HỘI NGHỊ SẢN PHỤ KHOA LẦN THỨ 19
VIỆT – PHÁP – CHÂU Á THÁI BÌNH DƯƠNG

TAPS: BIẾN CHỨNG CHUỖI THIẾU MÁU- ĐA HỒNG CẦU TRONG SONG THAI MỘT BÁNH NHAU

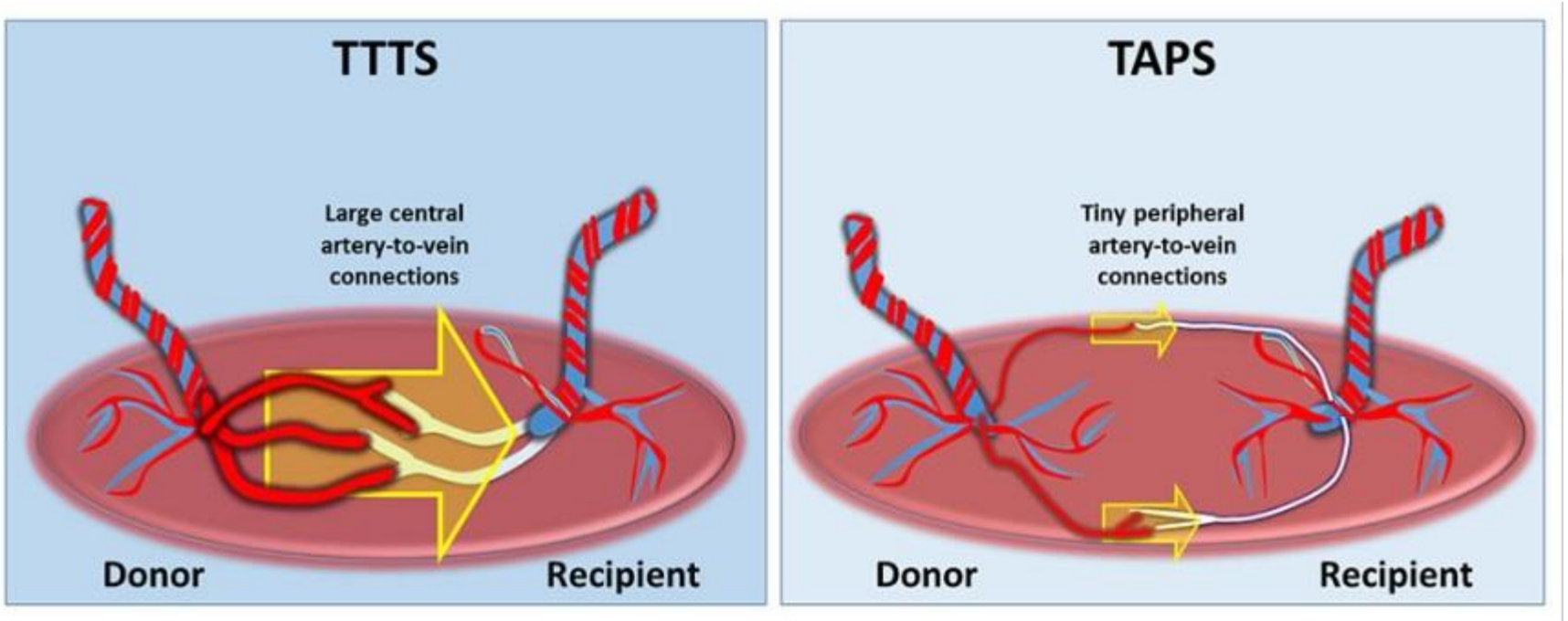
Báo cáo viên: Ths. Bs NGÔ THỊ KIM LOAN

KHOA CHẨN ĐOÁN HÌNH ẢNH BỆNH VIỆN TỪ DŨ

Thành Phố Hồ Chí Minh, Việt Nam

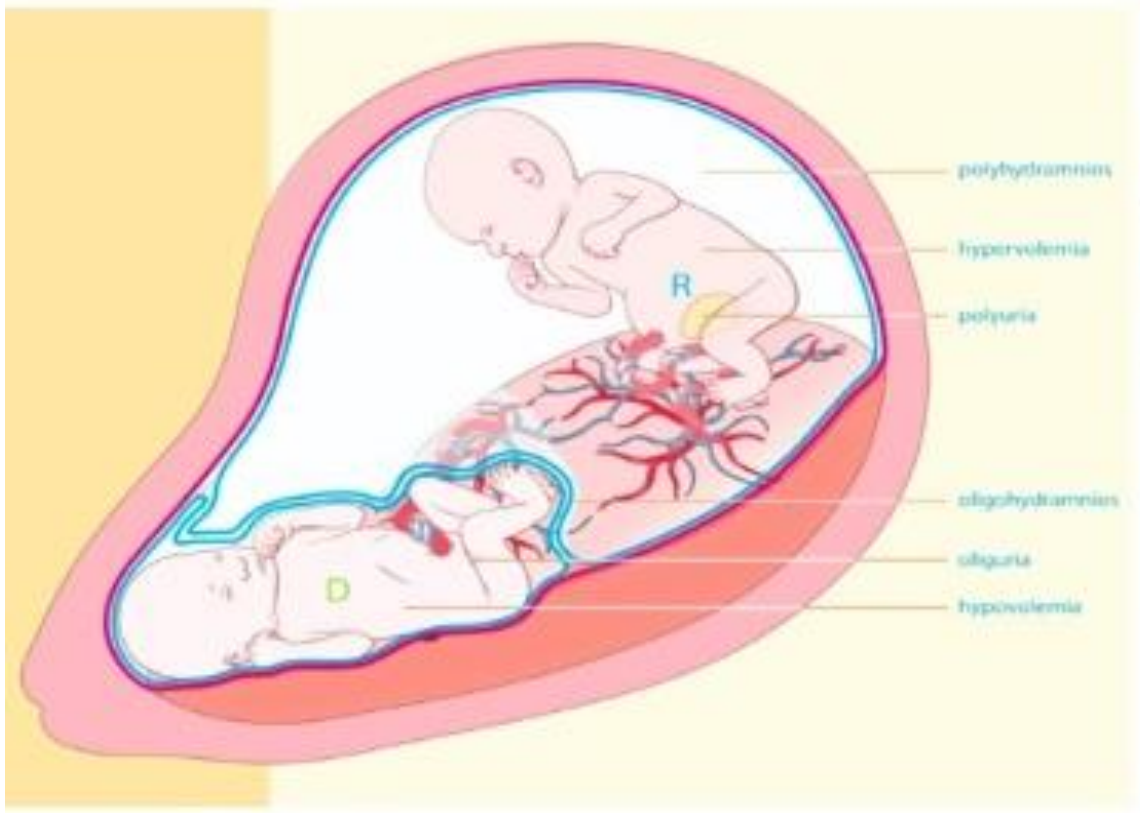
GIỚI THIỆU

- Là 1 dạng truyền máu từ thai sang thai trong song thai
- Chiếm 3-5% MCDA tự nhiên và # 0,3%-13% sau đốt laser điều trị TTTS
- Đặc trưng bởi sự chênh lệch đáng kể nồng độ hemoglobin giữa 2 thai trong song thai không có dấu hiệu " 1 đa ối- 1 thiểu ối"
- Sự truyền máu diễn ra lâu dài qua những động- tm nhỏ ngoại biên

