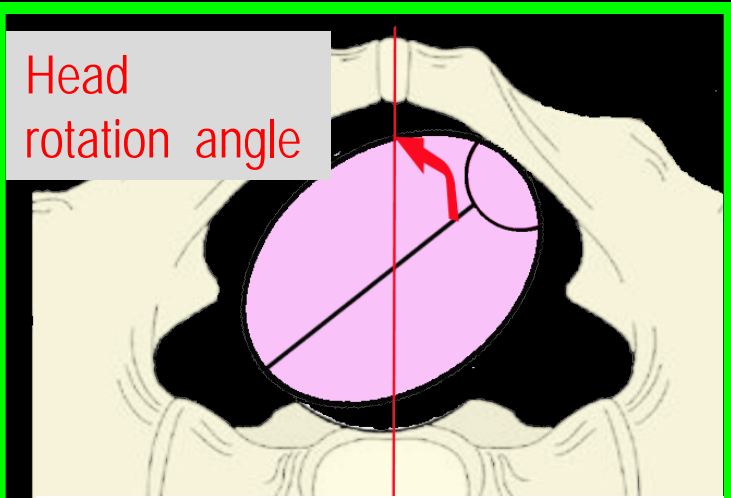
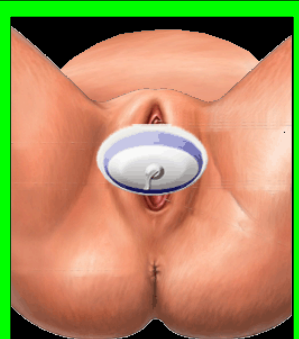
HENRICH et al. 2006



BARBERA et al 2009



EGGEBØ et al. 2006



GHI et al. 2009

What is the most reliable ultrasound parameter for assessment of fetal head descent?

F. S. MOLINA*, R. TERRA†, M. P. CARRILLO*, A. PUERTAS* and K. H. NICOLAIDES†

*Fetal Medicine Unit, Department of Obstetrics and Gynaecology, University Hospital 'Virgen de las Nieves', Granada, Spain and †Harris Birthright Research Centre for Fetal Medicine, King's College Hospital, London, UK

¿Cuál es mejor ?

Three-dimensional ultrasound in monitoring progression of labor: a reproducibility study

T. GHI, E. CONTRO, A. FARINA, M. NOBILE and G. PILU

Department of Obstetrics and Gynaecology, University of Bologna, Bologna, Italy

Ecografía Trans-PERINEAL en 2ª fase del parto

What is the most reliable ultrasound parameter for assessment of fetal head descent?

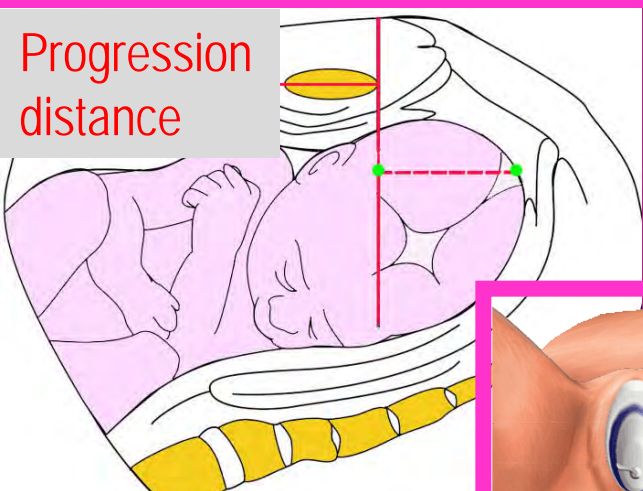
Ghi et al. 2010

Measurement	ICC	95% CI	P
Head direction			
Intraobserver	0.92	0.84–0.96	< 0.001
Interobserver	0.78	0.59–0.89	< 0.001
Midline angle			
Intraobserver	0.99	0.97–0.99	< 0.001
Interobserver	0.67	0.13–0.90	< 0.001
Progression distance			
Intraobserver	0.84	0.69–0.92	< 0.001
Interobserver	0.89	0.78–0.94	< 0.001
Progression angle			
Intraobserver	0.93	0.86–0.96	< 0.001
Interobserver	0.90	0.80–0.95	< 0.001

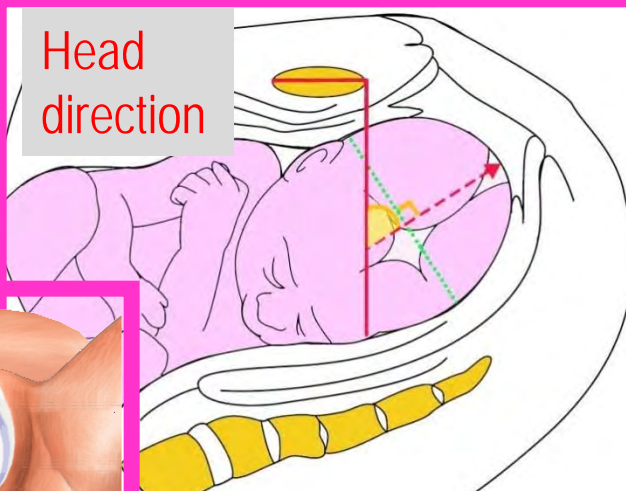
Molina et al. 2010

Measurement	Intraclass correlation coefficient	95% CI	SD of the differences (%)	P
Head direction				
Same observer	0.85	0.75–0.91	8.89	< 0.001
Two observers	0.69	0.52–0.82	11.53	< 0.001
Middle line				
Same observer	0.78	0.65–0.87	26.07	< 0.001
Two observers	0.67	0.48–0.79	44.83	< 0.001
Progression distance				
Same observer	0.93	0.87–0.96	23.18	< 0.001
Two observers	0.85	0.74–0.91	32.12	< 0.001
Progression angle				
Same observer	0.94	0.90–0.97	5.18	< 0.001
Two observers	0.84	0.73–0.91	8.59	< 0.001

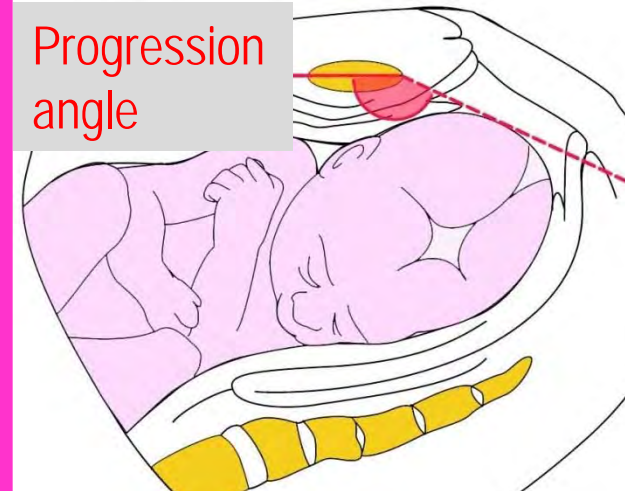
Ecografía Trans-PERINEAL en 2ª fase del parto



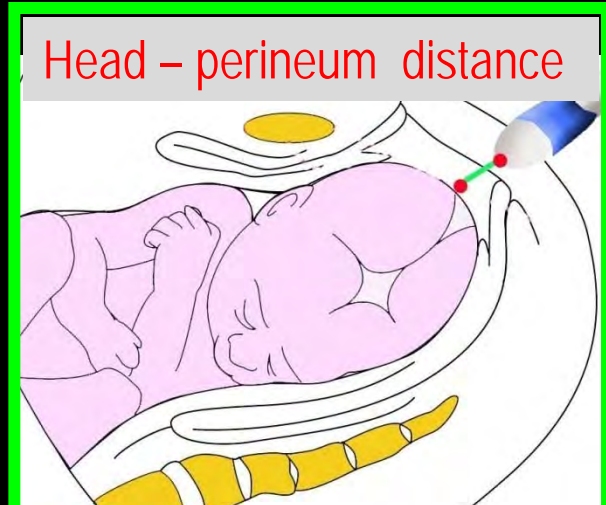
DIETZ et al 2005



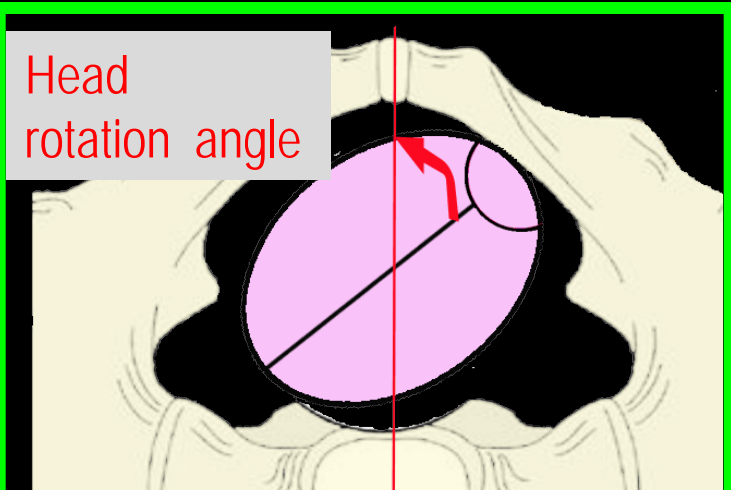
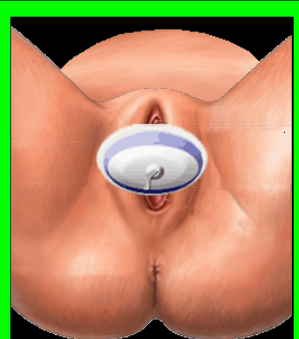
HENRICH et al. 2006



BARBERA et al 2009



EGGEBØ et al. 2006



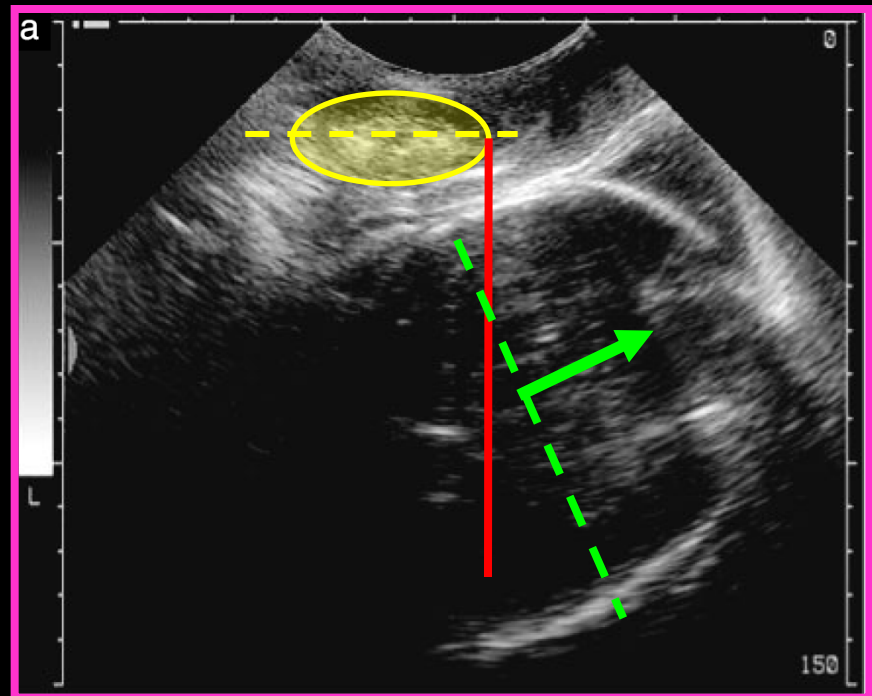
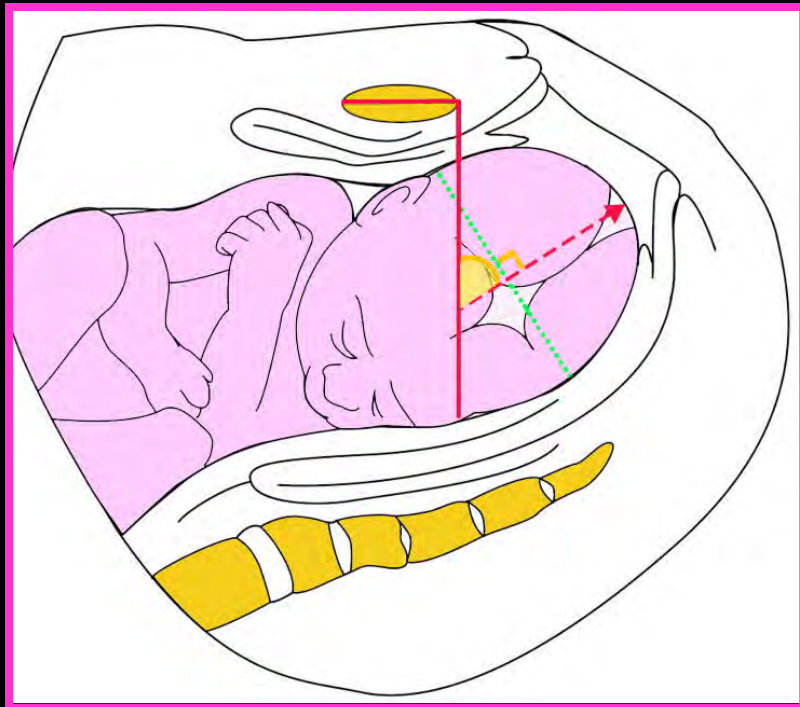
GHI et al. 2009

Intrapartum translabial ultrasound (ITU): sonographic landmarks and correlation with successful vacuum extraction

W. HENRICH*, J. DUDENHAUSEN*, I. FUCHS*, A. KÄMENA† and B. TUTSCHEK‡

Departments of *Obstetrics and †Radiology, Charité Virchow Clinic, Berlin and ‡Heinrich-Heine-University, Düsseldorf, Germany

