

Apport de l'échographie cérébrale chez le nouveau-né

R.Menten (Cliniques Universitaires Saint Luc, Bruxelles)

Quelques rappels d'anatomie

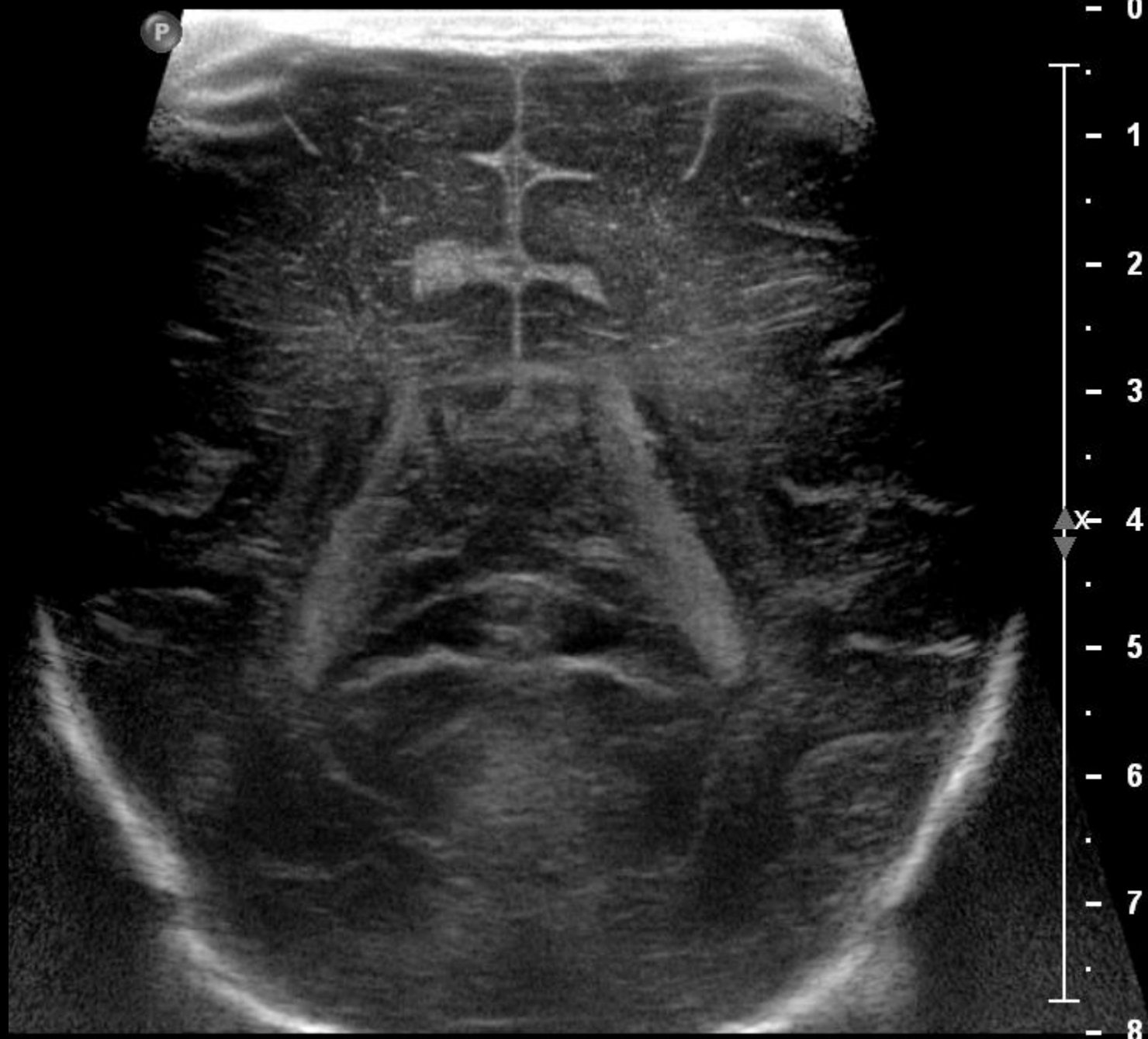


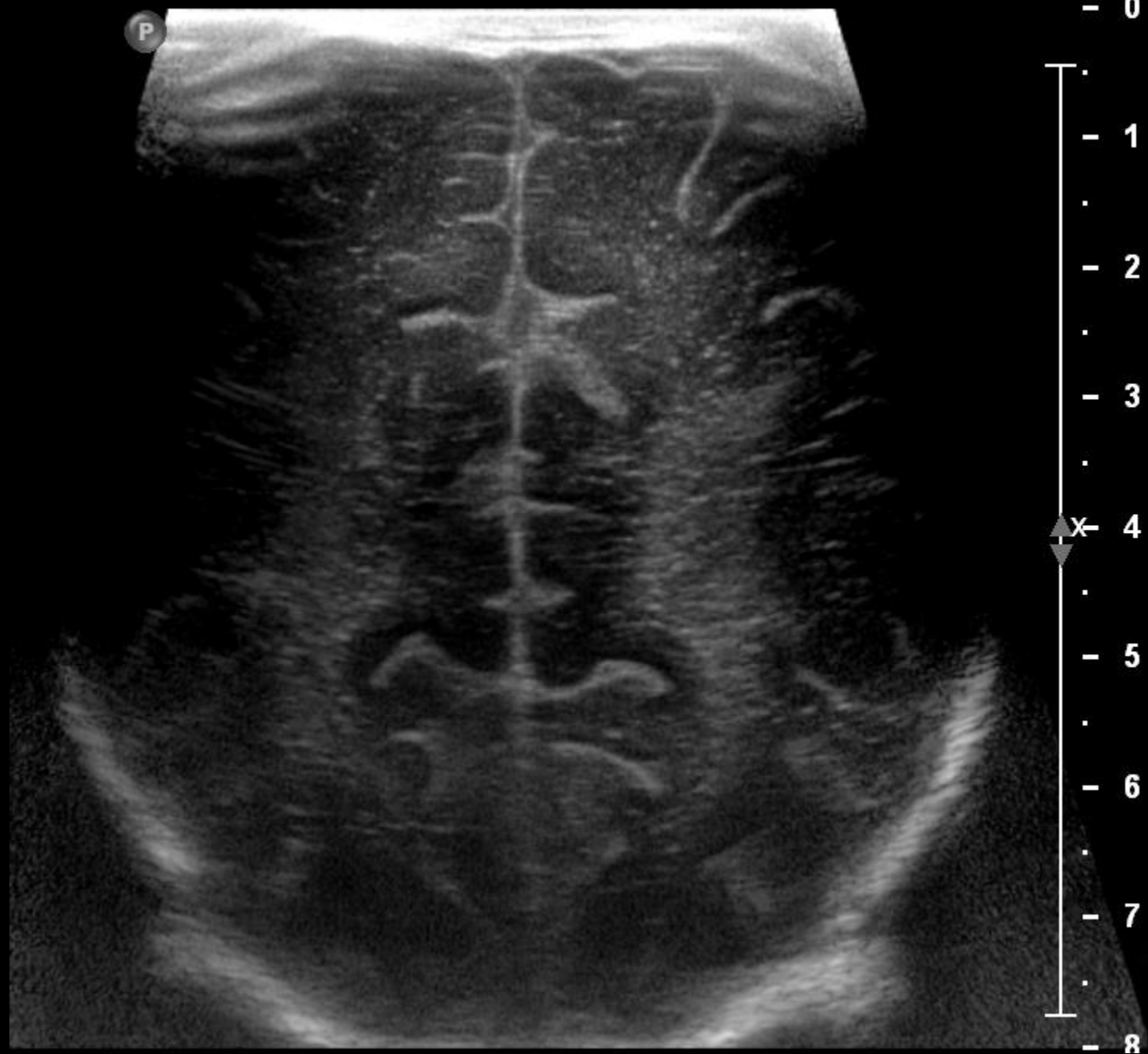


Plans de référence









Plans de référence
+...

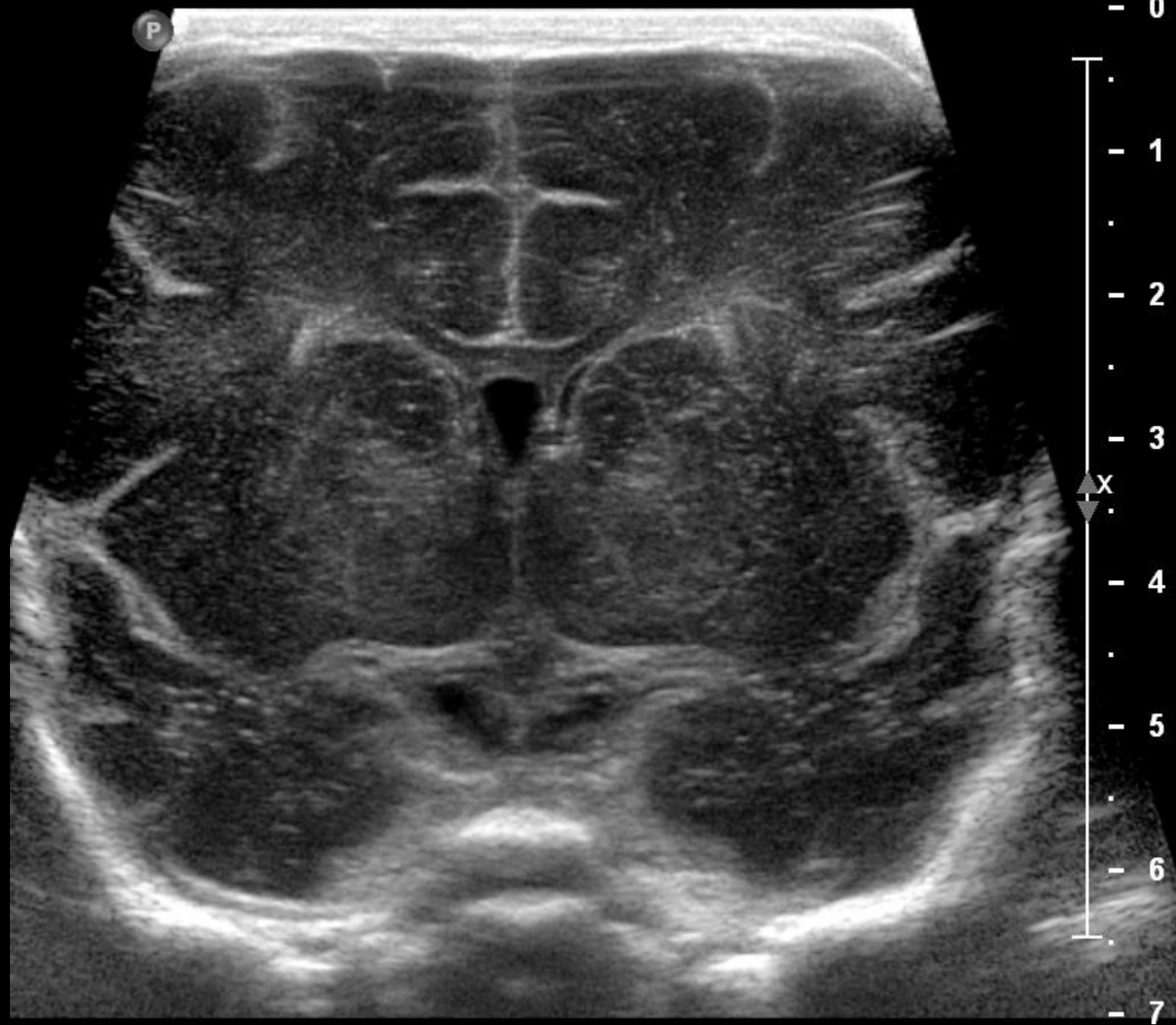






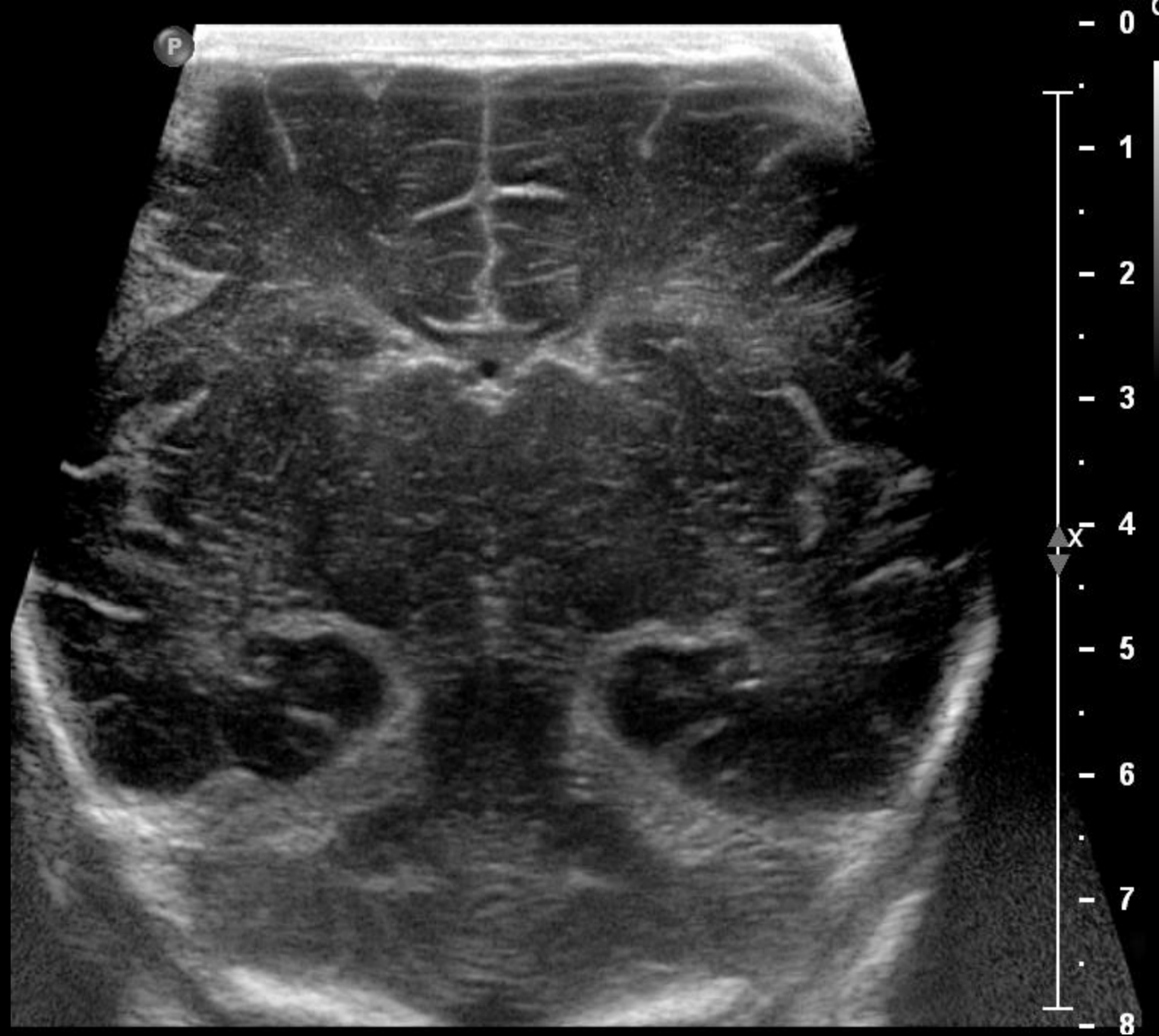


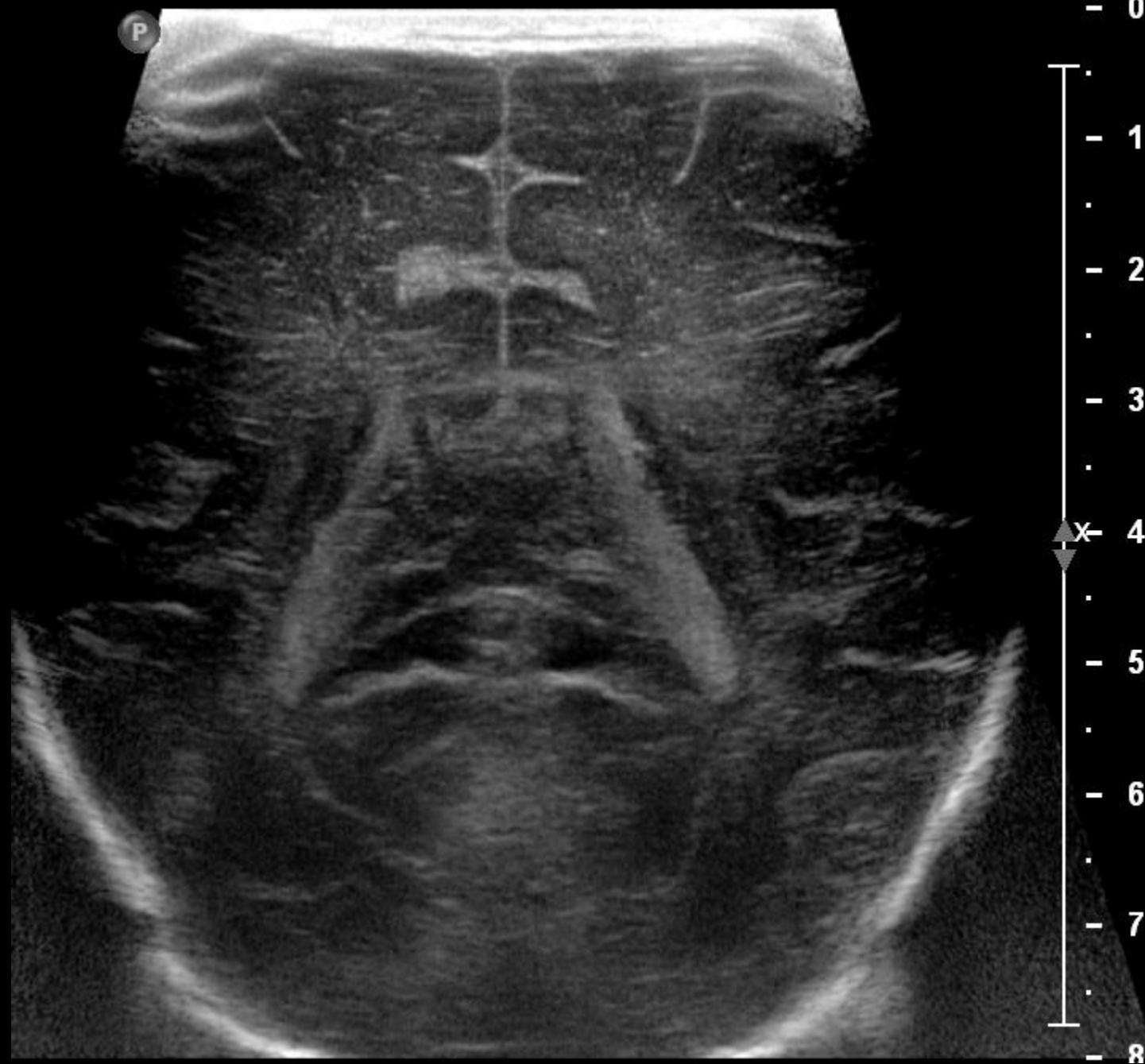






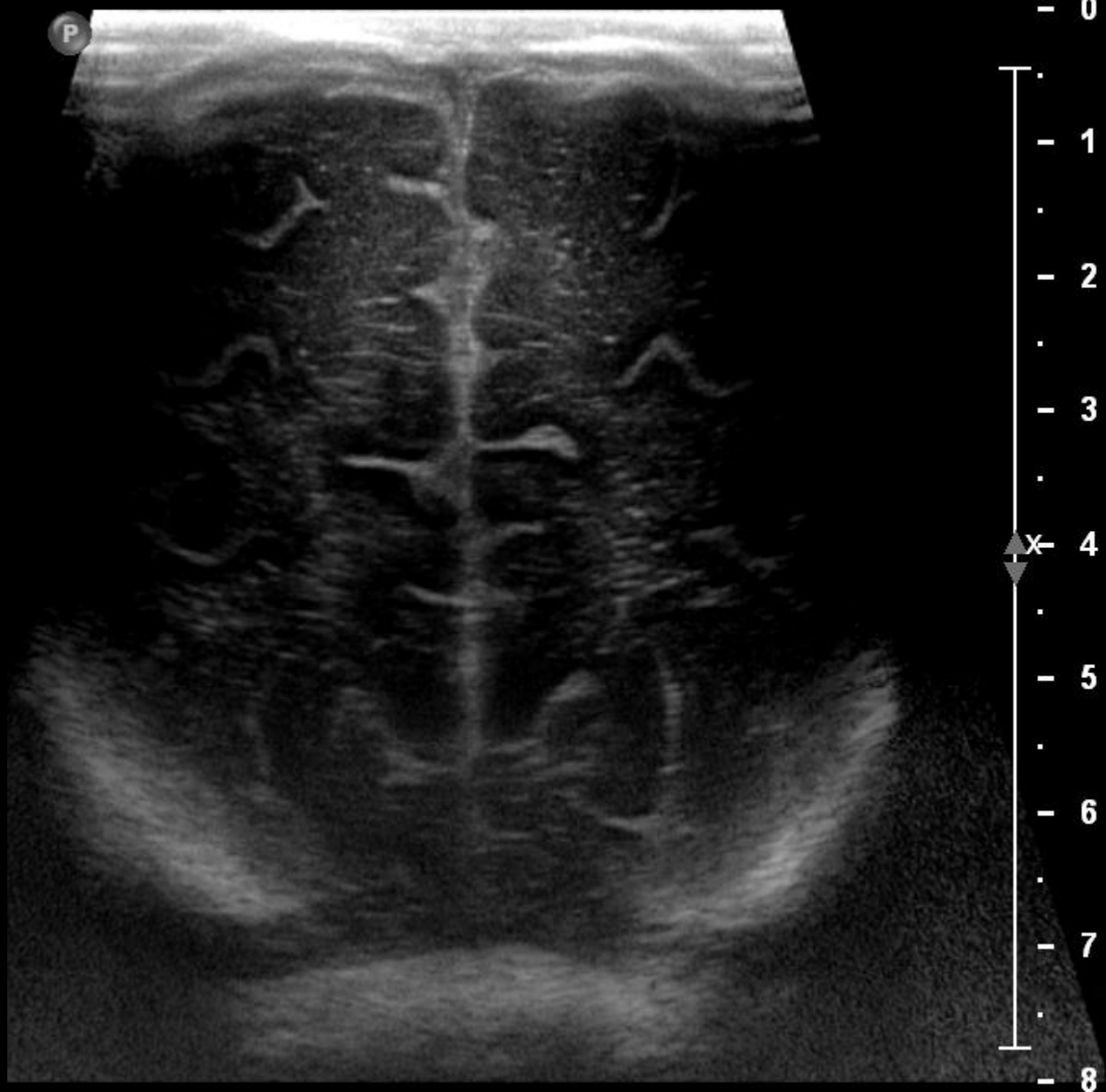












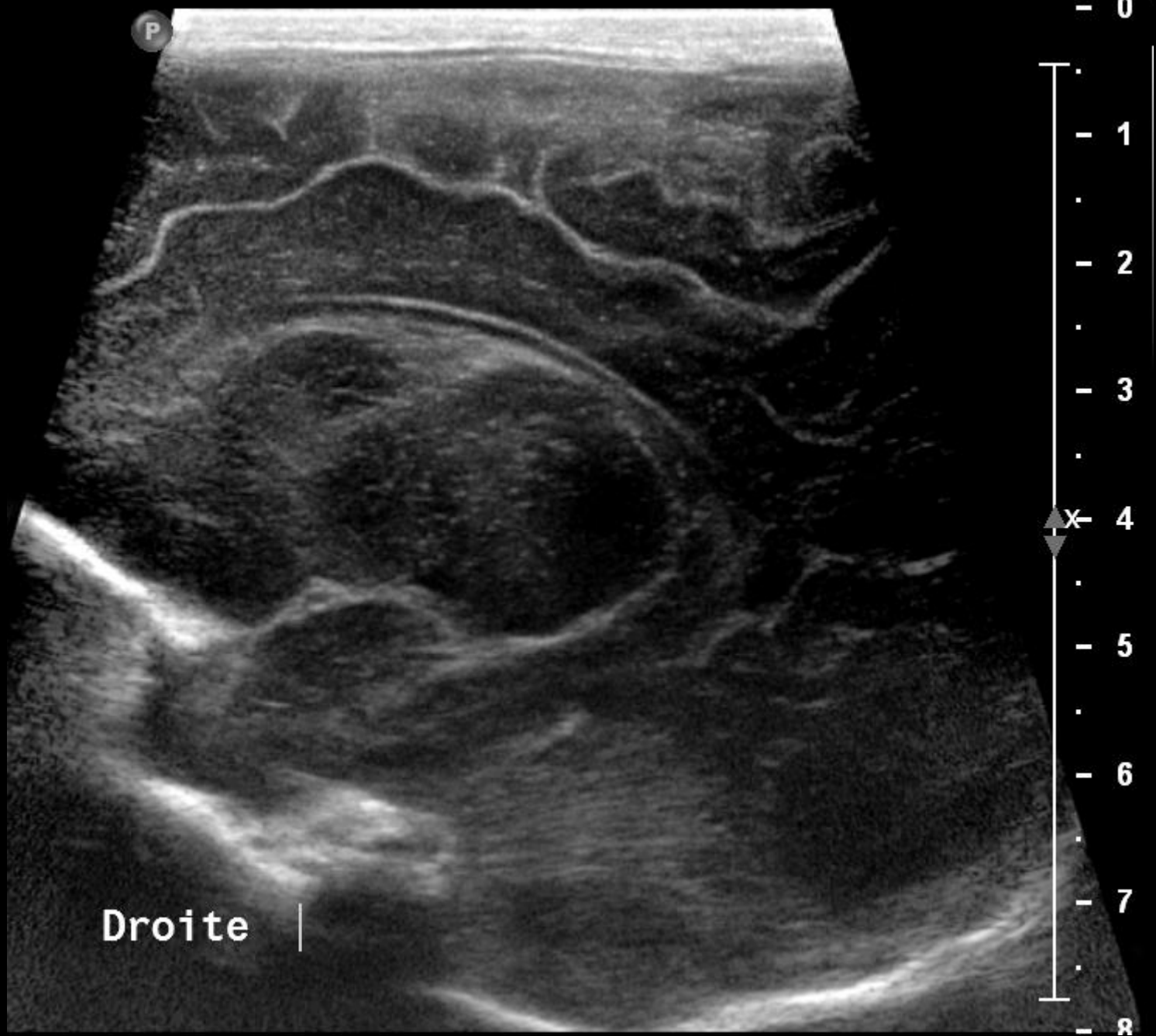




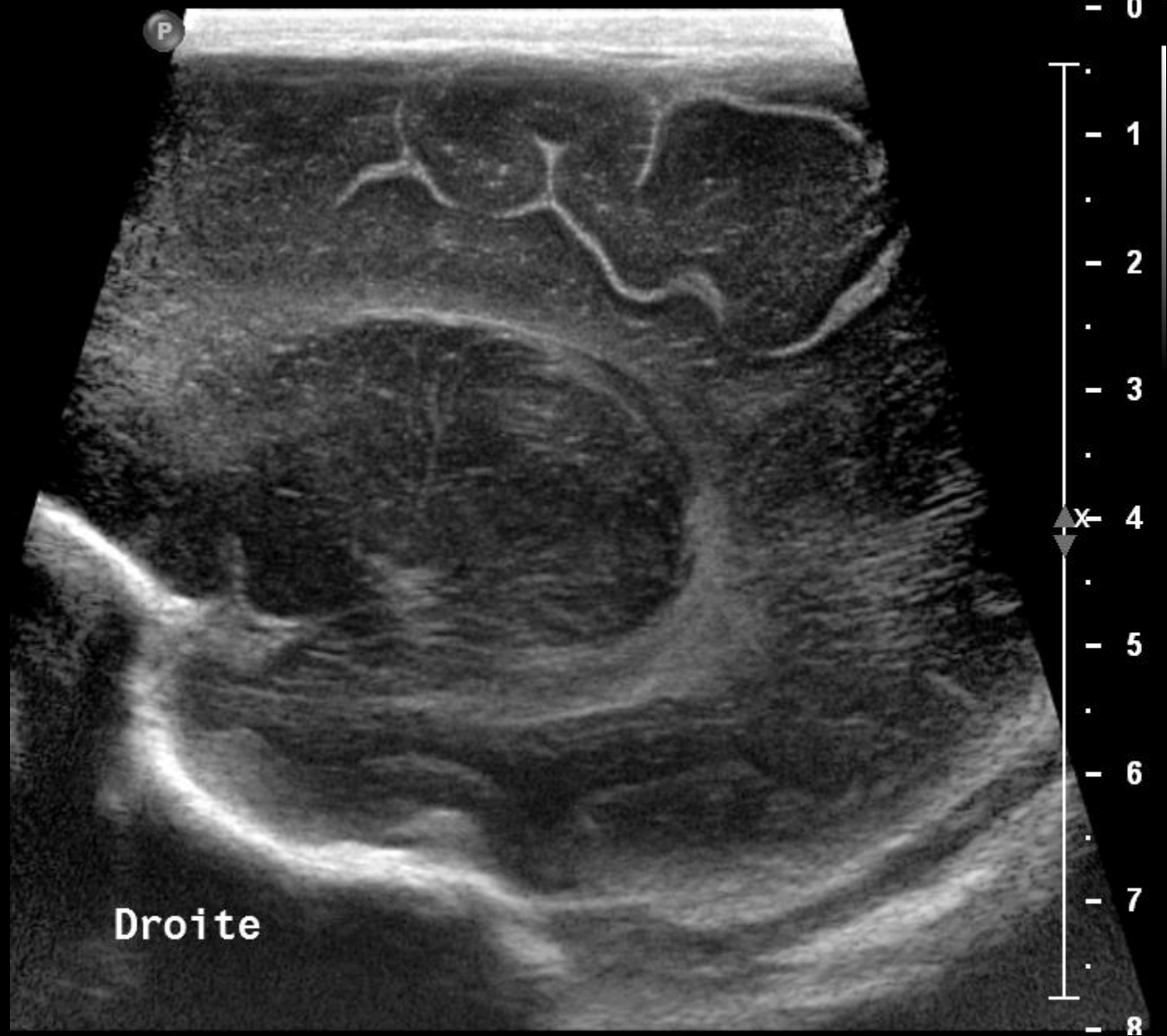


Sagittal: plans de référence
+...