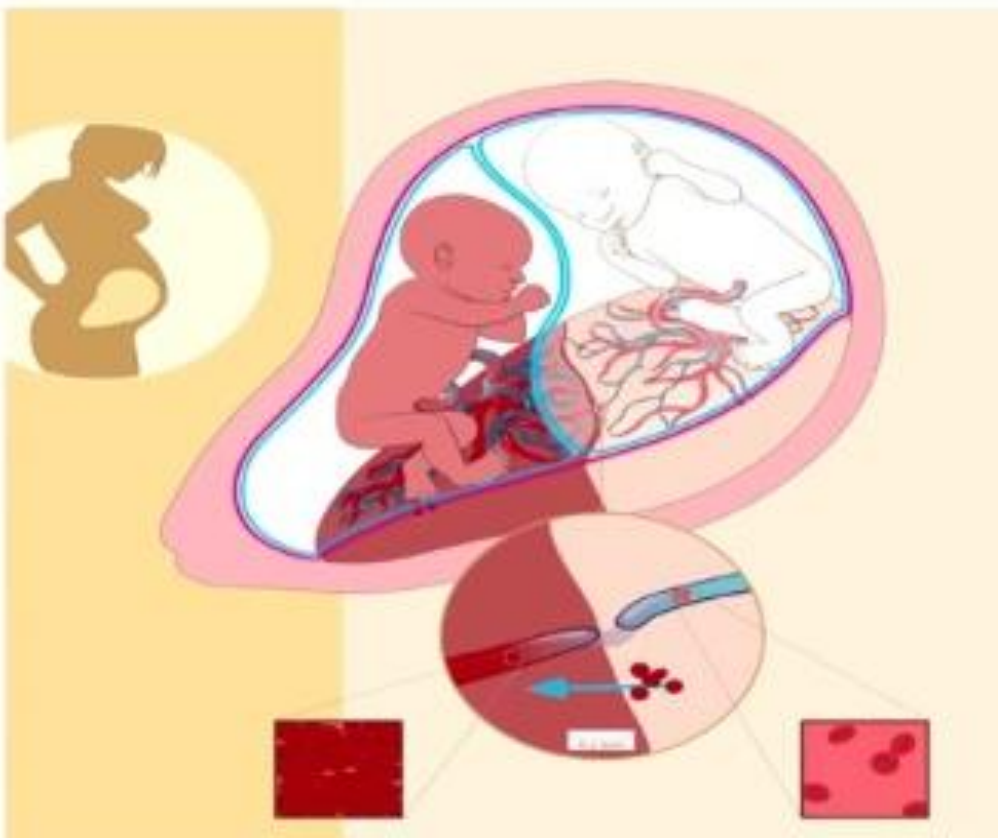


SINH LÝ BỆNH

TTTS



TAPS



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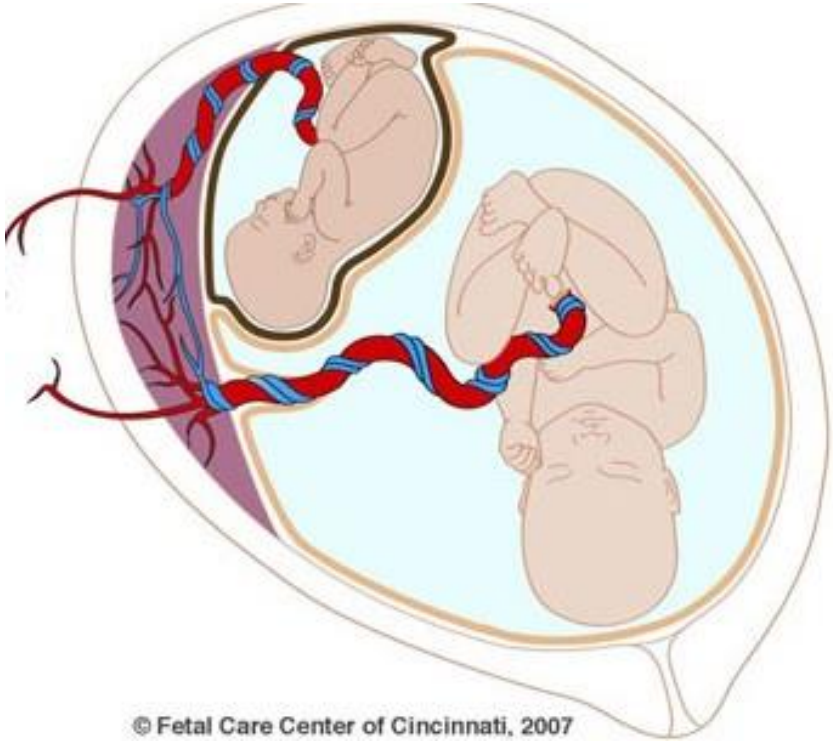

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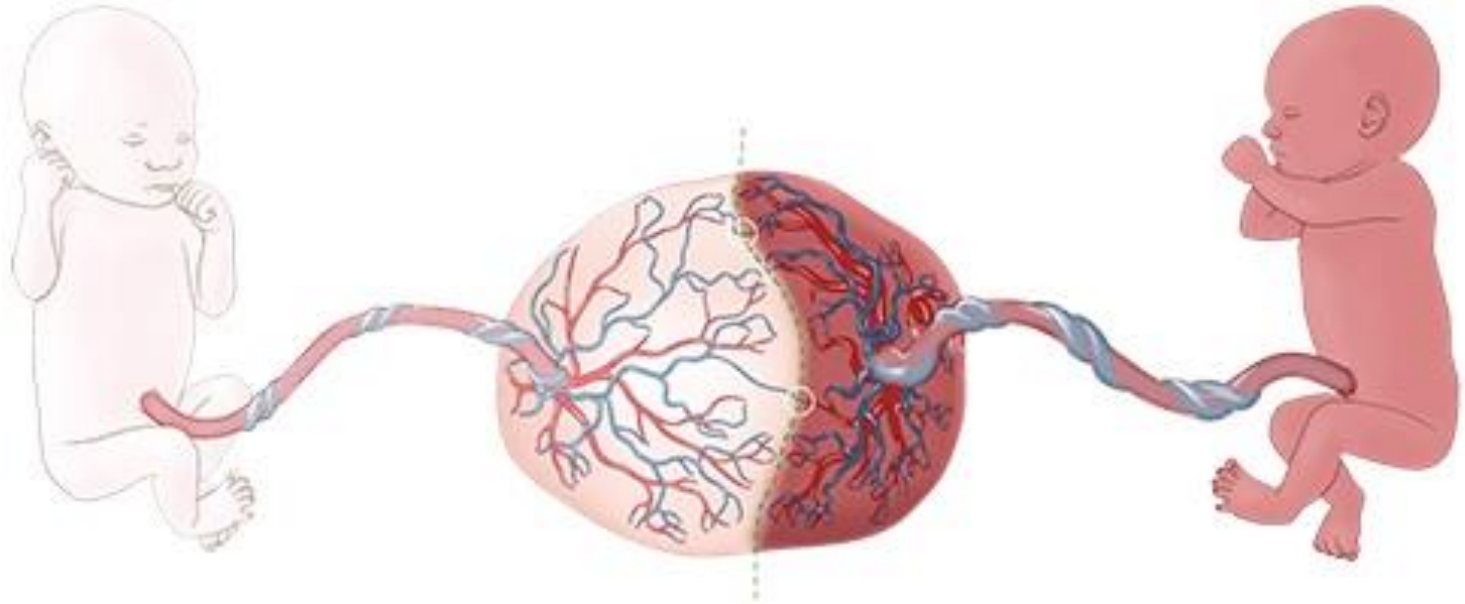

TAPS

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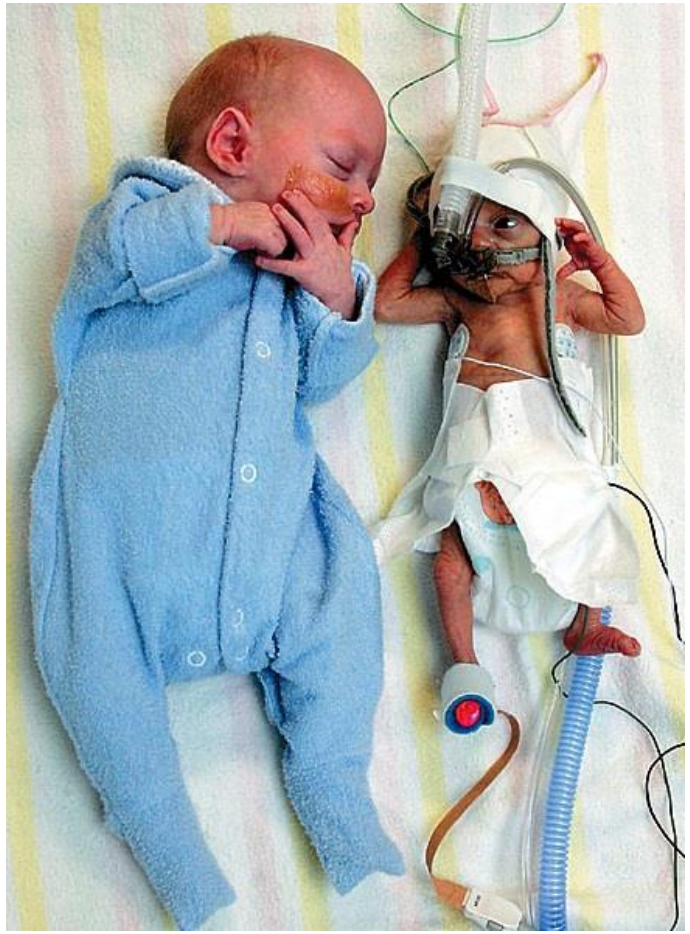

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TAPS

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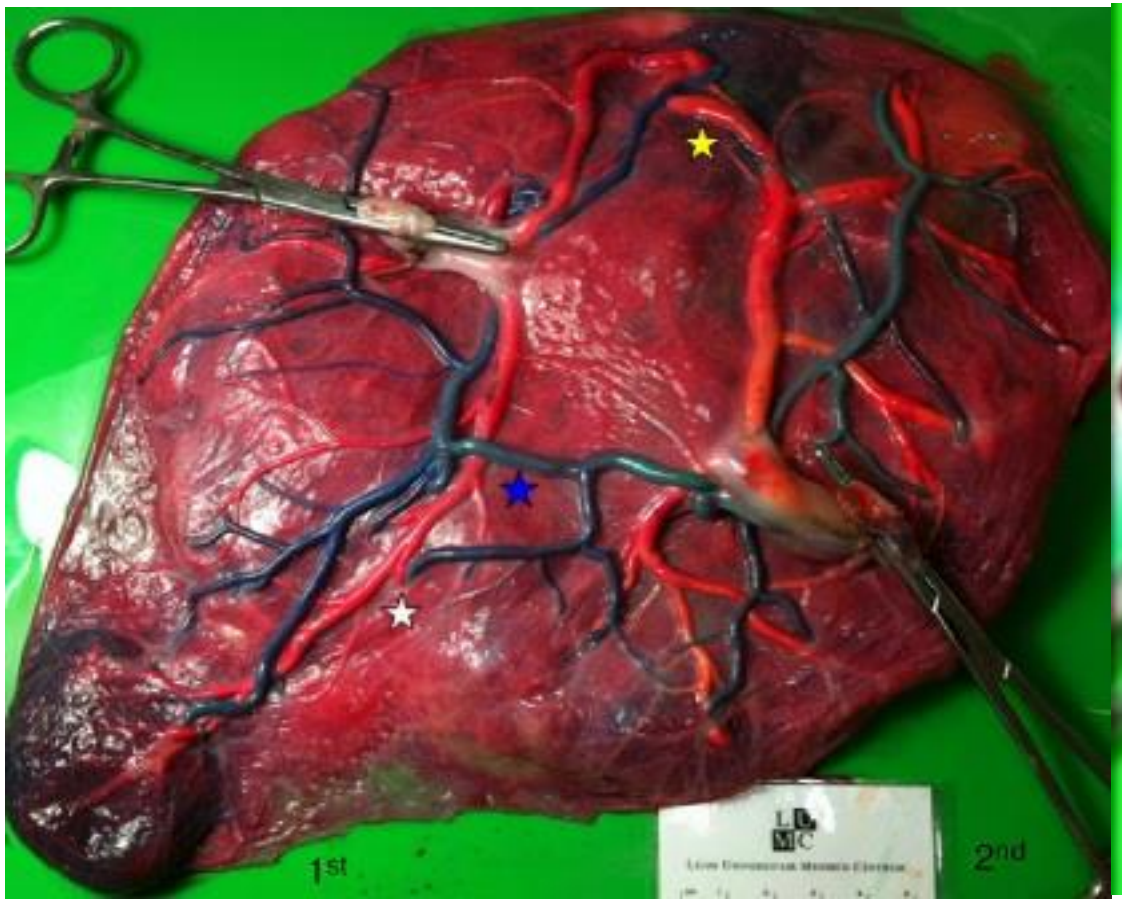