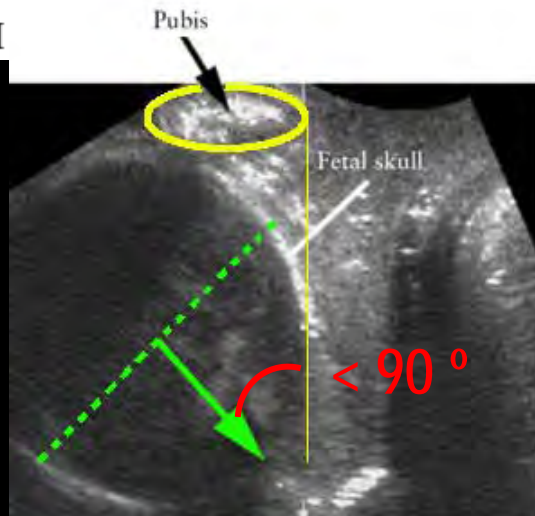
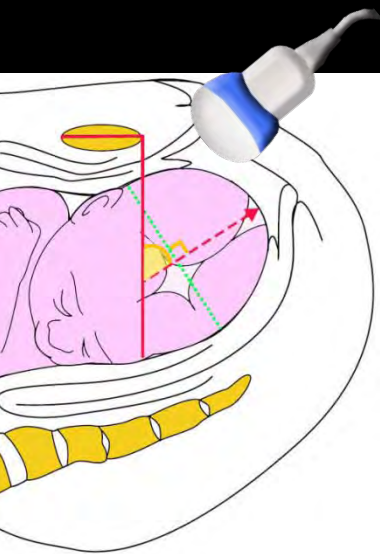
Head direction



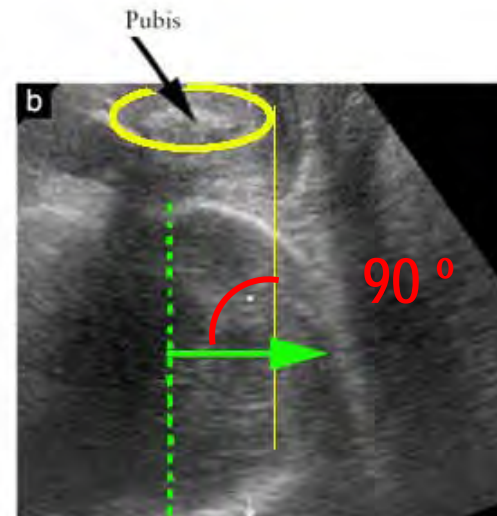
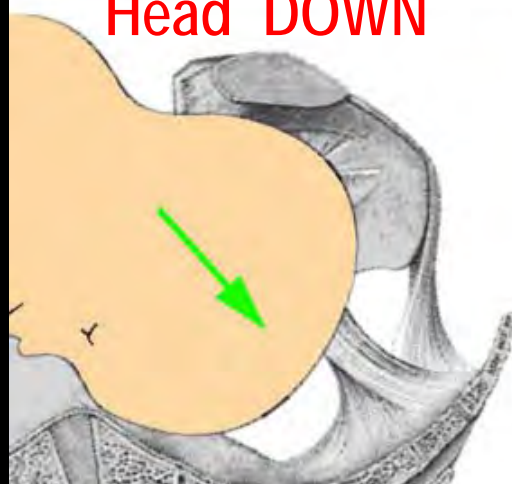
Intrapartum translabial ultrasound (ITU): sonographic landmarks and correlation with successful vacuum extraction

Head direction

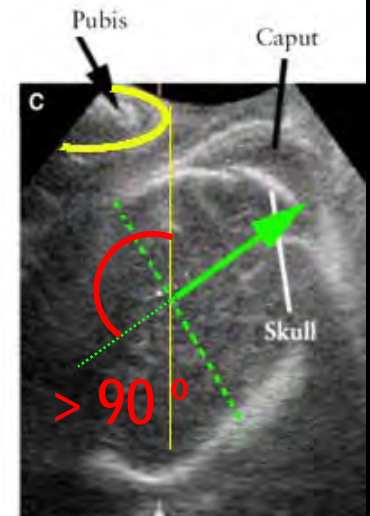
W. HENRICH



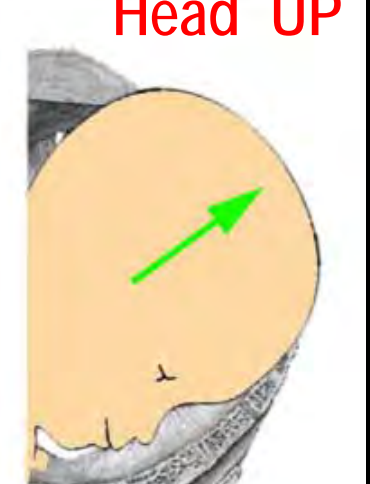
Head DOWN



HORIZONTAL head



Head UP



No siempre es fácil determinar el diámetro máximo

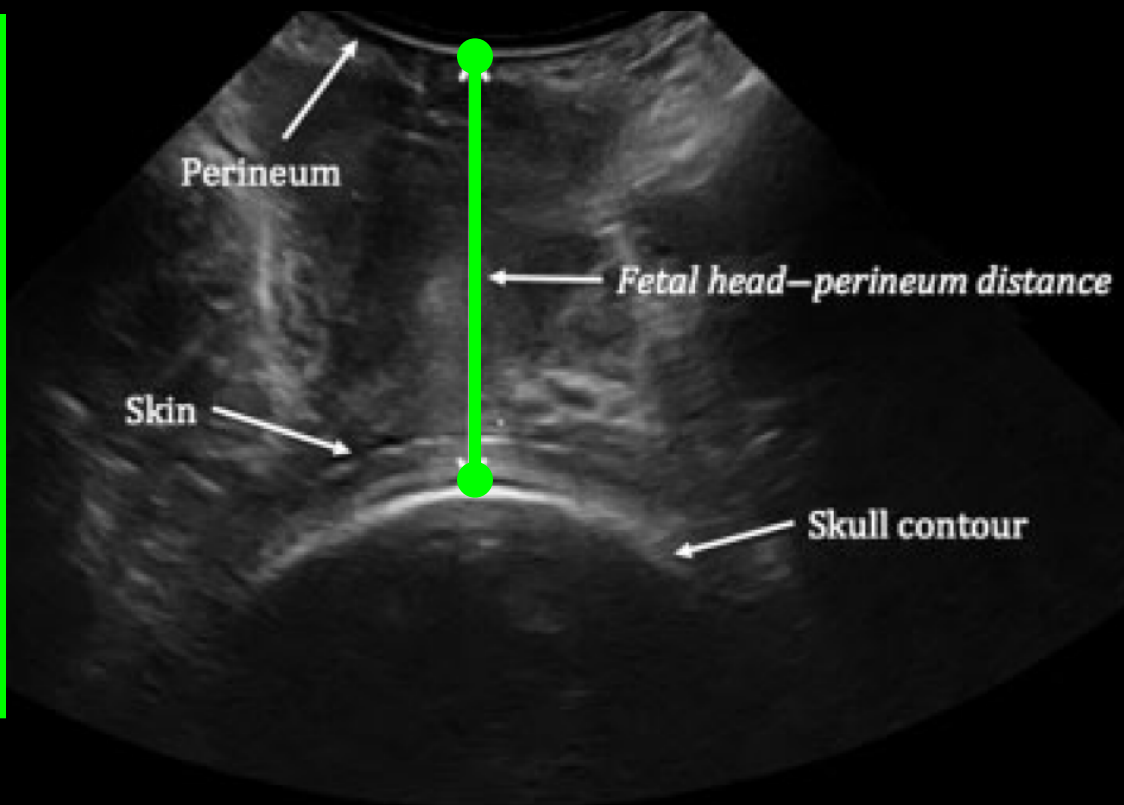
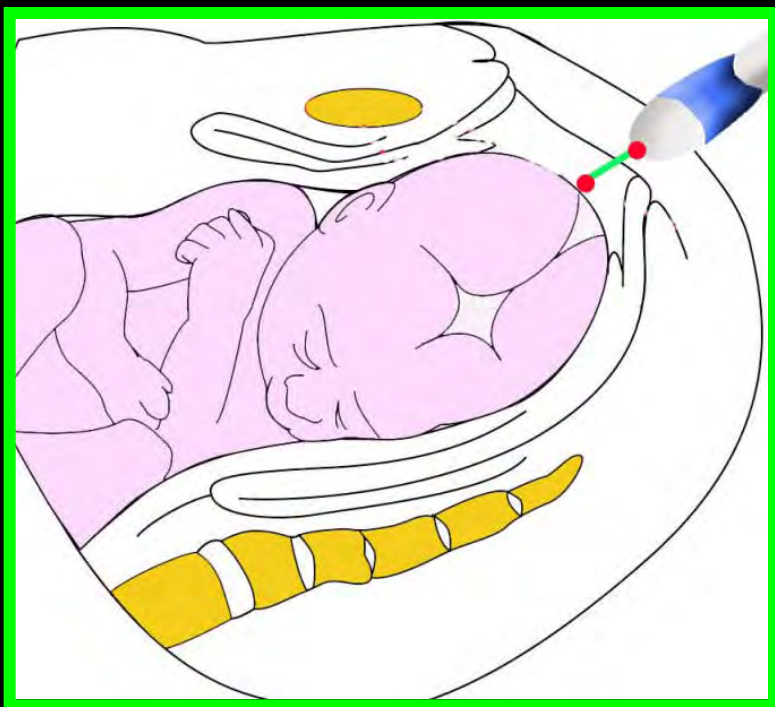
Prediction of labor and delivery by transperineal ultrasound in pregnancies with prelabor rupture of membranes at term

T. M. EGGEBØ*, L. K. GJESSING*, C. HEIEN*, E. SMEDVIG*, I. ØKLAND*, P. ROMUNDSTAD† and K. Å. SALVESEN‡

*Department of Obstetrics and Gynaecology, Stavanger University Hospital, Stavanger and †Department of Public Health, NTNU and ‡National Center for Fetal Medicine, Department of Obstetrics and Gynaecology, St. Olavs Hospital, Trondheim University Hospital, Trondheim, Norway



Distancia cabeza - periné



Prediction of labor and delivery by transperineal ultrasound in pregnancies with prelabor rupture of membranes at term

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*Department of Obstetrics and Gynaecology, Stavanger University Hospital, Stavanger and †Department of Public Health, NTNU and

‡National Center for Fetal Medicine, Department of Obstetrics and Gynaecology, St. Olavs Hospital, Trondheim University Hospital, Trondheim, Norway

Table 1. The ultrasound examination was done before regular contractions had started. No vaginal examinations were performed.

Three obstetricians and five specially trained midwives performed the sonographic measurements with EUB Hitachi (Kashiwa, Japan) or B & K (Copenhagen, Denmark) Medical Hawk ultrasound machines equipped with 3.5–6.5-MHz multifrequency transducers. The

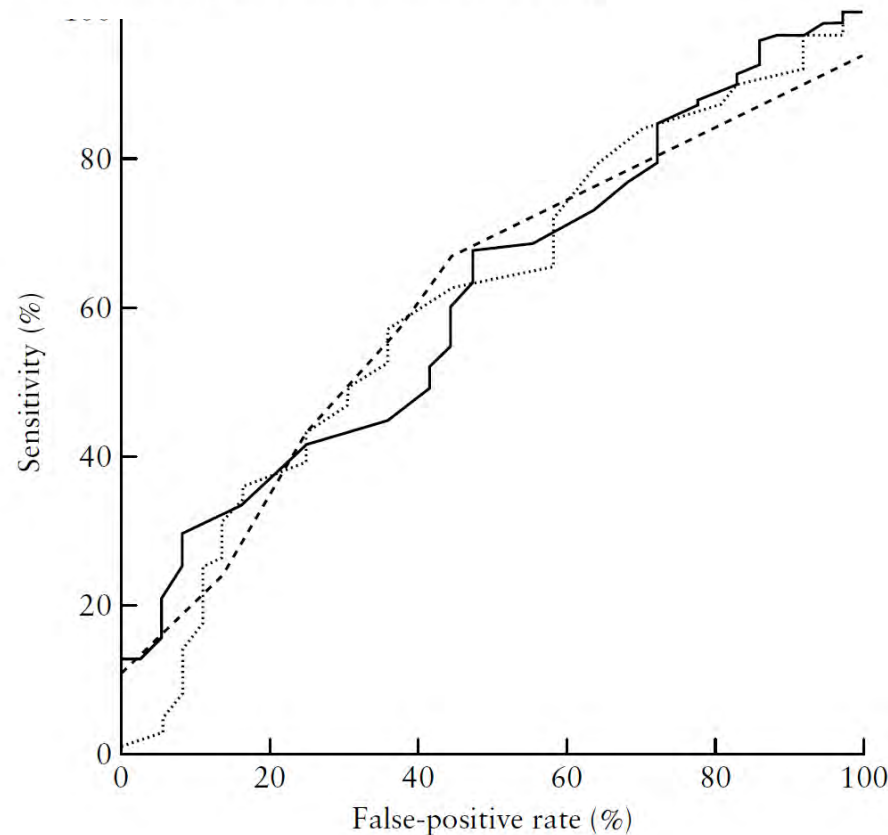


Figure 1 Receiver–operating characteristics curves for fetal head–perineum distance (—), cervical length (.....) and Bishop score (-.-.-) in predicting a vaginal delivery.

Ultrasound assessment of fetal head–perineum distance before induction of labor

T. M. EGGEBØ*, C. HEIEN*, I. ØKLAND*, L. K. GJESSING*, P. ROMUNDSTAD†
and K. Å. SALVESEN‡

Two obstetricians and three specially trained midwives performed the ultrasound measurements with an EUB Hitachi 5500 (Kashiwa, Japan) device with a 3.5–7.5-MHz multifrequency transabdominal transducer and a 5.0–9.0-MHz multifrequency transvaginal transducer.