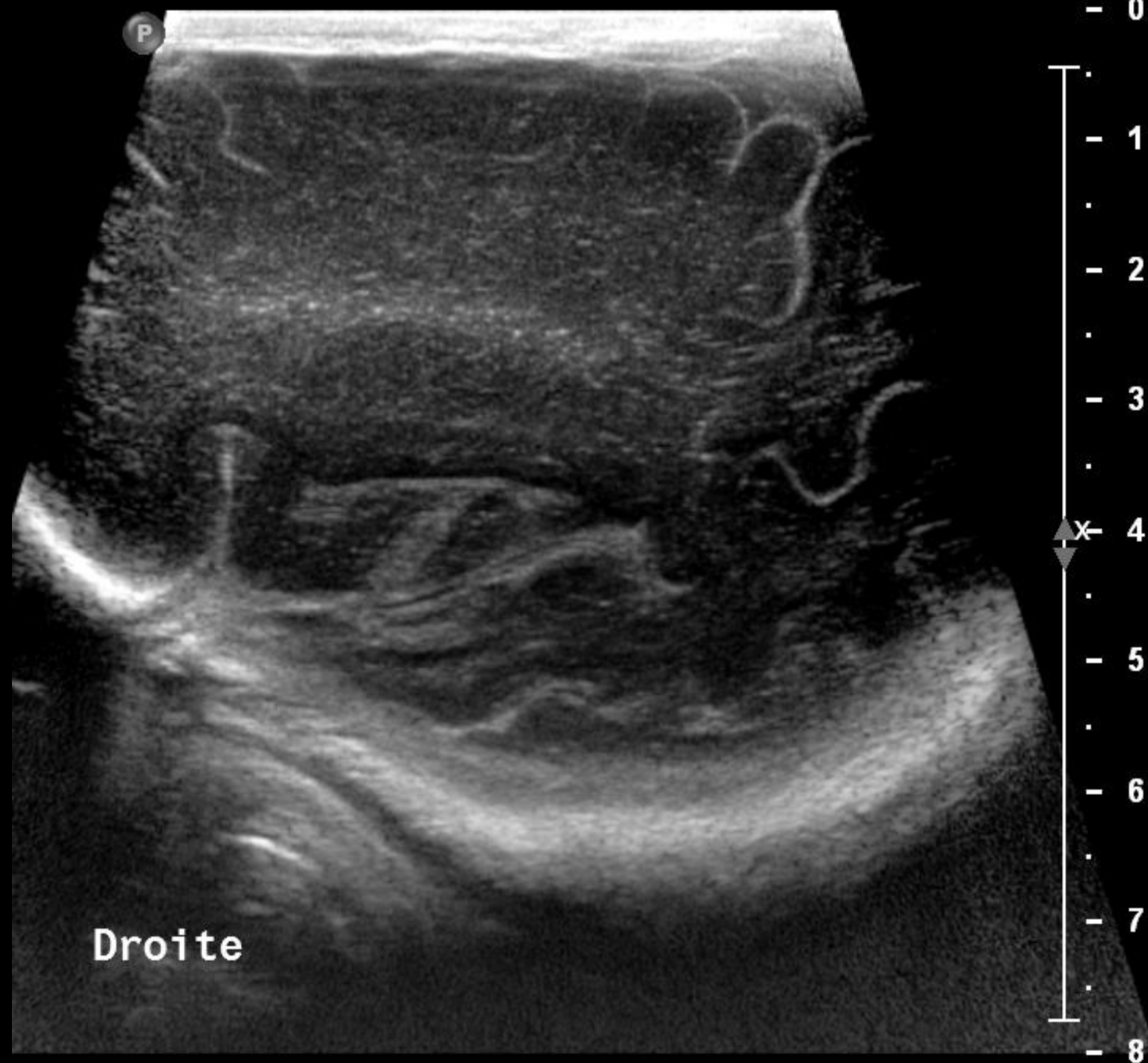




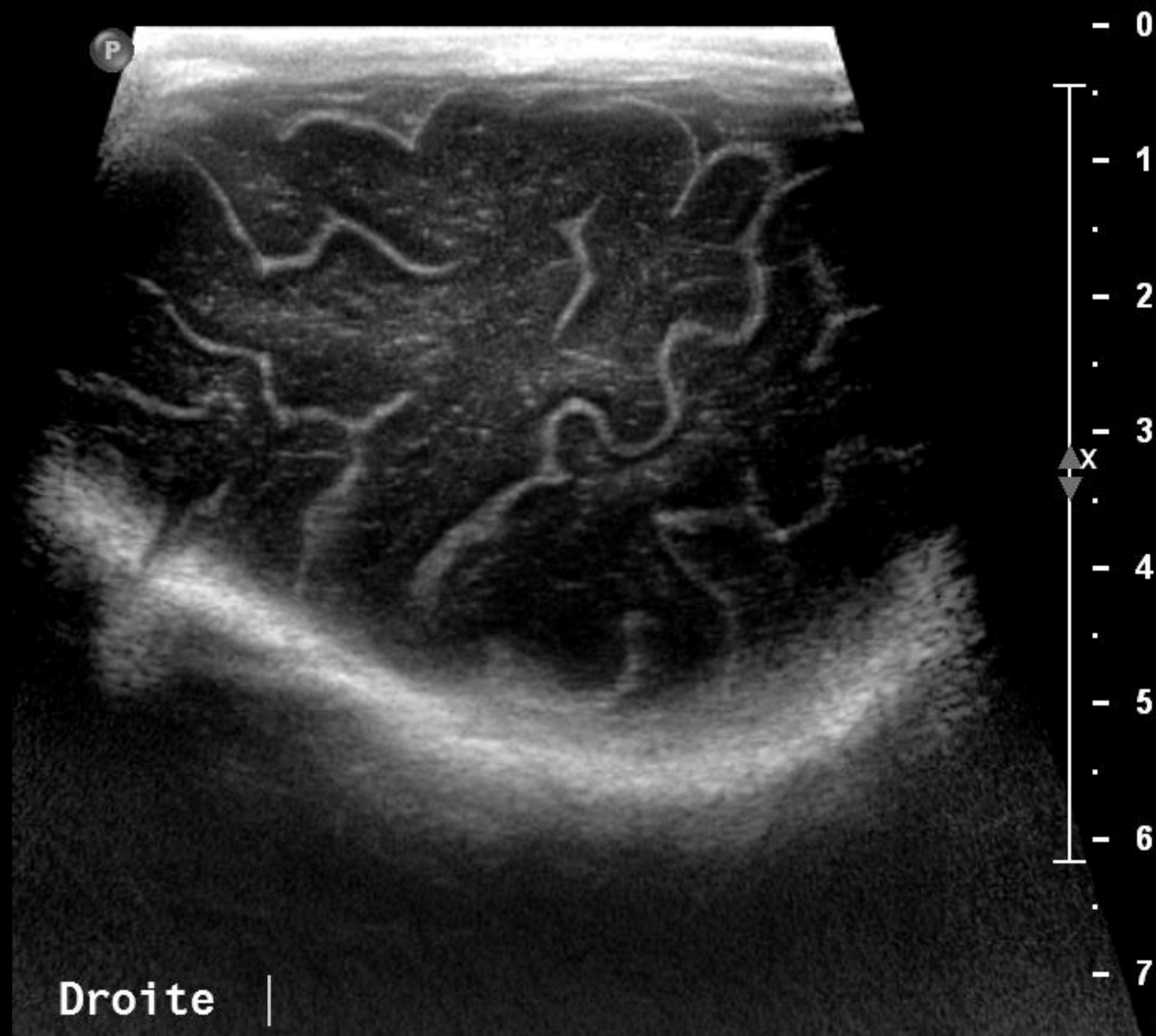


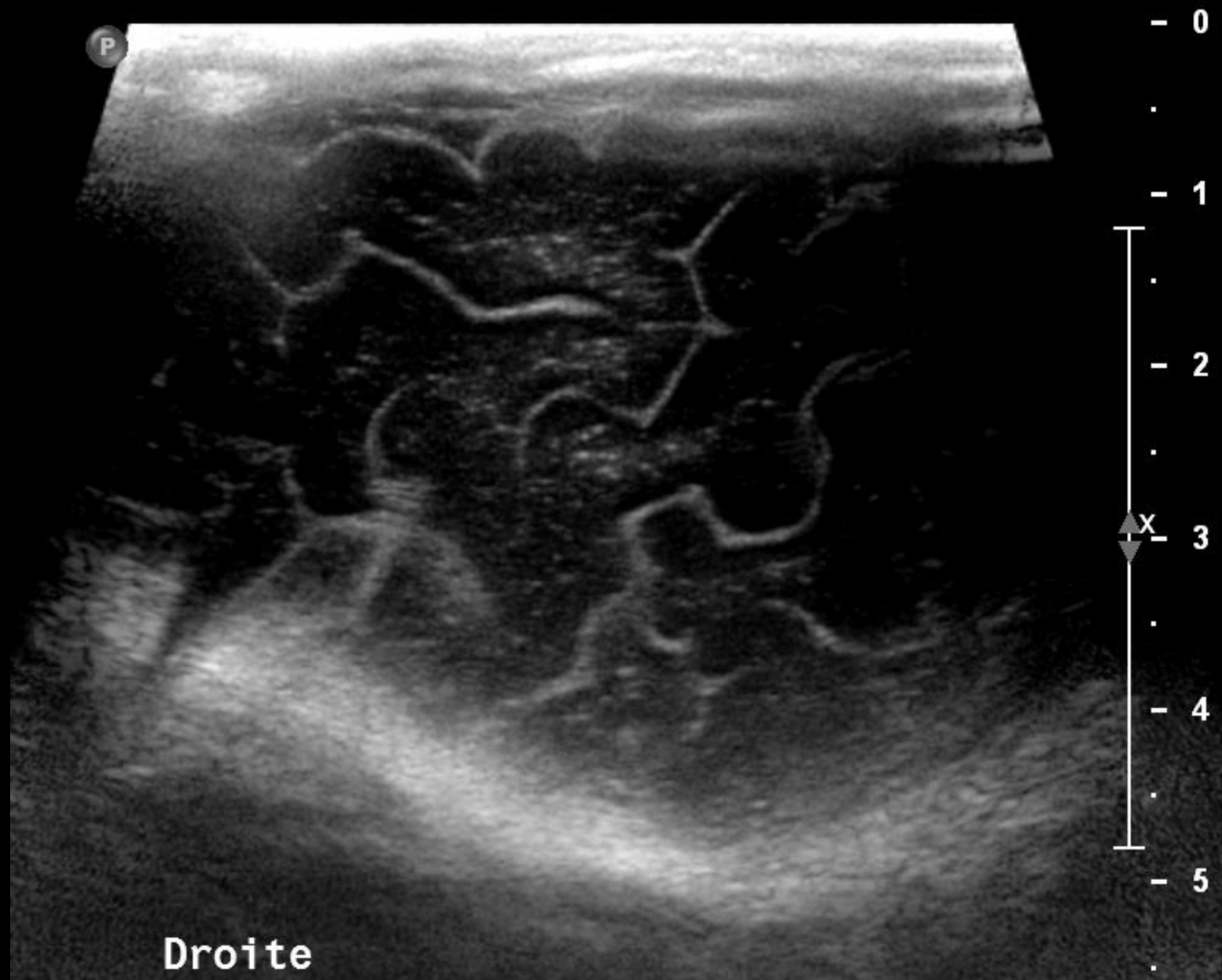












CI 7Hz
P1

2D

94%
C 64
P Moy
Rés

Coul

80%
4500Hz
FP 157Hz
Bas



- 0

.

- 1

.

- 2

.

- 3

.

- 4

.

÷ VSM 35.2 cm/s

VTD 6.05 cm/s

IR 0.83

.

- 7

.

- 8

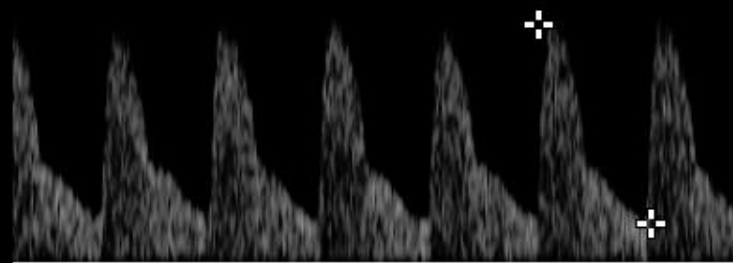
DP

12%
FP 60Hz
VE1.5mm
E3
6.0MHz
2.6cm

C3 C3
+30.1



-30.1
cm/s



-

-40

-

-20

-

- cm/s

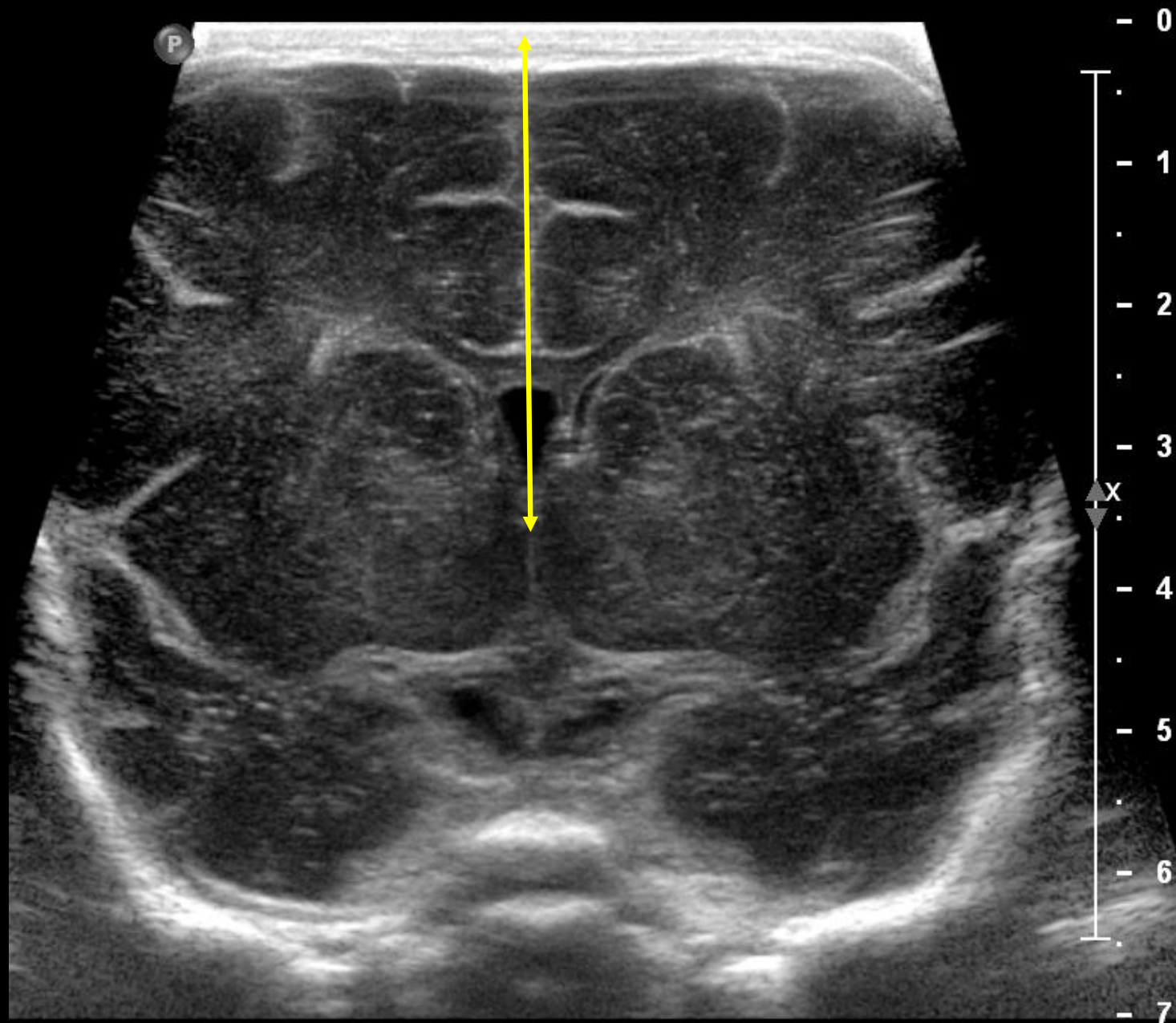
6.6s

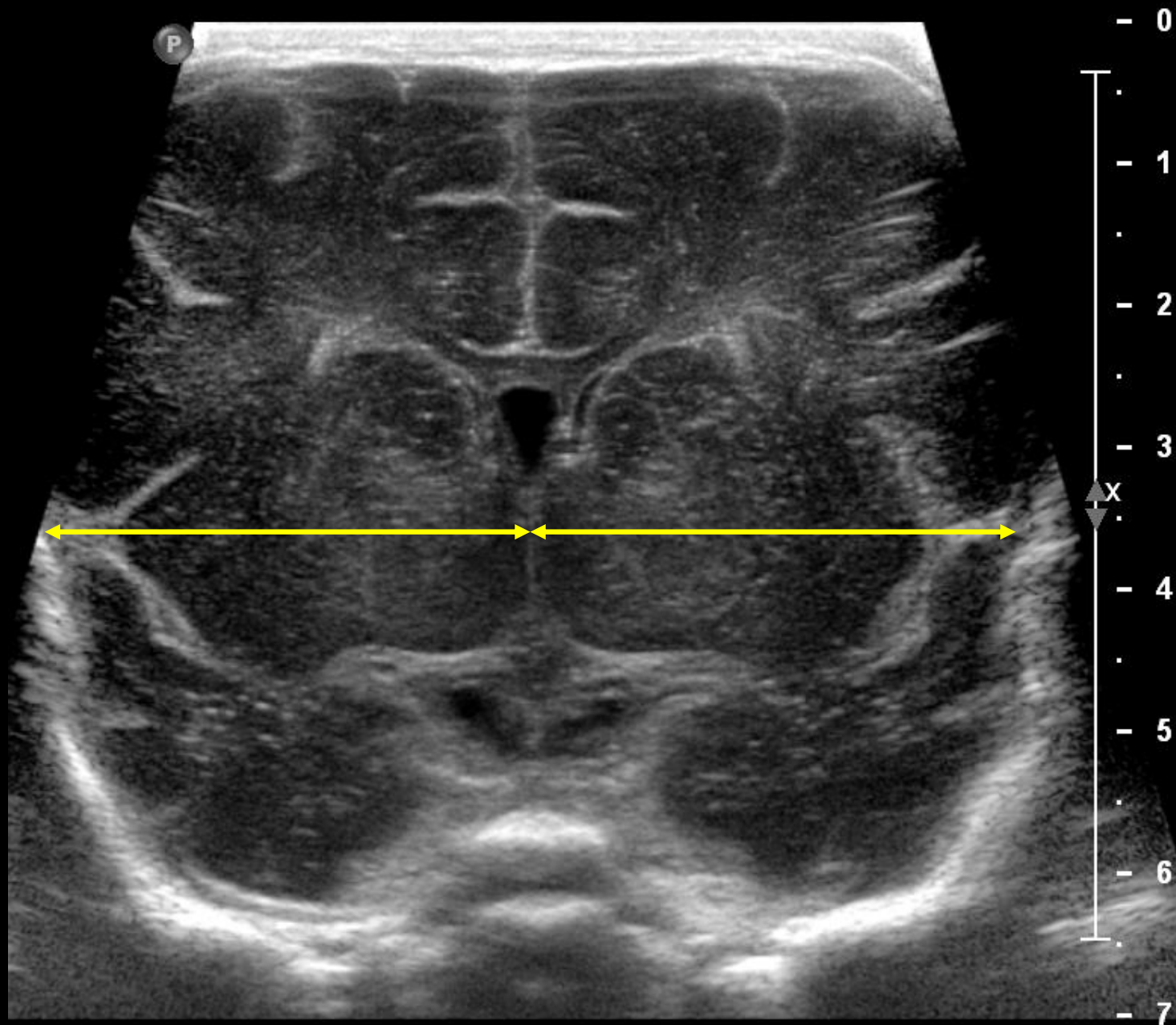


Technique élémentaire

Coupes coronales
Trois impératifs:

Au milieu
Vertical
Symétrique







ITm0.0 M

P

X

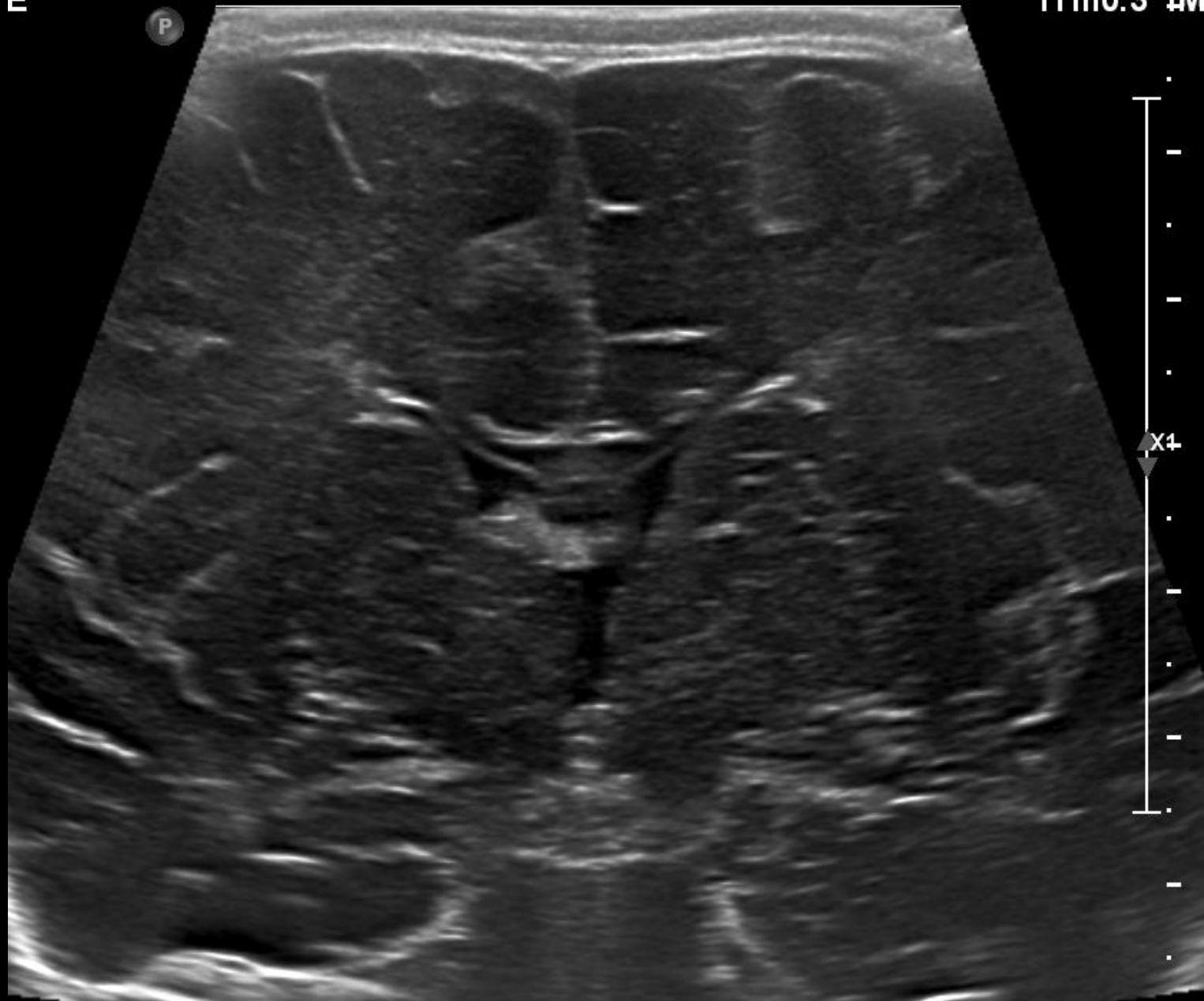
8.1cm



E

P

ITm0.3 4M



Coupes coronales

Trois impératifs:

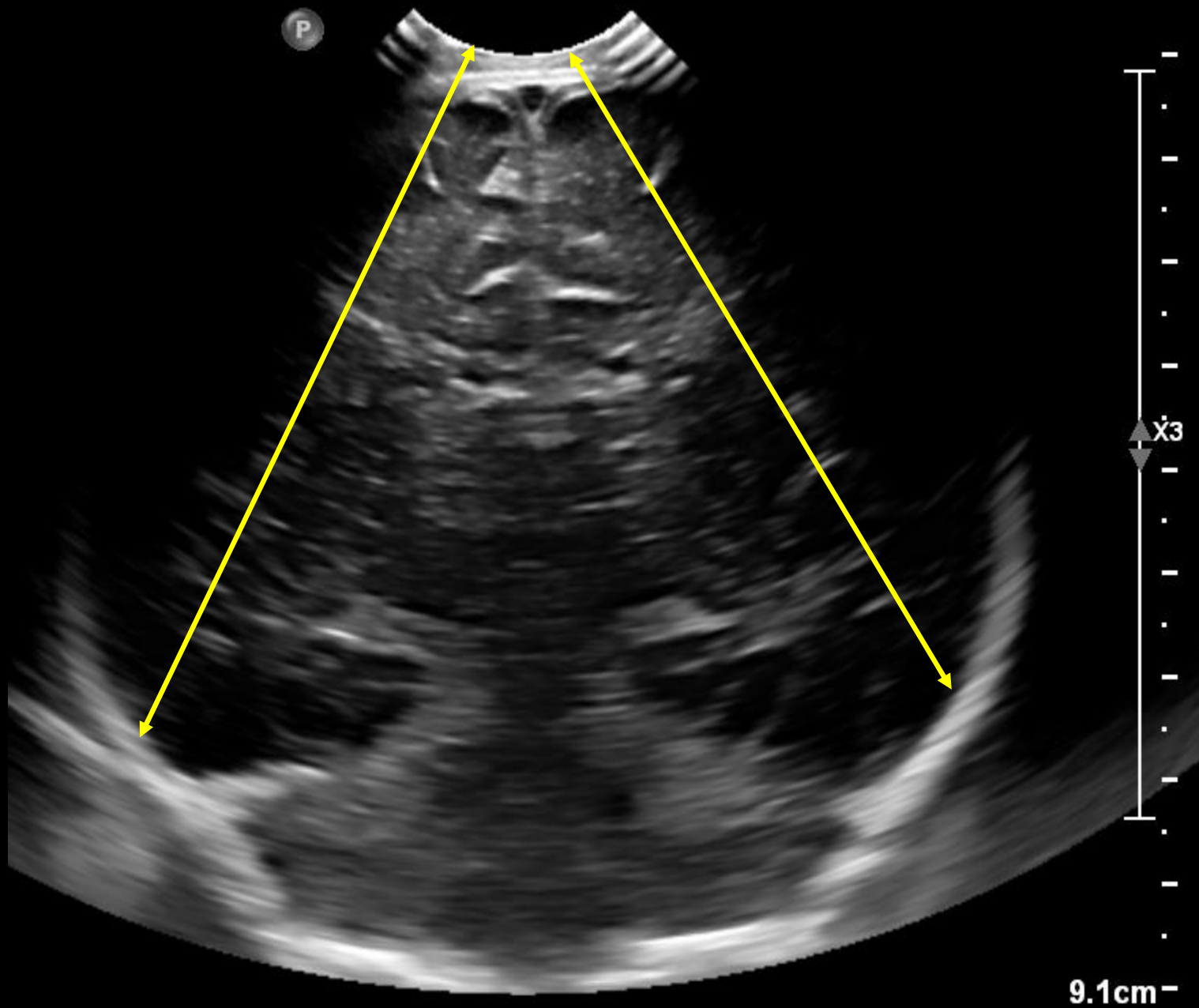
Au milieu

Vertical

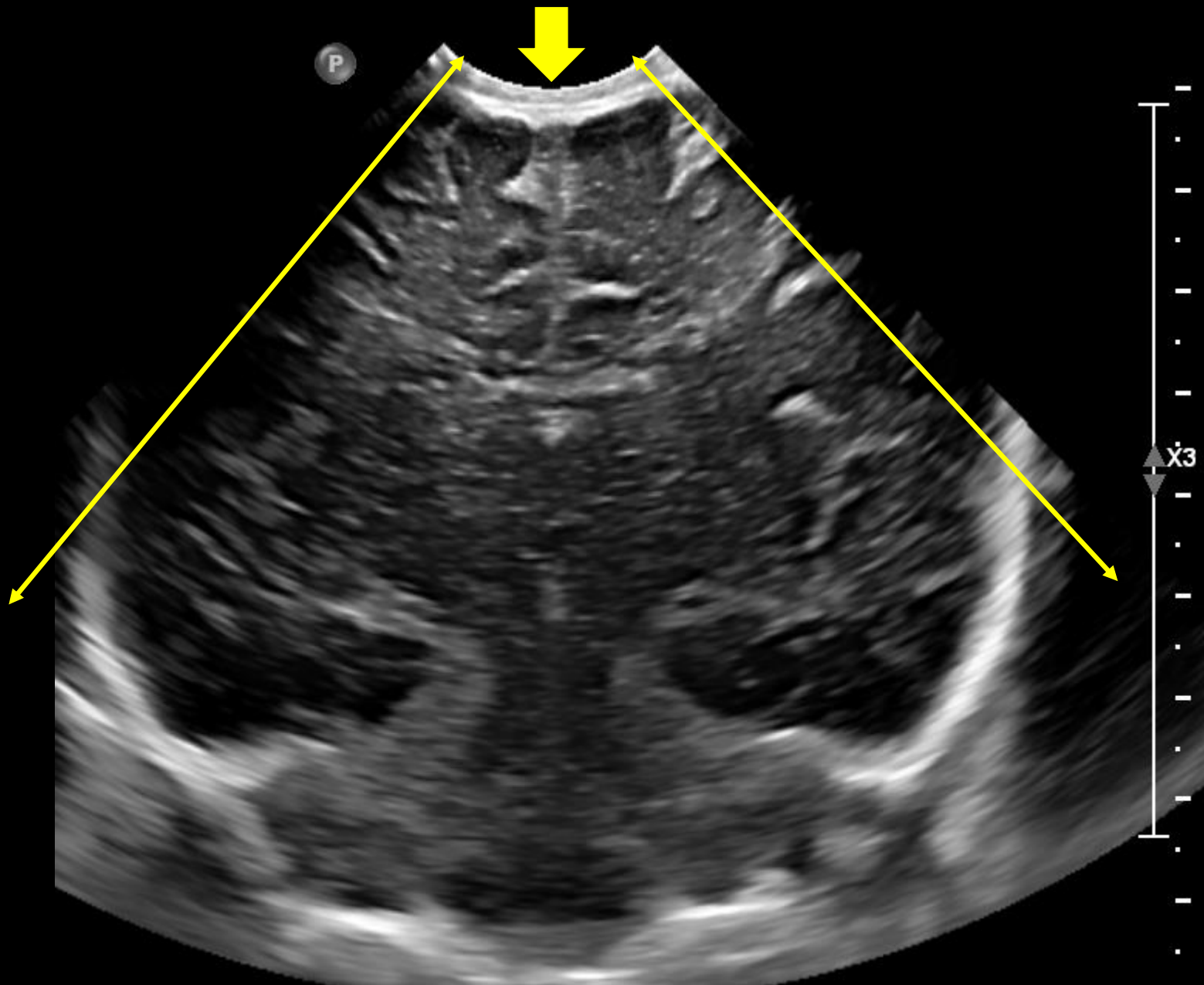
Symétrique

...et pousser

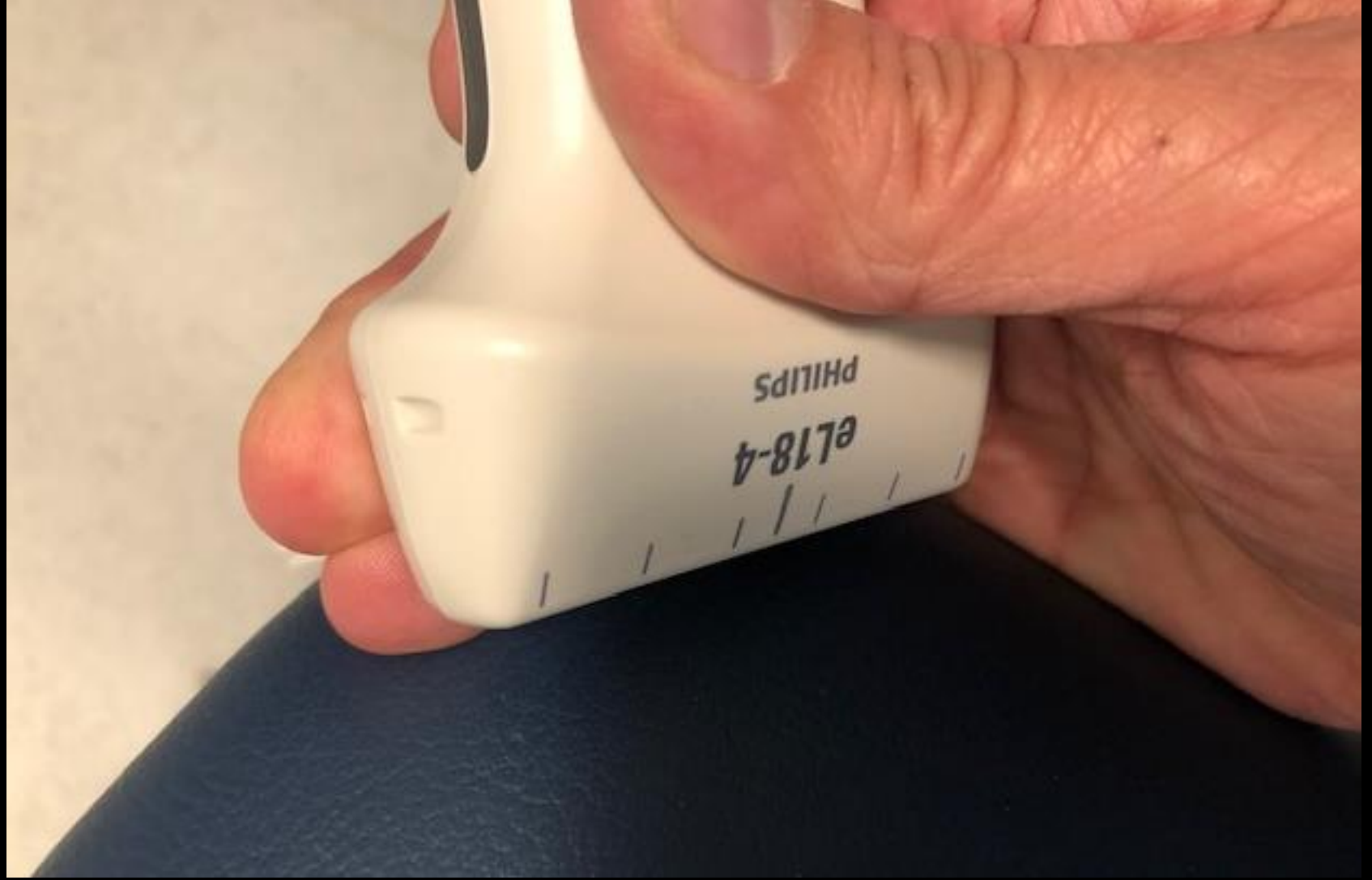




9.1cm









Pathologie

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

Infection

Trauma

Malformation

Tumeur

...