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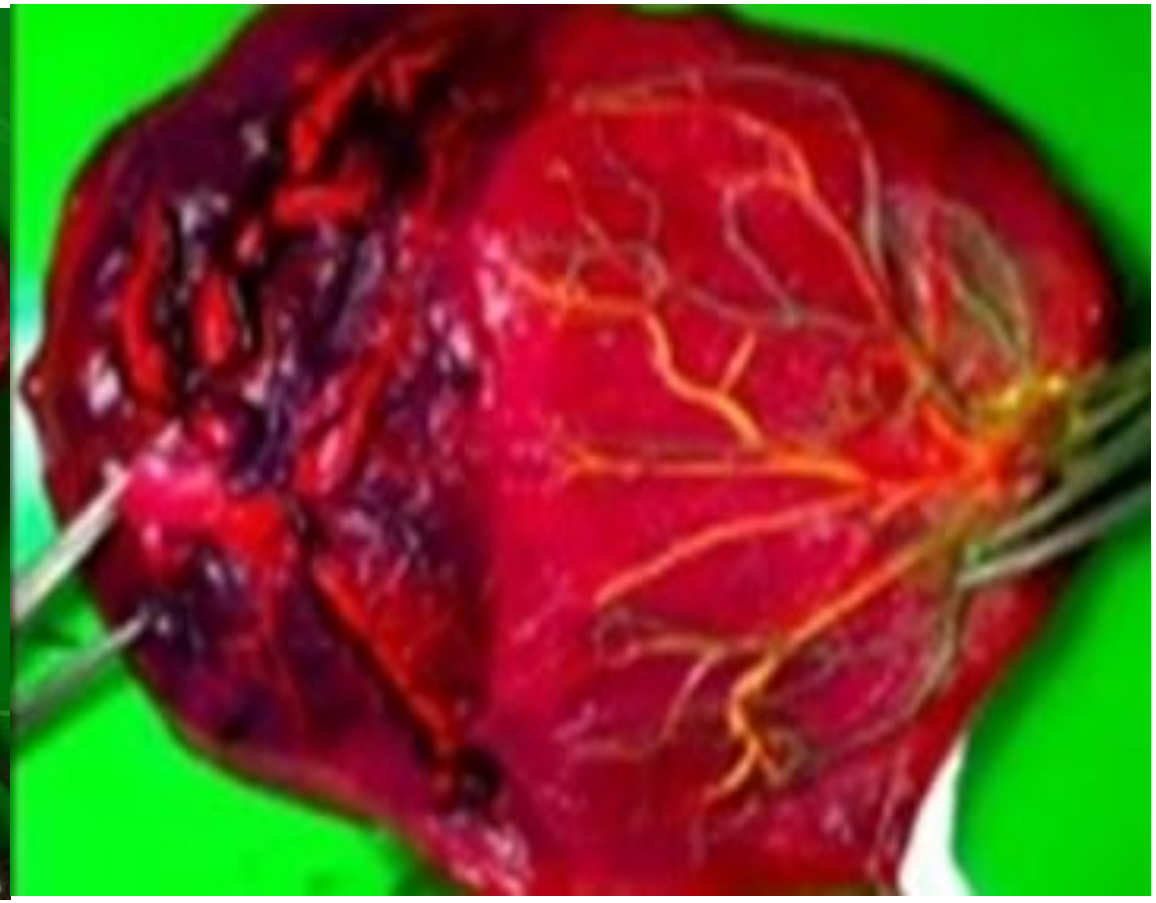
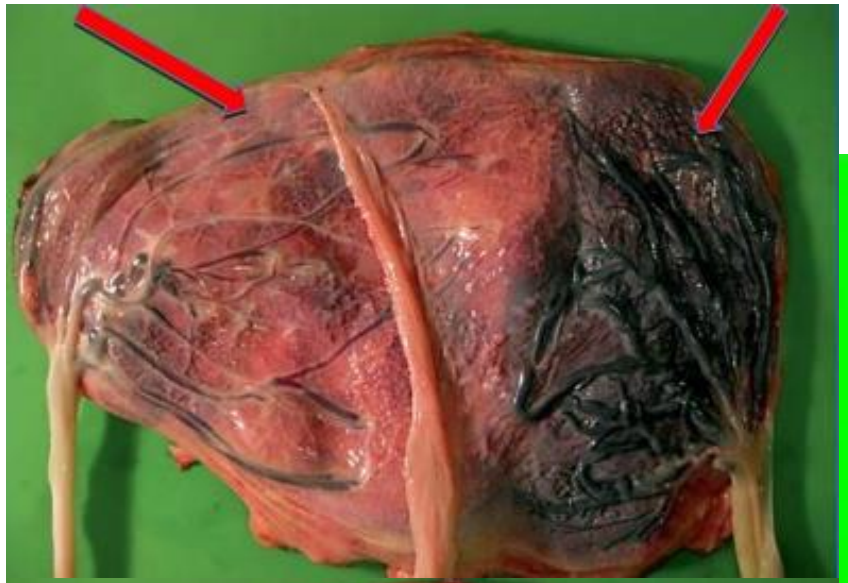
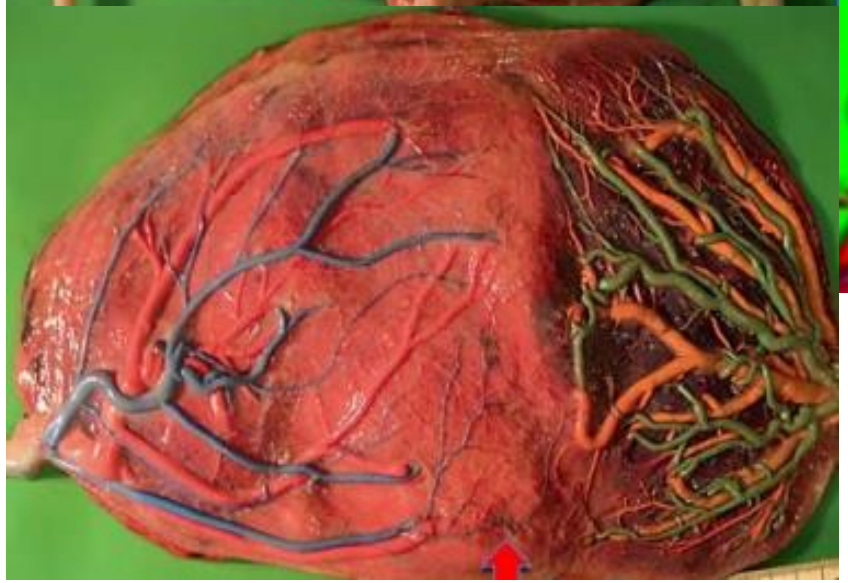
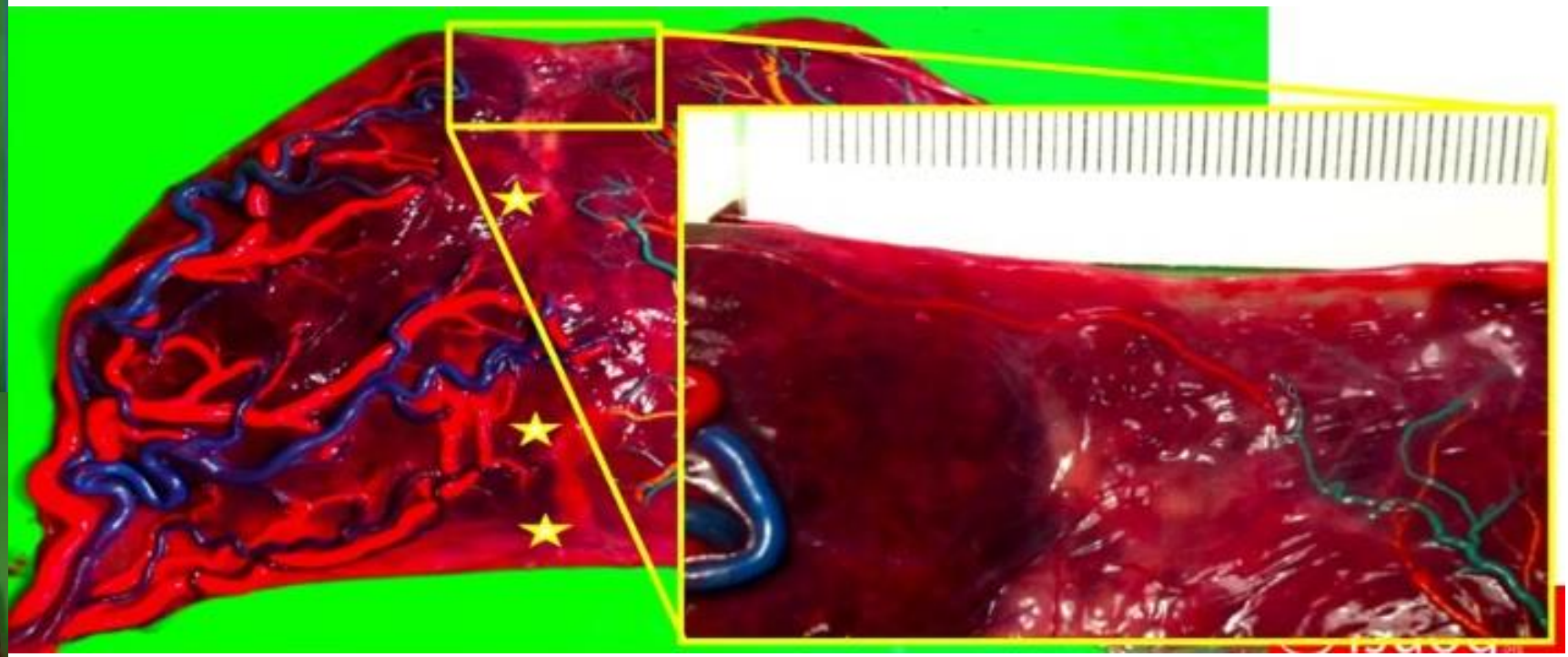