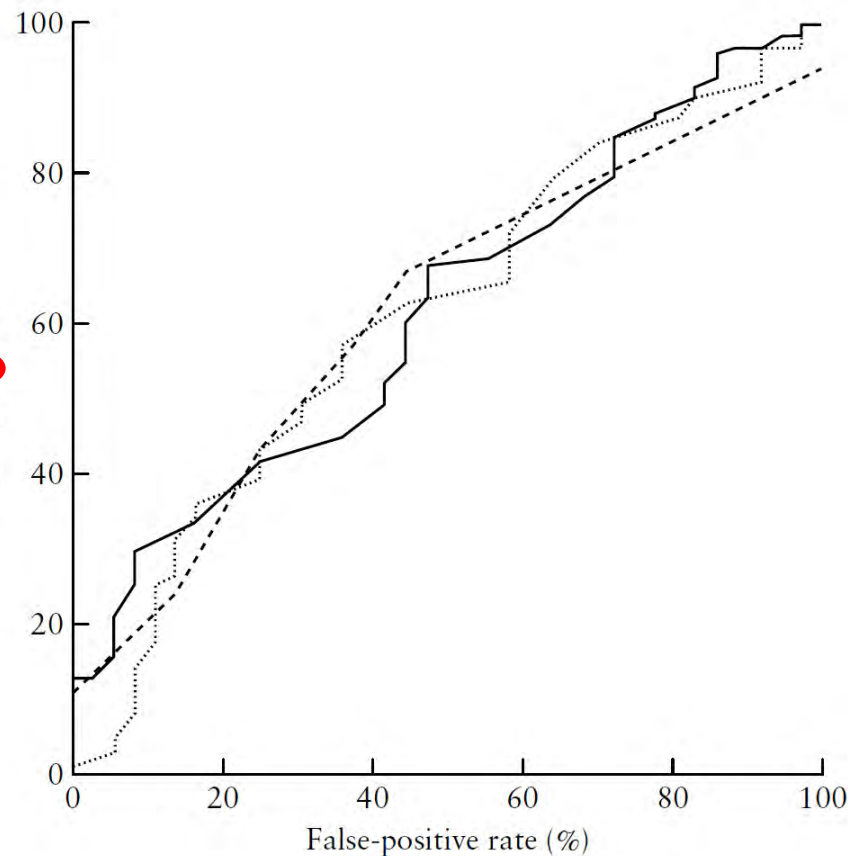


Figure 1 Receiver–operating characteristics curves for fetal head–perineum distance (—), cervical length (.....) and Bishop score (-----) in predicting a vaginal delivery.

Prediction of delivery mode with transperineal ultrasound in women with prolonged first stage of labor

E. A. TORKILDSEN*, K. Å. SALVESEN† and T. M. EGGEBO*

*Department of Obstetrics and Gynecology, Stavanger University Hospital, Stavanger, Norway; †National Center for Fetal Medicine, Trondheim University Hospital (St Olav's Hospital) and Department of Laboratory Medicine, Children's and Women's Health, Norwegian University of Science and Technology, Trondheim, Norway

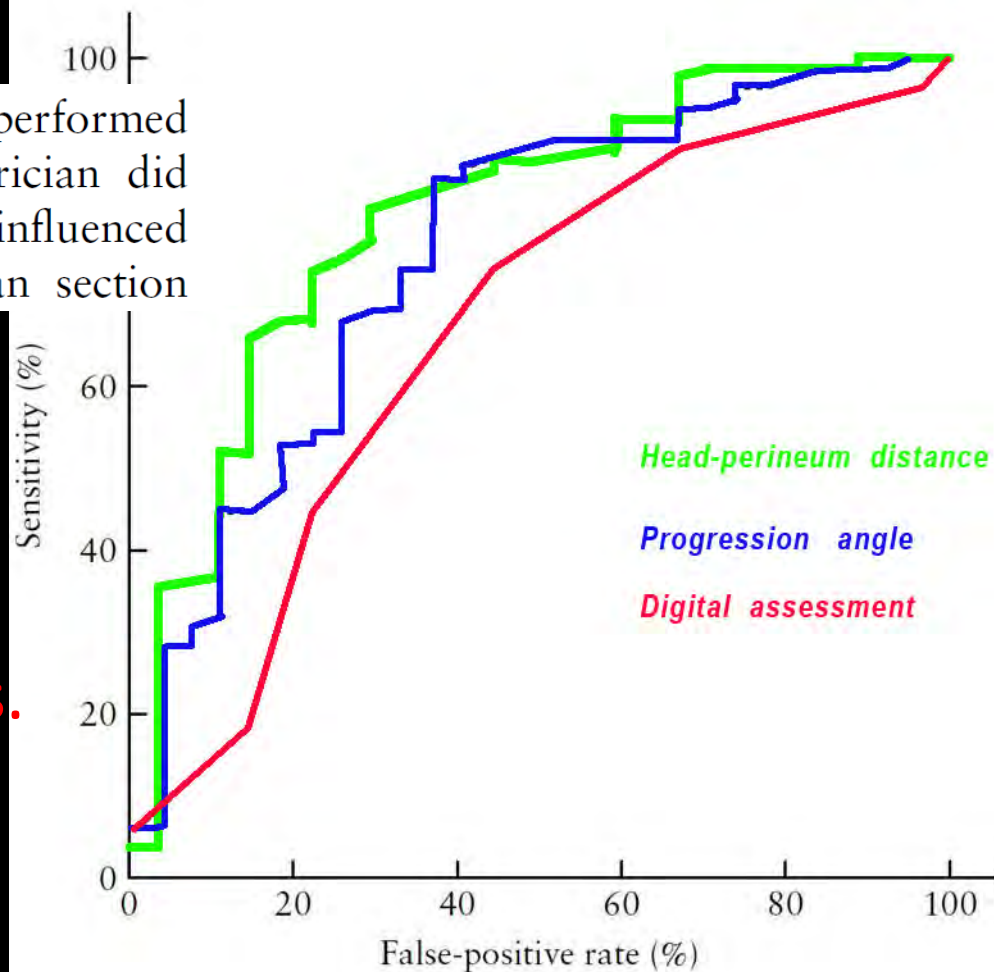
In the present study 68 birth providers performed digital assessments whereas only one obstetrician did the ultrasound measurements. This may have influenced the results. Furthermore, the overall Cesarean section

Aspectos criticables

Punto de corte = 40 mm.

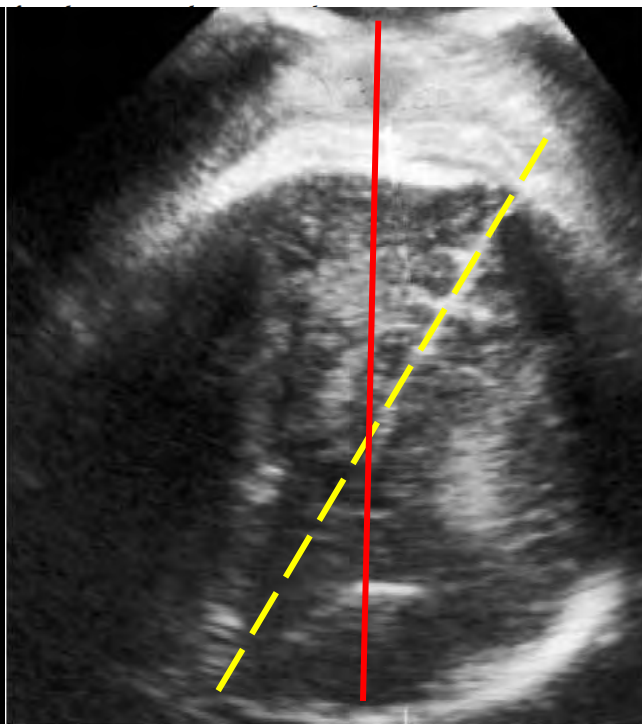
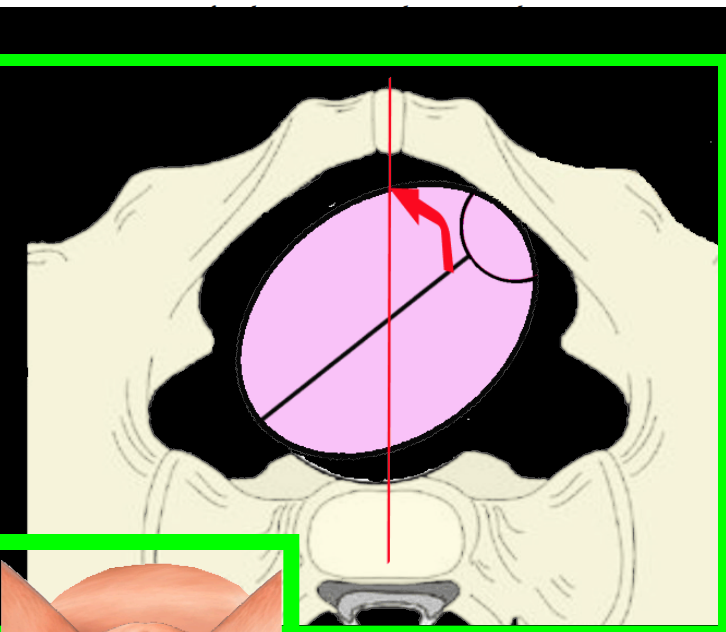
No hay referencias inmóviles.

Técnica tan simple como poco estandarizada.



Diagnosis of station and rotation of the fetal head in the second stage of labor with intrapartum translabial ultrasound

T. GHI, A. FARINA, A. PEDRAZZI, N. RIZZO, G. PELUSI and G. PILU

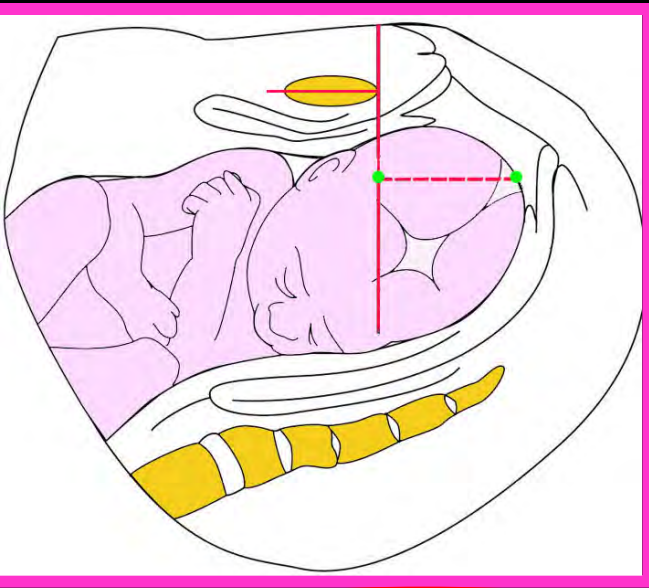


No siempre es visible la línea media

Brinda información adicional pero en combinación con otros parámetros (*Head direction*)

Measuring engagement of the fetal head: validity and reproducibility of a new ultrasound technique

H. P. DIETZ and V. LANZARONE



Ultrasound Obstet Gynecol 2006; 27: 409–415

Published online in Wiley InterScience (www.interscience.wiley.com). DOI: 10.1002/ulog.1765

Predicting operative delivery

H. P. DIETZ, V. LANZARONE

Progression distance

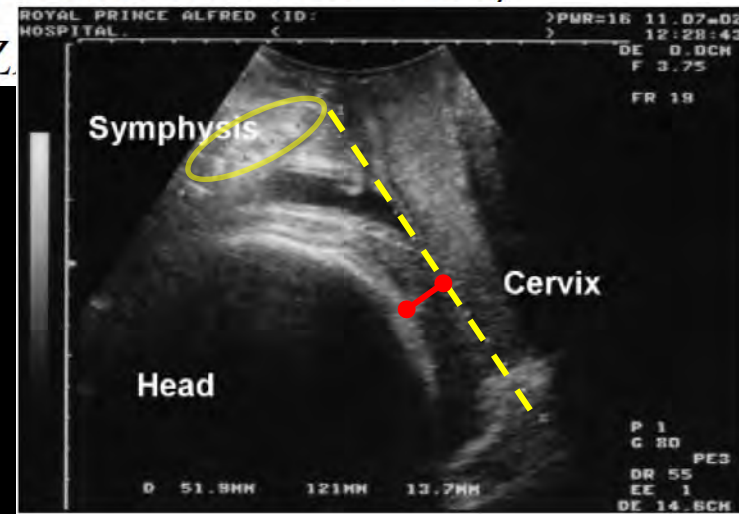
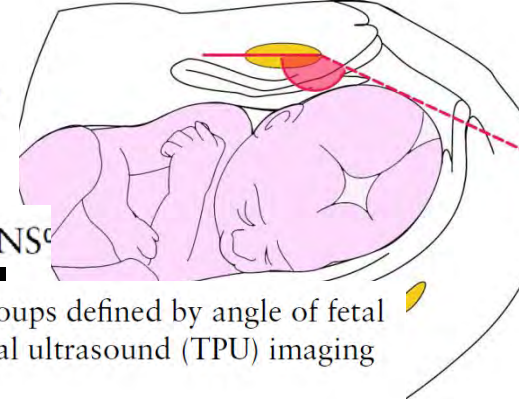


Table 4 Logistic regression for normal vaginal delivery (Model 1) using all available prenatal data ($n = 131$)

Prenatal variable	Unadjusted OR (all women, $n = 202$)	Unadjusted OR ($n = 131$)	Adjusted OR ($n = 128$) [95% CI]	P
Maternal age (per year)	0.87	0.85	0.78 [0.69, 0.87]	< 0.0001
Head engagement (per mm)	1.05	1.04		
Cesarean section	0.28	0.22	0.13 [0.03, 0.51]	0.002
Body mass index	0.92	0.94		
Bishop score	1.37	1.33	1.34 [1.06, 1.70]	0.01
Sonographic cervical length (per mm)	0.95	0.95		
Bladder position on Valsalva (per mm)	0.95	0.94	0.92 [0.87, 0.97]	0.0009