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

Infection

Trauma

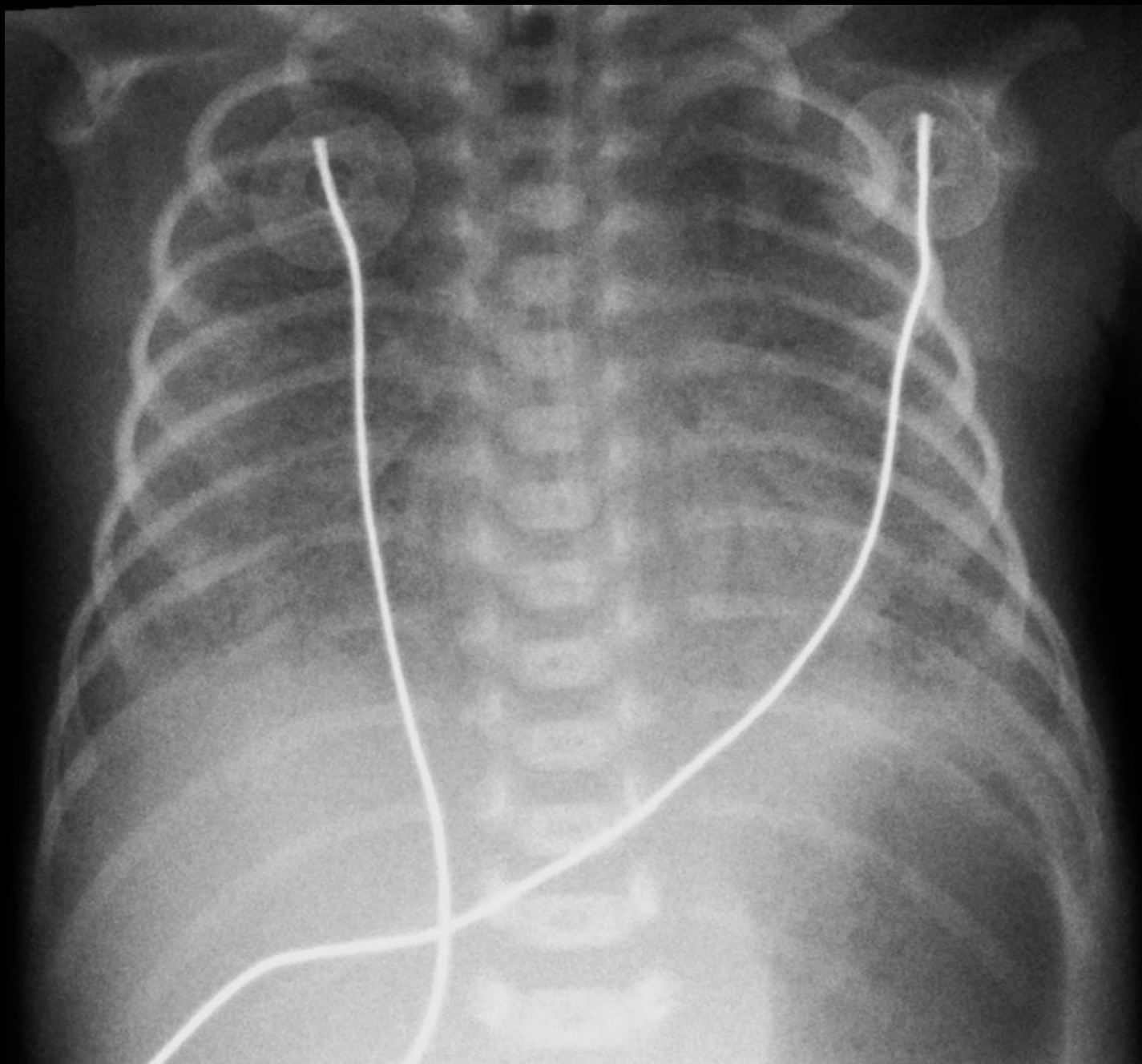
Malformation

Tumeur

...

ETF

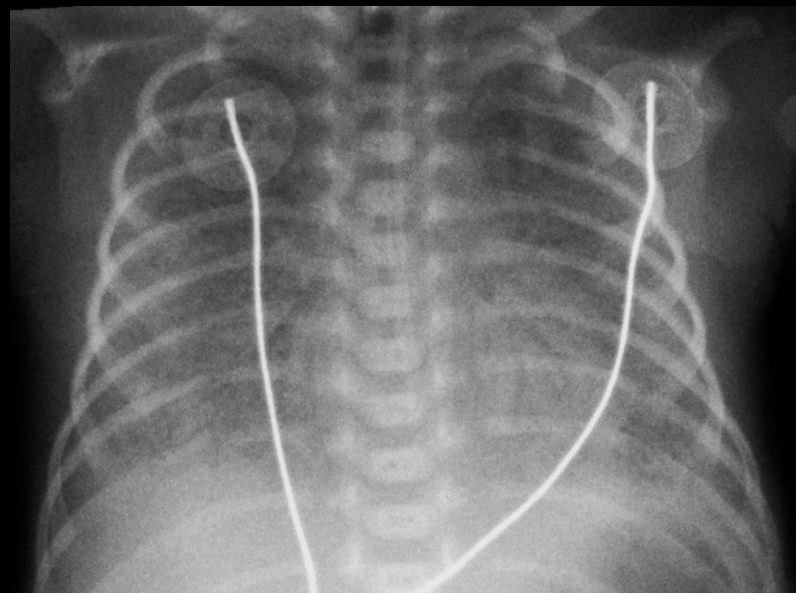
Ce qu'on vous demande en garde











Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

Infection

Trauma

Malformation

Tumeur

...

Hémorragie sous-épendymaire(HSE)



Hémorragie intraventriculaire



Hydrocephalie



Hypertension intracrânienne

Hémorragie sous-épendymaire(HSE)



Hémorragie intraventriculaire



Hydrocéphalie

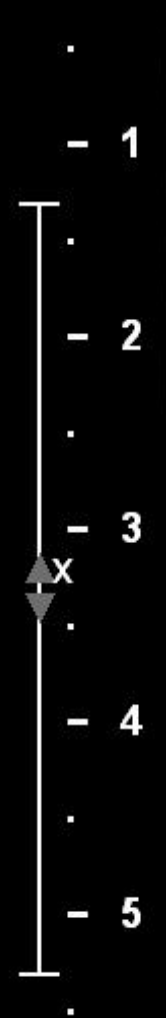


Hypertension intracrânienne

P



C



Un site préférentiel: le sillon thalamo-caudé







Hémorragie sous-épendymaire(HSE)



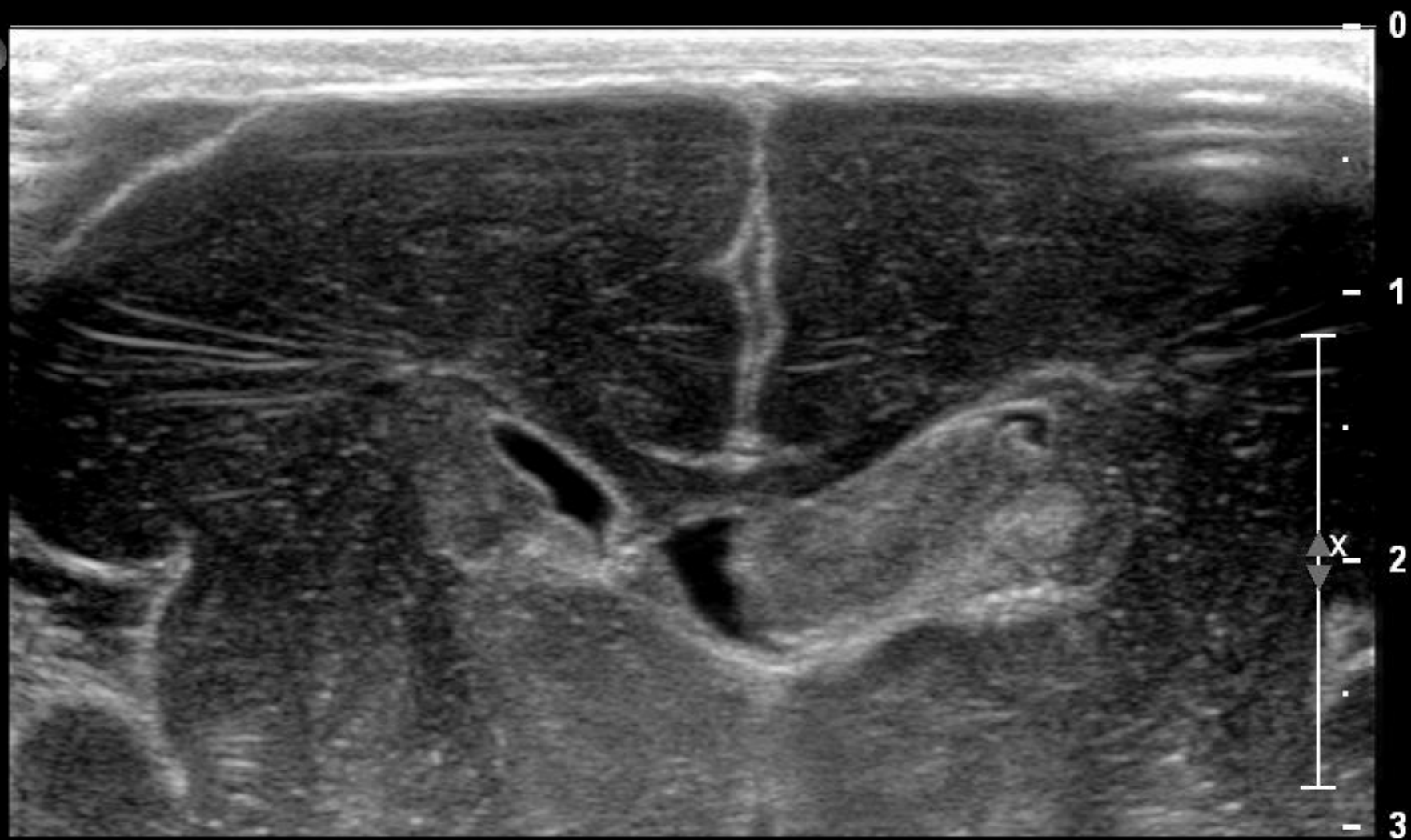
Hémorragie intraventriculaire



Hydrocephalie



Hypertension intracrânienne



CI 21Hz
RV

2D
80%
C 66
P Bas
Rés



Gauche

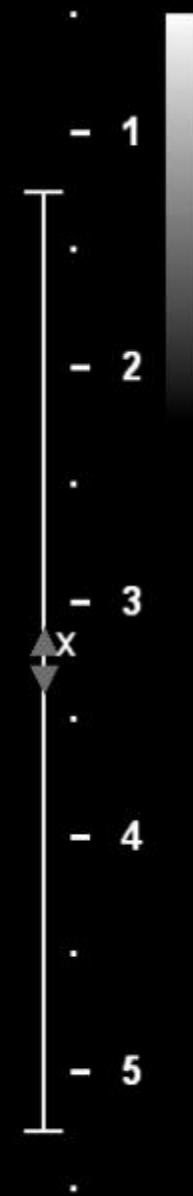
C3

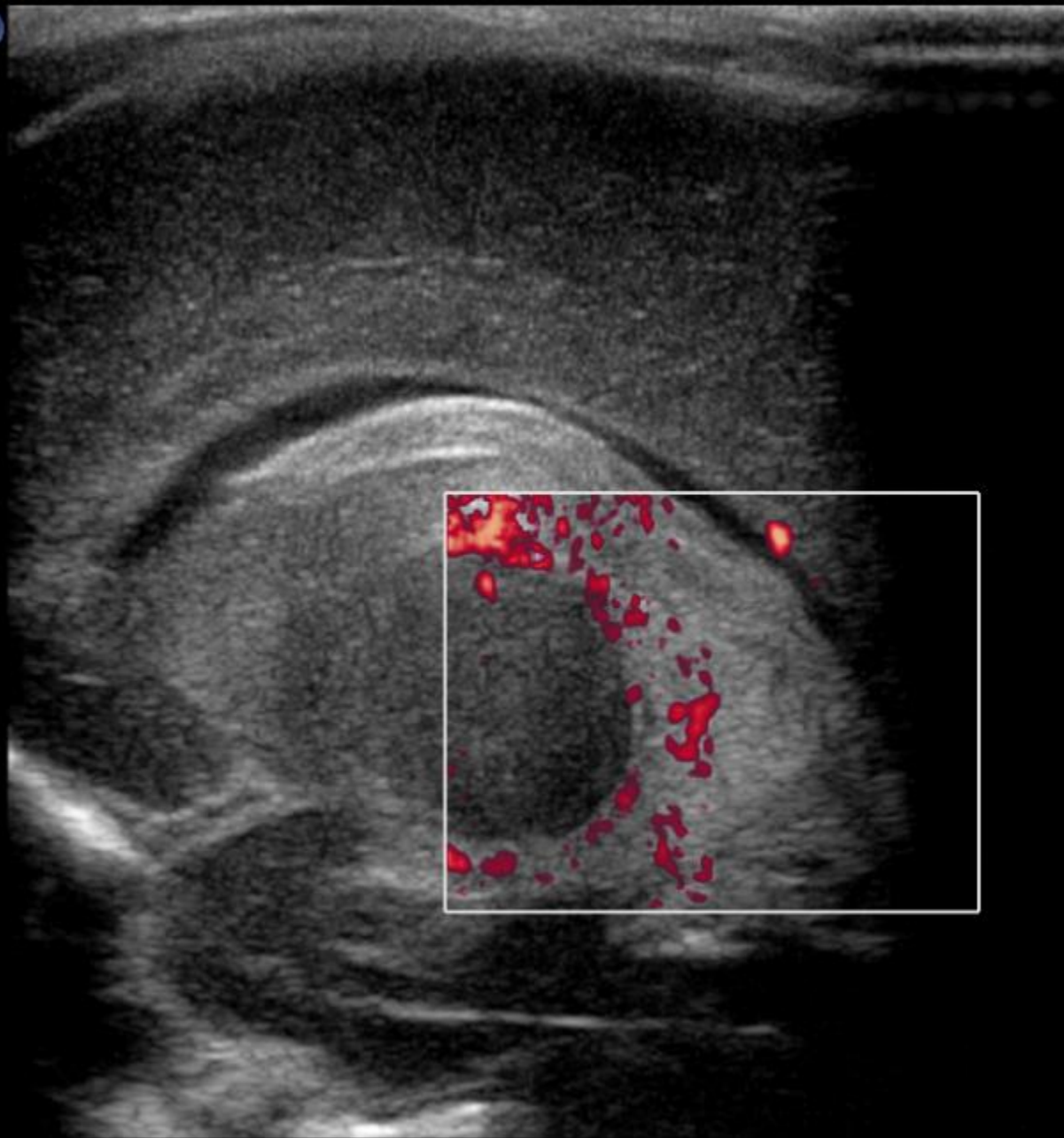
Hémorragie intraventriculaire

Toujours aussi simple ?



Plexus ou hémorragie ?





- 1

- 2

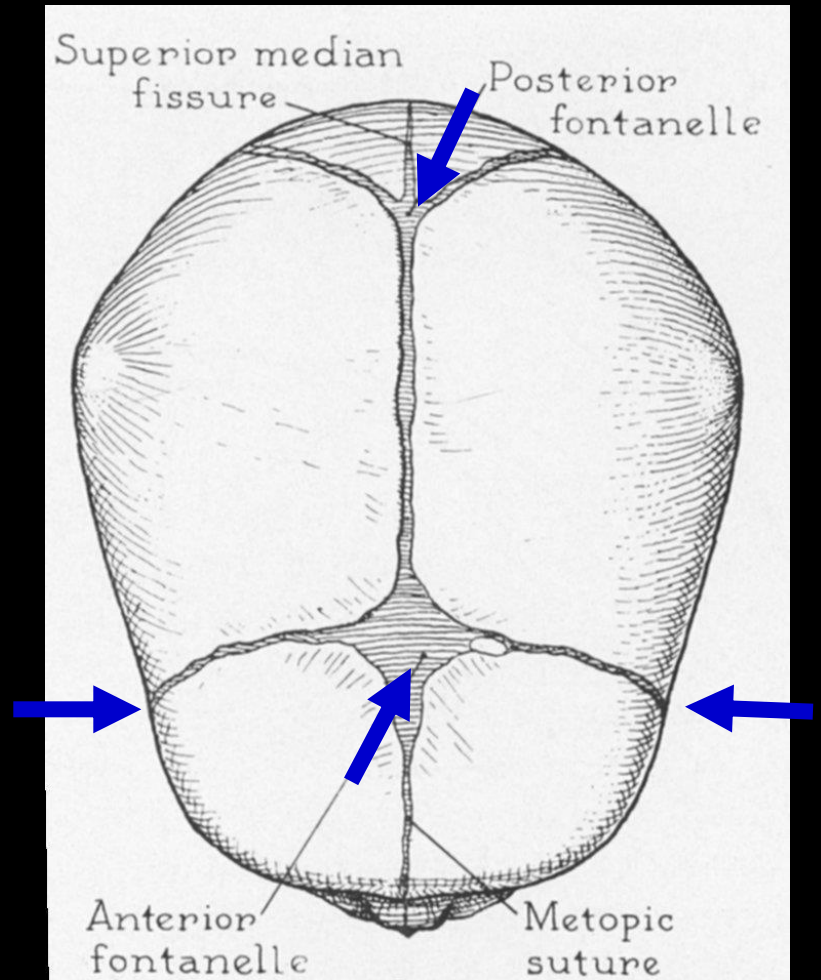
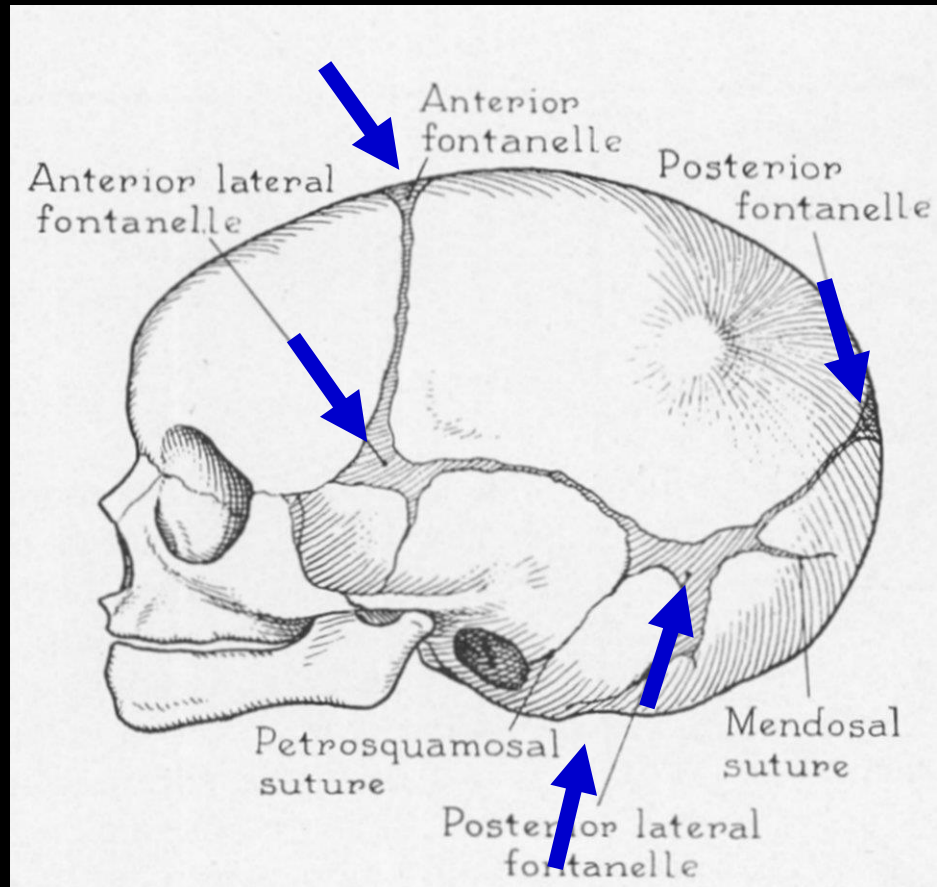
- 3

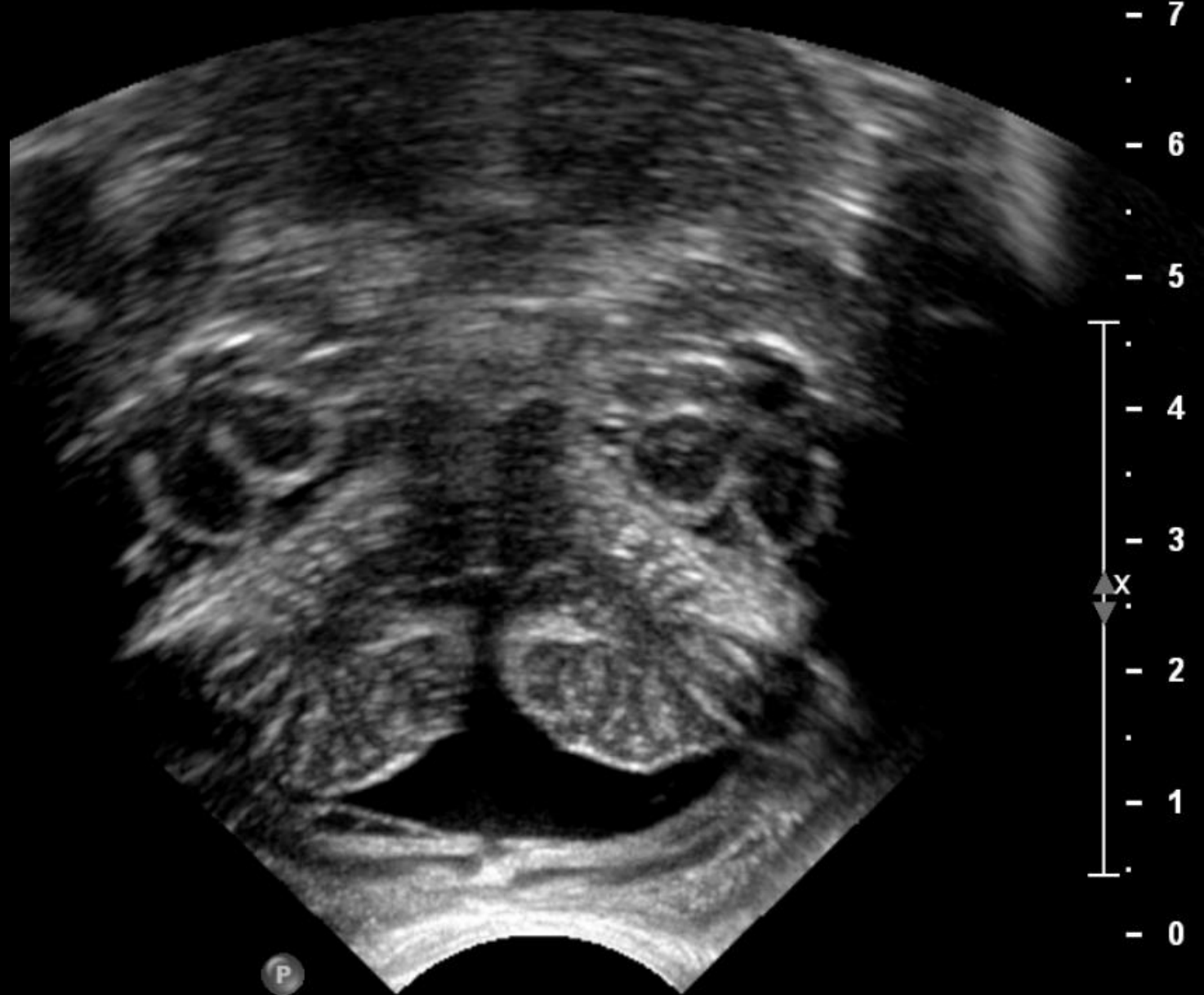
- 4

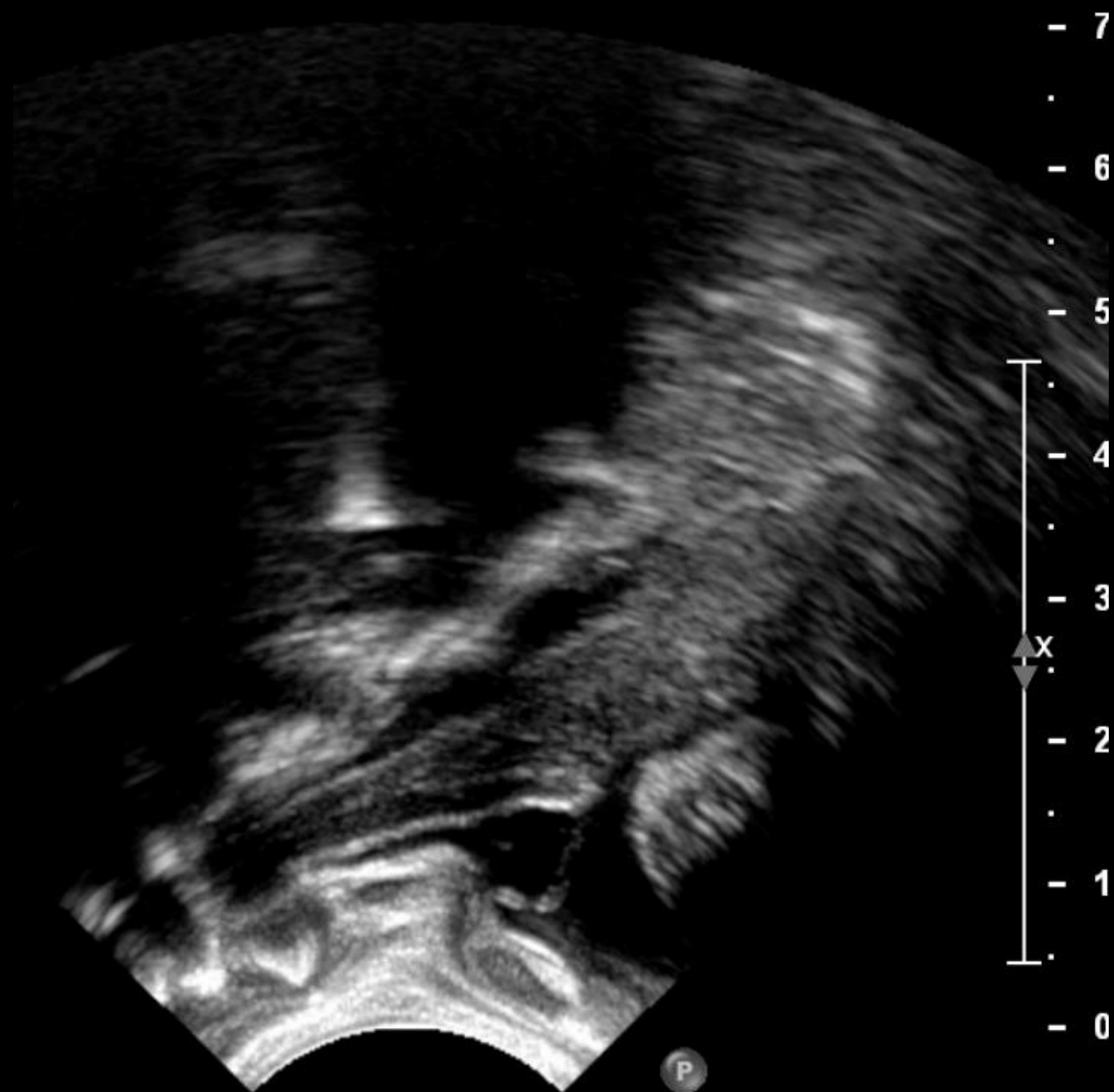
x
- 5

Hémorragie intraventriculaire

Toujours aussi simple ?







P

0

1

2

3

4

Droite



x

Hémorragie intraventriculaire

Toujours aussi simple ?