TAPS

BIỂU HIỆN

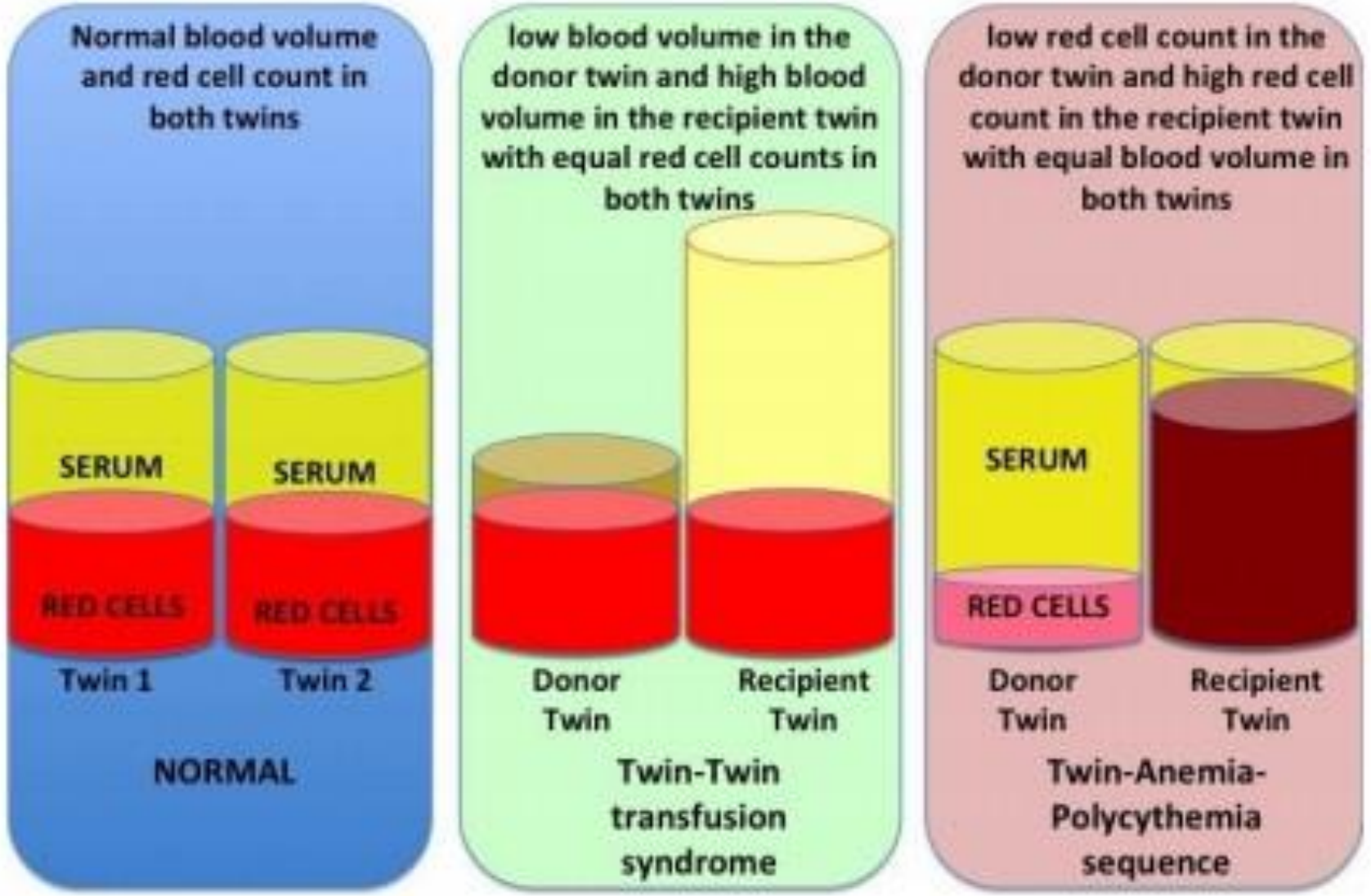






TAPS

SINH LÝ BỆNH

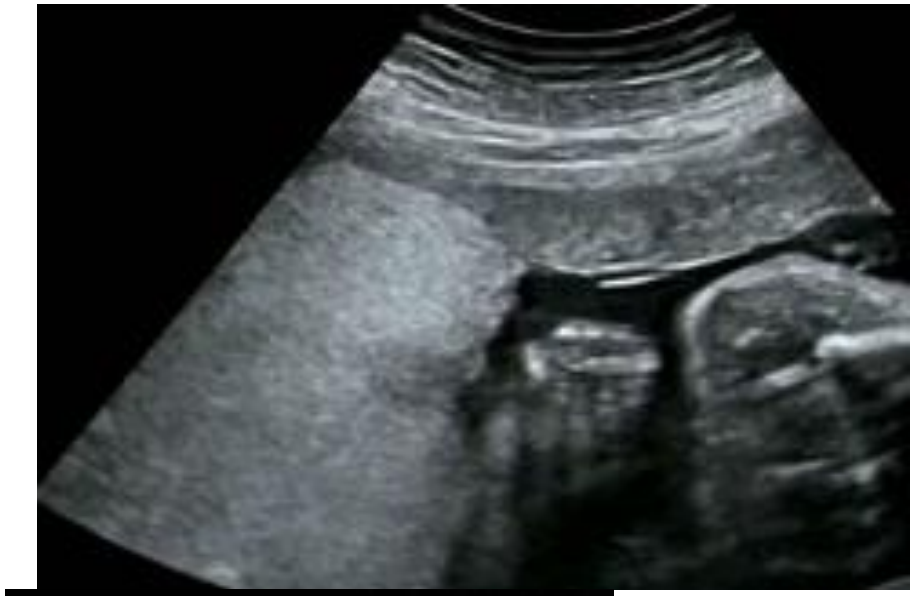

Normal blood volume and red cell count in both twins
SERUM
SERUM
RED CELLS
RED CELLS
Twin 1
Twin 2
NORMAL
low blood volume in the donor twin and high blood volume in the recipient twin with equal red cell counts in both twins
Donor Twin
Recipient Twin
Twin-Twin transfusion syndrome
low red cell count in the donor twin and high red cell count in the recipient twin with equal blood volume in both twins
SERUM
RED CELLS
Donor Twin
Recipient Twin
Twin-Anemia-Polycythemia sequence

HẬU QUẢ

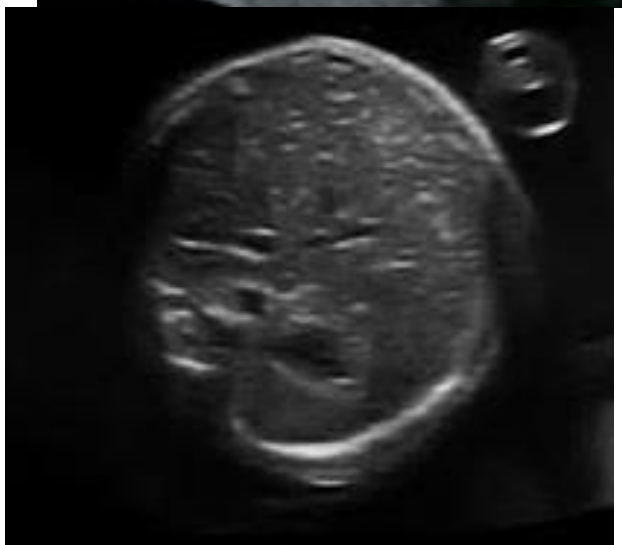
DẤU HIỆU TRÊN SIÊU ÂM

Bánh nhau có 2 phần với phản âm khác biệt:

- Một phần nhau dày, phù nề, echo dày
- Một phần nhau mỏng, echo kém



Gan của thai nhận có hình ảnh bầu trời sao



Doppler động mạch não giữa

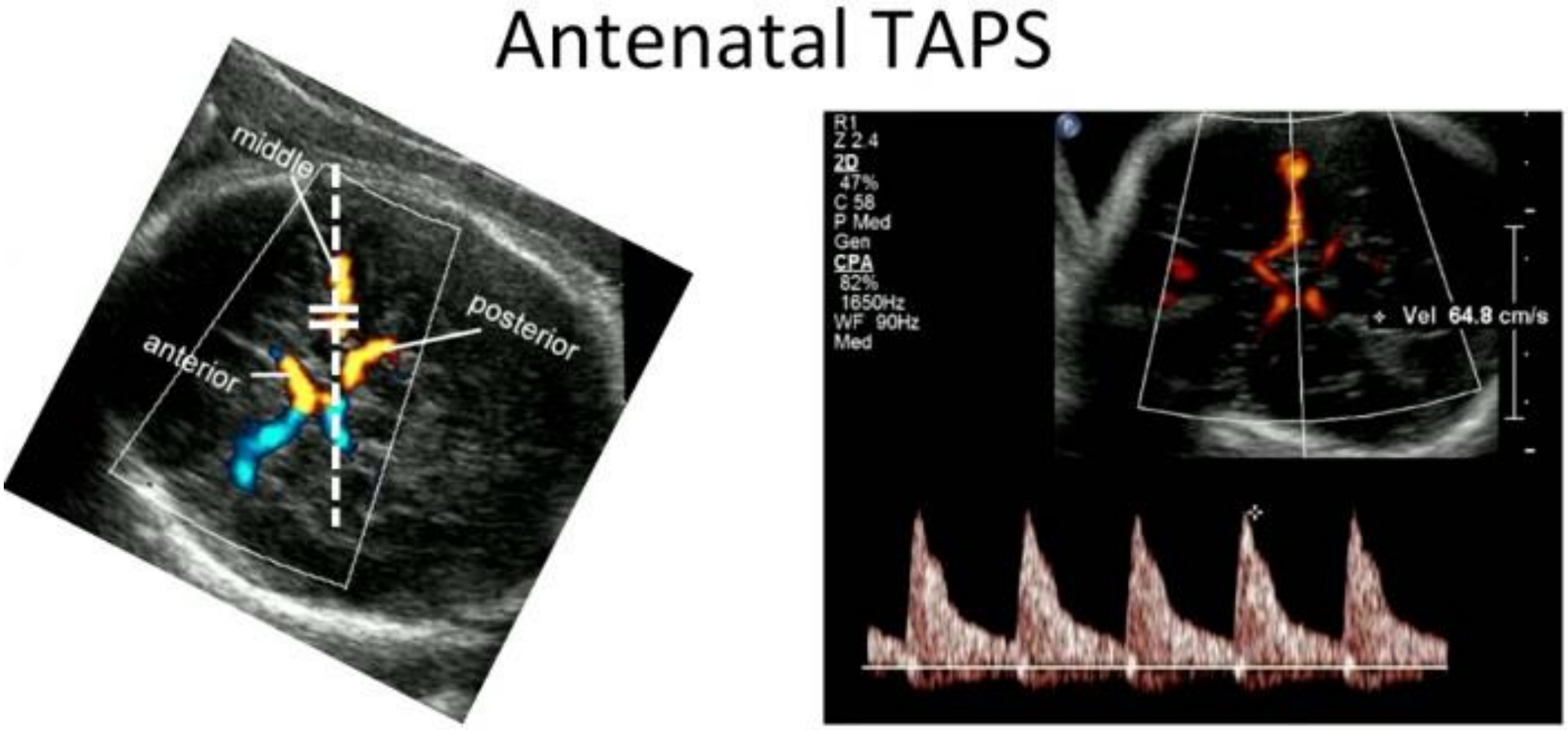
Hai sự kiện phải hiện diện:

- Dòng máu chảy chậm hơn bình thường ở thai nhận : thai đa hồng cầu
- Dòng máu chảy nhanh hơn bình thường ở thai cho : thai thiếu máu

⇒ Doppler động mạch não giữa:

- Tăng PSV ĐMNG: xác nhận tình trạng thiếu máu ở thai cho
- Giảm PSV ĐMNG: gợi ý tình trạng đa hồng cầu ở thai nhận

Doppler động mạch não giữa



Phân độ TAPS

Dấu hiệu chẩn đoán qua siêu âm Doppler

- Độ 1:MCA-PSV Thai cho >1.5 MoM và MCA-PSV thai nhận < 1.0 MoM, không có dấu hiệu của suy thai
- Độ 2: 1:MCA-PSV Thai cho >1.7 MoM và MCA-PSV thai nhận < 0.8 MoM, không có dấu hiệu của suy thai
- Độ 3: như độ 1 hoặc 2 nhưng có dấu hiệu của suy thai, xác định qua dòng chảy có bất thường

❖ Độ 4: Phù thai cho

- Độ 5: Một hoặc cả hai thai lưu được xác định nguyên nhân do TAPS

Dòng chảy có bất thường khi: Mất hoặc đảo ngược cuối tâm trương ĐMR, có mạch nẩy trên dòng TMR, tăng PI hoặc đảo ngược sóng ống TM

Can middle cerebral artery peak systolic velocity predict polycythemia in monochorionic–diamniotic twins? Evidence from a prospective cohort study

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KEYWORDS: MCA-PSV; monochorionic twins; polycythemia; twin anemia–polycythemia sequence

ABSTRACT

Objective *The antenatal diagnosis of twin anemia–polycythemia sequence (TAPS) in monochorionic–diamniotic (MCDA) twin pregnancies is based on elevated peak systolic velocity in the middle cerebral artery (MCA-PSV) in the donor twin and decreased MCA-PSV in the recipient twin. However, the association between these parameters and polycythemia has not yet been established. The aim of this study was to determine whether MCA-PSV can predict polycythemia in MCDA pregnancies.*

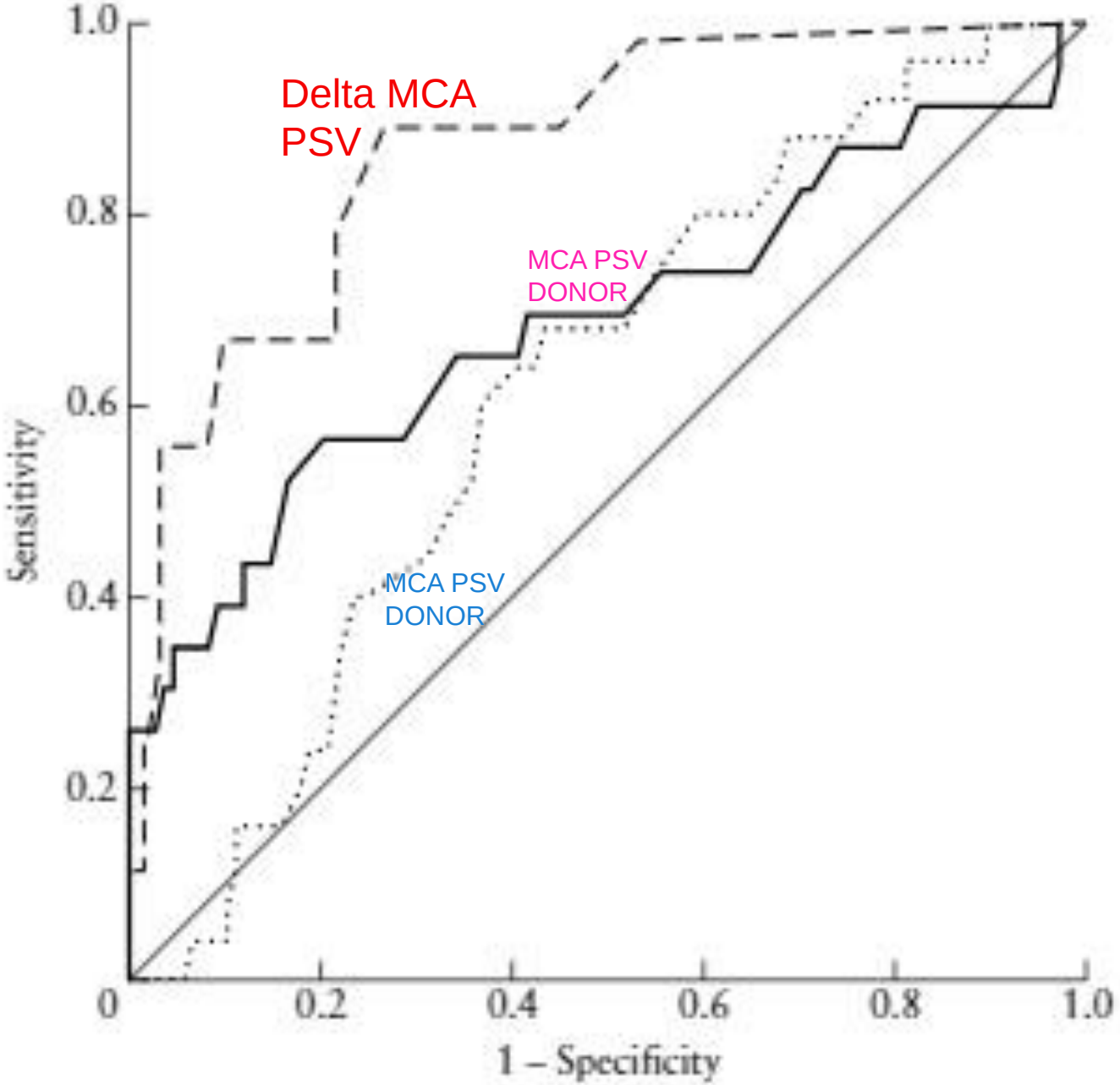
Methods *This was a prospective cohort study of MCDA pregnancies recruited at 14–18 weeks' gestation from a single tertiary care center between January 2011 and June 2014. Fetal MCA Doppler waveforms were recorded every 2 weeks from 18 weeks' gestation until delivery. Only those with an MCA-PSV measurement within 1 week of delivery were included in the analysis. Neonatal hematocrit level was determined in all twins from venous blood obtained within 4 h of delivery. Polycythemia was defined as a hematocrit of > 65%, and anemia as a hematocrit of < 45%. TAPS was diagnosed when an intertwin hemoglobin difference of > 8 g/dL and reticulocyte count ratio of > 1.7 were observed.*

Results *Of 162 MCDA pregnancies followed during the study period, 69 had an MCA-PSV measurement within 1 week of delivery and were included in the study. Twenty-five neonates were diagnosed with polycythemia and nine twin pairs met the criteria for TAPS. In a pooled analysis, MCA-PSV was negatively correlated with neonatal hematocrit (P = 0.017, r = −0.215) and was significantly higher in anemic fetuses than in normal controls (1.15 multiples of the median (MoM) vs 1.02 MoM, respectively; P = 0.001). However, MCA-PSV was similar among polycythemic and normal fetuses (0.95 MoM vs 1.02 MoM, respectively; P = 0.47). Intertwin difference in MCA-PSV (delta MCA-PSV) was positively correlated with intertwin hematocrit difference (P = 0.002, r = 0.394). Moreover, twin pregnancies with an intertwin hematocrit difference of > 24% had a significantly greater delta MCA-PSV than did those with an intertwin hematocrit difference of ≤ 24% (delta MCA-PSV, 19 vs 5 cm/s; P < 0.001).*

Conclusions *MCA-PSV is not significantly decreased in polycythemic MCDA twins. However, delta MCA-PSV is associated with a large intertwin difference in hematocrit, and its use may be better than conventional methods for the risk assessment of TAPS.*

INTRODUCTION

Monochorionic–diamniotic (MCDA) twin pregnancies share a single placenta and nearly all have intertwin anastomoses connecting the fetal circulations, which may cause intertwin blood exchange[1,2]. In most cases intertwin blood transfusion is balanced. However, an unbalanced net transfusion may occur and lead to various complications. Twin-to-twin transfusion syndrome (TTTS) is a well-established complication, with a reported incidence of 10–15% in MC twin pregnancies, characterized by severe amniotic fluid discordance, although similar hemoglobin levels are usually observed[3,4]. Another recently described clinical complication of MCDA twin pregnancy is twin anemia–polycythemia sequence (TAPS). TAPS is caused by the slow net transfer of blood from one fetus to the other via a few tiny, and mostly


Delta MCA PSV
MCA PSV DONOR
MCA PSV DONOR
Sensitivity
1 – Specificity
0
0.2
0.4
0.6
0.8
1.0

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Improved prediction of twin anemia–polycythemia sequence by delta middle cerebral artery peak systolic velocity: new antenatal classification system

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KEYWORDS: diagnostic accuracy; MCA-PSV; monochorionic twins; TAPS; twin–twin transfusion syndrome

ABSTRACT

Objectives To investigate the diagnostic accuracy of delta middle cerebral artery peak systolic velocity (MCA-PSV) > 0.5 multiples of the median (MoM) and compare its predictive value with that of the current MCA-PSV cut-off values of > 1.5 MoM in the donor and < 1.0 MoM in the recipient, for the diagnosis of twin anemia–polycythemia sequence (TAPS) in monochorionic twin pregnancy.