A new method to assess fetal head descent in labor with transperineal ultrasound



A. F. BARBERA*, X. POMBAR†, G. PERUGINO‡, D. C. LEZOTTE§ and J. C. HOBBS¶

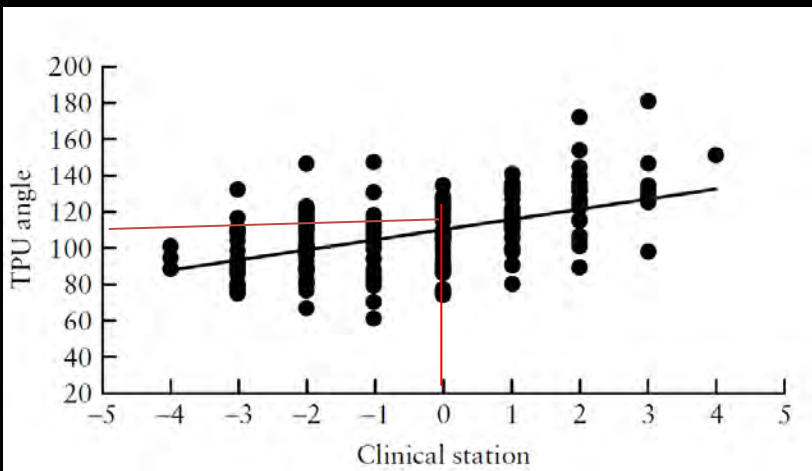
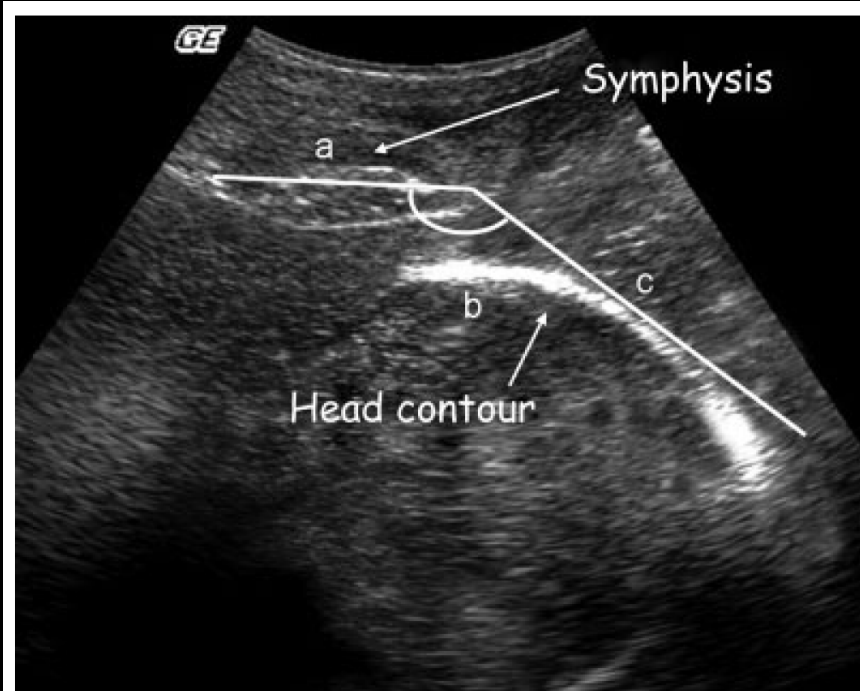


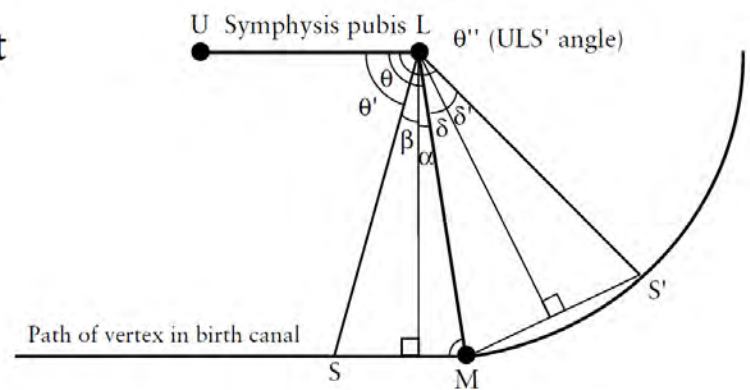
Table 2 Mean times to delivery for groups defined by angle of fetal head descent measured on transperineal ultrasound (TPU) imaging during the second stage of labor

TPU angle of head descent (°)	Angles measured (n)	Mean ± SE time to delivery (min)
≤ 135	10	42.1 ± 3.16
136–167	30	20.3 ± 2.48
168–200	19	12.4 ± 2.36
> 200	12	5.8 ± 1.65



Anatomic relationship between the pubic symphysis and ischial spines and its clinical significance in the assessment of fetal head engagement and station during labor

A. F. BARBERA*, F. IMANI†, T. BECKER‡, D. C. LEZOTTE§ and J. C. HOBBS¶



U: Upper border of symphysis pubis
 L: Lower border of symphysis pubis
 M: Midpoint between right and left ischial spines (station 0)
 S: Any station proximal to station 0
 S': Any station distal to station 0
 θ : X-angle for station 0
 θ' : X-angle for stations proximal to station 0
 θ'' : ULS' angle

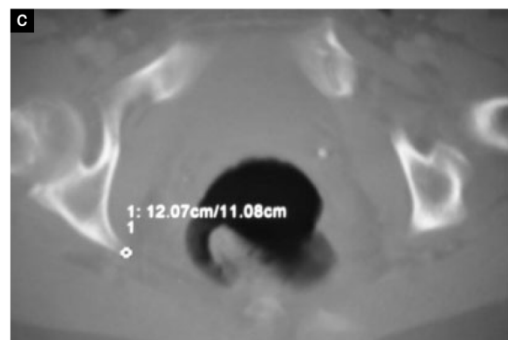
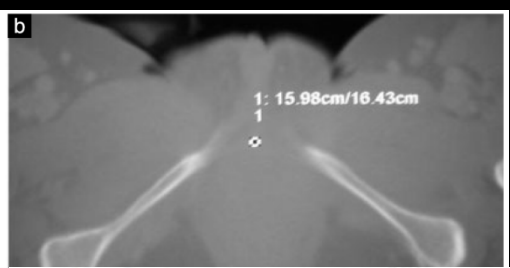
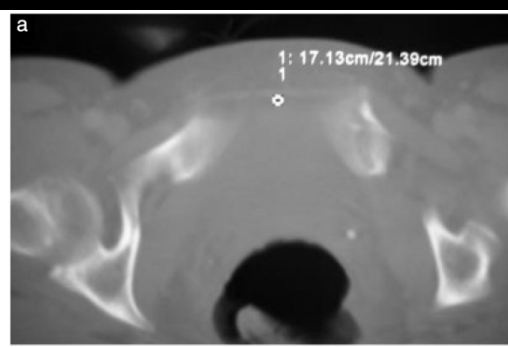


Table 1 Mean and SD of the calculated pelvic angle for each theoretical clinical station

Station	Angle (°) (mean (SD))
-5	65 (5)
-4	71 (6)
-3	78 (6)
-2	85 (6)
-1	92 (6)
0	99 (6)
1	106 (7)
2	113 (7)
3	120 (7)
4	127 (7)
5	135 (8)

Relationship between fetal head station established using an open magnetic resonance imaging scanner and the angle of progression determined by transperineal ultrasound

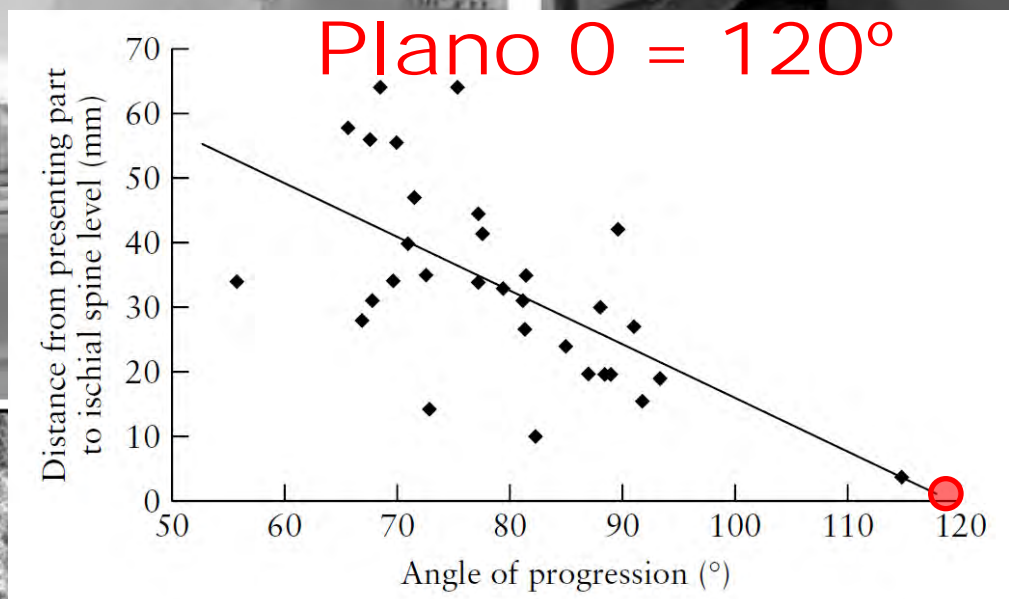
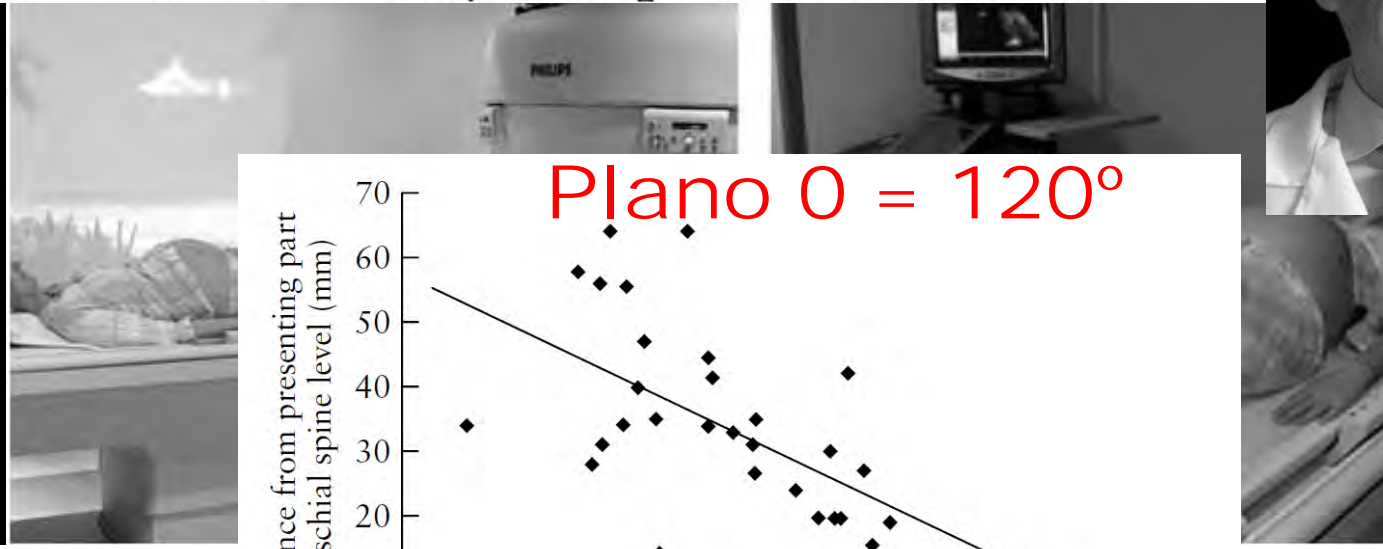
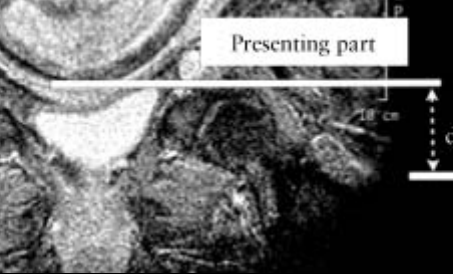


Figure 4 Correlation between the angle of progression and fetal head station assessed by open magnetic resonance imaging.

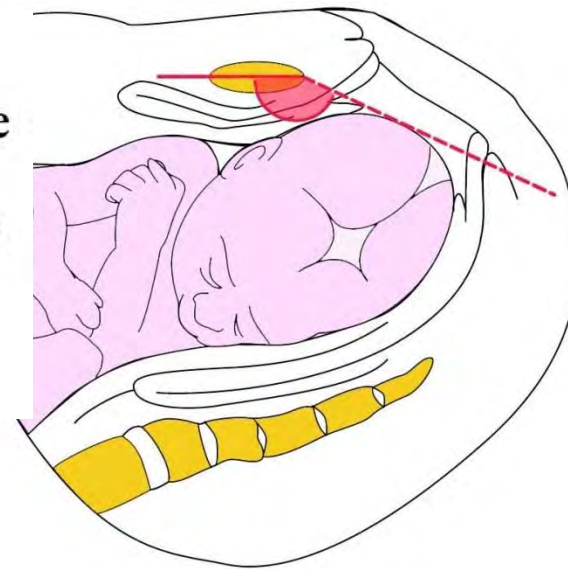


Charite Berlin
27.01.2009
14:57:56

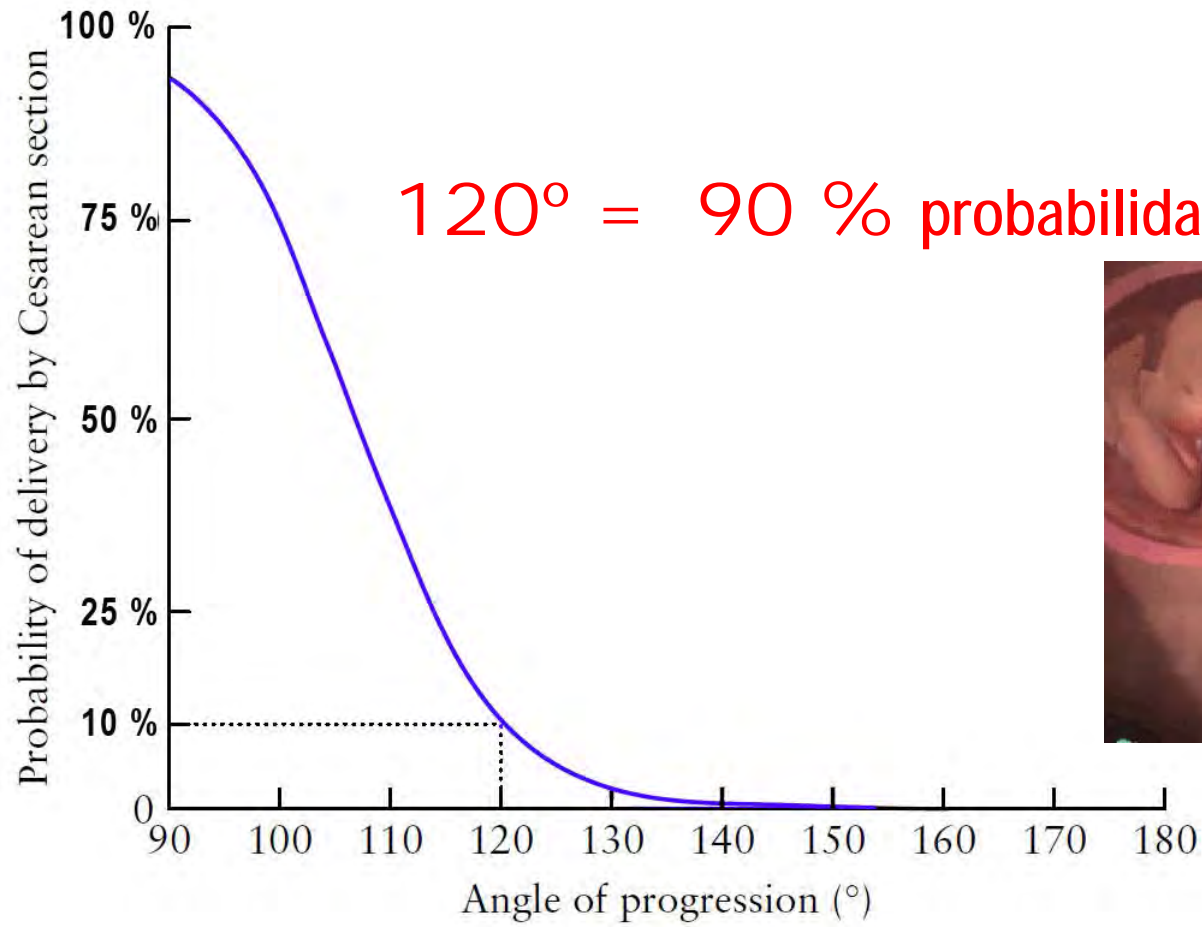
Transperineal ultrasound imaging in prolonged second stage of labor with **occipitoanterior** presenting fetuses: how well does the 'angle of progression' predict the mode of delivery?