CI 19Hz
RV

2D
78%
C 70
P Bas
Rés



CI 19Hz
RV

2D
78%
C 70
P Bas
Rés



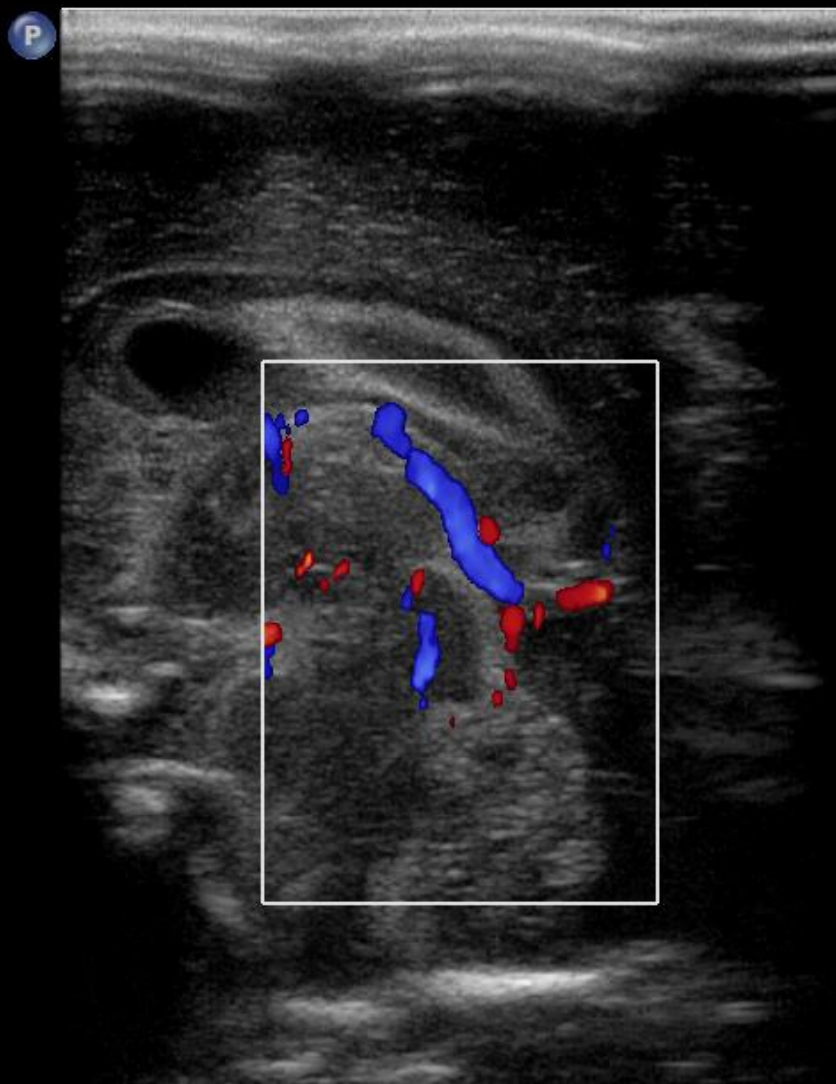
CI 7Hz
P1

2D

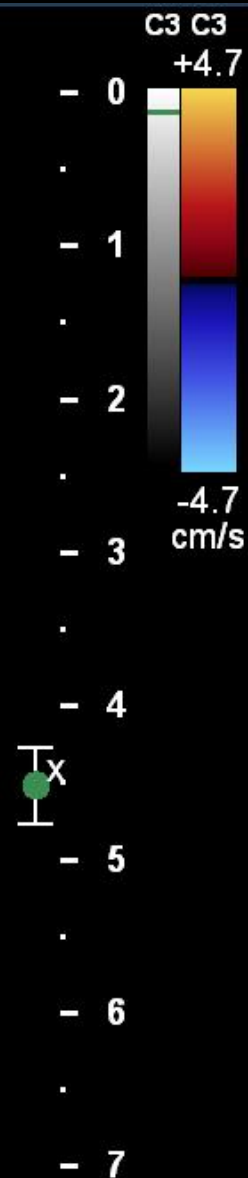
92%
C 68
P Moy
Rés

Coul

80%
700Hz
FP 38Hz
Bas



PRESS



CI 7Hz

P1

2D

92%

C 68

P Moy

Rés

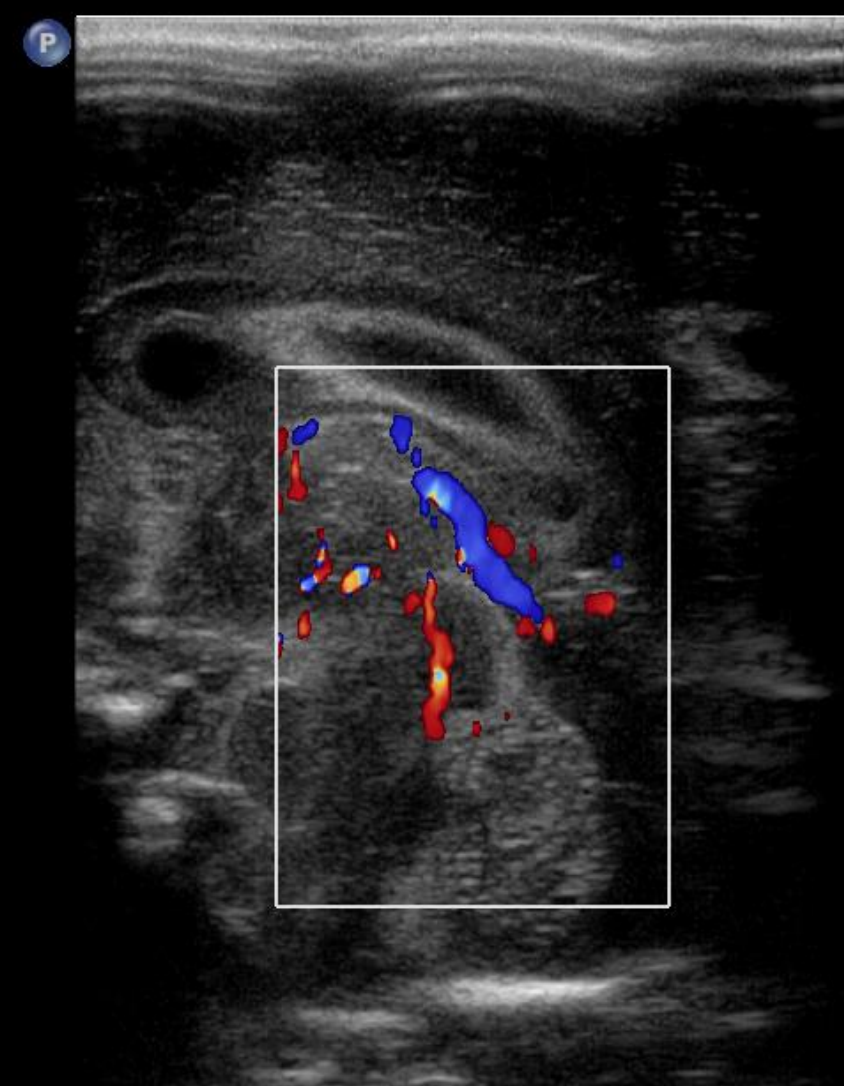
Coul

80%

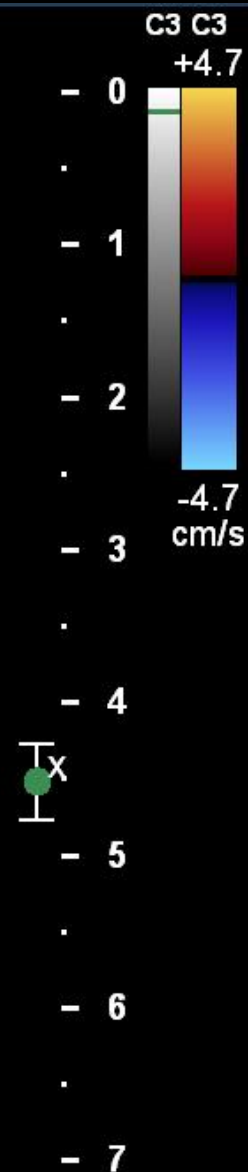
700Hz

FP 38Hz

Bas



DEPRESS



CI 9Hz
P1

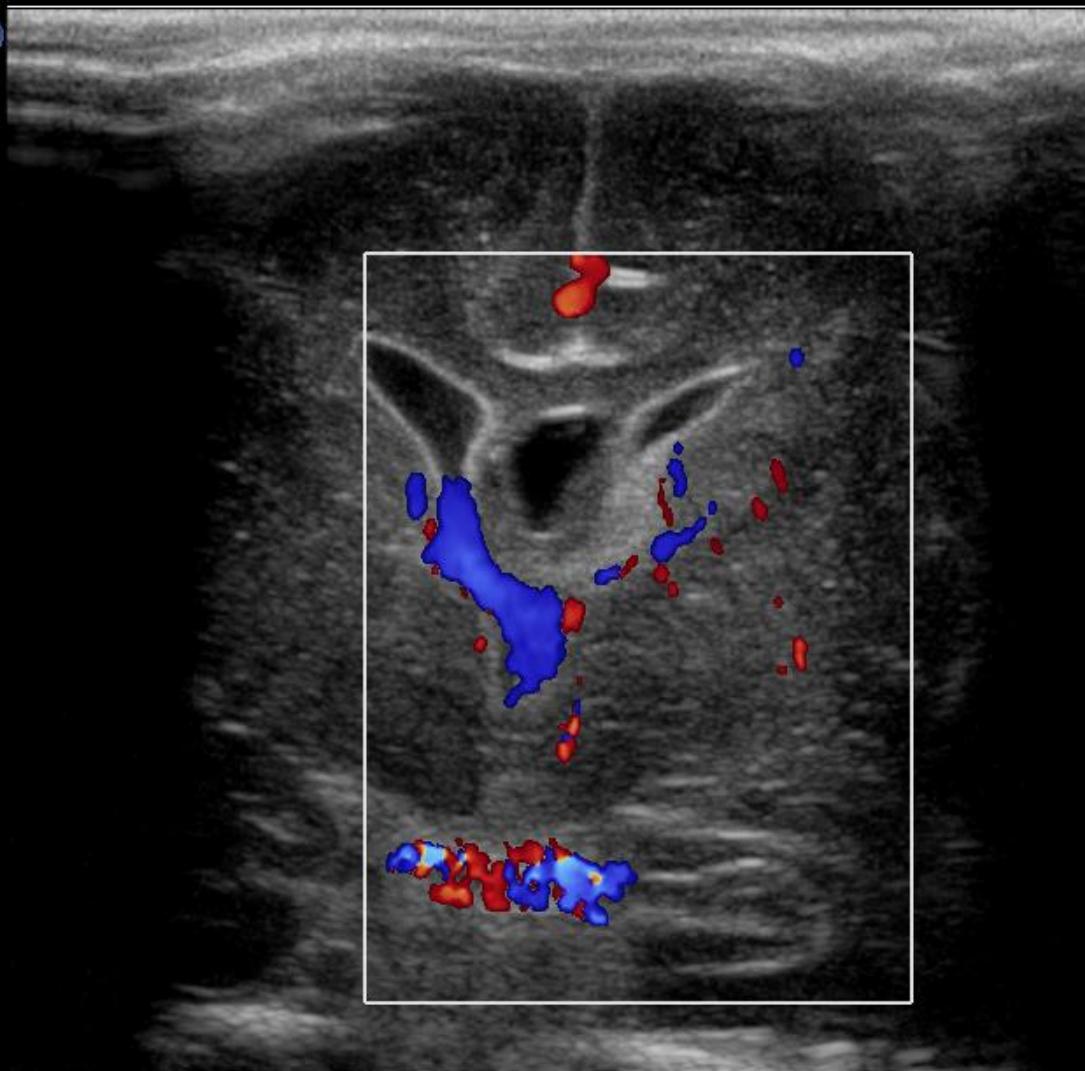
2D

90%
C 68
P Moy
Rés

Coul

80%
700Hz
FP 38Hz
Bas

P



PRESS

C3 C3
+4.7

- 0

.

- 1

.

- 2

.

- 3

.

- 4

.

- 5



CI 9Hz
P1

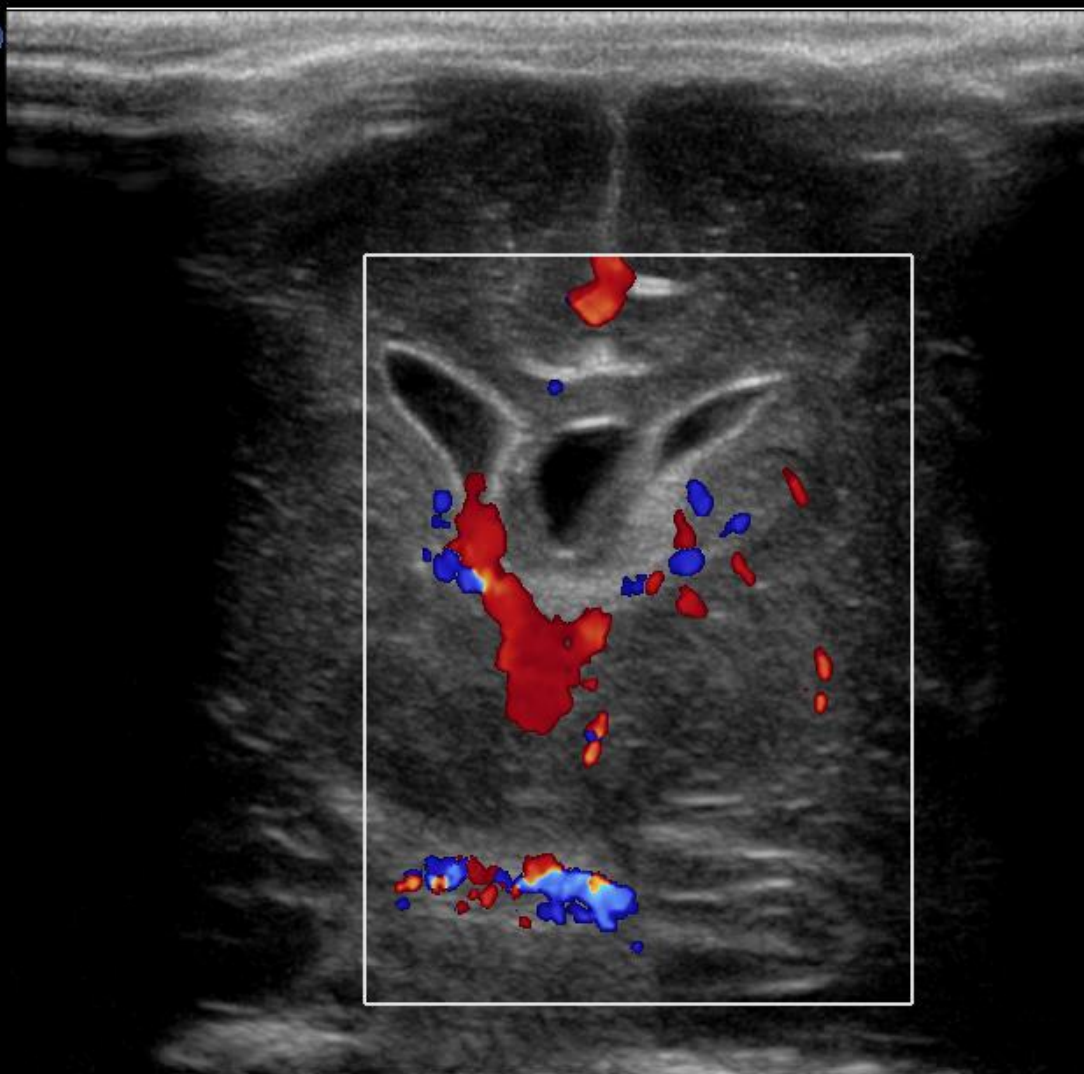
2D

90%
C 68
P Moy
Rés

Coul

80%
700Hz
FP 38Hz
Bas

P



C3 C3
+4.7

- 0

.

- 1

.

- 2

-4.7
cm/s

$\dot{x}$

- 3

.

- 4

.

- 5

DEPRESS

P



Hémorragie sous-épendymaire(HSE)



Hémorragie intraventriculaire



Hydrocephalie



Hypertension intracrânienne

CI 21Hz

RV

2D

73%

C 56

P Arrêt

Gén

C3

✚ Dist 1.21 cm
✕ Dist 1.07 cm
⊞ Dist 0.351 cm



0
1
2
3
4
5
6
7

CI 21Hz

RV

2D

73%

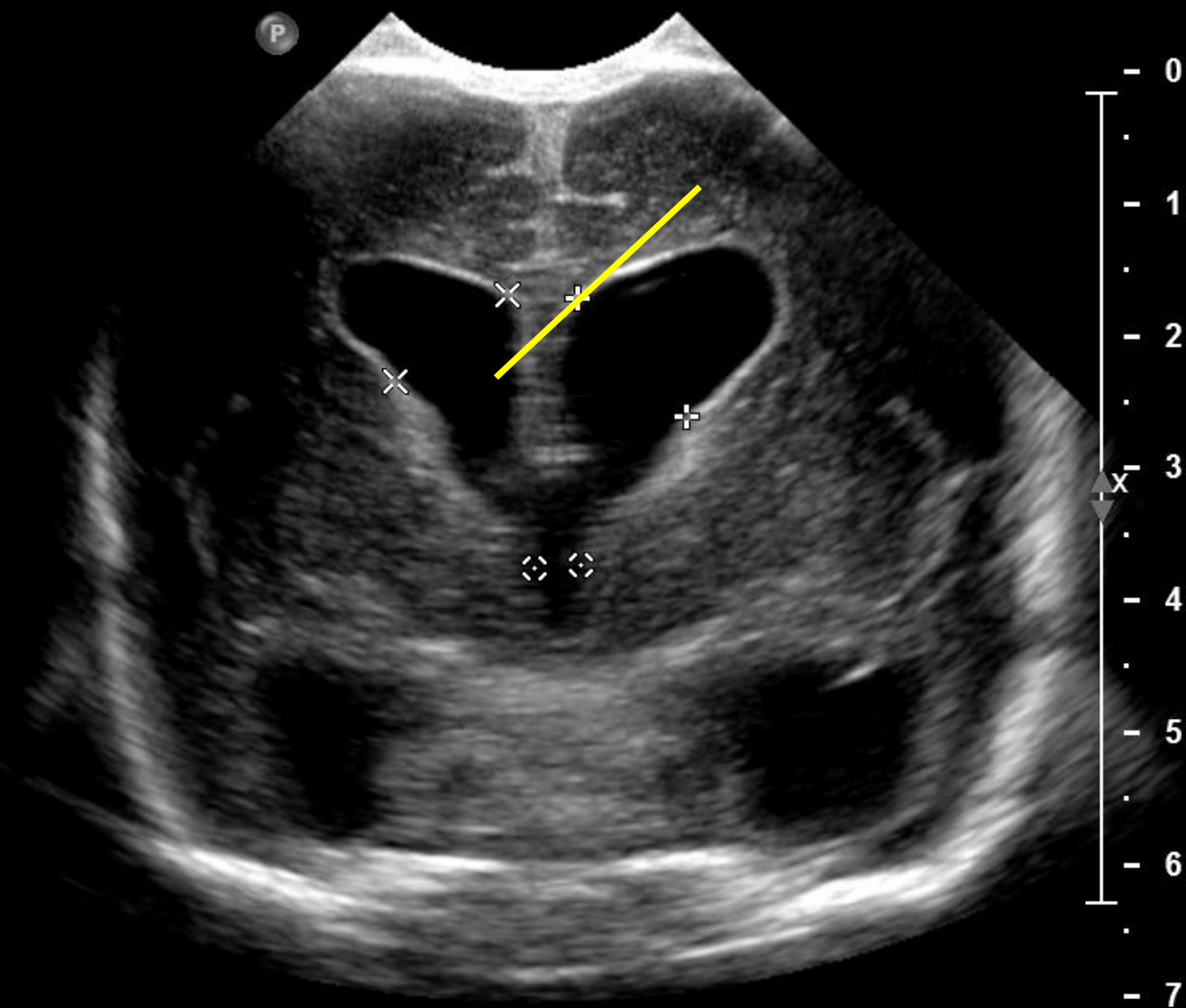
C 56

P Arrêt

Gén

C3

✚ Dist 1.21 cm
✕ Dist 1.07 cm
⊞ Dist 0.351 cm



CI 21Hz

RV

2D

73%

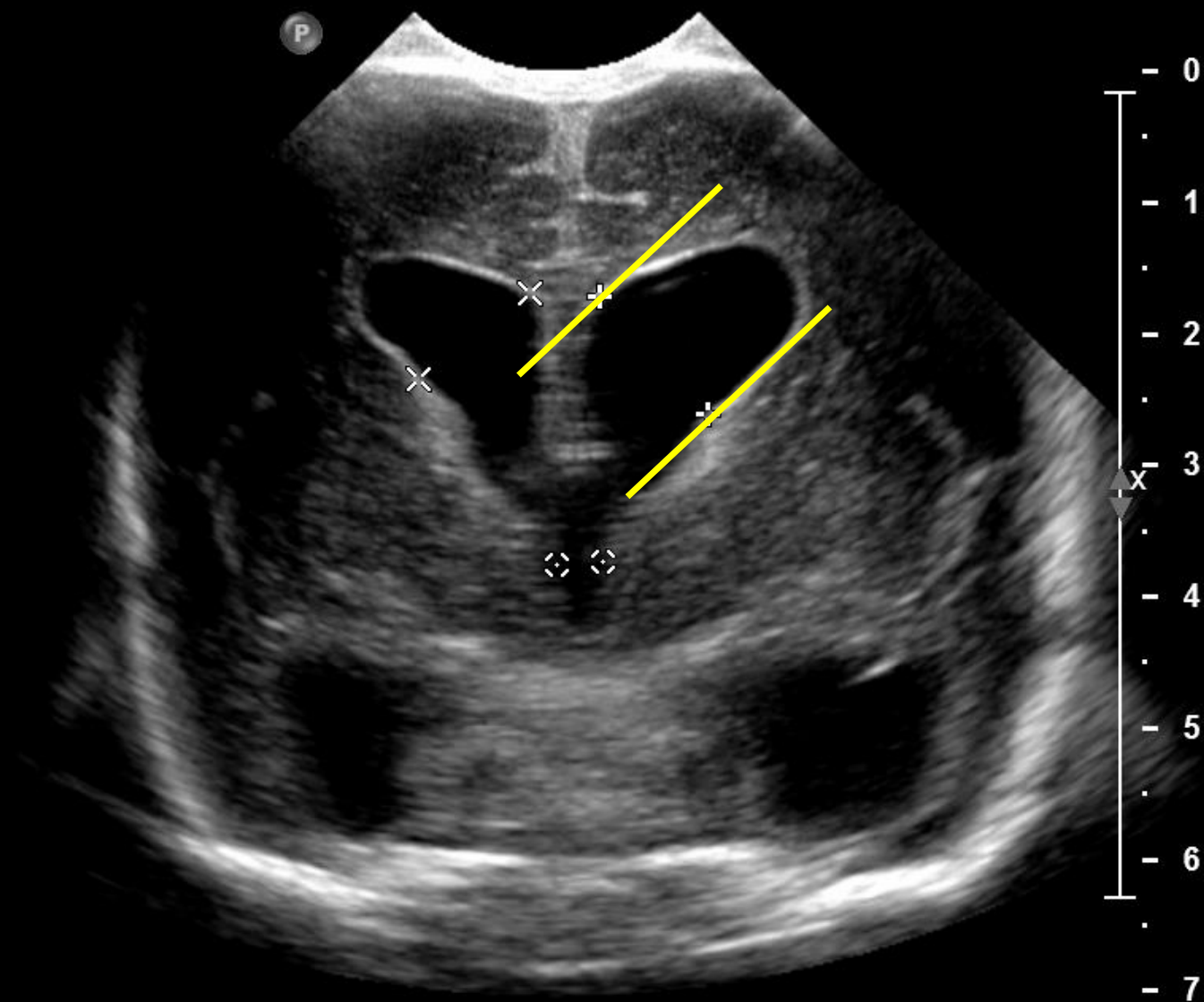
C 56

P Arrêt

Gén

C3

✦ Dist 1.21 cm
✕ Dist 1.07 cm
◇ Dist 0.351 cm



CI 21Hz

RV

2D

73%

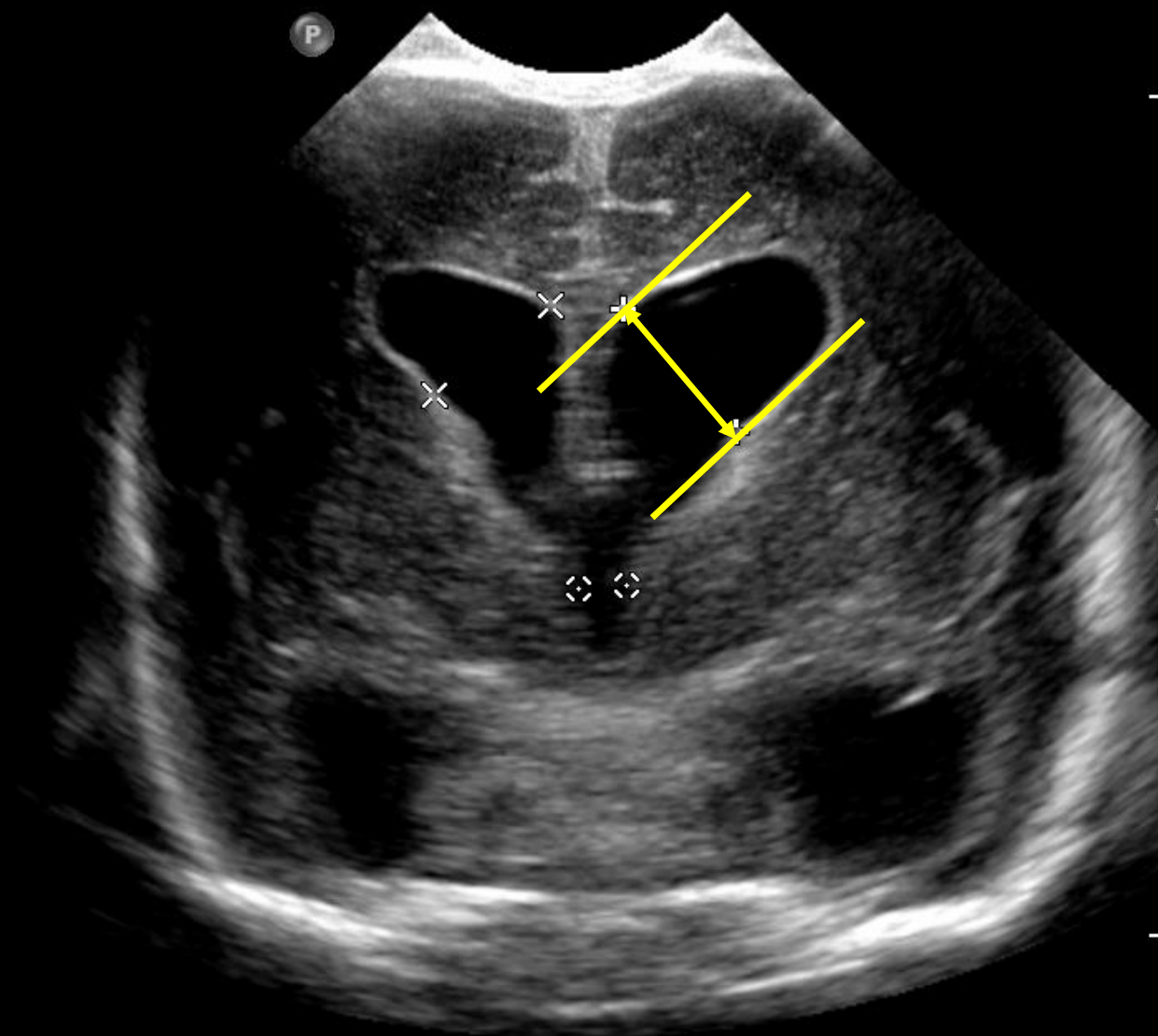
C 56

P Arrêt

Gén

C3

✦ Dist 1.21 cm
✕ Dist 1.07 cm
◇ Dist 0.351 cm



CI 27Hz
RV

2D
84%
C 55
P Arrêt
Gén

C3



Hydrocephalie

Toujours aussi clair ?