Methods This was a retrospective consecutive cohort study comprising all uncomplicated monochorionic twin pregnancies and twin pregnancies with a postnatal diagnosis of TAPS managed between 2003 and 2017 in the Dutch national referral center for fetal therapy. Cases with incomplete MCA-PSV Doppler measurements 1 week prior to delivery or with incomplete hemoglobin measurements within 1 day after birth were excluded. The postnatal diagnosis of TAPS was based on an intertwin hemoglobin difference > 8 g/dL and at least one of the following: reticulocyte count ratio > 1.7 or presence of minuscule anastomoses on the placental surface. We compared the predictive accuracy of the current diagnostic method using MCA-PSV cut-off values of > 1.5 MoM in the donor and < 1.0 MoM in the recipient with that of a new method based on intertwin difference in MCA-PSV > 0.5 MoM for prediction of TAPS.

Results In total, 45 uncomplicated and 35 TAPS monochorionic twin pregnancies were analyzed. The sensitivity and specificity of the cut-off MCA-PSV values (donor > 1.5 MoM, recipient < 1.0 MoM) to predict TAPS was 46% (95% CI, 30–62%) and 100% (95% CI, 92–100%), respectively; positive predictive value was 100% (95% CI, 81–100%) and negative predictive value 70% (95% CI, 58–80%). Delta MCA-PSV showed a sensitivity of 83% (95% CI, 67–92%) and a specificity of 100% (95% CI, 92–100%); the positive and negative predictive values were 100% (95% CI, 88–100%) and 88% (95% CI, 77–94%), respectively. Of the 35 cases with TAPS diagnosed postnatally, 13 twin pairs showed a delta MCA-PSV > 0.5 MoM but did not fulfill the cut-off MCA-PSV criteria. Of these 13 TAPS twins, nine donors and four recipients had normal MCA-PSV values. There was a high correlation between delta MCA-PSV and intertwin difference in hemoglobin level ($R = 0.725$, $P < 0.01$).

Conclusion Delta MCA-PSV > 0.5 MoM has a greater diagnostic accuracy for predicting TAPS compared to the current MCA-PSV cut-off criteria. We therefore propose a new antenatal classification system for TAPS. In monochorionic twin pregnancies with delta MCA-PSV > 0.5 MoM on Doppler ultrasound, but normal MCA-PSV values in the donor or recipient, obstetricians should be aware of the therapeutic implications and neonatal morbidities associated with TAPS. © *2018 The Authors. Ultrasound in Obstetrics & Gynecology published by John Wiley & Sons Ltd on behalf of the International Society of Ultrasound in Obstetrics and Gynecology.*

INTRODUCTION

Twin anemia–polycythemia sequence (TAPS) is a fetofetal transfusion syndrome in monochorionic twins, in which chronic net intertwin blood transfusion through minuscule placental anastomoses leads to large hemoglobin differences between donor and recipient, without signs

Table 5 Proposed antenatal classification system for twin anemia–polycythemia sequence (TAPS)

Antenatal stage	*Previous criteria*	*Proposed criteria*
Stage 1	MCA-PSV donor > 1.5 MoM, recipient < 1.0 MoM; without signs of fetal compromise	Delta MCA-PSV > 0.5 MoM; without signs of fetal compromise
Stage 2	MCA-PSV donor > 1.7 MoM, recipient < 0.8 MoM; without signs of fetal compromise	Delta MCA-PSV > 0.7 MoM; without signs of fetal compromise
Stage 3	As Stage 1 or 2; with cardiac compromise of donor*	As Stage 1 or 2; with cardiac compromise of donor*
Stage 4	Hydrops of donor	Hydrops of donor
Stage 5	Intrauterine demise of one or both fetuses preceded by TAPS	Intrauterine demise of one or both fetuses preceded by TAPS

*Defined as critically abnormal flow: Doppler shows absent or reversed end-diastolic flow in umbilical artery, pulsatile flow in umbilical vein and/or increased pulsatility index or reversed flow in ductus venosus. MCA-PSV, middle cerebral artery peak systolic velocity; MoM, multiples of the median.

with the current criteria of fixed MCA-PSV cut-off values. Moreover, we showed that TAPS twins with delta MCA-PSV > 0.5 MoM but with normal MCA-PSV values (in either the donor or the recipient) were comparable with respect to perinatal mortality and neonatal morbidity to the TAPS twins that met MCA-PSV cut-off criteria. Based on these findings, we propose a new antenatal classification system for TAPS (Table 5).

In the new classification system, Stage 1 TAPS is changed from MCA-PSV > 1.5 MoM in the donor and

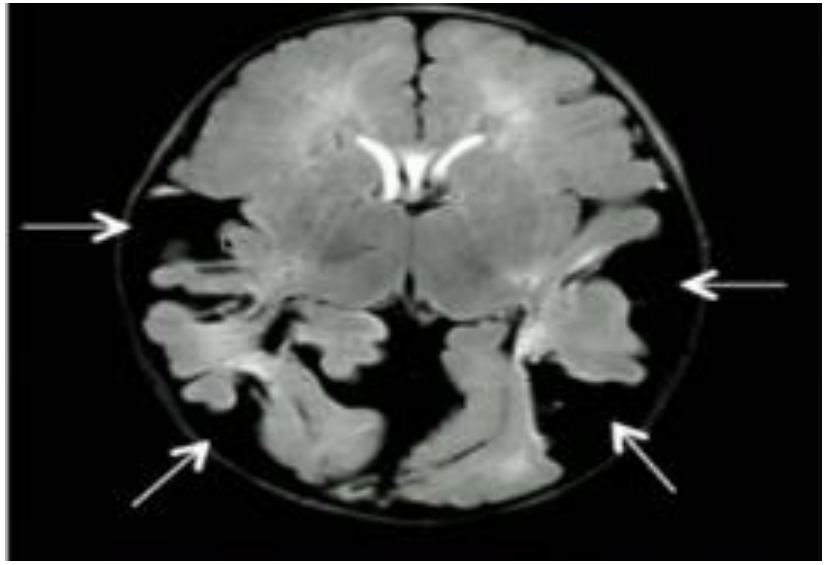
twins with delta MCA-PSV > 0.5 MoM but normal MCA-PSV compared with the cut-off MCA-PSV group. It is possible that coexisting selective intrauterine growth restriction is of influence on the hemodynamic balance in this population. Between the two groups, no statistically significant differences were found with respect to the type of TAPS, placental anastomoses and perinatal outcome, corroborating the fact that these two groups probably share the same elemental pathological mechanism responsible for the intertwin difference in hemoglobin

TIÊU CHUẨN CHẨN ĐOÁN TAPS
Delta MCA- PSV MoMs

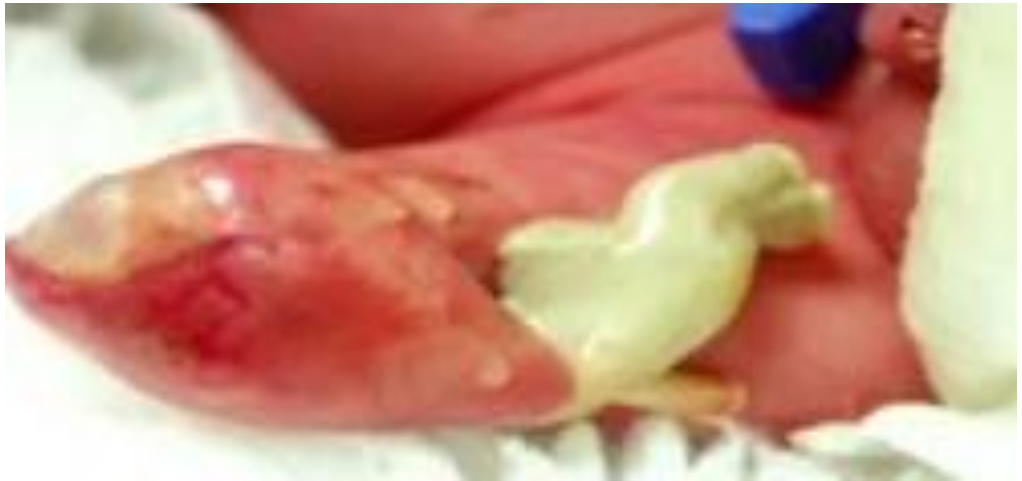
	Tavares de Sousa (Cách biệt > 0.373 MoM, > 7.25 g/dl Hb)	Tollenaar(mới) (Cách biệt > 0.5 MoM, Delta > 8g/dl Hb)	Tollenaar (cũ) (> 1.5 MoM, < 1.0 MoM)
Độ nhạy(%)	93	83	46
Độ đặc hiệu(%)	96	100	100
GTTL dương (%)	70	100	100
GTTL âm (%)	99	88	70