K. D. KALACHE, A. M. DÜCKELMANN, S. A. M. MICHAELIS, J. LANGE, G. CICHON
and J. W. DUDENHAUSEN

Department of Obstetrics, Charité University Hospital, Campus Benjamin Franklin, Berlin, Germany



120° = 90 % probabilidad de parto vaginal



Measurement of fetal head descent using the ‘angle of progression’ on transperineal ultrasound imaging is reliable regardless of fetal head station or ultrasound expertise

A. M. DÜCKELMANN, C. BAMBERG, S. A. M. MICHAELIS, J. LANGE, A. NONNENMACHER, J. W. DUDENHAUSEN and K. D. KALACHE

Table 2 Interobserver reliability of angle of progression offline measurement on transperineal ultrasound images according to ultrasound experience

<i>Observer group</i>	<i>Intraclass correlation coefficient (95% CI)</i>
All observers ($n = 9$)	0.72 (0.63–0.81)
No ultrasound experience ($n = 3$)	0.61 (0.43–0.74)
< 5 years’ ultrasound experience ($n = 3$)	0.81 (0.71–0.88)
> 10 years’ ultrasound experience ($n = 3$)	0.82 (0.70–0.89)

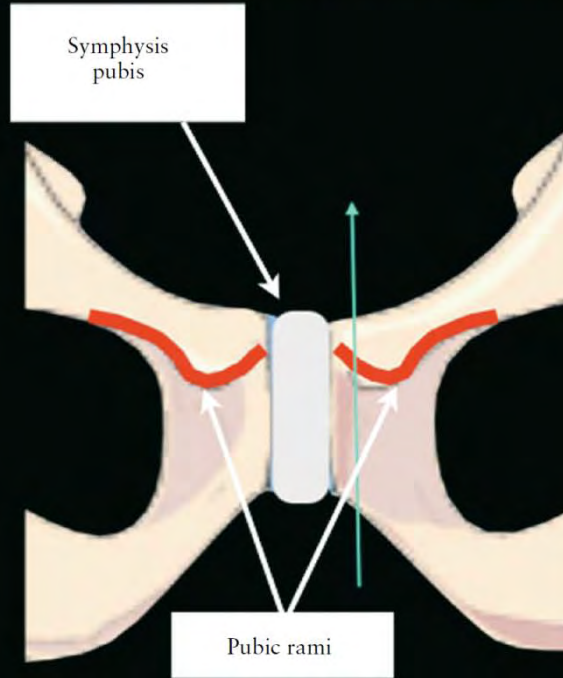
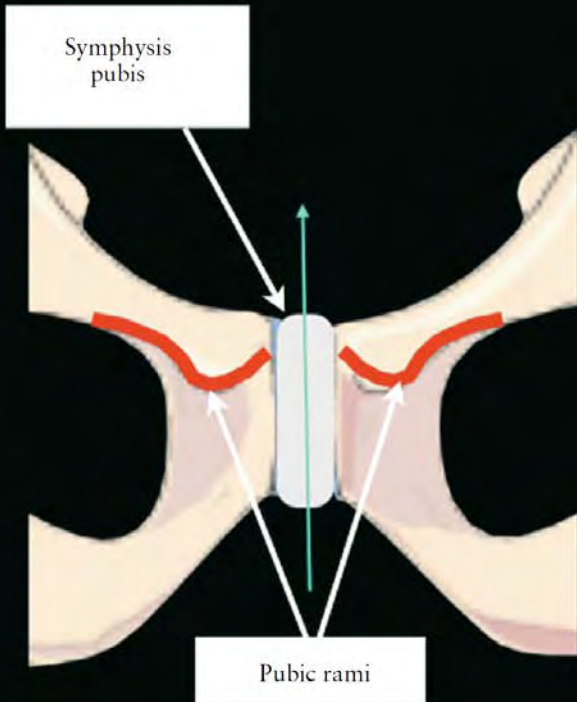
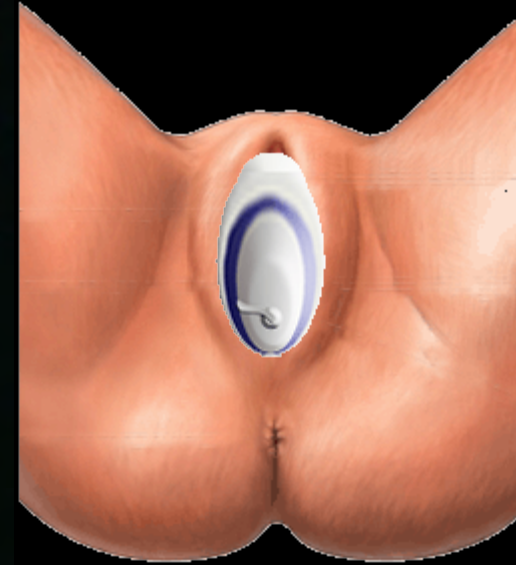
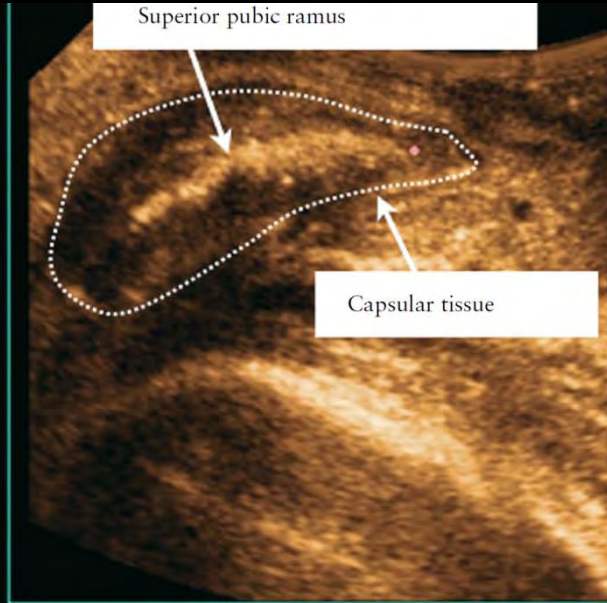
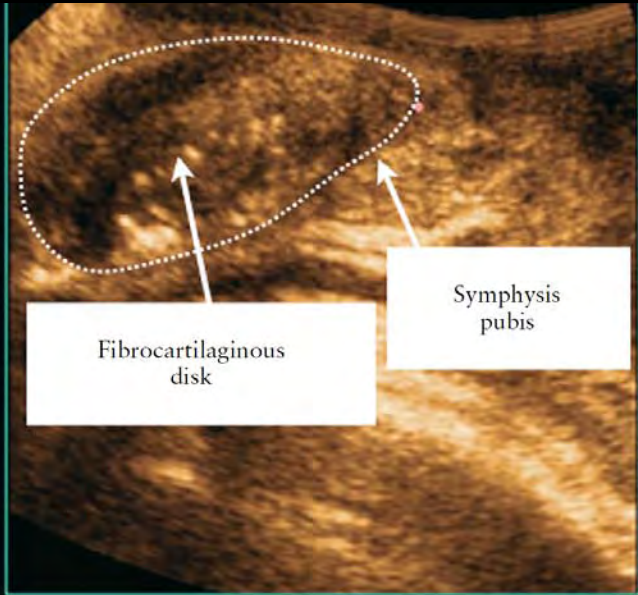
There were no significant differences.

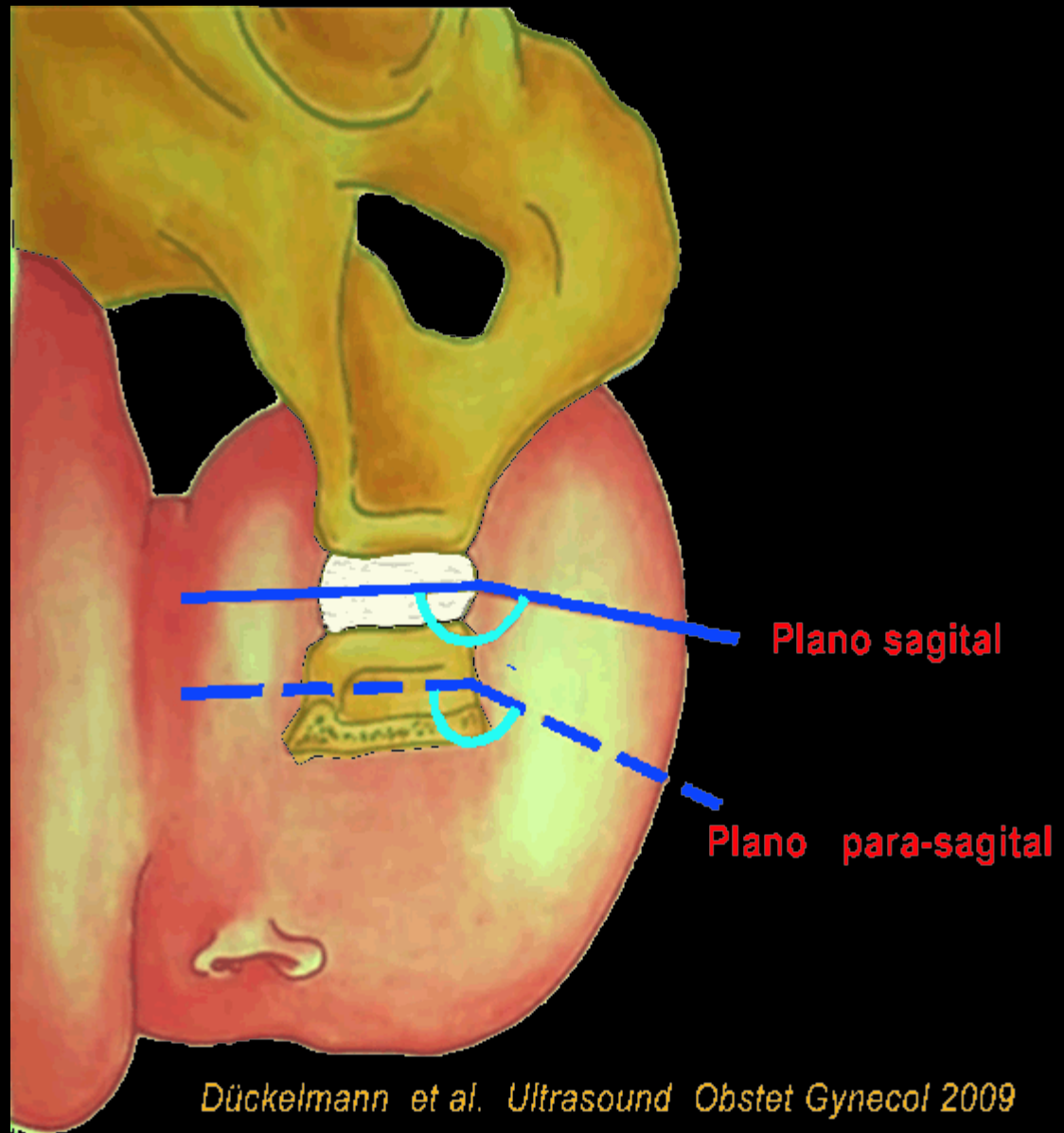
Table 3 Interobserver reliability of angle of progression offline measurement on transperineal ultrasound images according to fetal head station

<i>Mode of delivery/ fetal head station</i>	<i>Intraclass correlation coefficient (95% CI)</i>
All cases ($n = 44$)	0.72 (0.63–0.81)
Cesarean section and fetal vertex above +1 station ($n = 9$)	0.71 (0.59–0.81)
Vacuum extraction and fetal vertex station at or below +1 station ($n = 35$)	0.69 (0.47–0.89)

There were no significant differences.

Consejos del Pf Kalache para obviar el punto debil...