- 40 days

CI 30Hz
RV

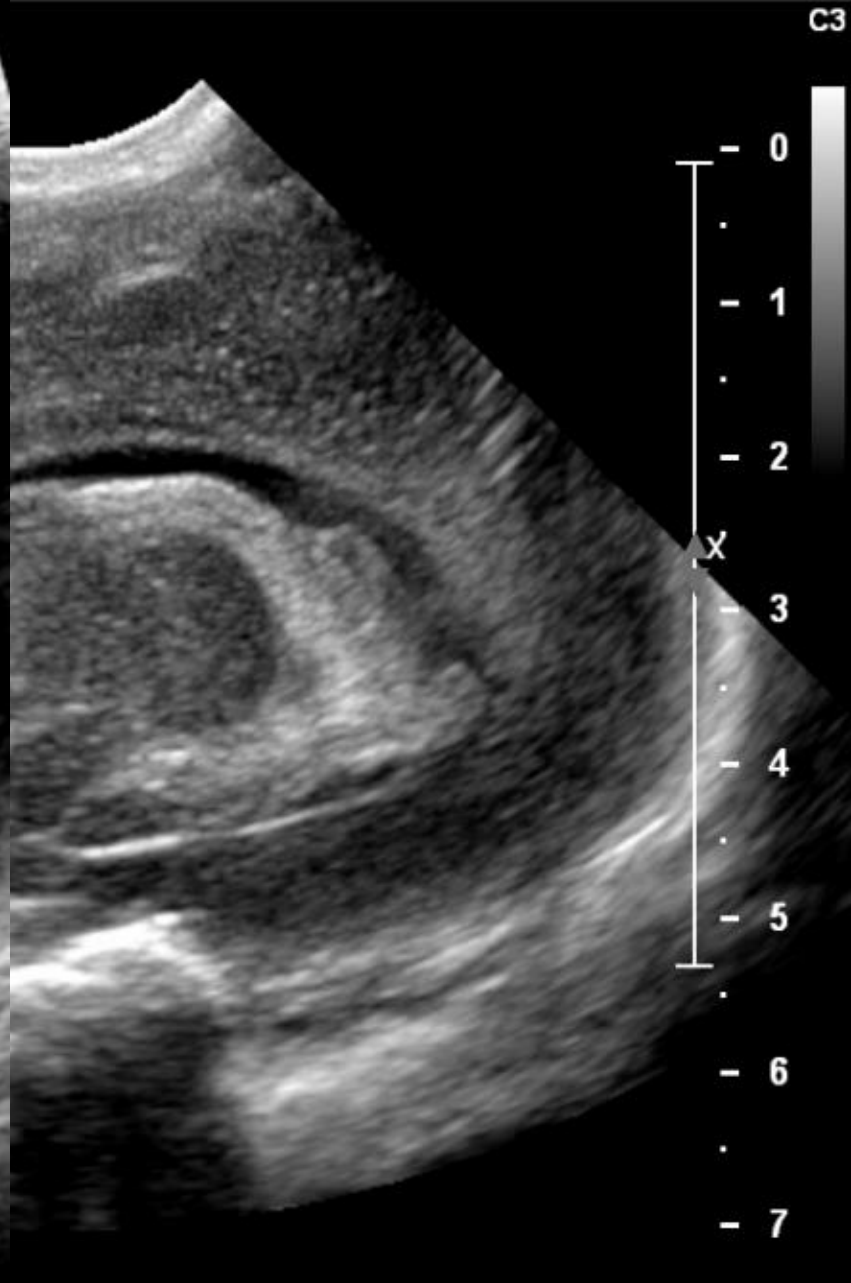
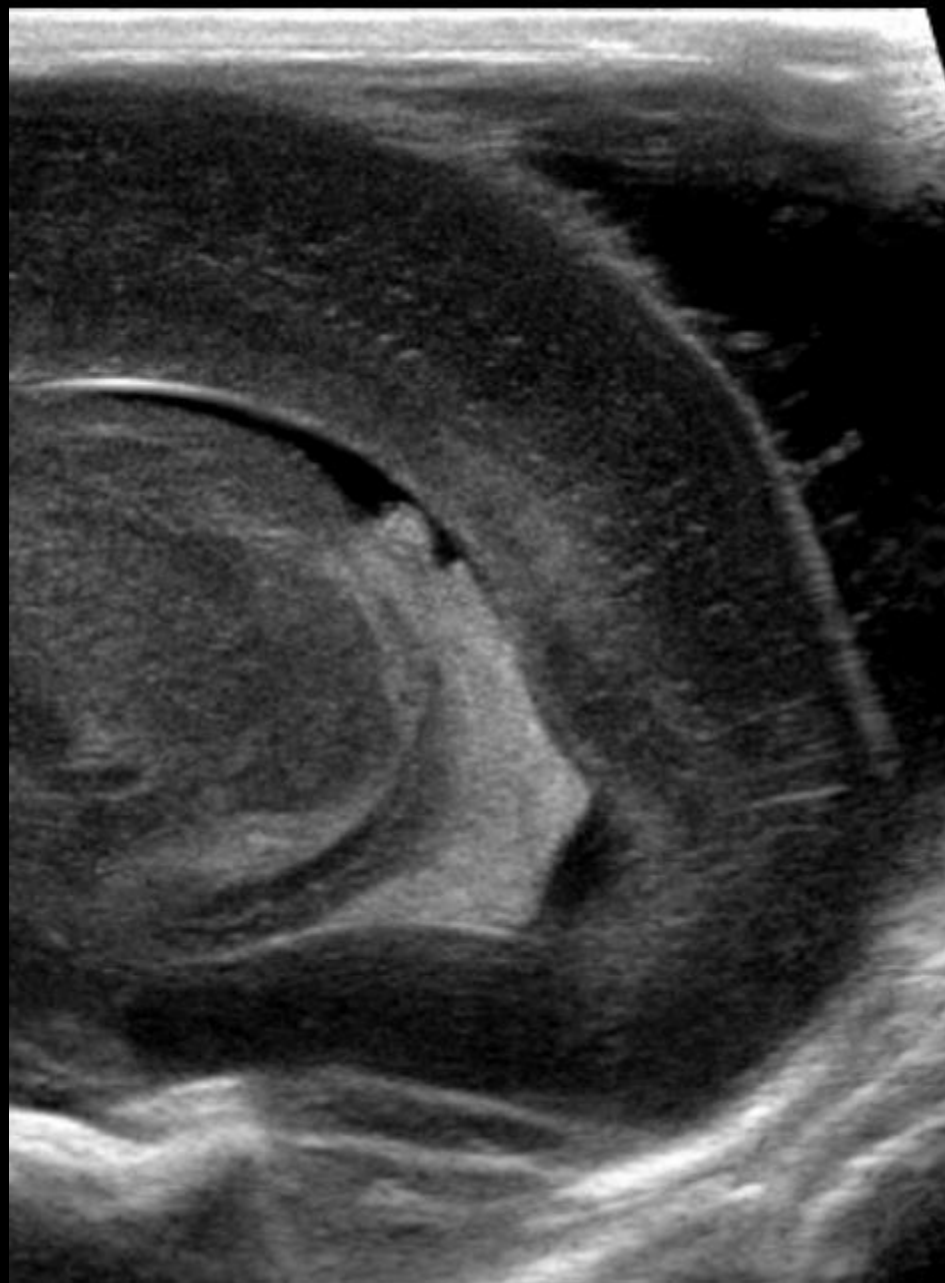
2D
72%
C 58
P Arrêt
Gén

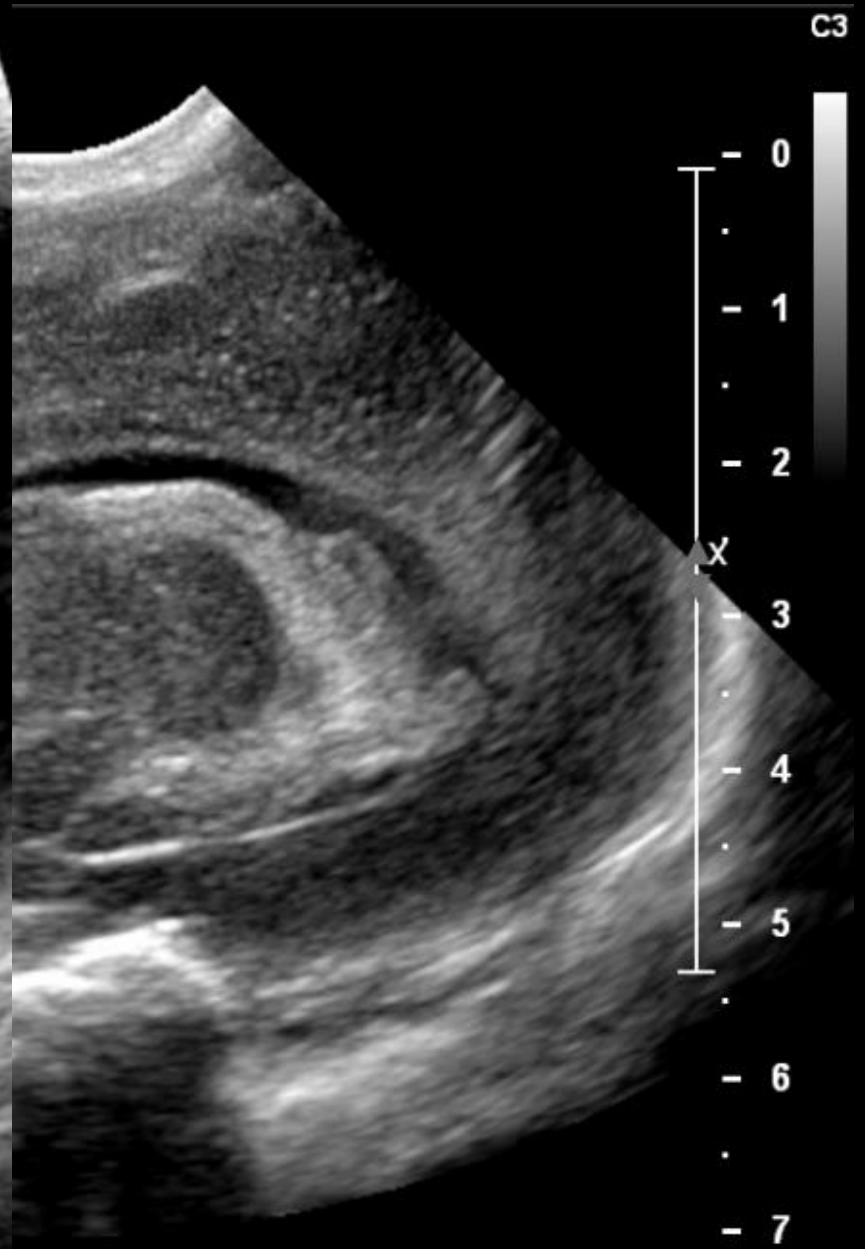
C3

GAUCHE

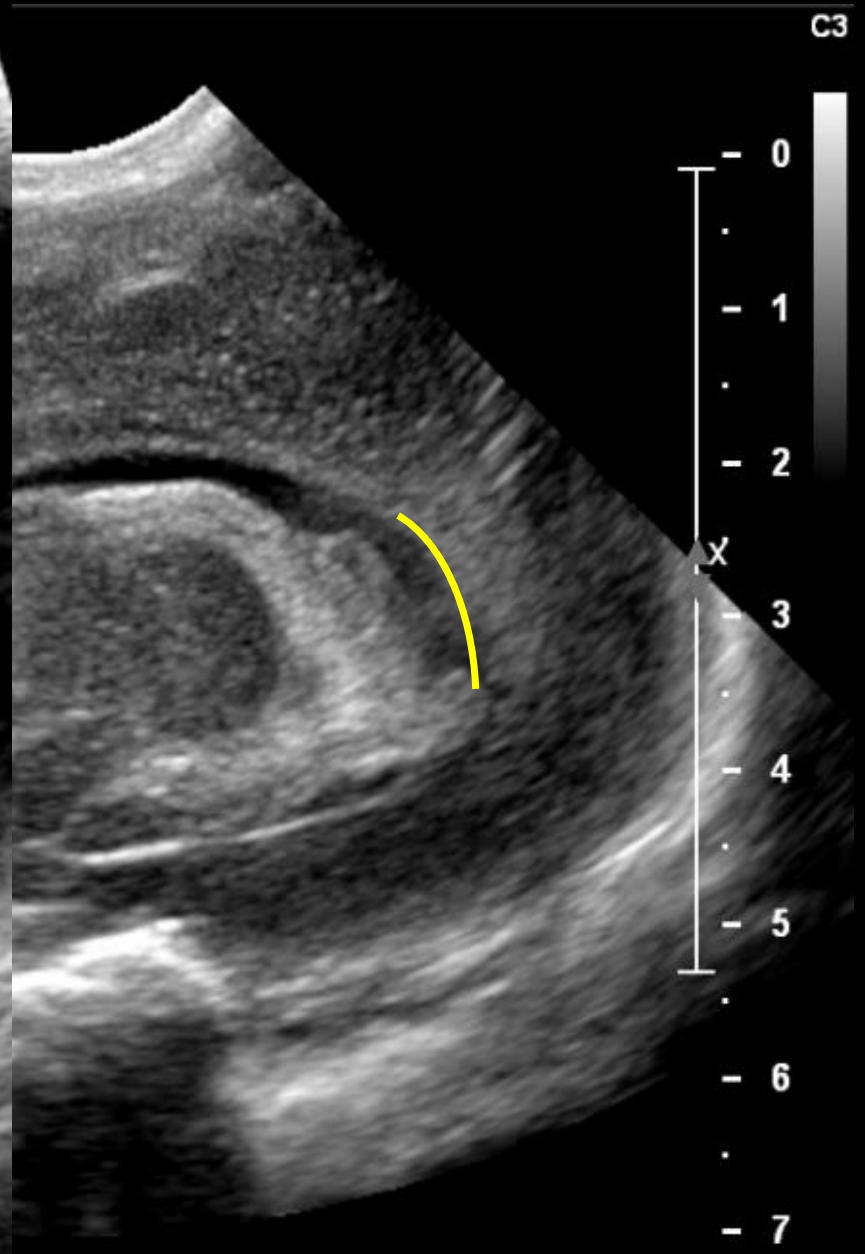


C3





- 40 days



- 40 days

Hémorragie sous-épendymaire(HSE)



Hémorragie intraventriculaire



Hydrocephalie

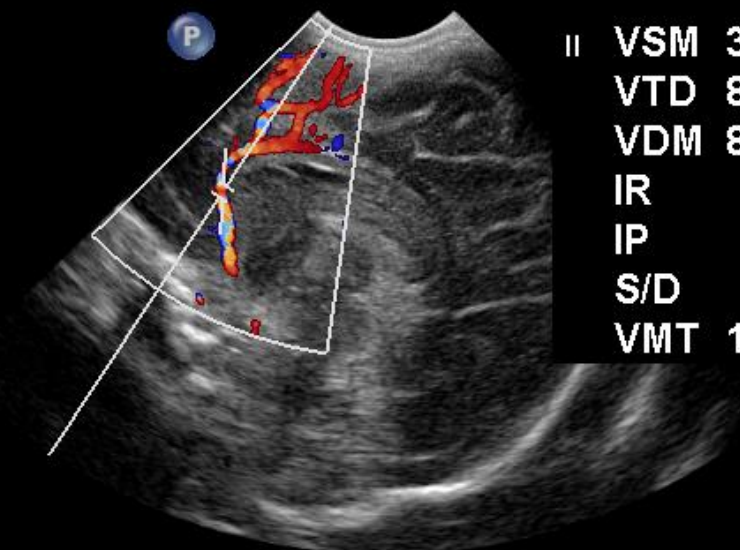


Hypertension intracrânienne

Rôle du Doppler dans le suivi de l'hydrocéphalie

CI 14Hz 30°
P1

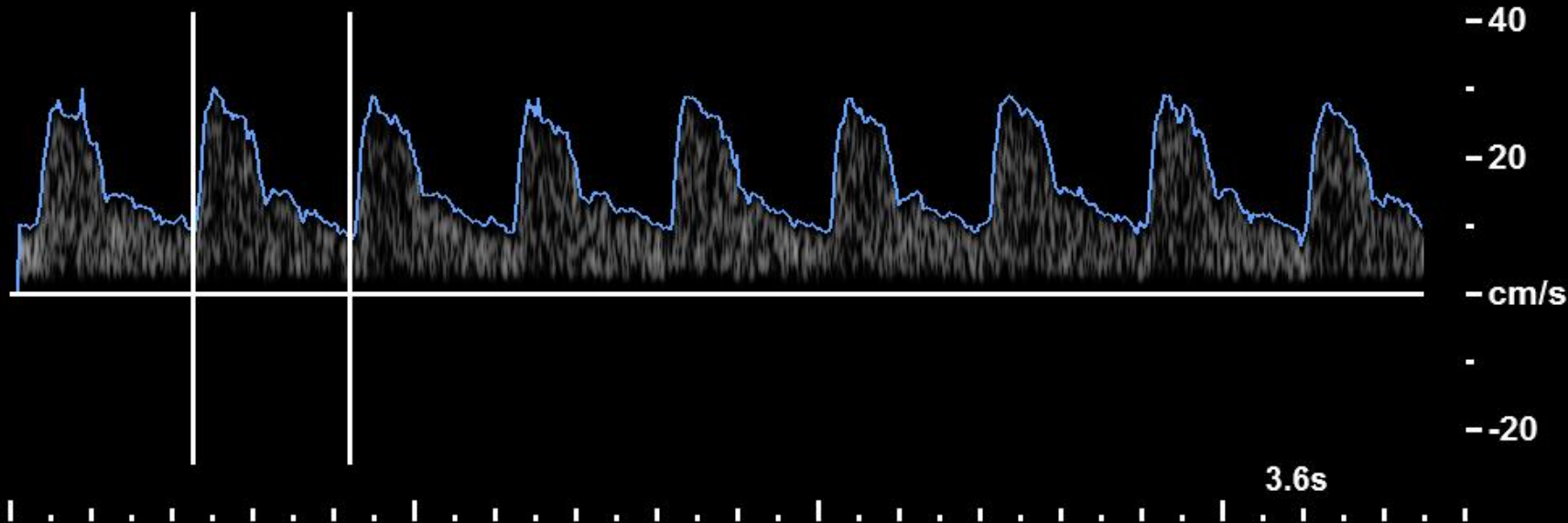
2D
75%
C 56
P Bas
Rés
Coul
75%
1500Hz
FP 82Hz
Bas



|| VSM 30.1 cm/s
VTD 8.03 cm/s
VDM 8.03 cm/s
IR 0.73
IP 1.28
S/D 3.7
VMT 17.2 cm/s

DP
48%
FP 100Hz
VE2.0mm
E3
5.0MHz
3.1cm

C3 C3
+12.8
-12.8
cm/s



*1

CI 14Hz 18°

P1

2D

75%

C 56

P Bas

Rés

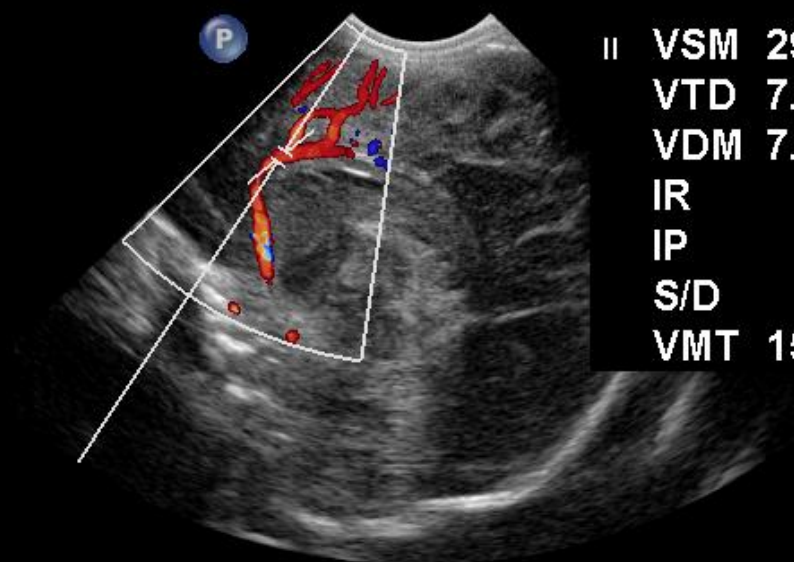
Coul

75%

1500Hz

FP 82Hz

Bas



VSM 29.3 cm/s
VTD 7.55 cm/s
VDM 7.32 cm/s
IR 0.74
IP 1.38
S/D 3.9
VMT 15.9 cm/s

DP

48%

FP 100Hz

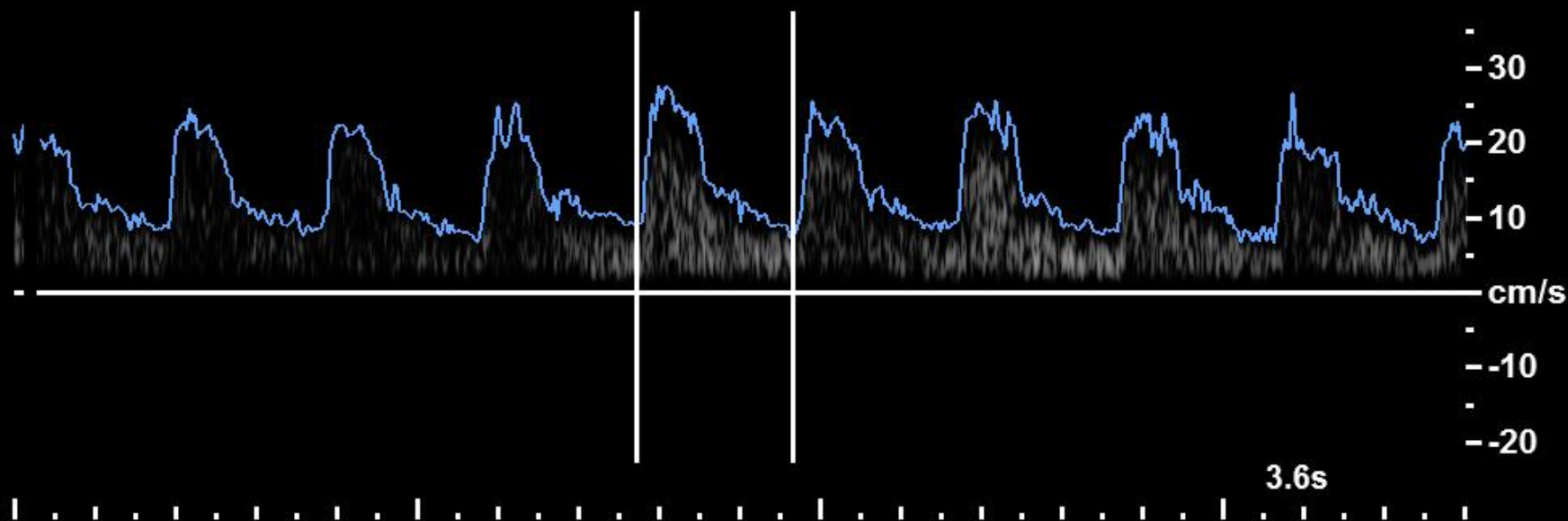
VE2.0mm

E3

5.0MHz

2.4cm

C3 C3
+12.8
-12.8
cm/s



*1

CI 5Hz

P1

2D

84%

C 56

P Bas

Rés

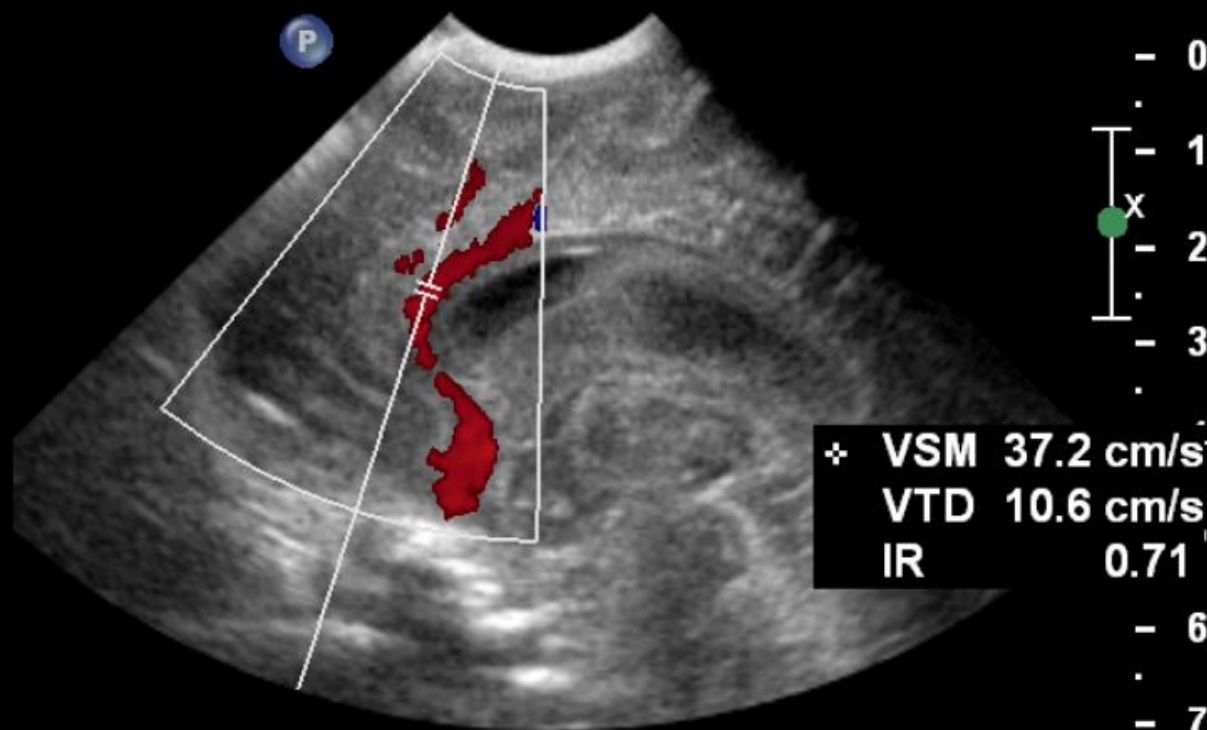
Coul

77%

8000Hz

FP 280Hz

Bas



✦ VSM 37.2 cm/s
VTD 10.6 cm/s
IR 0.71

DP

56

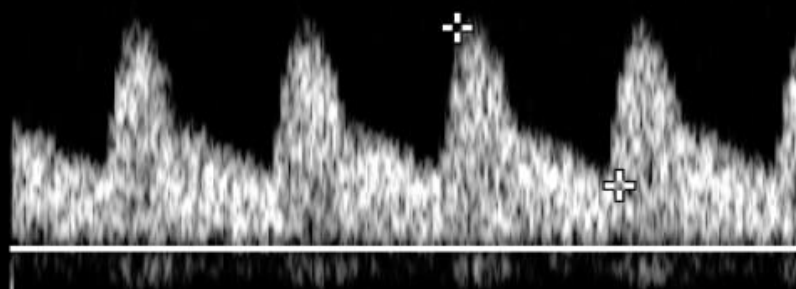
FP

VE

E3

5.0

2.6



*2

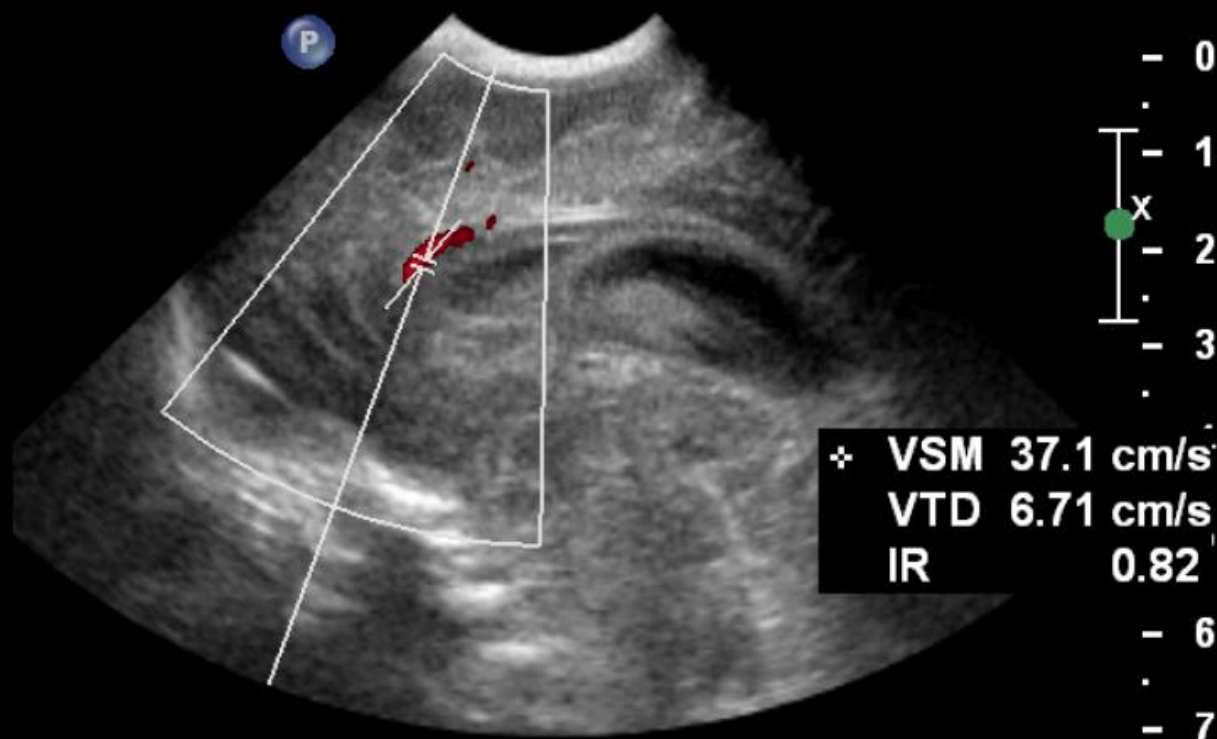
LIBRE

3.6s

CI 5Hz 20°
P1

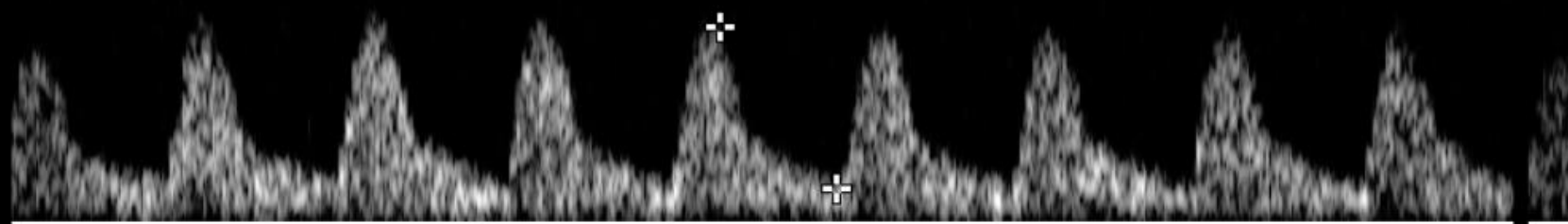
2D
84%
C 56
P Bas
Rés

Coul
77%
8000Hz
FP 280Hz
Bas



÷ VSM 37.1 cm/s
VTD 6.71 cm/s
IR 0.82

DP
56
FP
VE
E3
5.0
2.4



*2

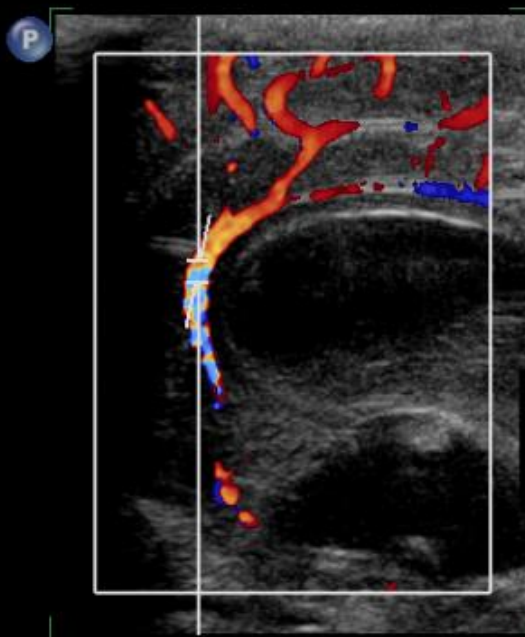
COMP

3.6s

CI 10Hz 12°
P1

2D
88%
C 64
P Moy
Rés

Coul
80%
700Hz
FP 38Hz
Bas



- 1

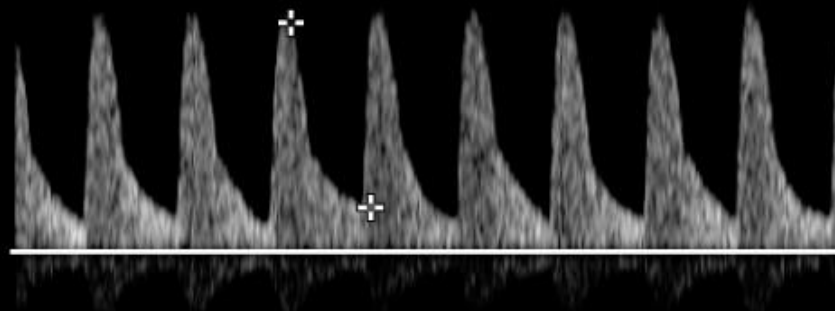
Tx
- 2

÷ VSM 38.0 cm/s
VTD 7.31 cm/s
IR 0.81

- 4

DP
40%
FP 60Hz
VE1.5mm
E3
6.0MHz
2.1cm

C3 C3
+4.7
-4.7
cm/s



-40

-20

- cm/s

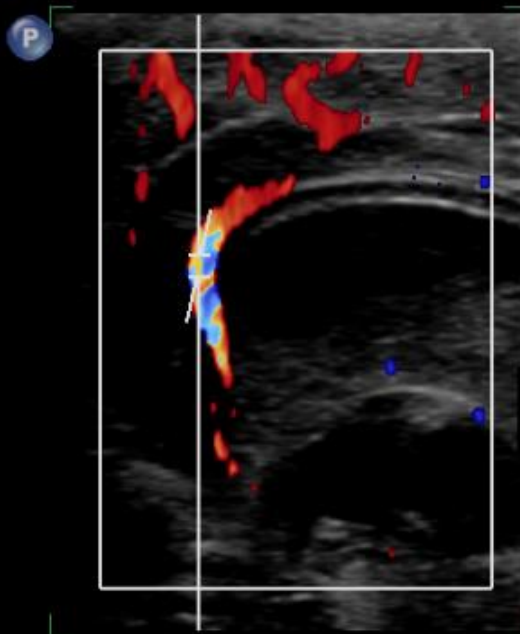
6.6s

*3

CI 5Hz 12°
P1

2D
87%
C 64
P Moy
Rés

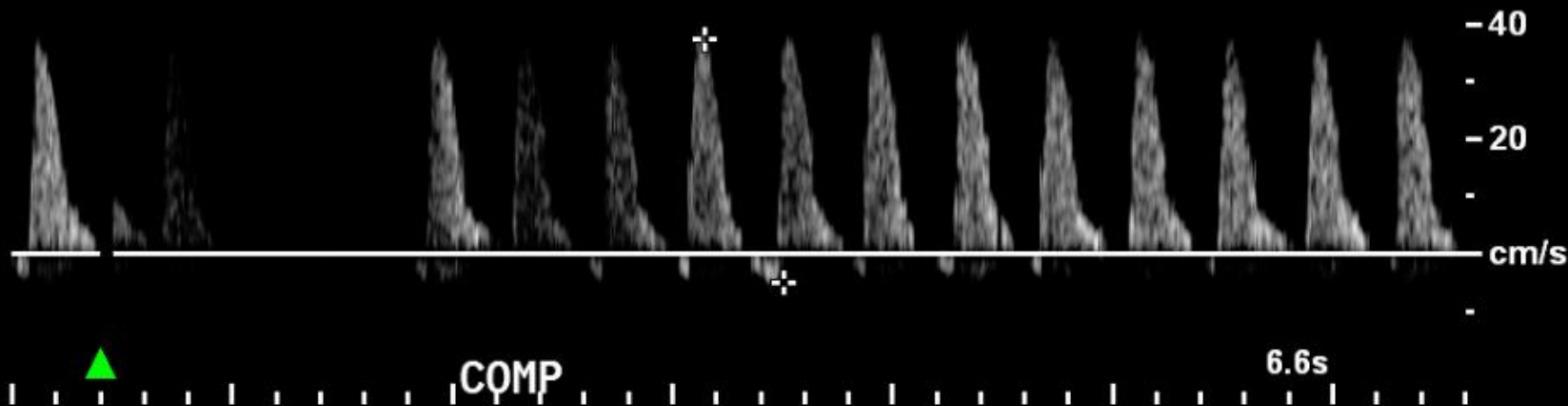
Coul
78%
700Hz
FP 38Hz
Bas



÷ VSM 37.4 cm/s
VDM -5.06 cm/s

DP
40%
FP 60Hz
VE1.5mm
E3
6.0MHz
2.1cm

C3 C3
+4.7
-4.7
cm/s



*3

Rôle du Doppler dans le suivi de l'hydrocéphalie

➤ Taylor's Fontanellar Compression Test*

$$\Delta RI = \frac{\text{Fontanellar compression RI} - \text{Baseline RI}}{\text{Baseline RI}}$$

*Neonatal hydrocephalus: hemodynamic response to fontanelle compression-- correlation with intracranial pressure and need for shunt placement. Taylor GA, Madsen JR., Radiology. 1996 Dec;201(3):685-9.