CÁC BIẾN CHỨNG CỦA TAPS

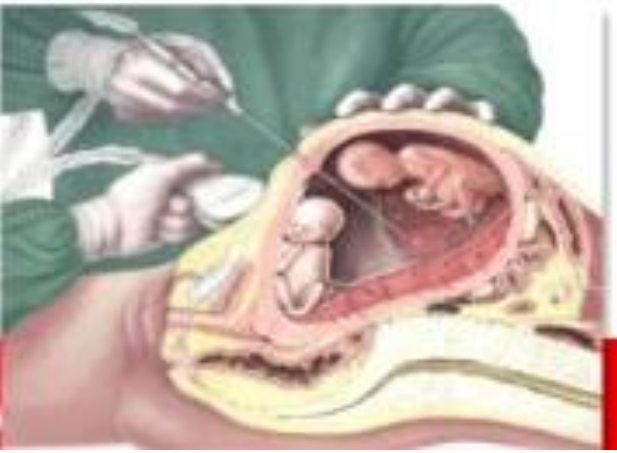
- Thai lưu
- Tổn thương não

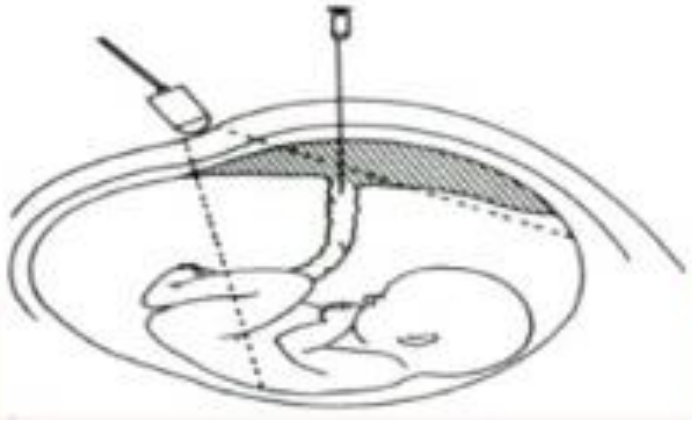


- Những biến chứng liên quan đến huyết động học: truyền máu…
- Hoại tử chi



ĐIỀU TRỊ



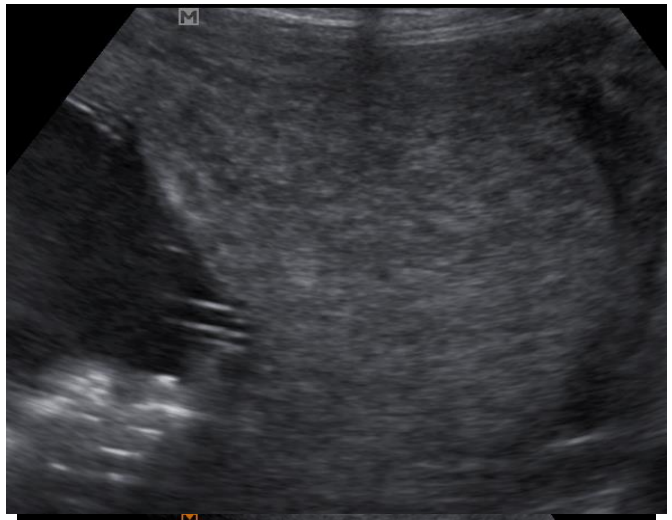


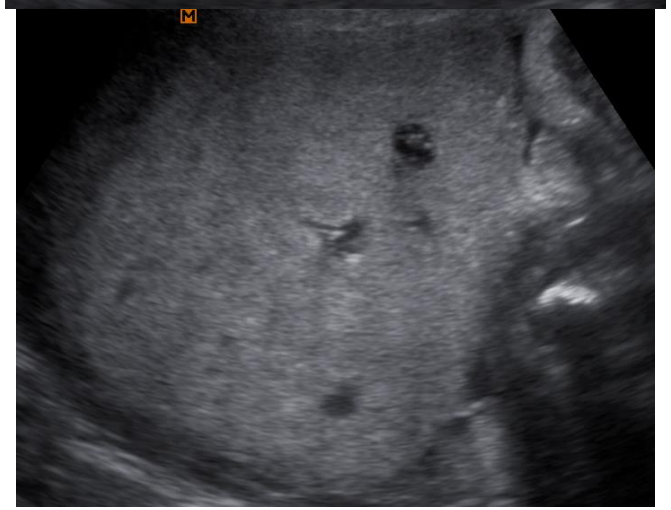
Đốt laser

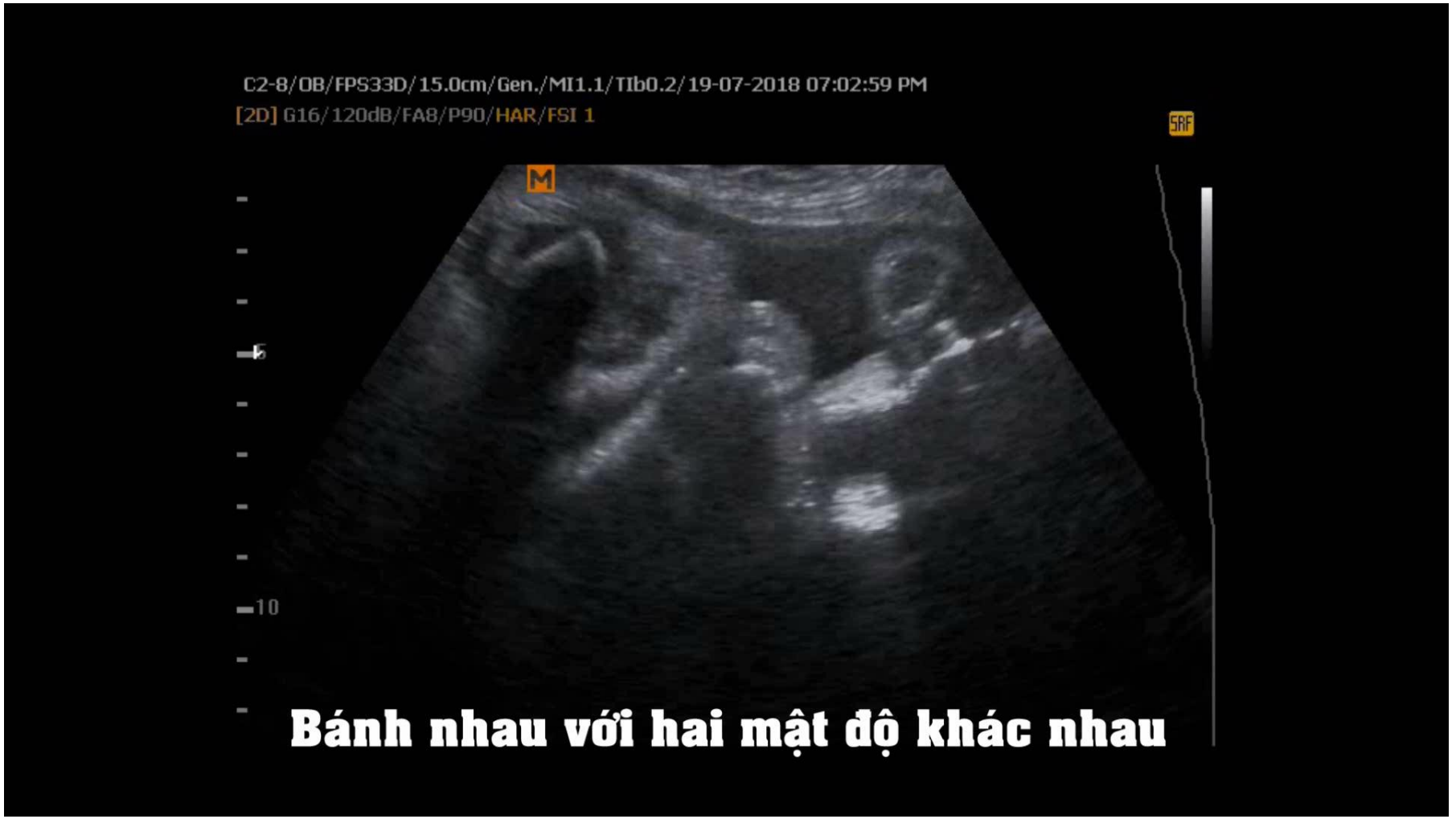
Truyền máu bào thai

Theo dõi sát qua siêu âm

TRƯỜNG HỢP 1:
Song thai 33.5 tuần MCDA

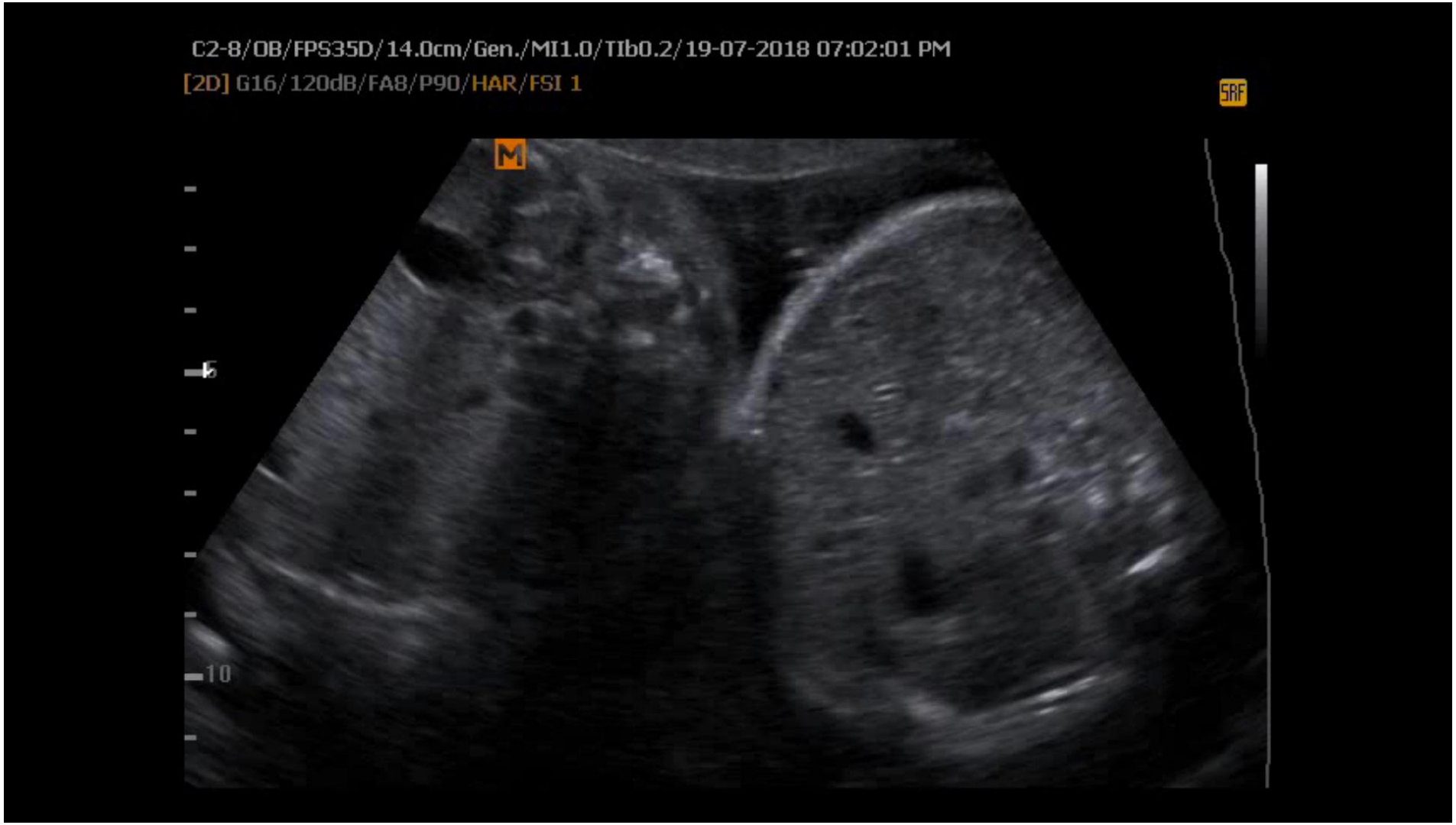




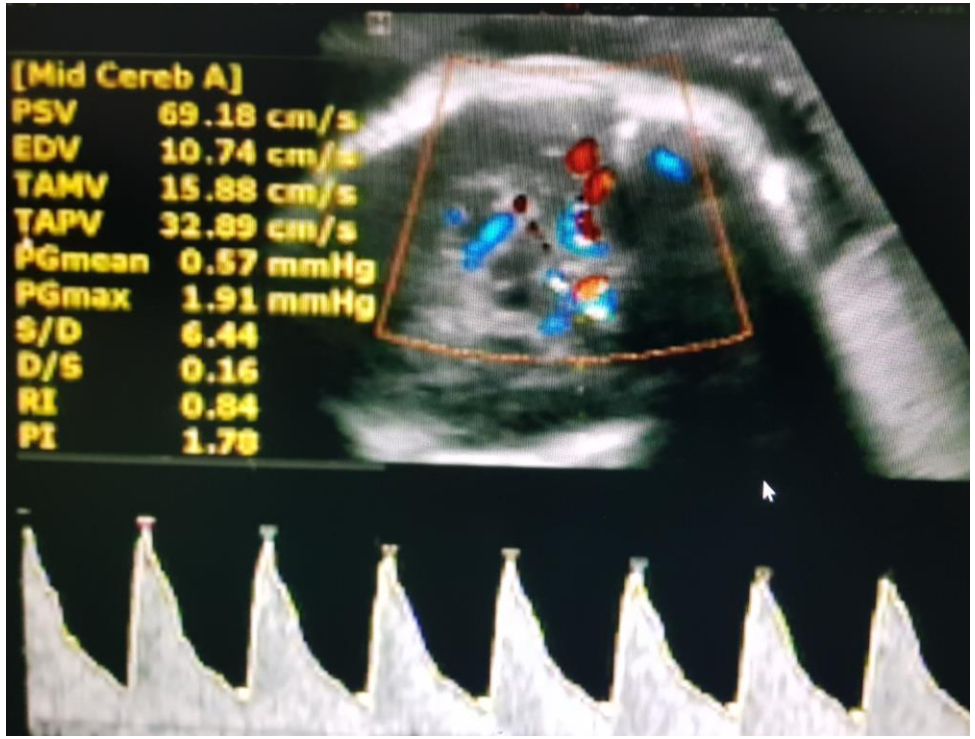


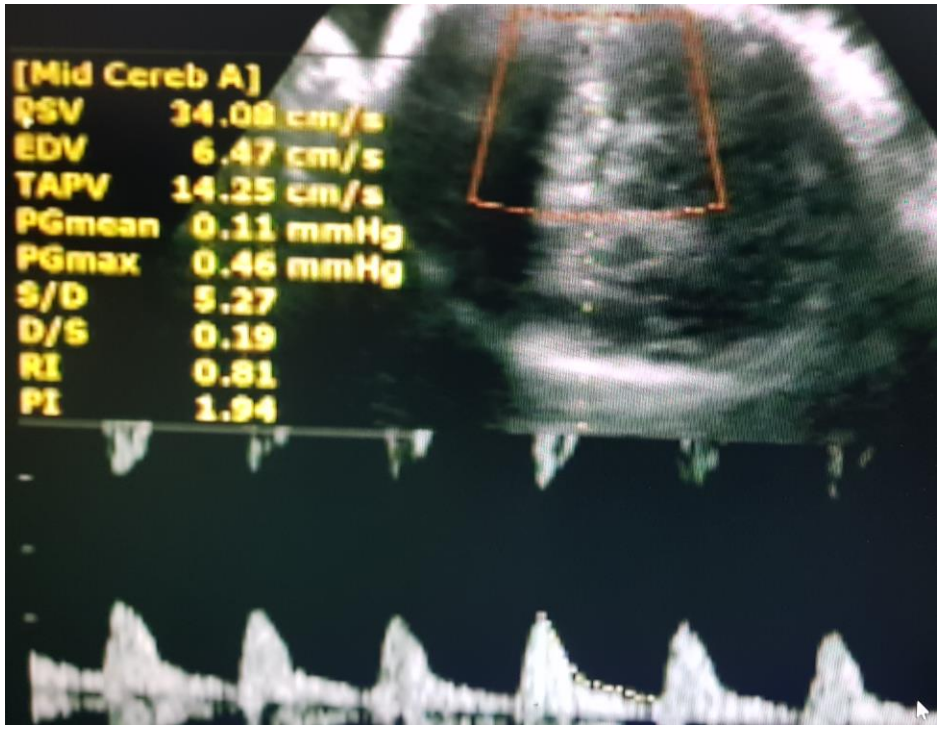