Ecografía 3D en el parto

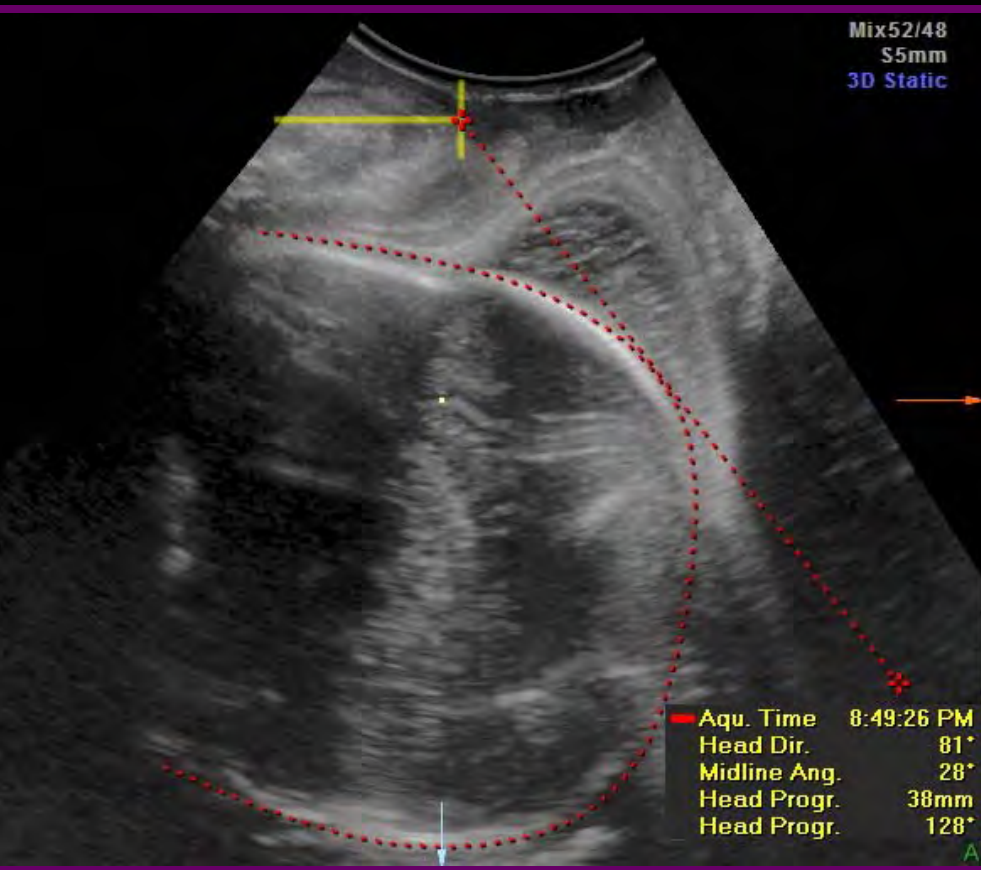
¿ Puede ayudarnos ?

Aportación de la 3D a la Ecografía intra-parto

- Permite la evaluación de todos estos parámetros **asegurando** la obtención del **plano correcto** de medición.
- Permite una **precisa comparación entre imágenes** (volúmenes) adquiridas en un lapso de tiempo.
(Las imágenes 2D estáticas pueden resultar muy difíciles de comparar.)
- Proporciona **evidencia visual y objetiva** del progreso del parto, en el que poder argumentar nuestras decisiones en la sala de parto

SonoVCAD™ labor

Sonography-based Volume Computer Aided Display

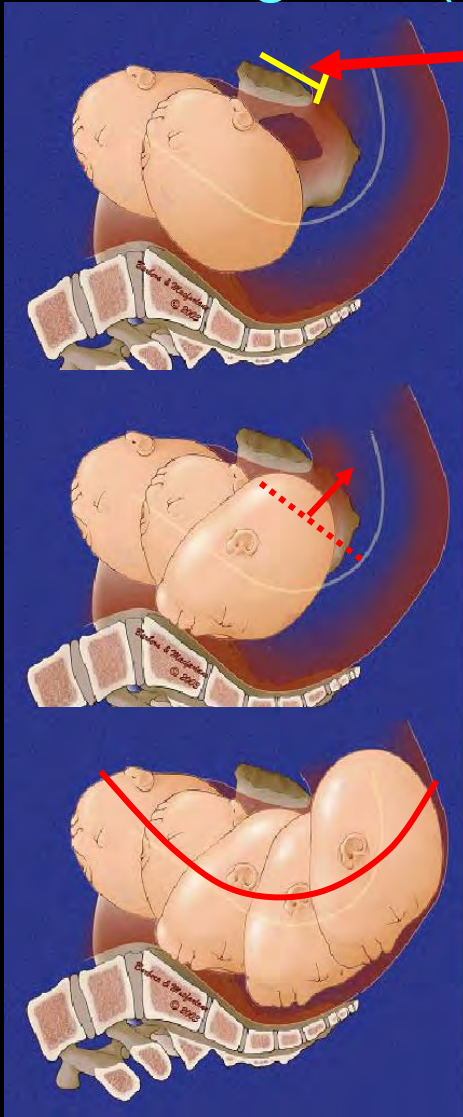


Software basado en ecografía 3D para evaluar la progresión del descenso de la cabeza fetal durante el expulsivo

SonoVCAD™ labor

Plano Sagital (A)

Plano Transversal (B)



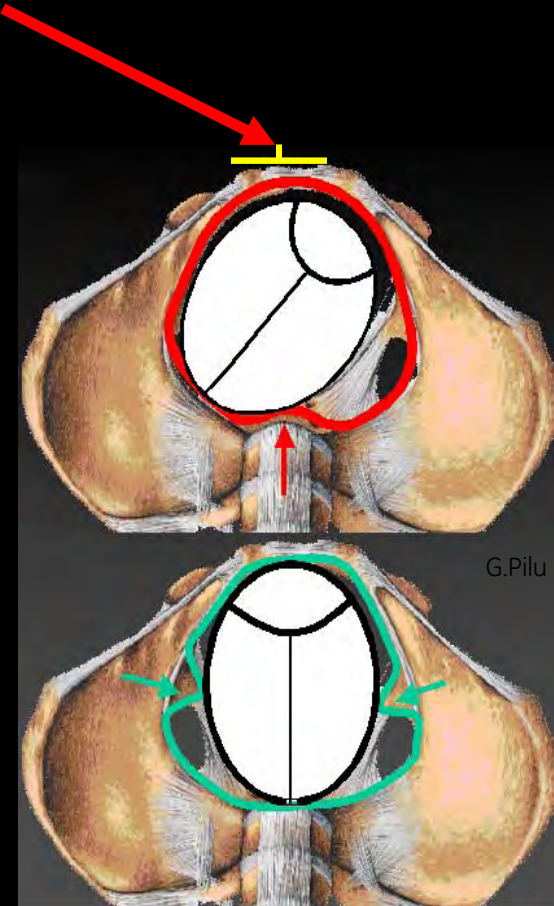
Pubis como punto de referencia

Distancia de progresión

Dirección cabeza

Angulo de progresión

Courtesy of Dr. Barbra

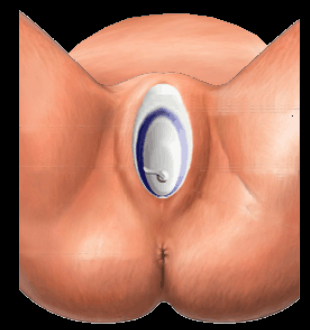


Rotación de la cabeza con respecto a la línea media

G.Pilu

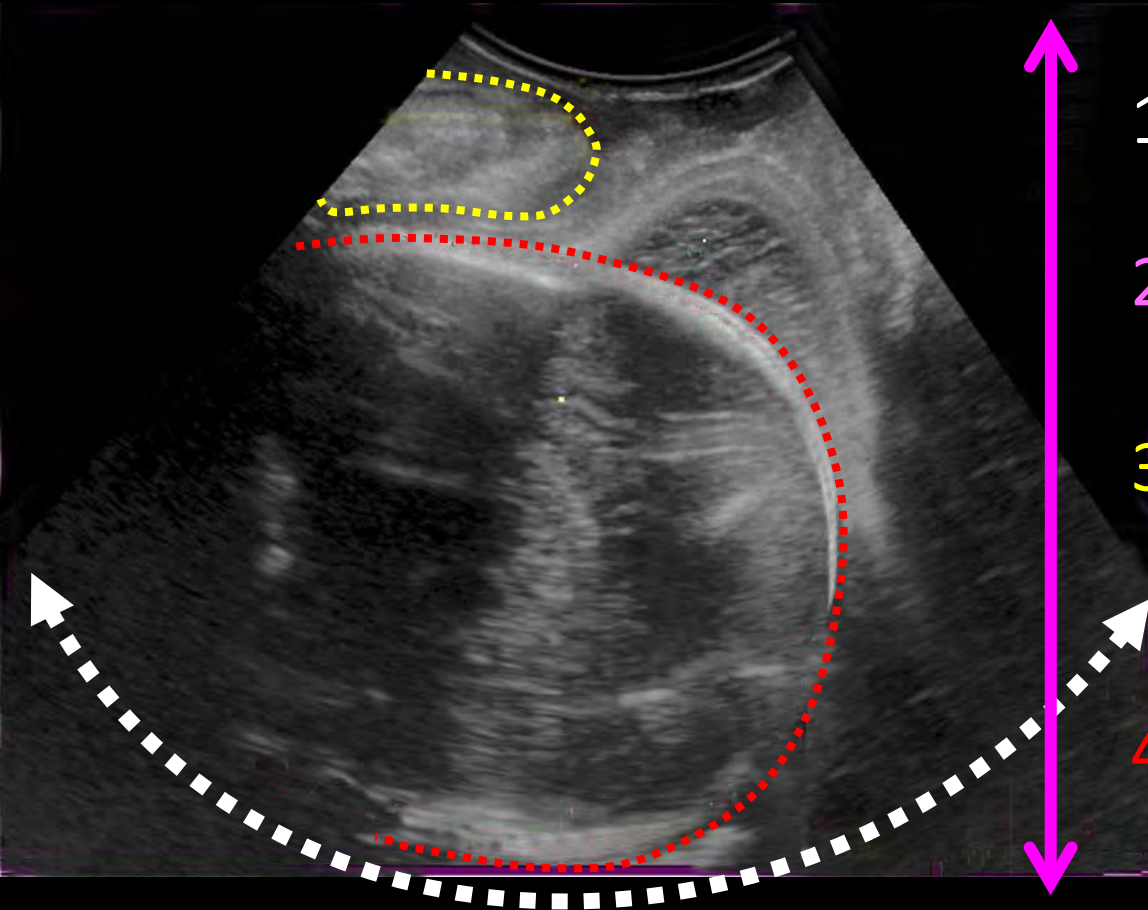
SonoVCADlabor

Metodología



Adquirir un volumen por **vía translabial** longitudinal.

(Sonda de 2,5 Mhz e incluyendo pubis)



- 1.- Sector amplio
- 2.- Máxima profundidad
- 3.- Visualizar gran parte de *sínfisis* púbica
- 4.- Visualizar gran parte del *contorno* de la cabeza fetal

SonoVCADlabor Metodología

PROCESADO del volumen adquirido

Seleccionar
multiplanar view.

Seleccionar
SonoVCAD labor.

Seleccionar Auto
Adjust

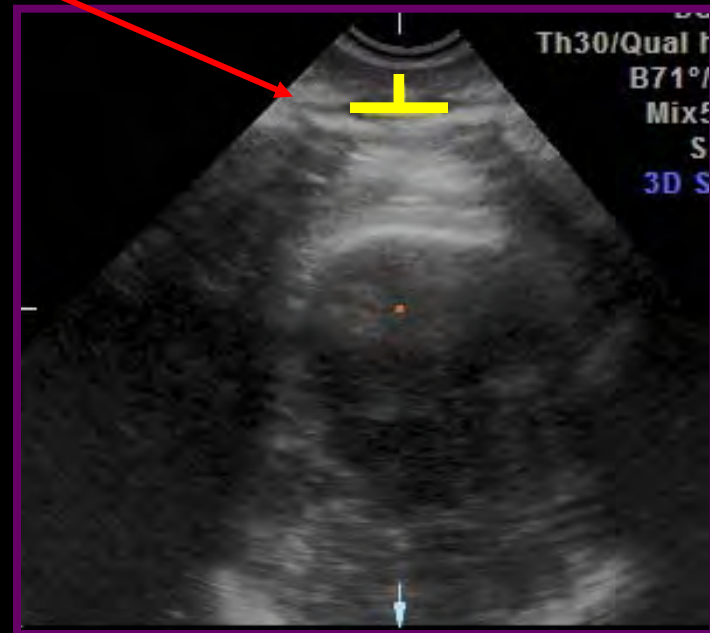
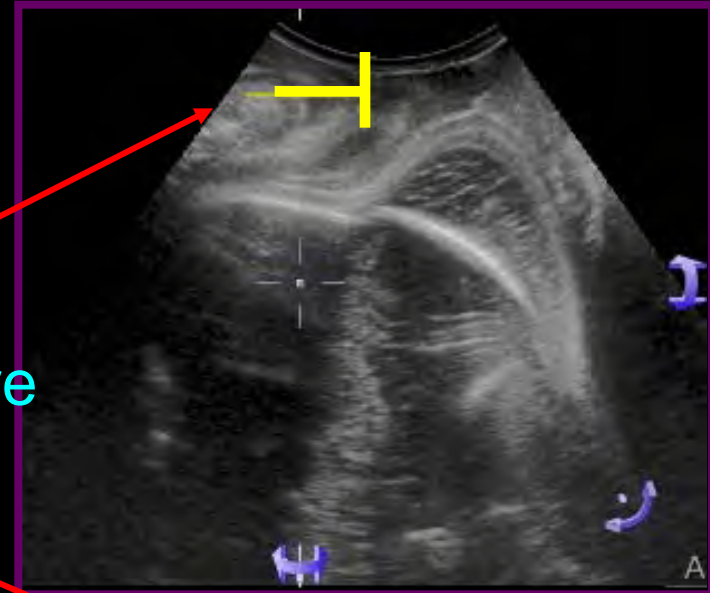
(para orientar
automaticamente el
volumen).