CI 26Hz
RV

2D

85%
C 55
P Arrêt
Gén

C3



DROIT

Position drain



Position drain

Hémorragie sous-épendymaire(HSE)



Hémorragie intraventriculaire



Hydrocéphalie



Parenchyme ?

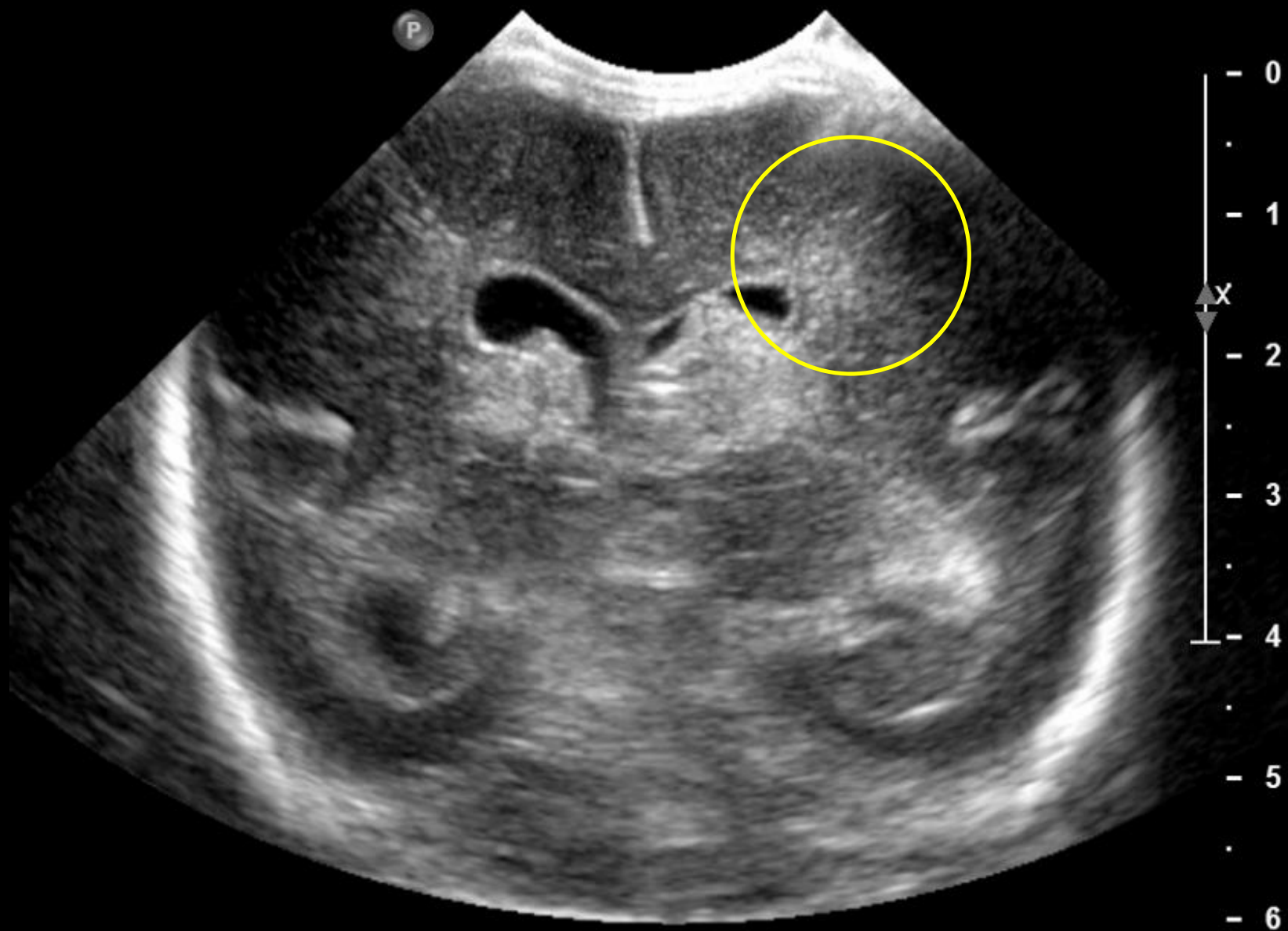


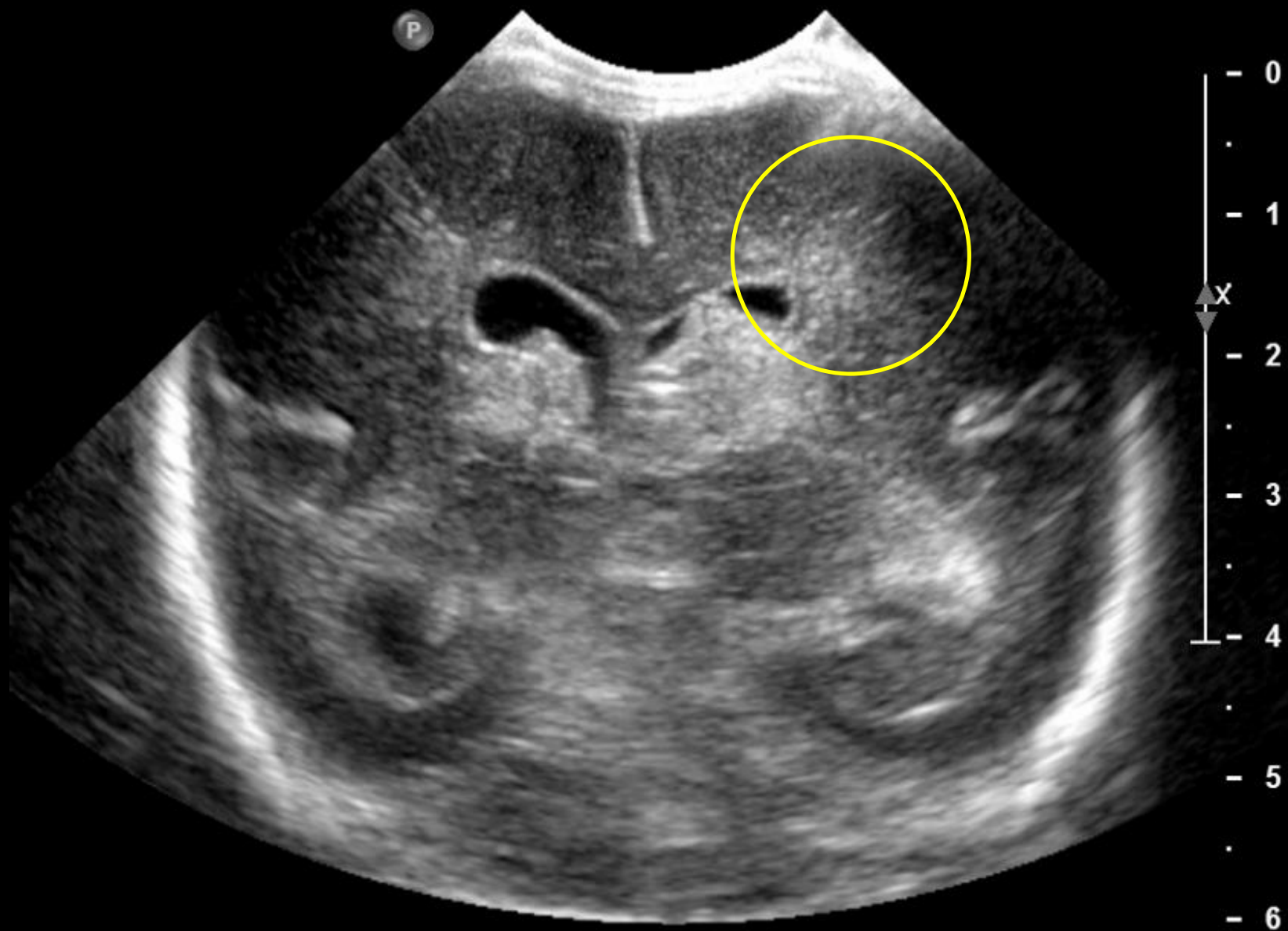
RICP



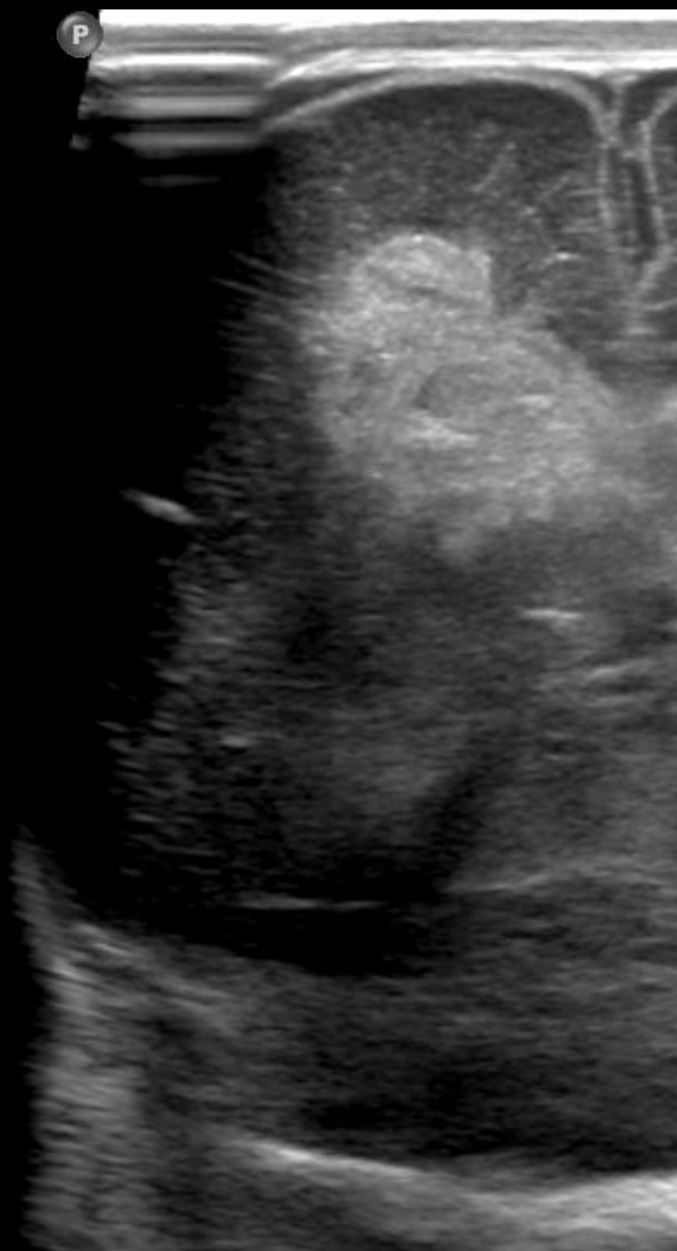




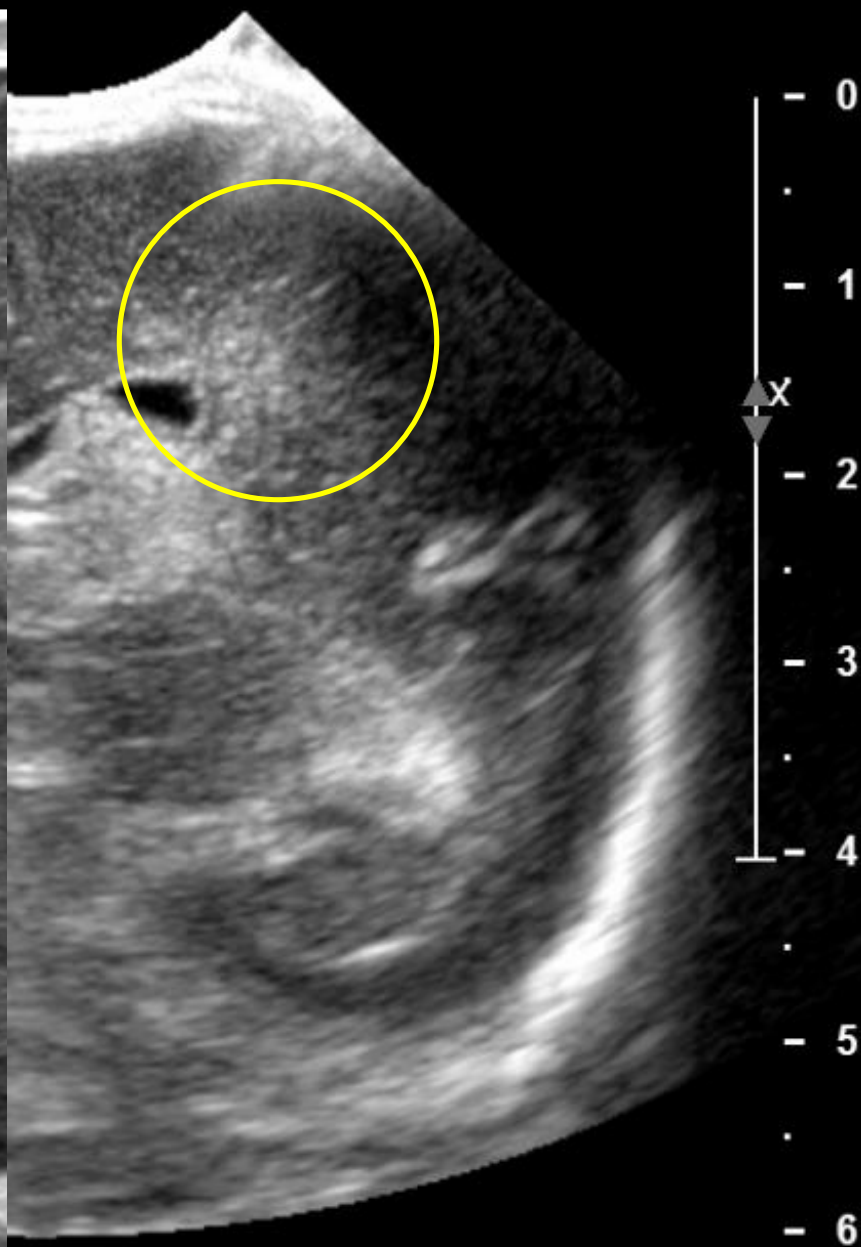




Flaring



Parenchymal haemorrhage



Flaring

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

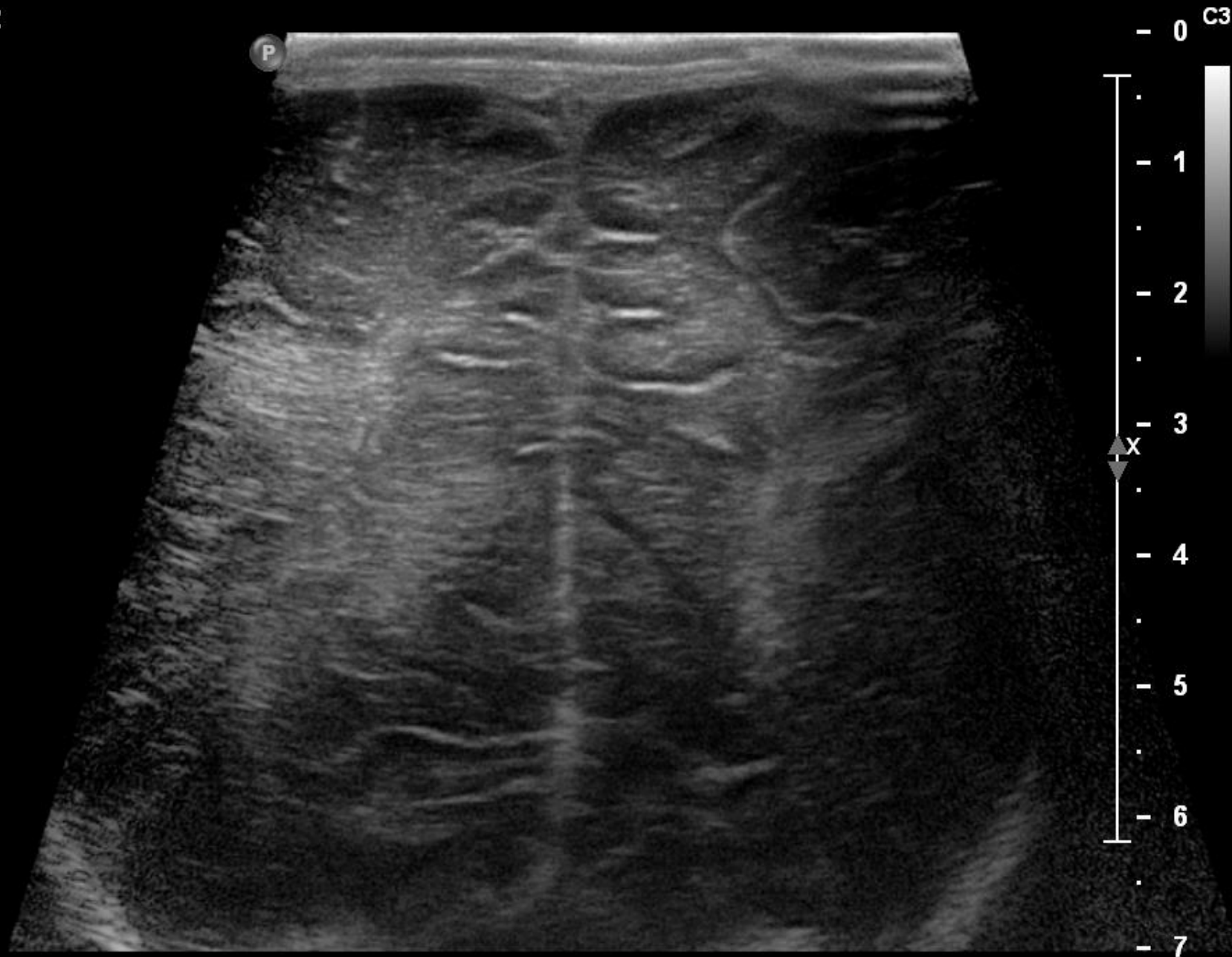
Infection

Trauma

Malformation

Tumeur

...



Bright brain

Bright brain

- Toujours aussi simple ?

C3

P

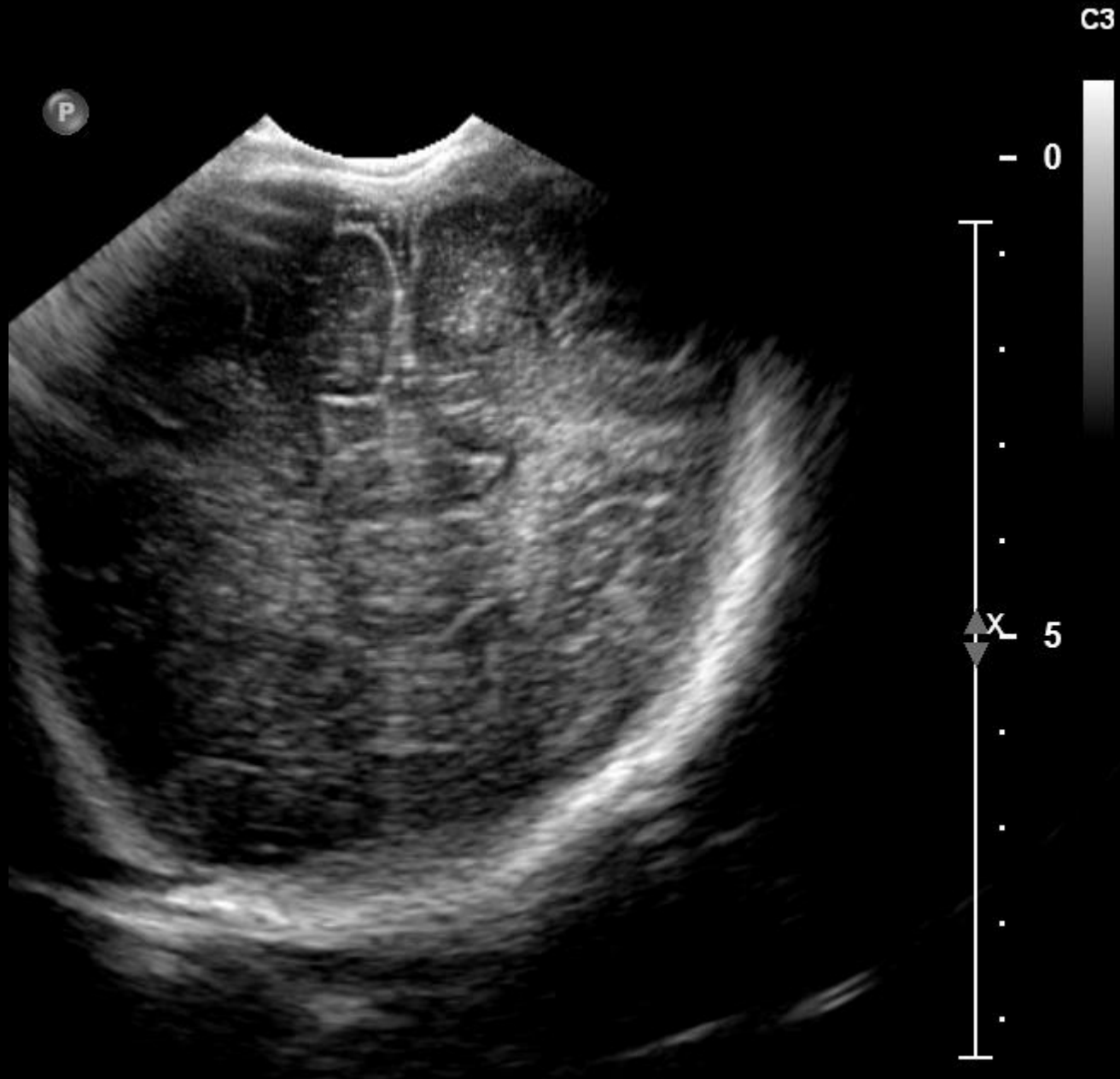
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

?





Hyperéchogénicité physiologique de la substance blanche retroventriculaire du prématuré



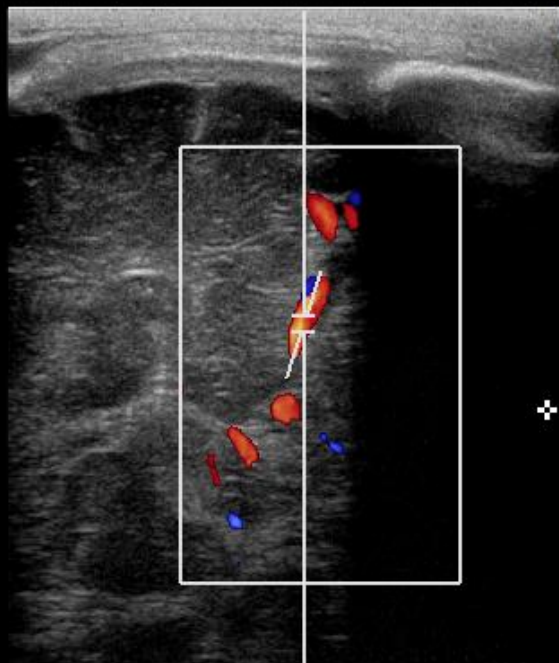
Hyperéchogénicité physiologique mais...



CI 4Hz 18°
P1

2D
89%
C 64
P Moy
Rés

Coul
80%
5000Hz
FP 174Hz
Bas

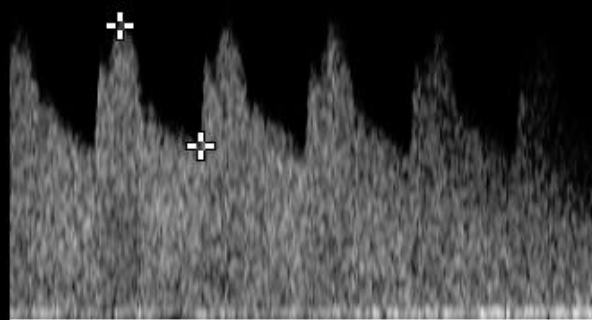


- 0
.
- 1
.
- 2
IX
- 3
.
- 5
.
- 6

÷ VSM 80.0 cm/s
VTD 47.5 cm/s
IR 0.41

DP
40%
FP 70Hz
VE1.5mm
E3
6.0MHz
2.9cm

C3 C3
+33.5
-33.5
cm/s



- 80
-
- 40
-
- cm/s

Droite

6.6s

CI 4Hz 8°
P1

2D
89%
C 64
P Moy
Rés

Coul
80%
5000Hz
FP 174Hz
Bas

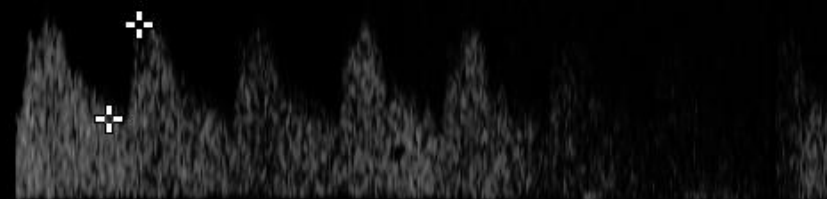


- 0
.
- 1
.
- 2
IX
- 3
.
- 5
.
- 6

÷ VSM 46.5 cm/s
VTD 21.9 cm/s
IR 0.53

DP
48%
FP 70Hz
VE1.5mm
E3
6.0MHz
2.4cm

C3 C3
+33.5
-33.5
cm/s



- 80

-

- 40

-

- cm/s

Gauche

6.6s

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

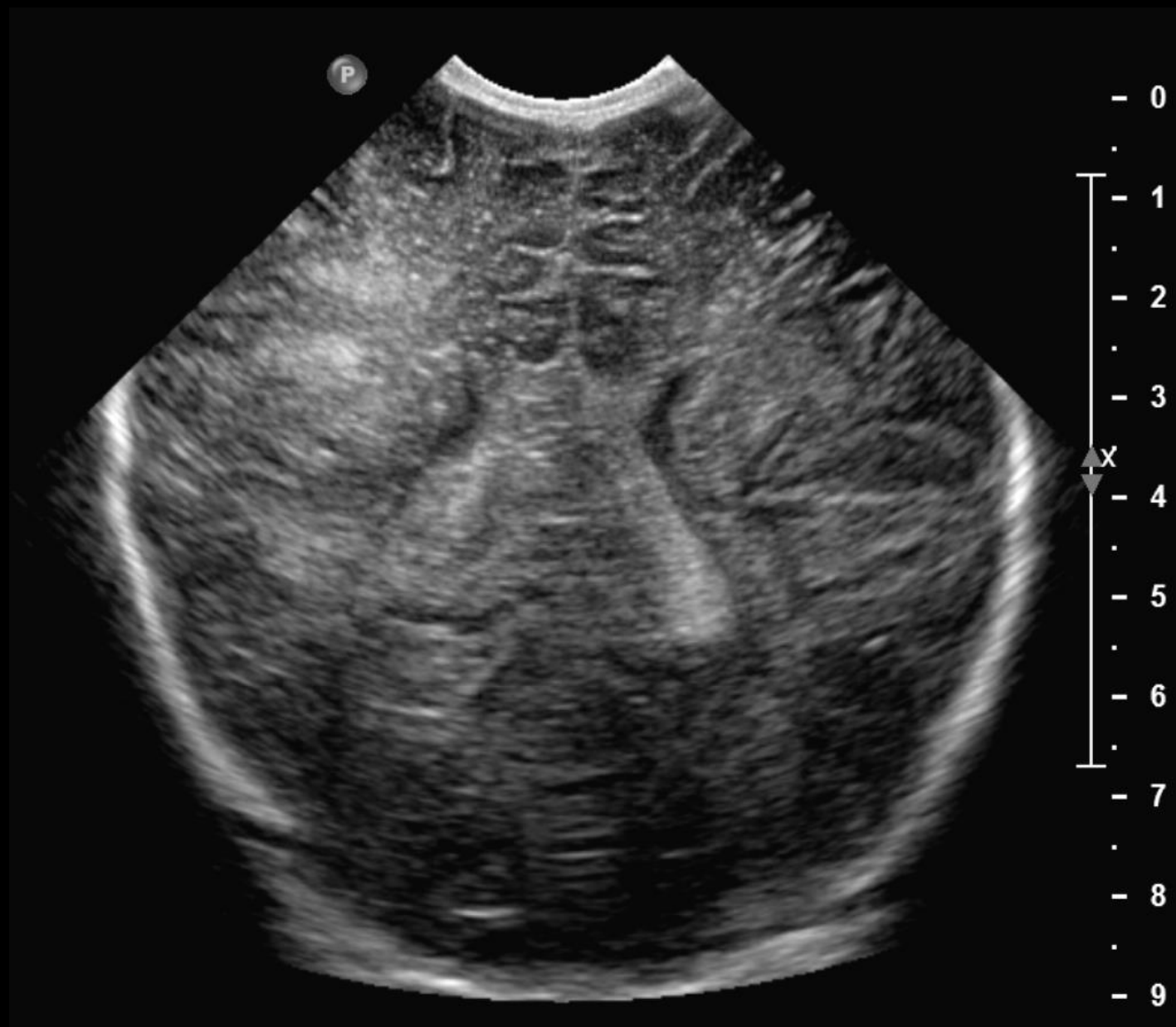
Infection

Trauma

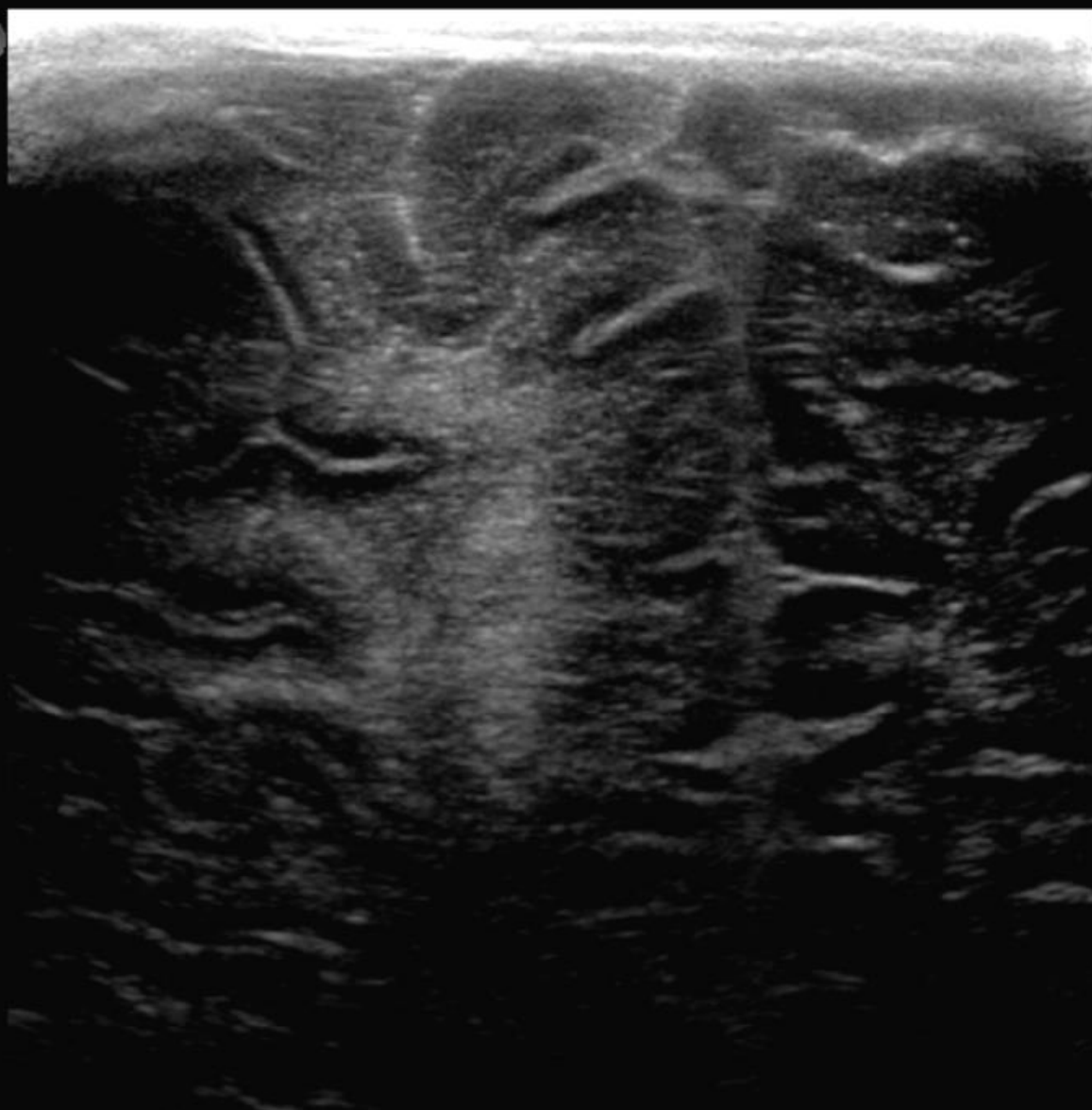
Malformation

Tumeur

...