SonoVCADlabor

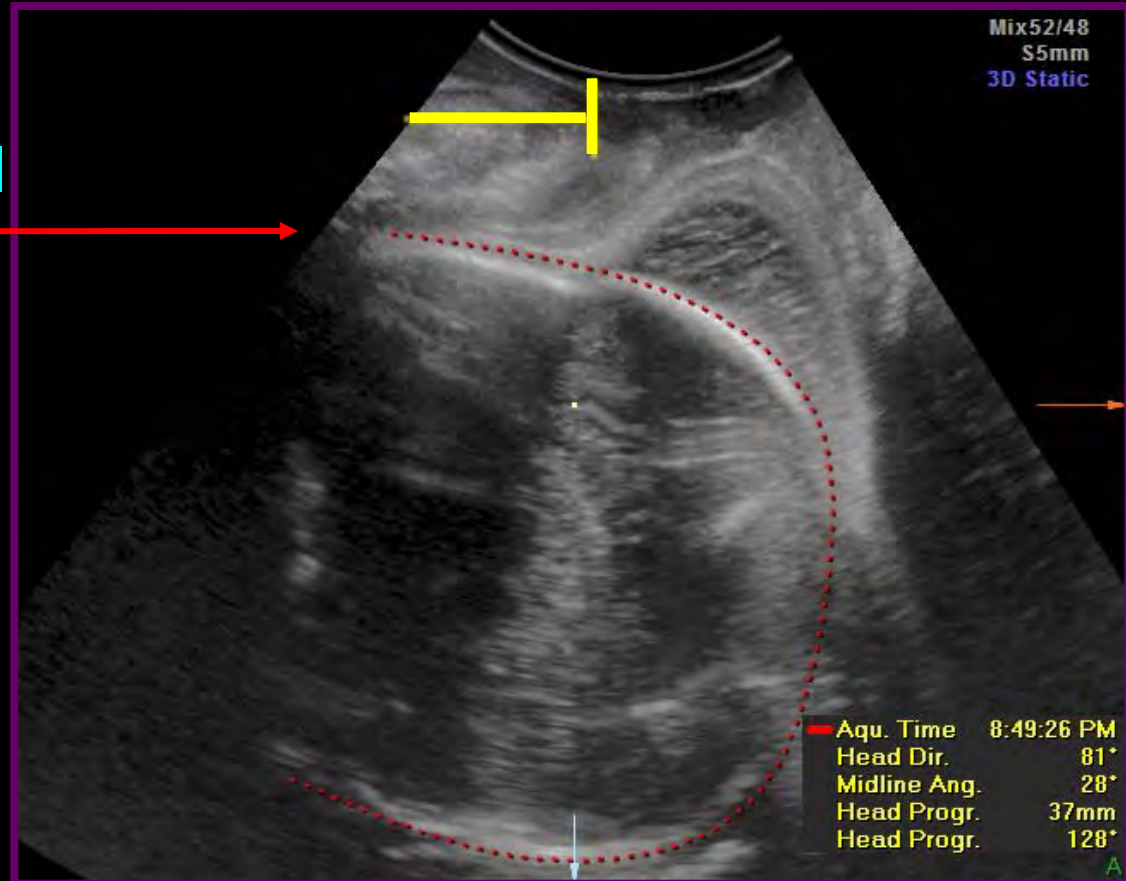
Metodología

Situar la marca amarilla en T sobre el PUBIS en los planos A y B.



El pubis será la referencia para posteriores mediciones.

Trazar el contorno craneal en el plano A.



El contorno craneal permite visualizar la posición de la cabeza fetal con respecto al pubis.

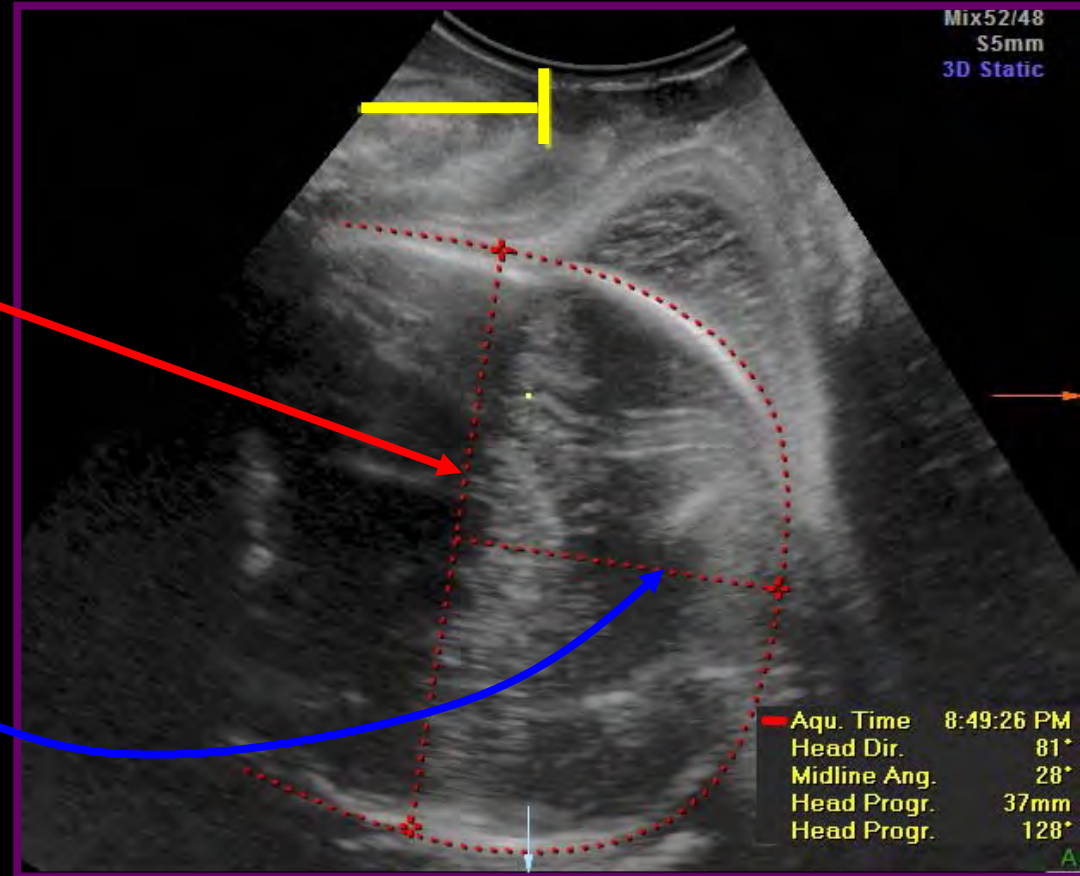
SonoVCADlabor

Parámetros a evaluar

Dirección de la cabeza

Trazar en máximo diámetro transverso (DBP) en el plano A

Desde el punto medio extender una línea perpendicular hasta el punto más distal del contorno craneal .



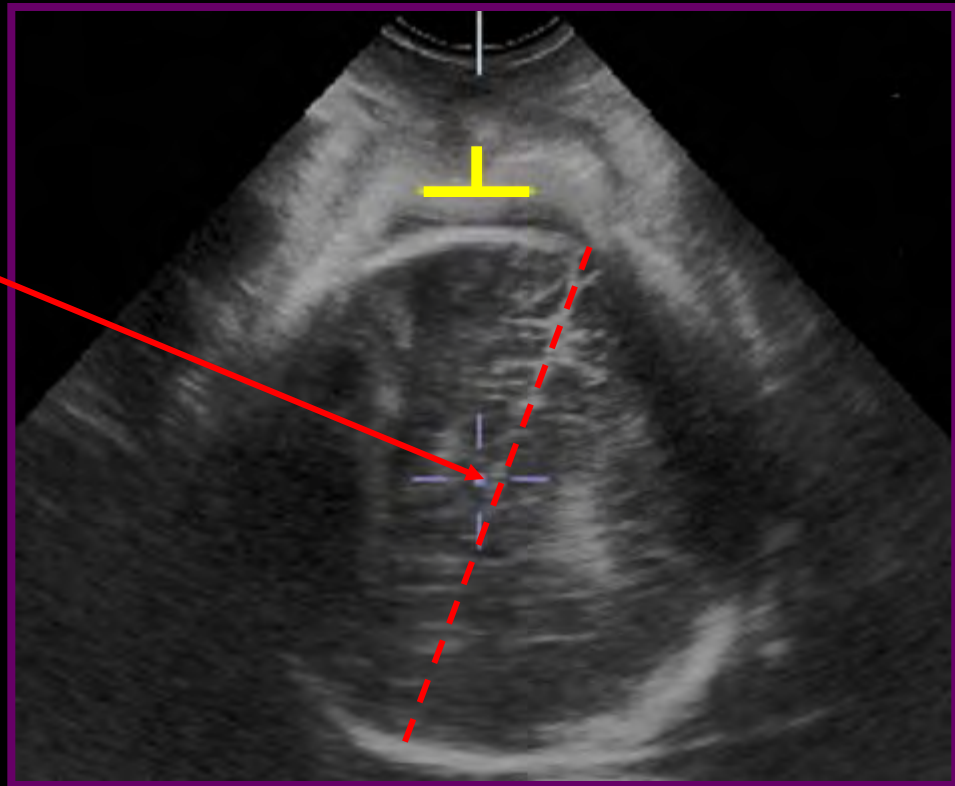
La dirección de la cabeza fetal indica la progresión y añade información de la posición de la cabeza fetal útil en la toma de decisiones.

SonoVCADlabor

Parámetros a evaluar

Ángulo de rotación

En el plano B trazar la *línea media* haciendo clic en los huesos occipital y frontal.



La línea media rota durante el parto hasta alcanzar la posición vertical al final del canal del parto.

En el periodo expulsivo suele verse una porción de la línea media.

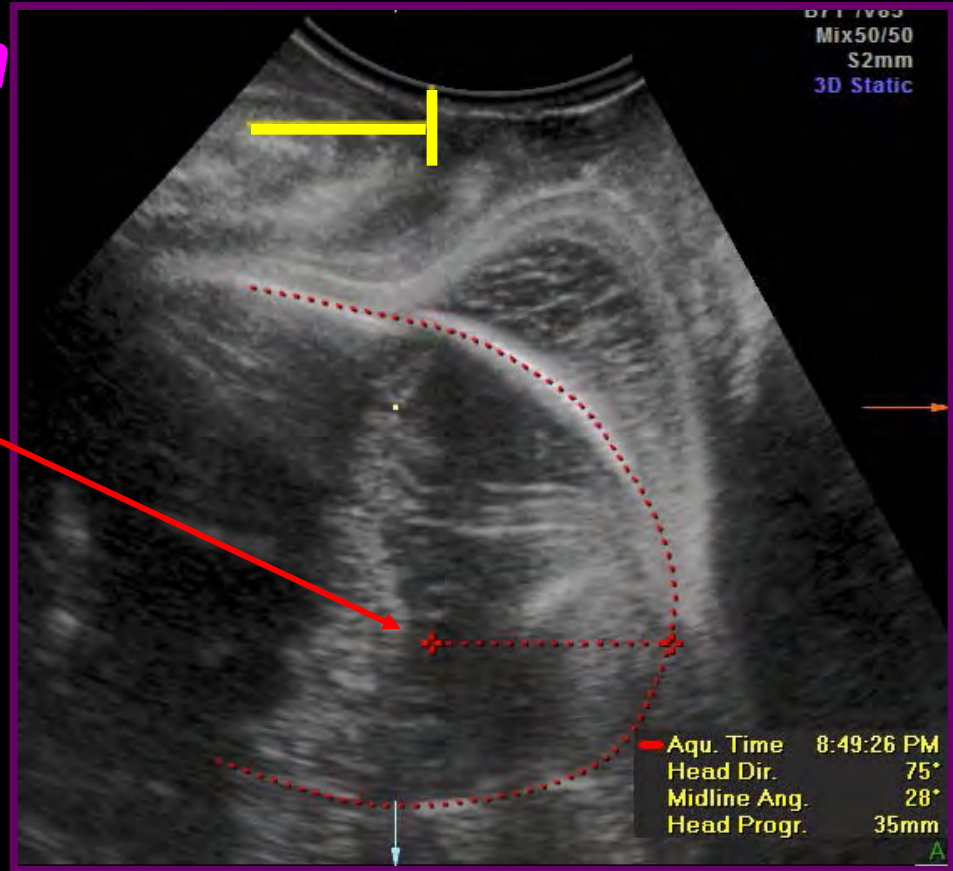
SonoVCADlabor

Parámetros a evaluar

distancia de progresión

En el plano A hacer click en el punto más distal del contorno craneal.

El software mostrará automáticamente la distancia de progresión desde el pubis.



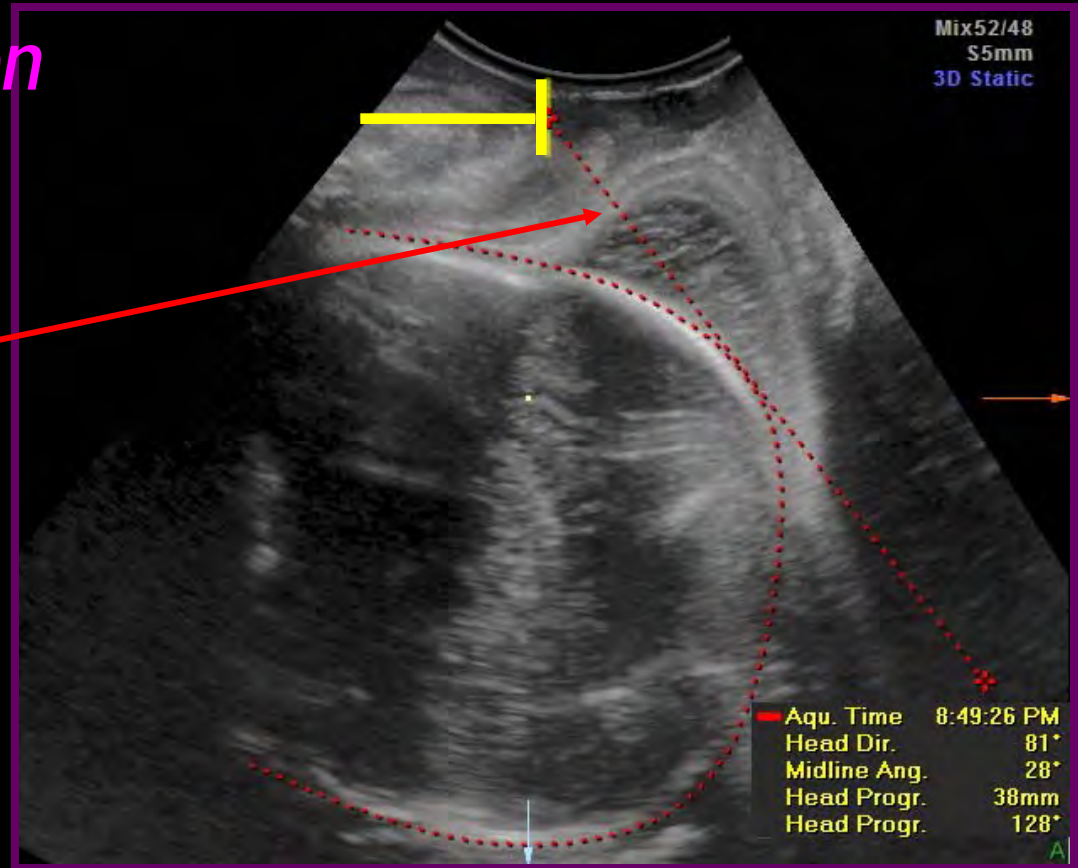
La *distancia de progresión* es la medida de la posición de la cabeza respecto al pubis.