P



- 0

- 1

- 2

- 3

- 4

- 5

P



C

- 0

- 1

- 2

- 3

- 4

- 5

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

Infection

Trauma

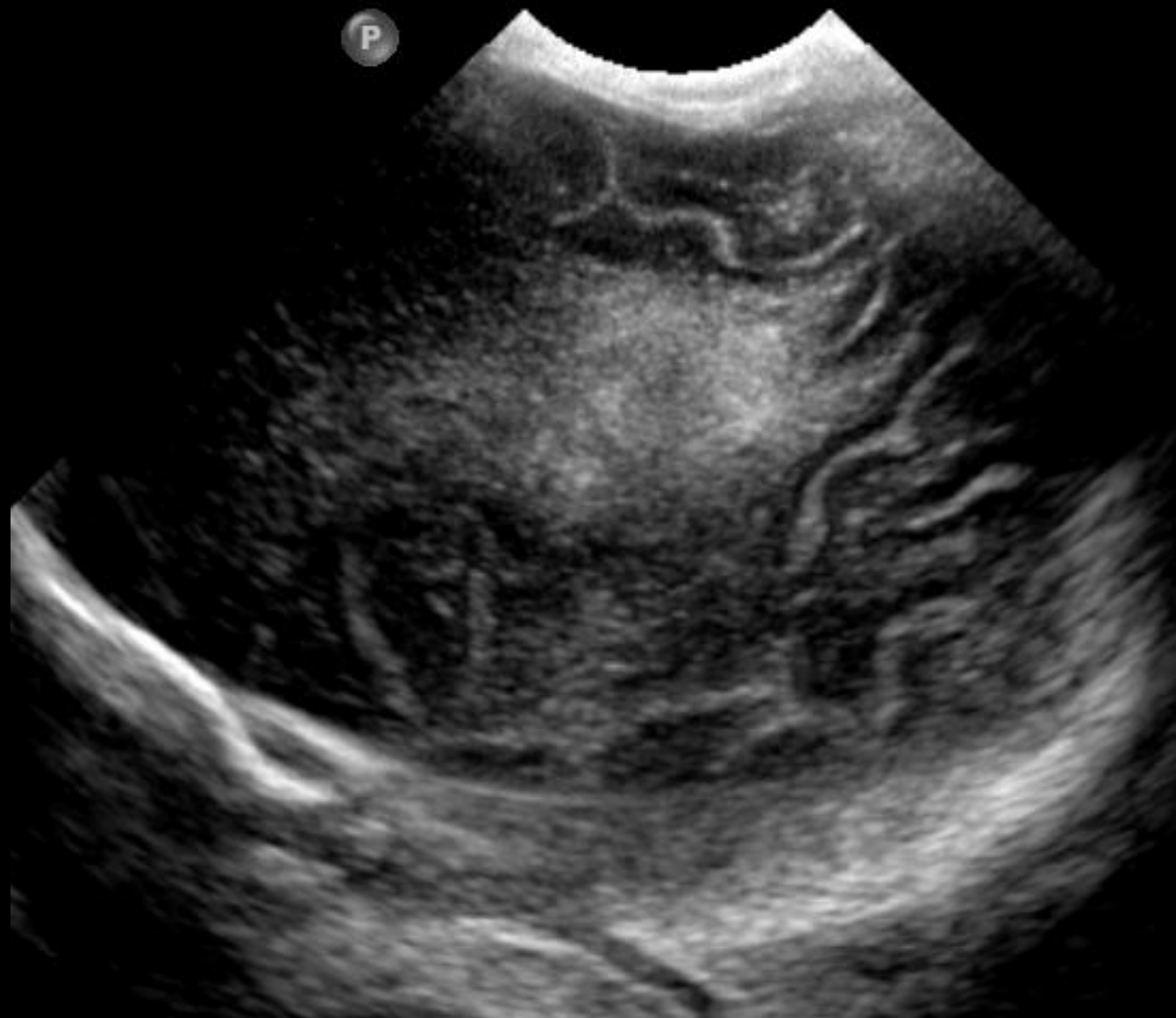
Malformation

Tumeur

...









Autres indications ?

Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

Infection

Trauma

Malformation

Tumeur

...

4012
V

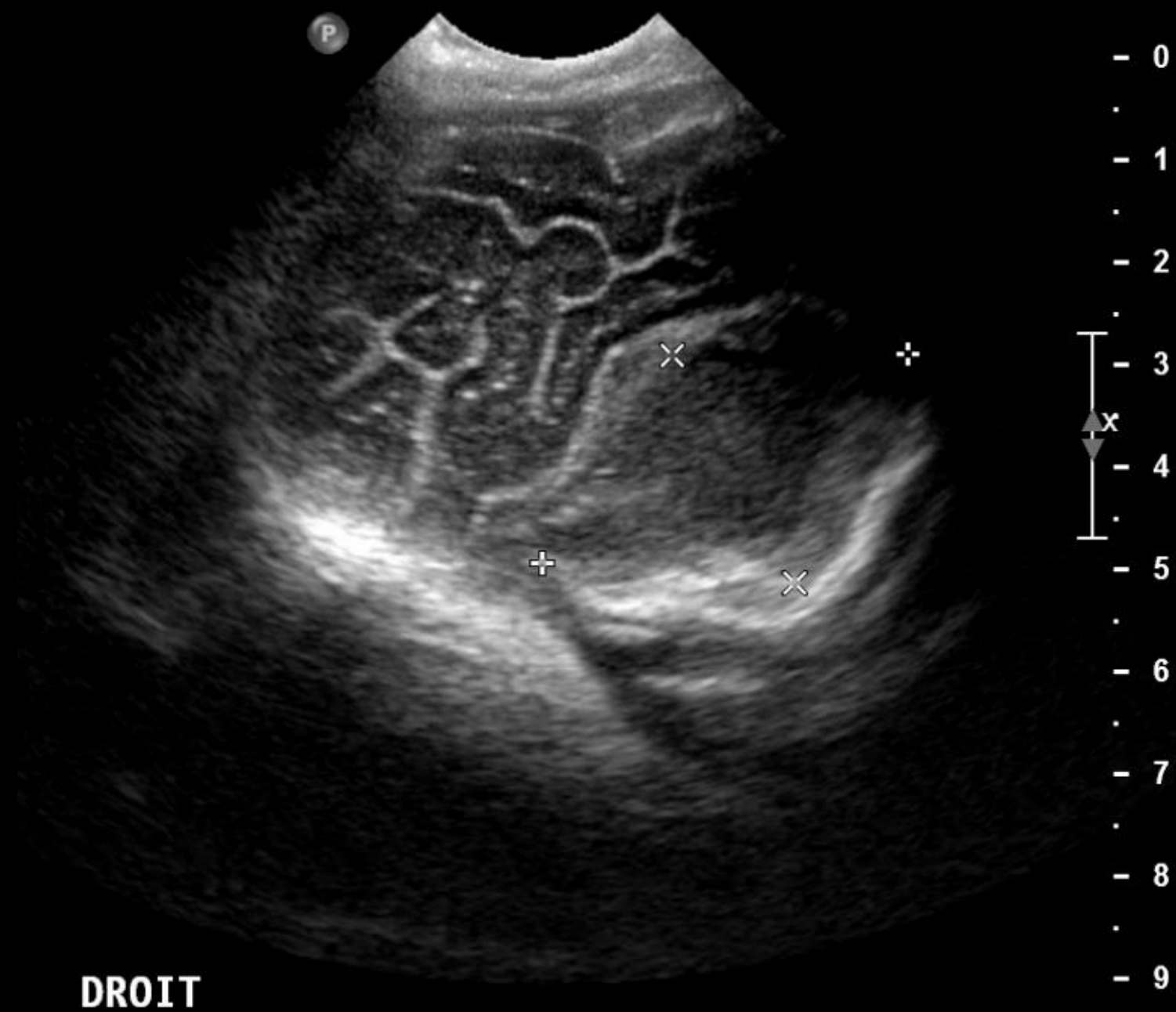
D
30%
55
Arrêt
bén

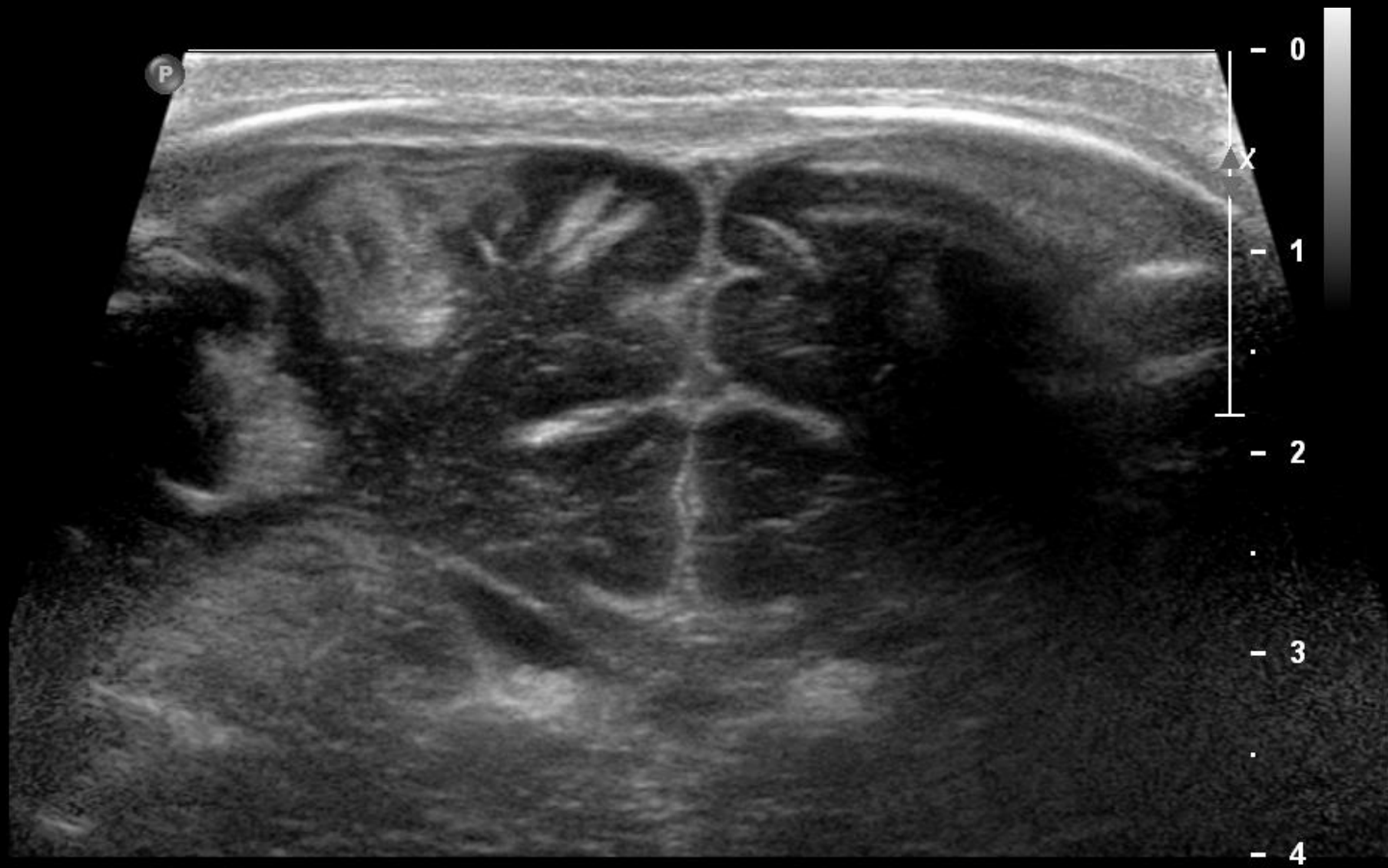
P

- 0
.
- 1
.
- 2
.
- 3
.
- 4
.
- 5
.
- 6
.
- 7
.
- 8
.
- 9

Dist 1.87 cm
Dist 4.52 cm





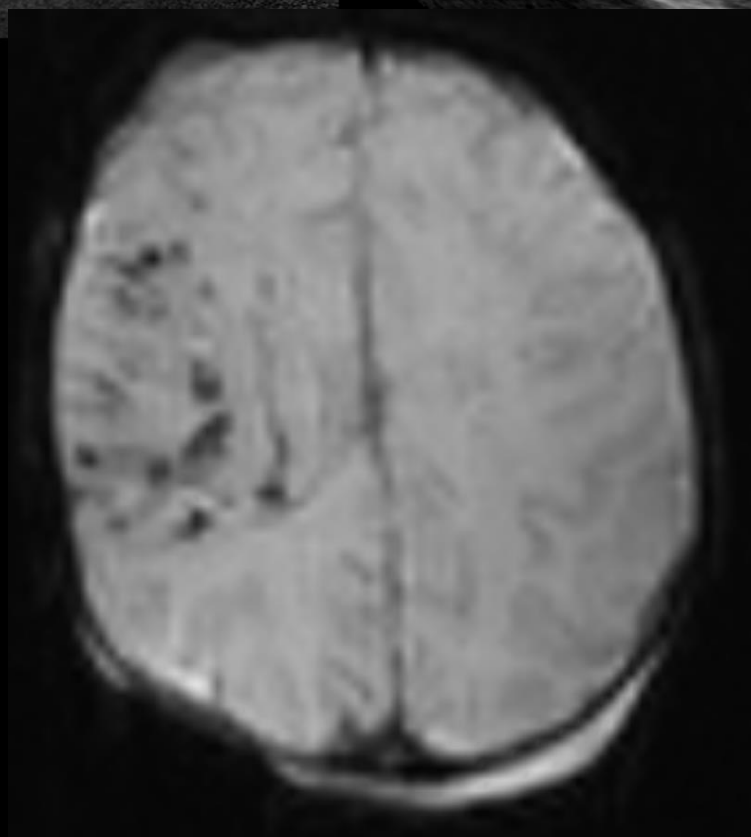


C3

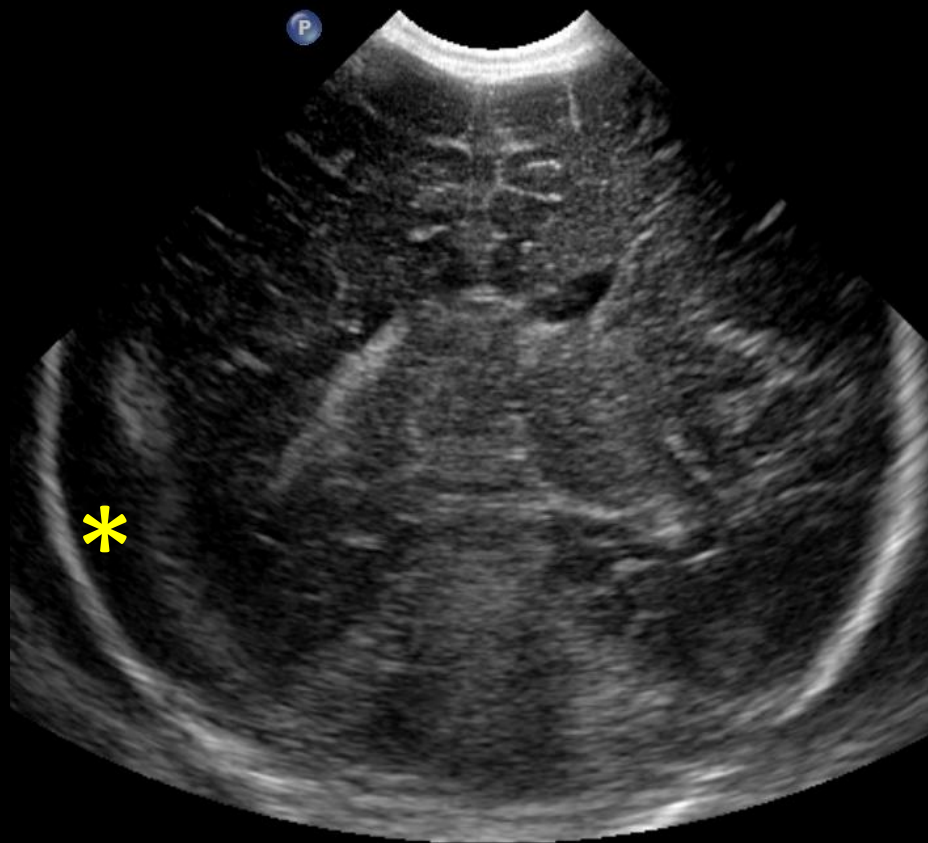
P

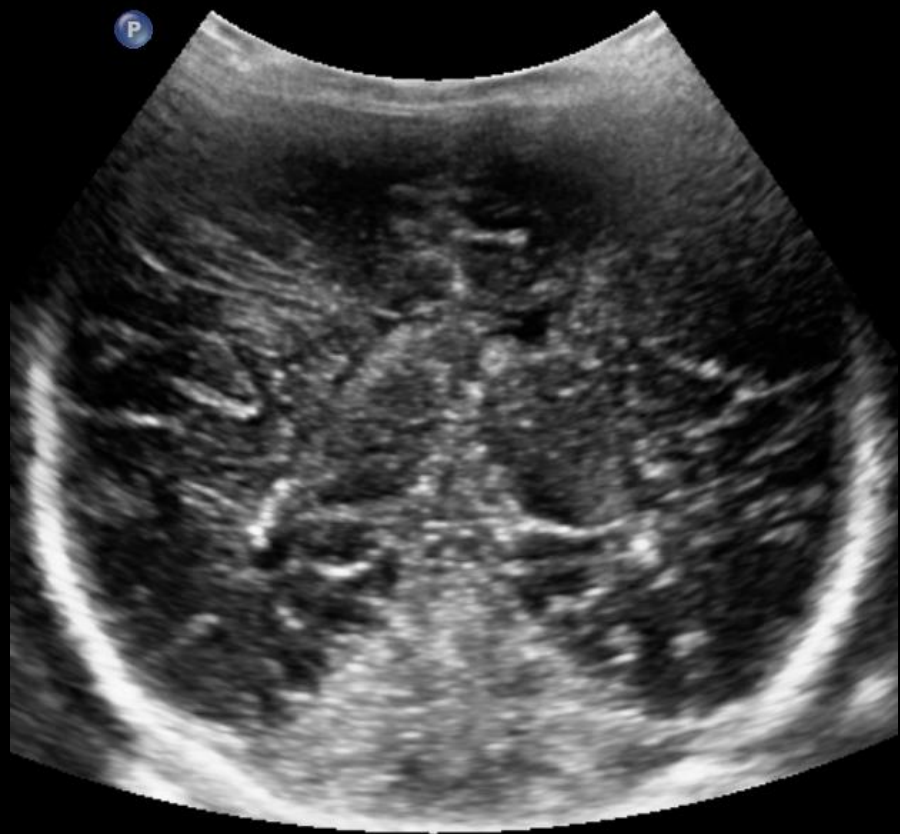
Droite











Hémorragie

Hydrocéphalie

Asphyxie et hypoxie

AVC

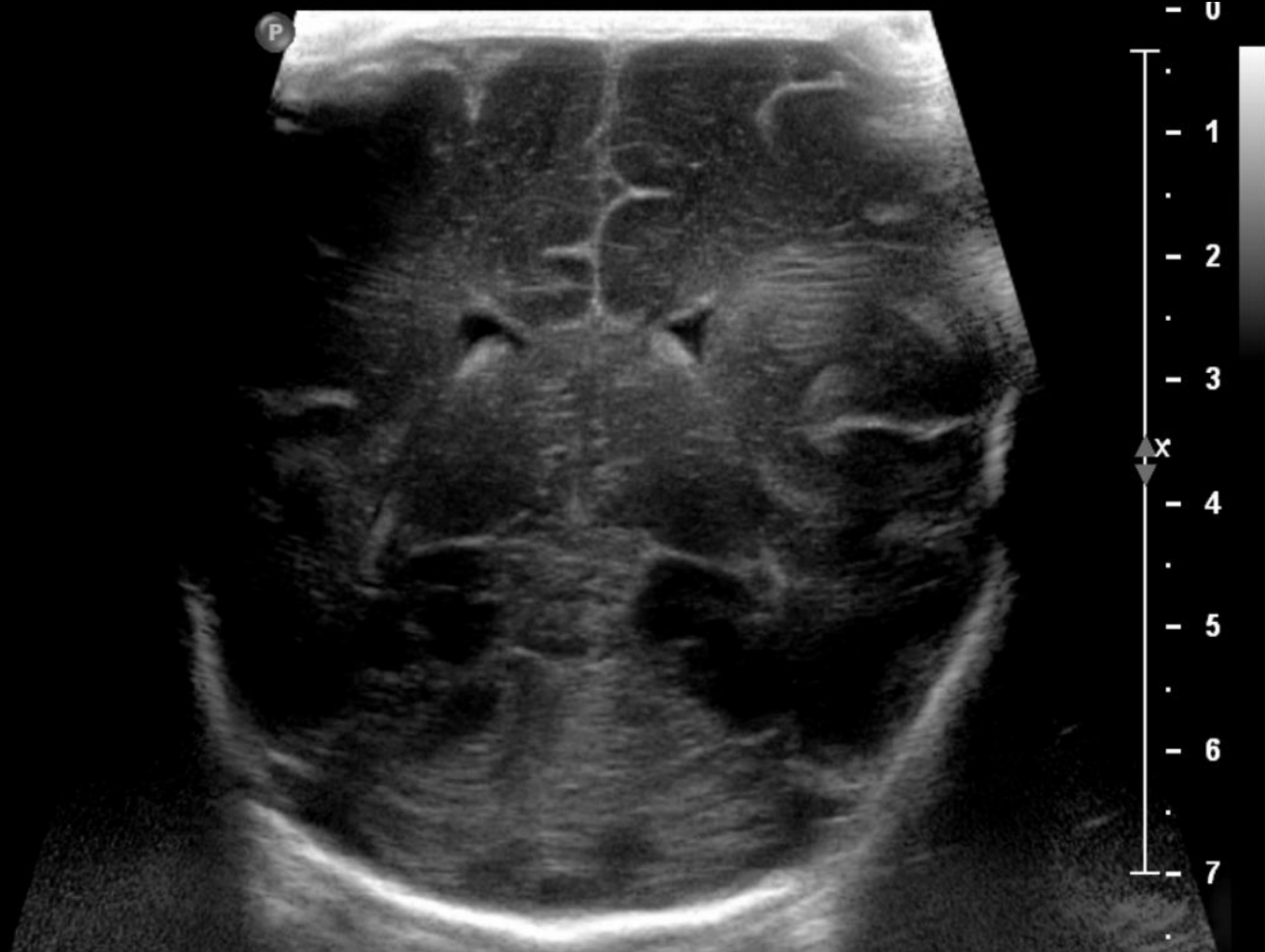
Infection

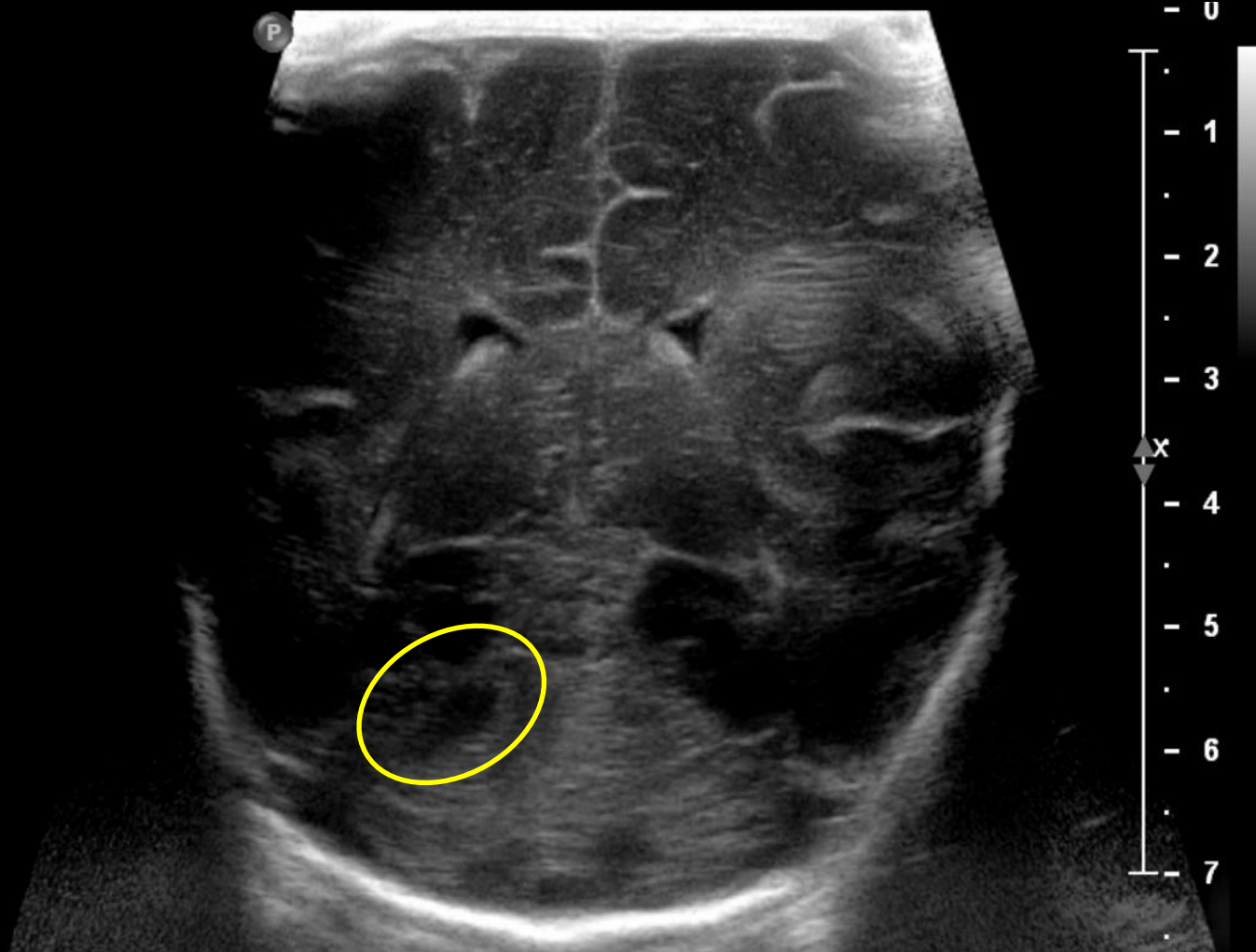
Trauma

Malformation

Tumeur

...





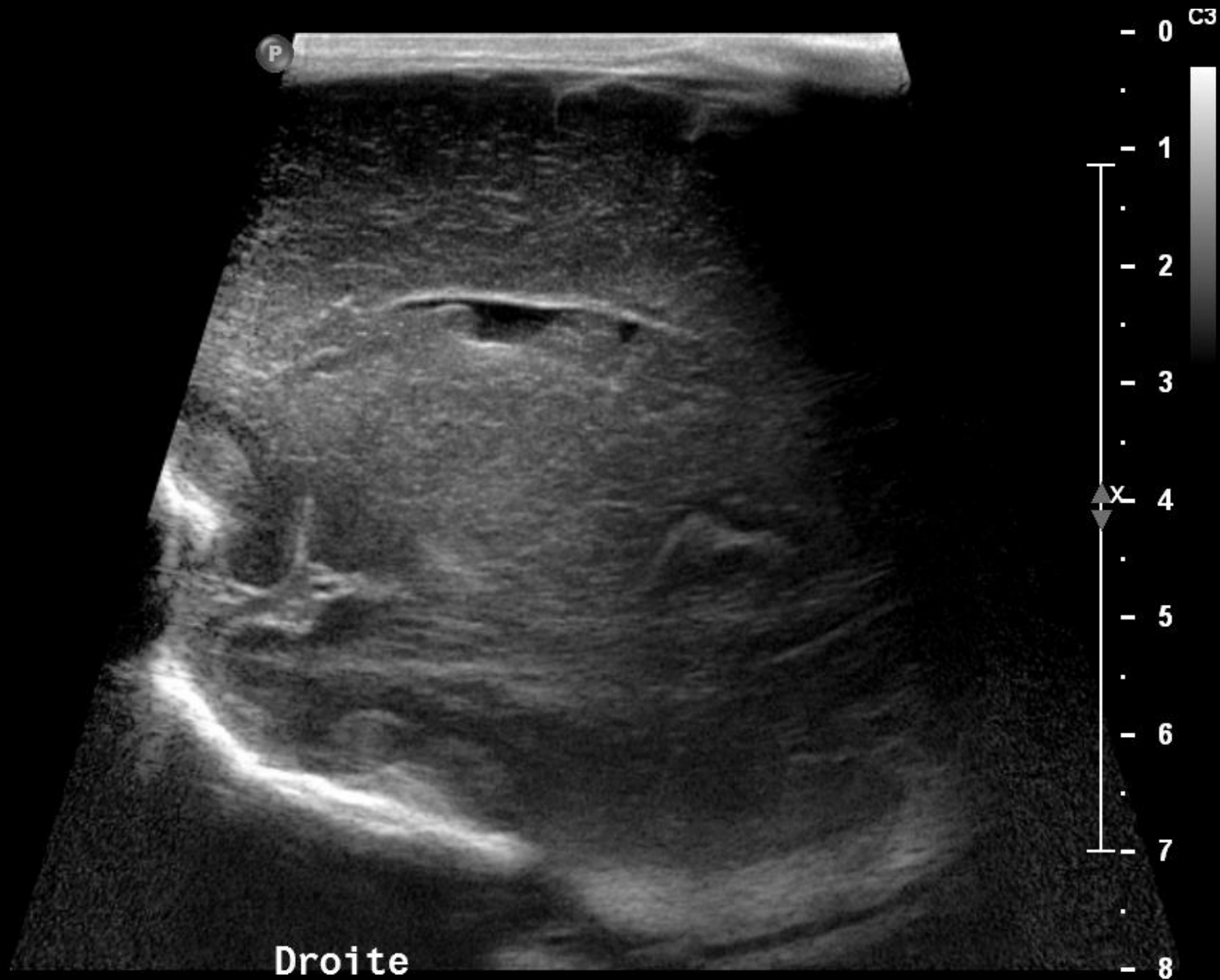




MRI ?



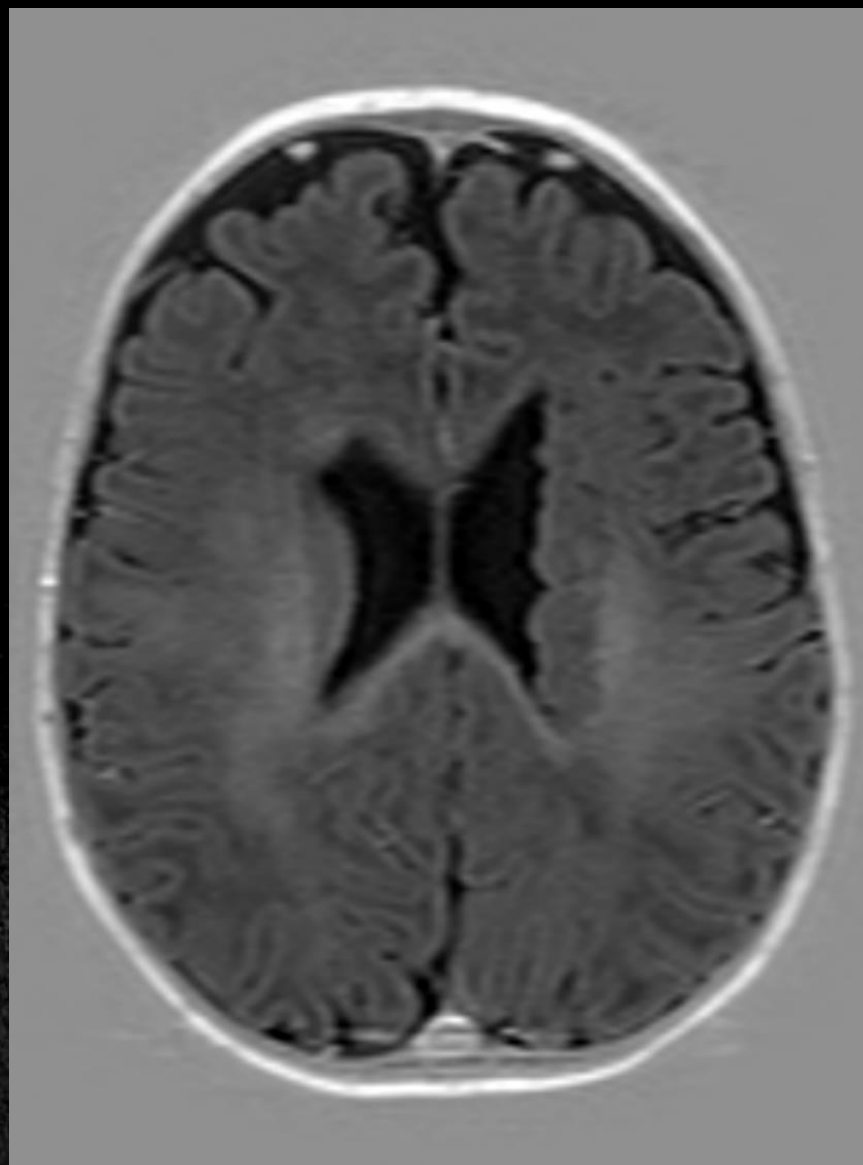
MRI?





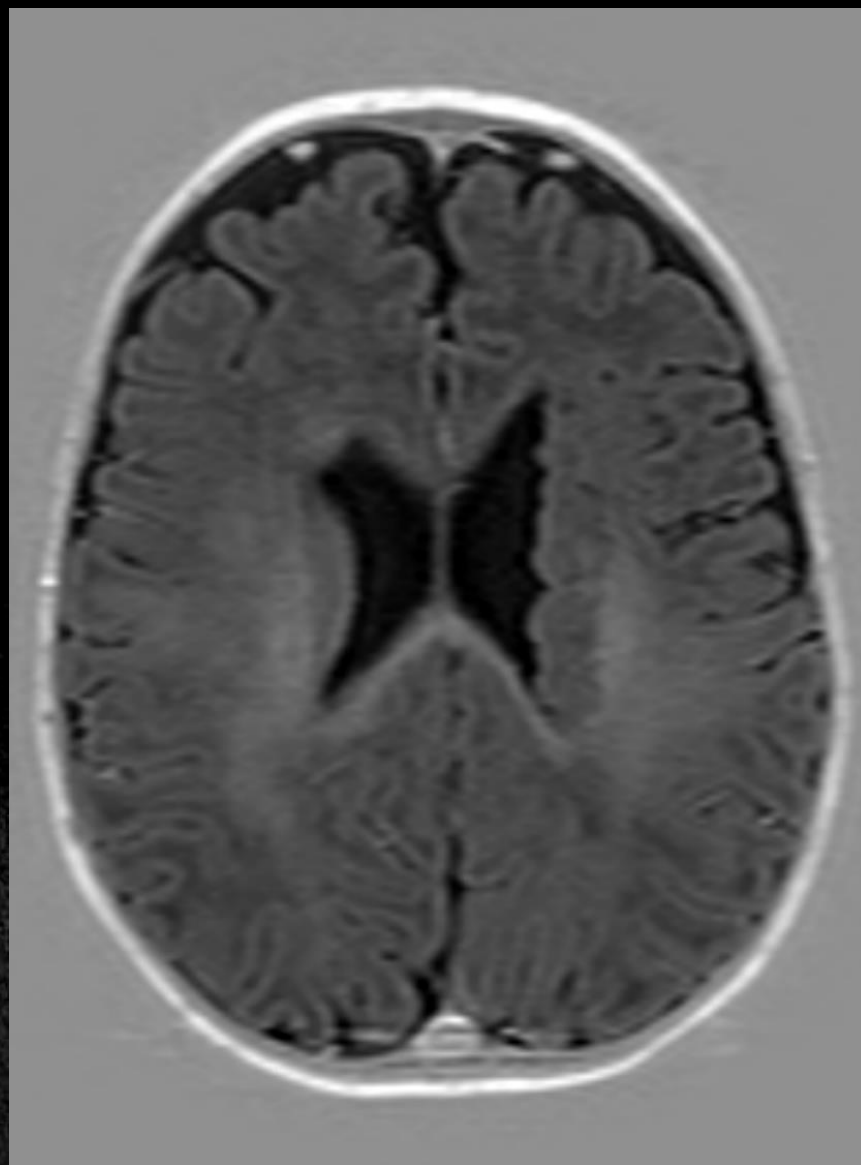


MR ?





2012 Oct 8 (D3)



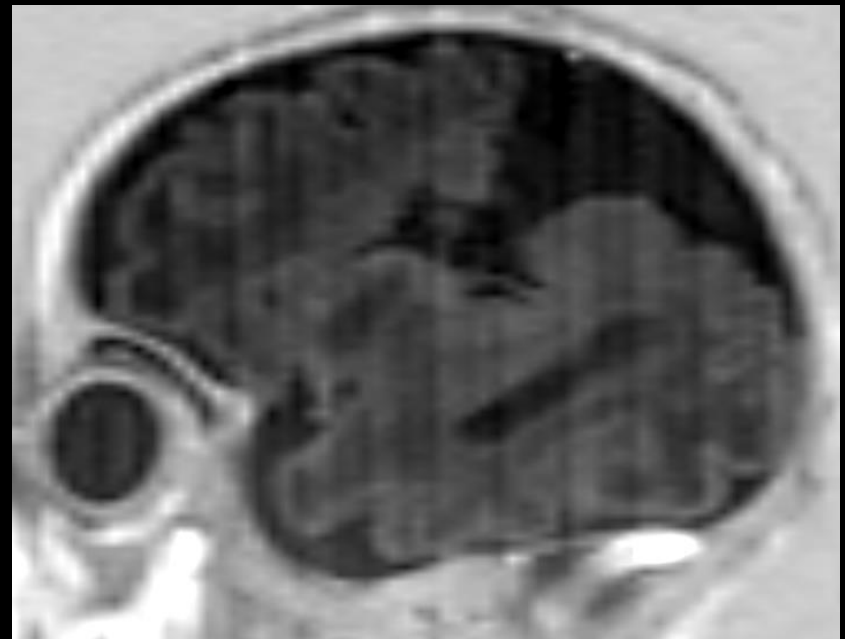
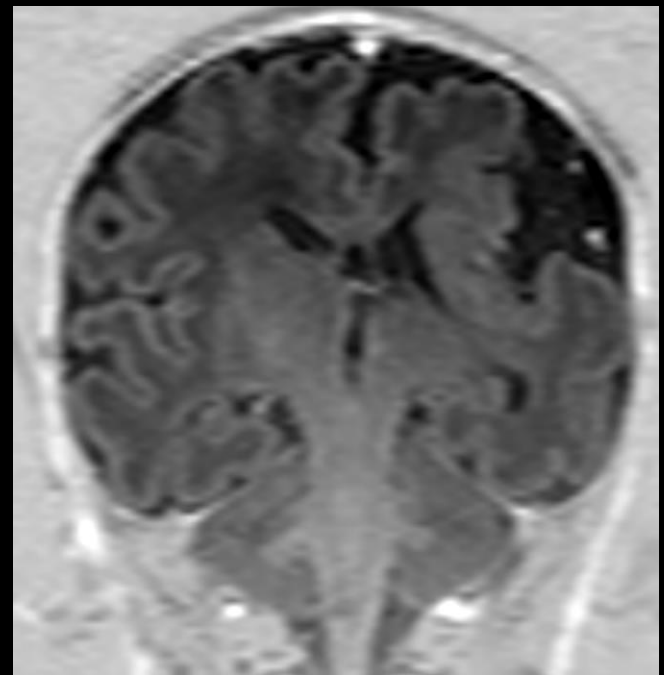
2013 Apr 22 (M6)





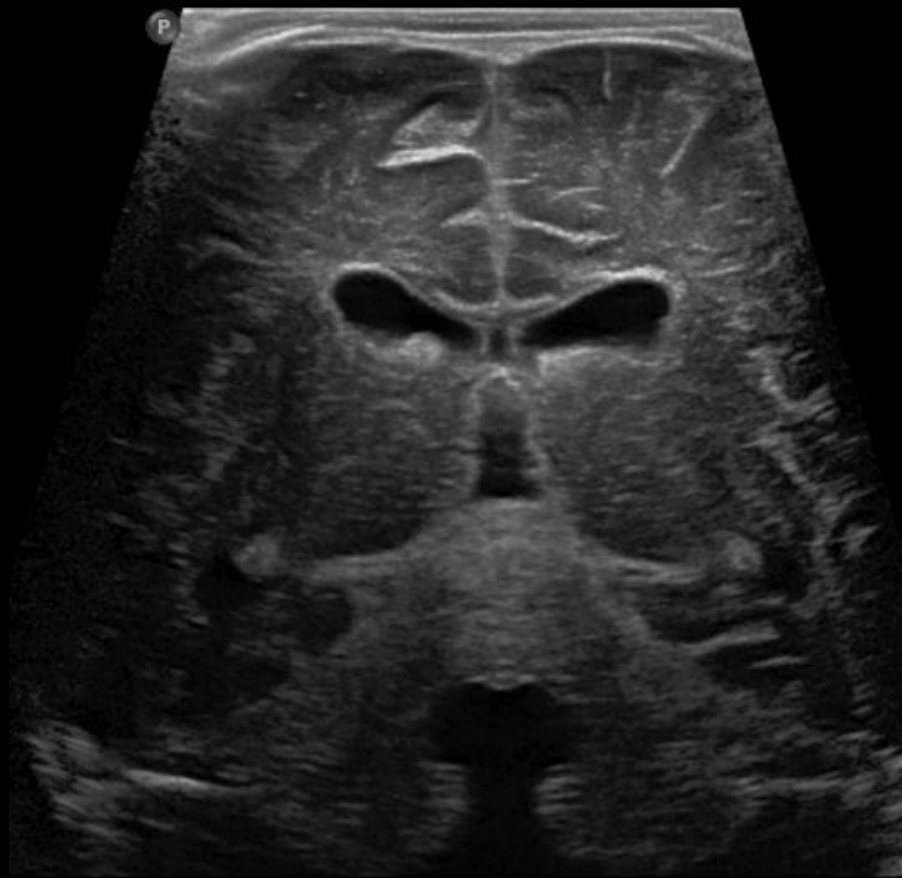
MRI ?





D2

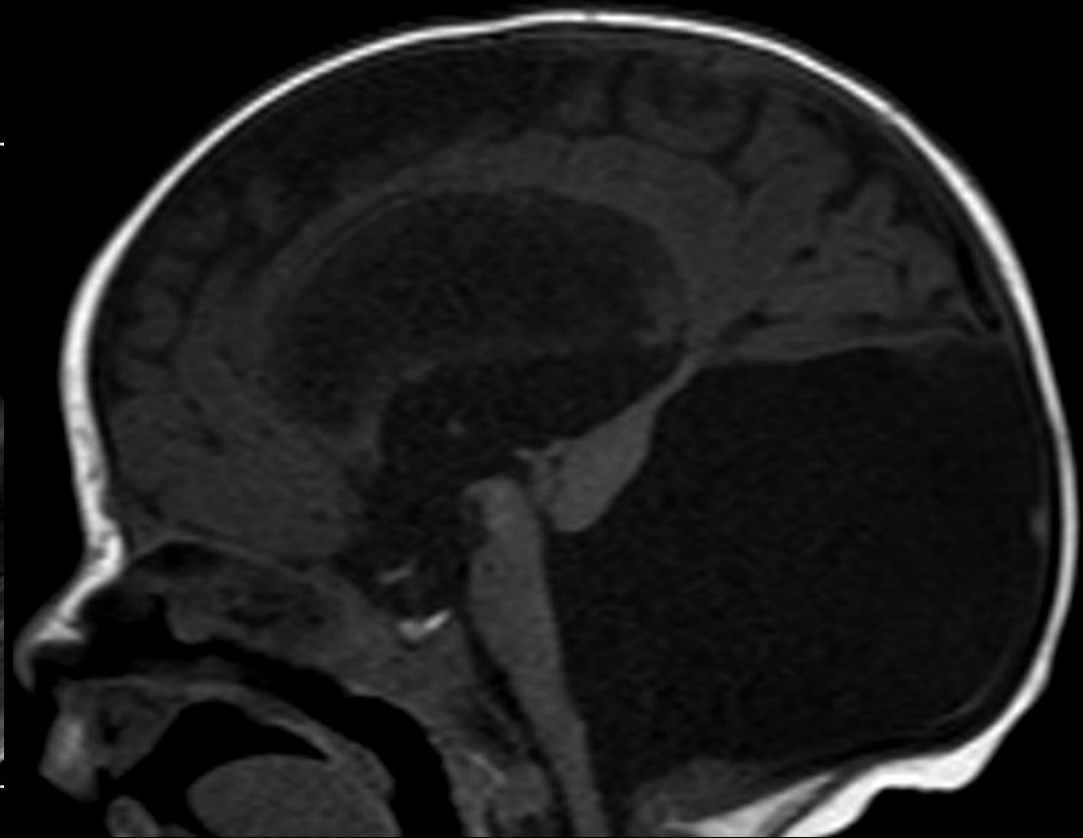
D9



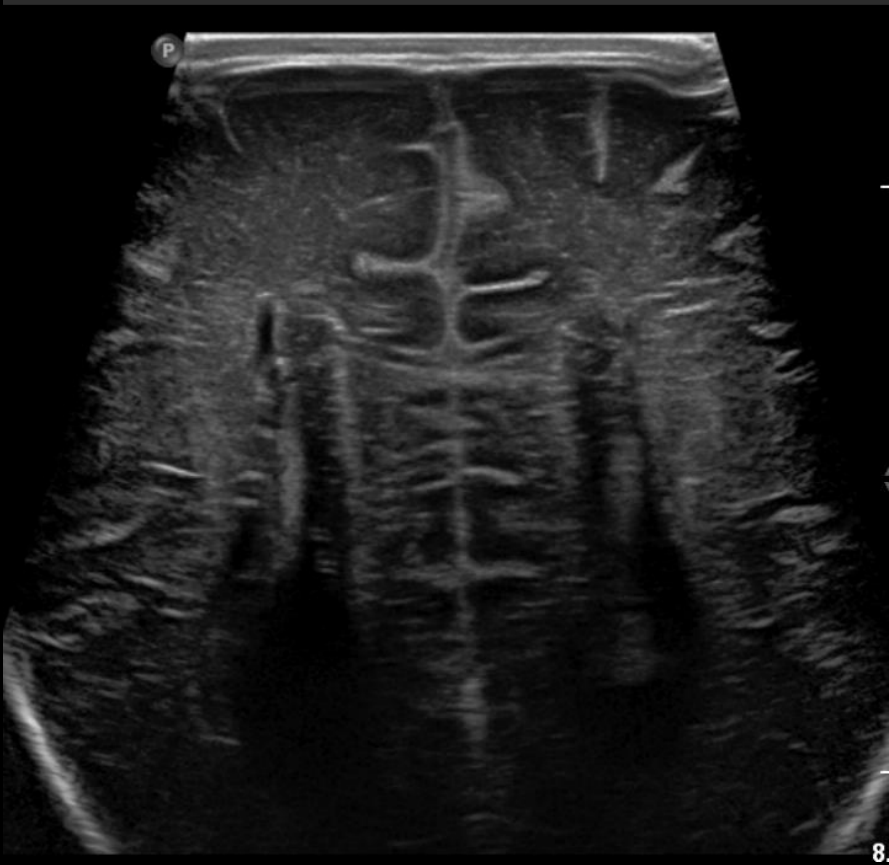
Gauche



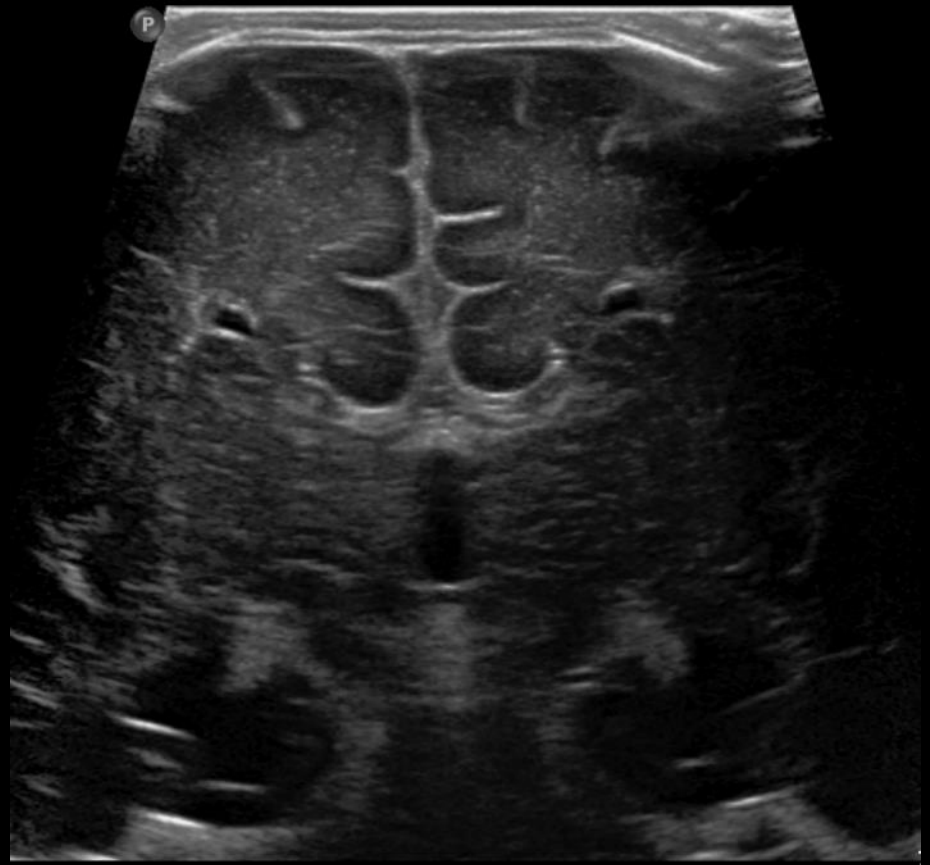
10-



Dandy-Walker

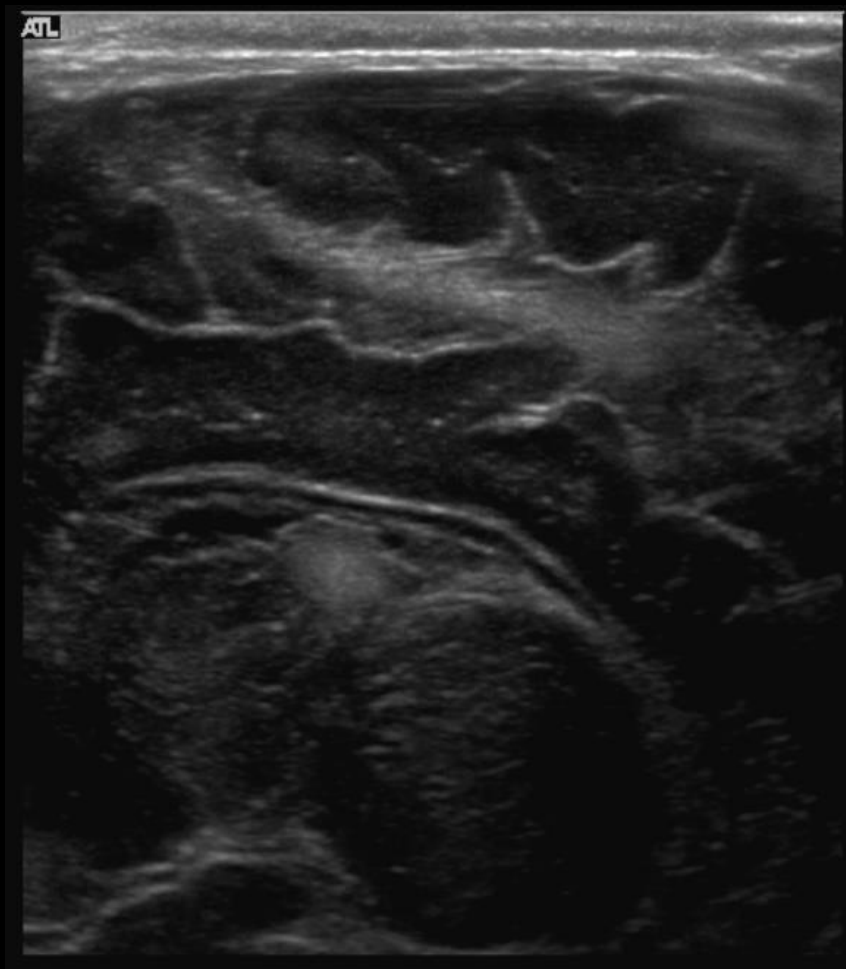


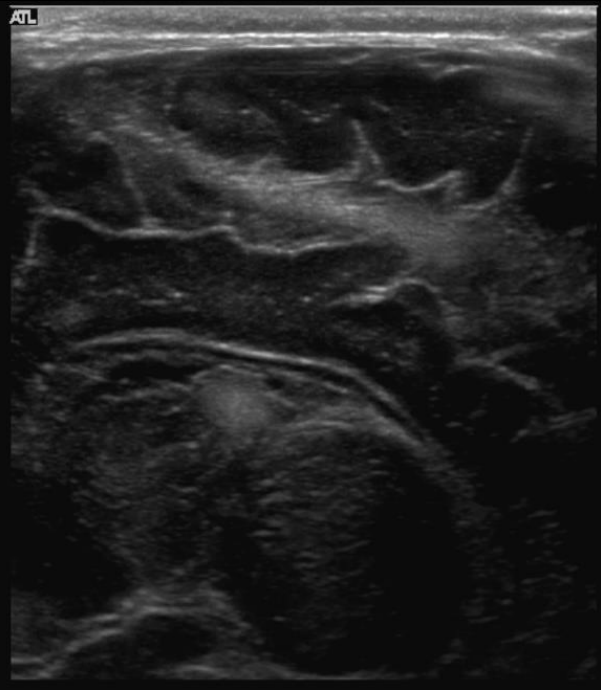
8.



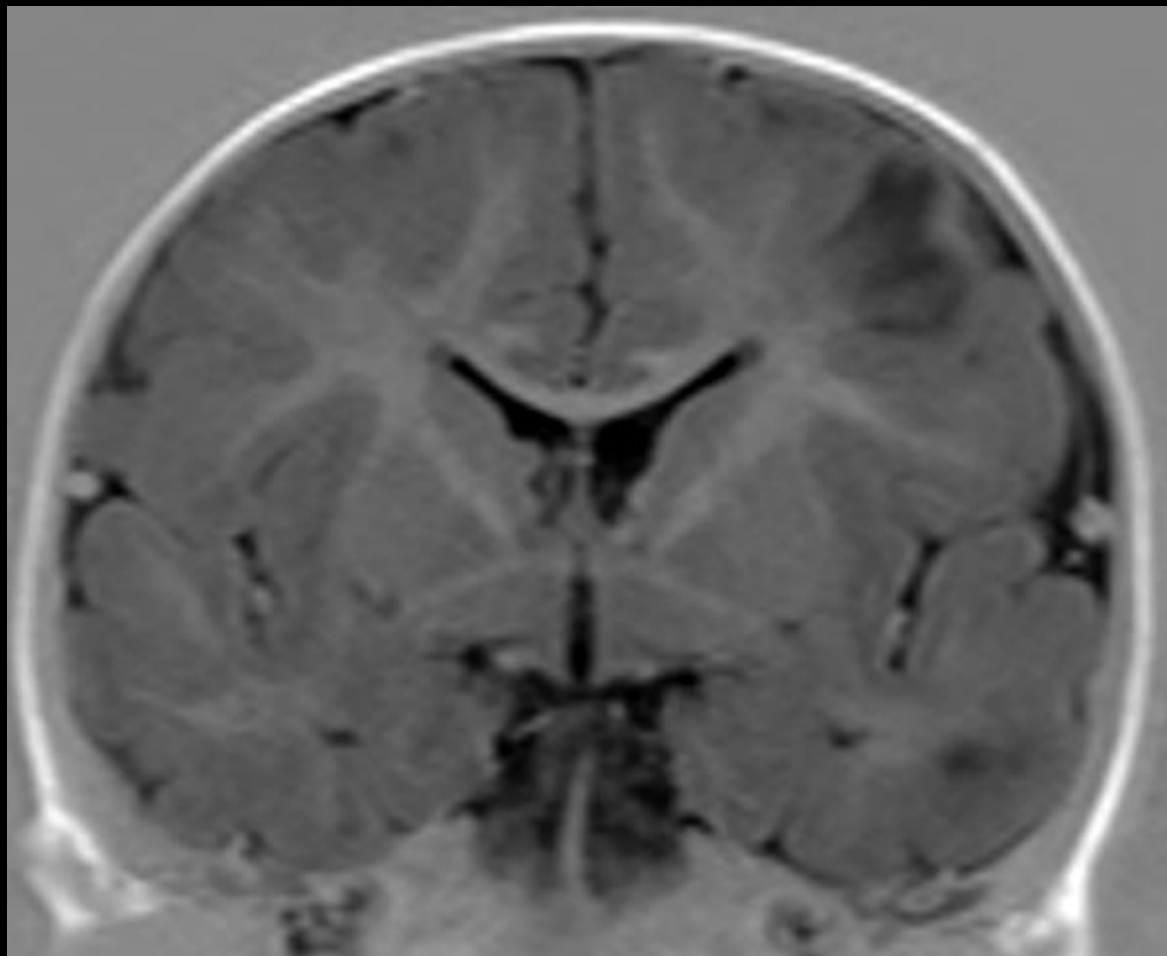


Confirmation agénésie cc





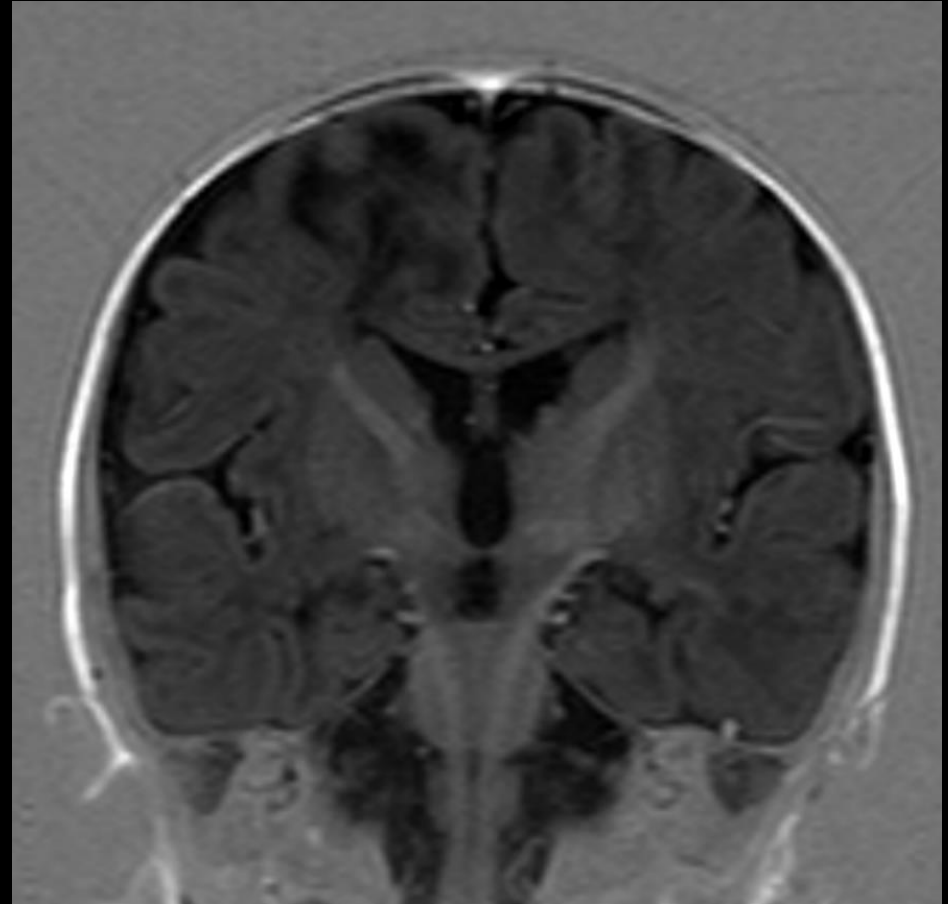
D13



1 Y.O.



J3



6 M

Apport de l'échographie cérébrale chez le nouveau-né

Réactivité face aux situations d'urgence
Et plus...