SonoVCADlabor

Parámetros a evaluar

Ángulo de progresión

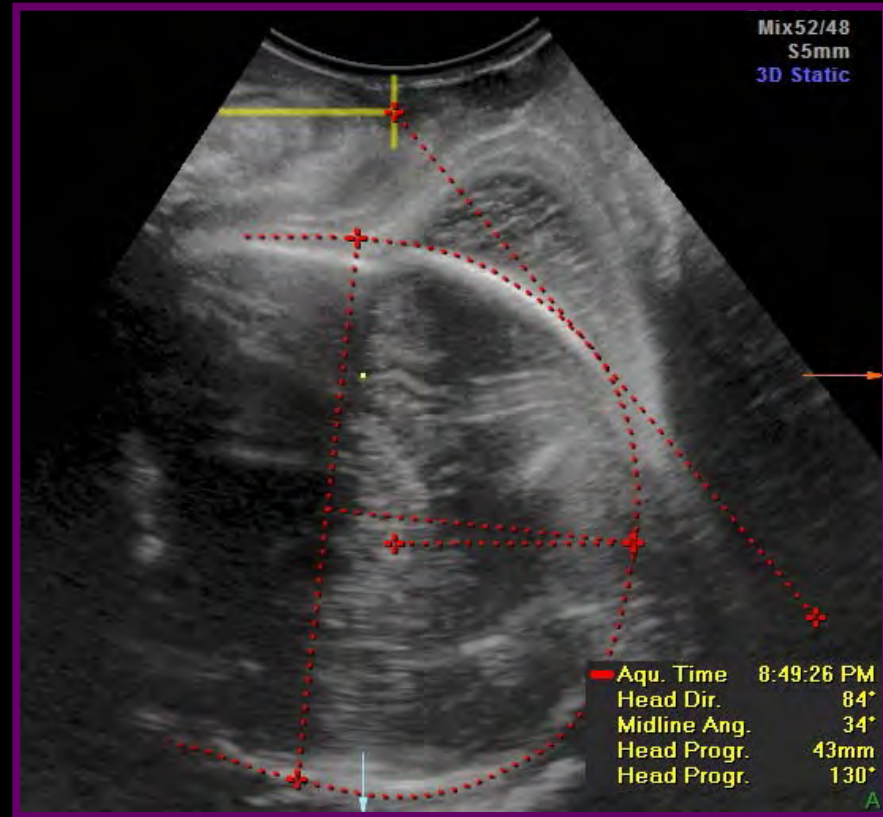
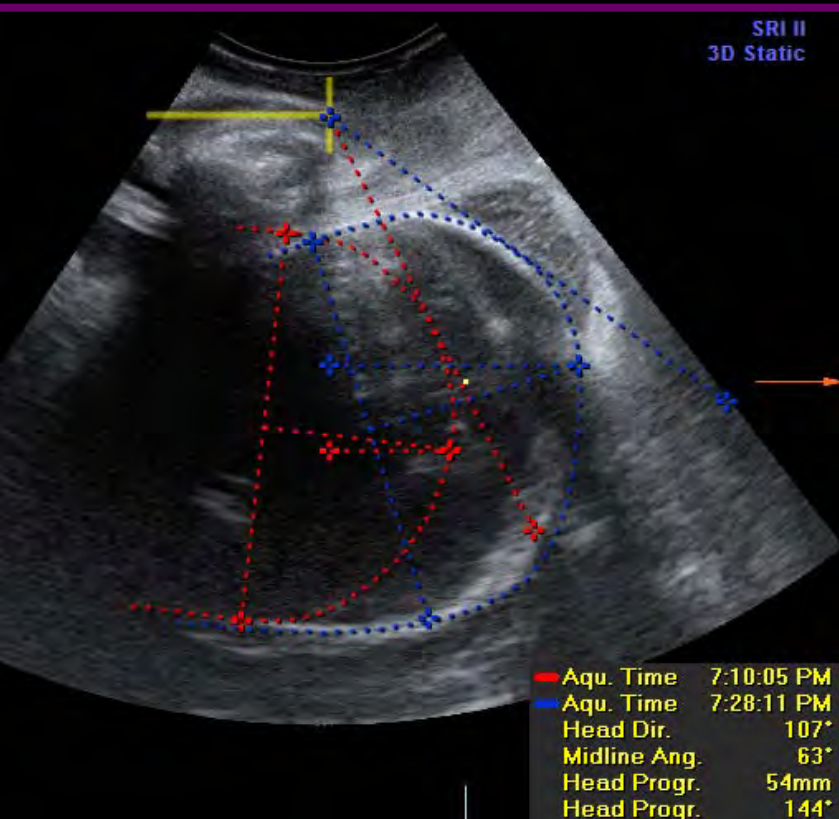
En el plano A trazar una tangente desde la marca amarilla (pubis) al borde del craneo.



El *ángulo de progresión* es una medida radial de la progresión de la cabeza fetal en el canal del parto.

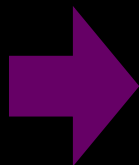
SonoVCADlabor Valoración de la PROGRESION fetal

Todas las medidas pueden mostrarse a la vez en cada volumen.



Adquiriendo un nuevo volumen en la misma paciente, se puede **visualizar fácilmente la progresión de la cabeza fetal.**

Documentación estandarizada del parto.



GE logo Date of Exam: 07/25/2008 Page 1 / 4
Exam Type:

Name		Perf. Phys.	
Pat. ID	B01052-08-07-25-2	DOB	
Indication		Sex	Female
		Sonogr.	
LMP		GA(LMP)	
DOC		GA(AUA)	
		EDD(LMP)	
		EDD(AUA)	
G		Ab	
P		Ec	

EFW (Hadlock) Value Range Age Range Growth
AC/BPD/FL/HC Williams N/A

SonoVCAD labor

Aquisition Time [hh:mm]	Head Direction [°]	Midline Angle [°]	Head Progr. [mm]	Head Progr. [°]	Head Station	Head Rotation	Occiput Position	Cervix Dilatation
7:10 PM	83	70	26	116	1cm	45°-90°	Post/L	7 cm
7:28 PM	107	63	54	144	3cm	45°-90°	Post/L	10 cm

mediciones seriadas

mediciones automáticas

mediciones manuales

SonoVCAD™ labor documenta el parto con un informe basado en datos objetivos de ecografía 3D.

Se pueden añadir mediciones manuales al informe.

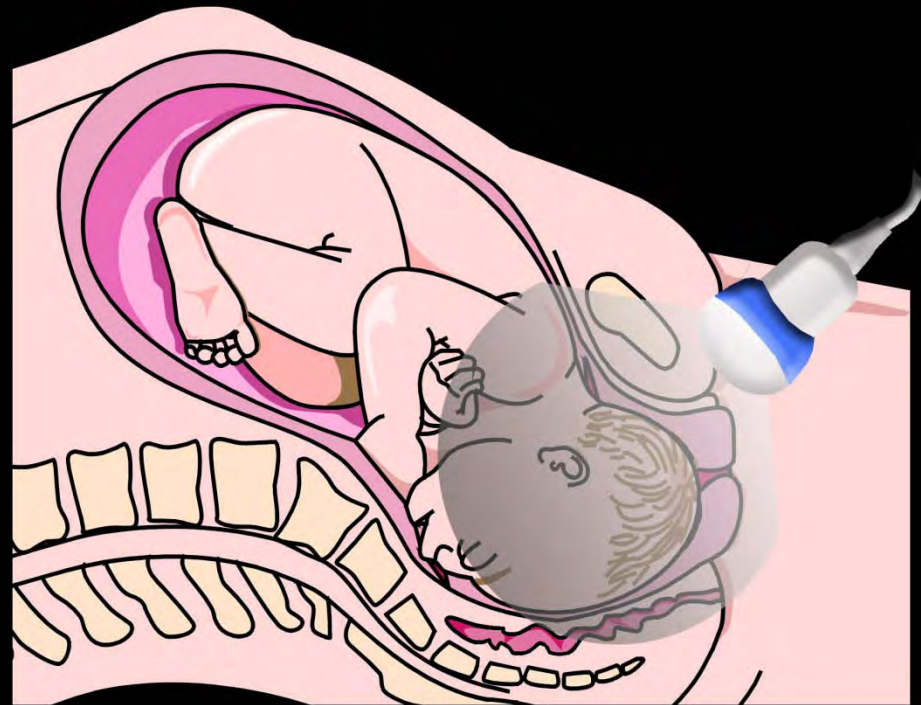
SonoVCAD™ labor

Contexto de aplicación :

Periodo expulsivo lento / “estancado”

+

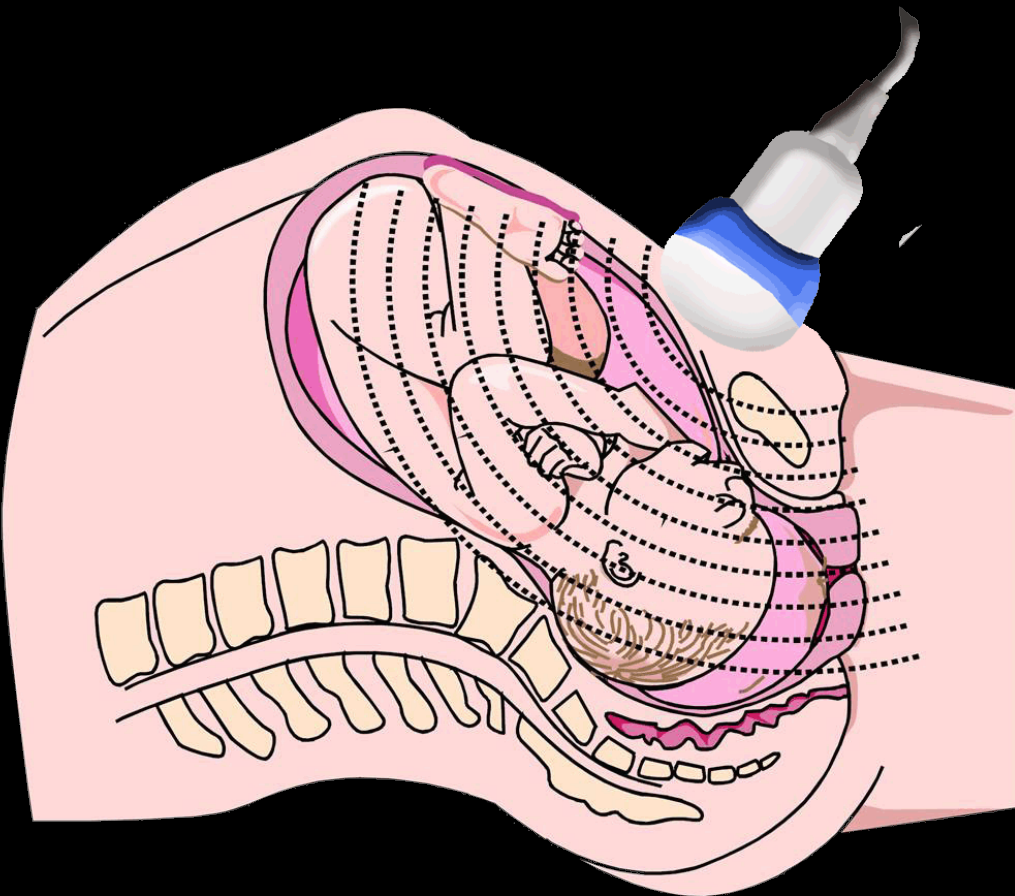
Presentación Occipito Anterior ($< 45^\circ$)



SonoVCAD™ labor

Excepción :

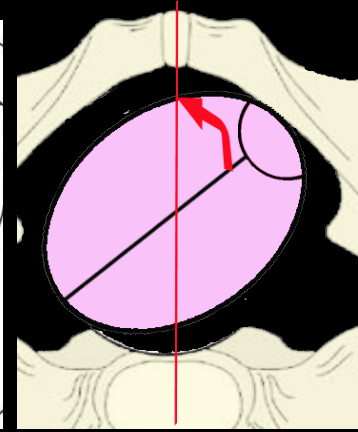
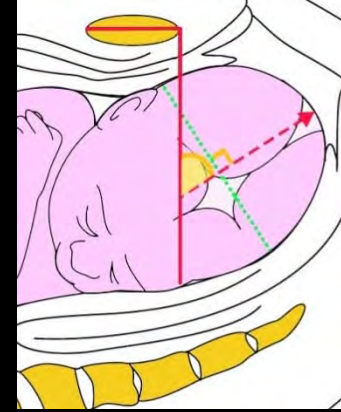
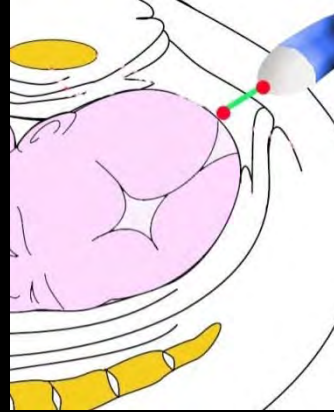
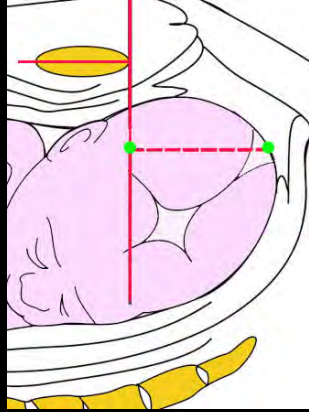
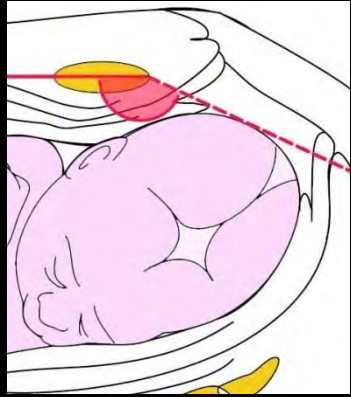
Presentación *Occipito Posterior*



órbitas



Parámetros ecográficos predictivos de parto vaginal



Angulo de Progresion

Distancia de progresion

Distancia Cabeza -Perine

Dirección de la cabeza

Angulo Rotación

> 120°

> 40 mm
?????

< 40 mm

> 90°
Head UP

< 45°

... Pero es necesario seguir investigando y aportando datos !!