TRƯỜNG HỢP 1:
Song thai 33.5 tuần MCDA

Starry sky



TRƯỜNG HỢP 1:
Song thai 33.5 tuần MCDA

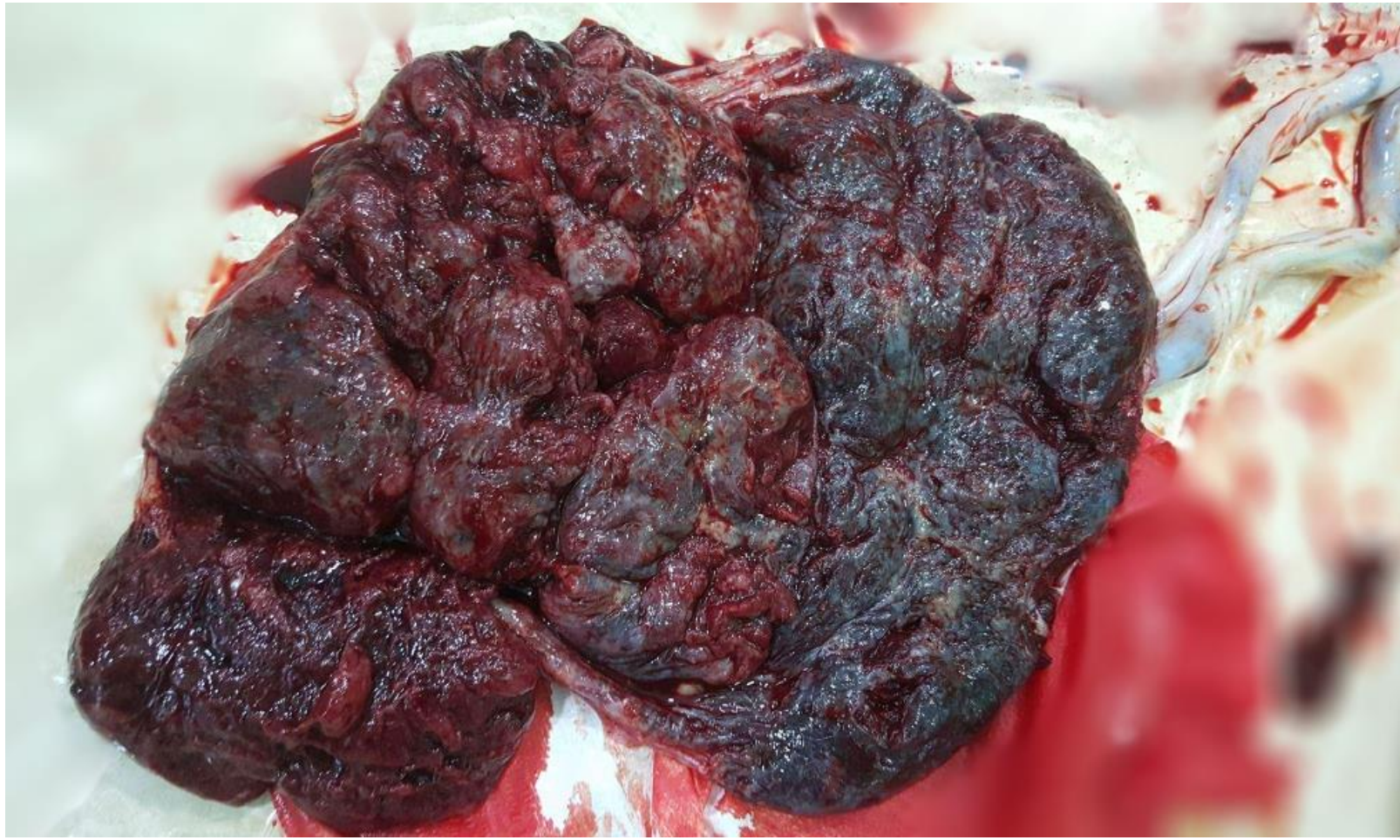




Thai cho:PSV MCA : 69.1 cm/s(1.48 MoM) Thai nhận:PSV MCA : 34 cm/s(0.7 MoM)

Delta MCA PSV: 0.78 MoM

TRƯỜNG HỢP 1:
Song thai 33.5 tuần MCDA



2 bé gái, 2100 gr; Apgar 1’ =7, 5’= 8

Bánh nhau: Thai cho: nhạt màu và dày
Thai nhận: sậm màu và mỏng hơn

TRƯỜNG HỢP 1:
Song thai 33.5 tuần MCDA

2 bé gái, 2100 gr; Apgar 1’ =7, 5’= 8

Bé cho (thiếu máu): da niêm nhợt

Hb: 7.6 g/dl

Hct: 22.4 %

Bé nhận (đa hồng cầu): da đỏ sậm

Hb 23.9 g/dl

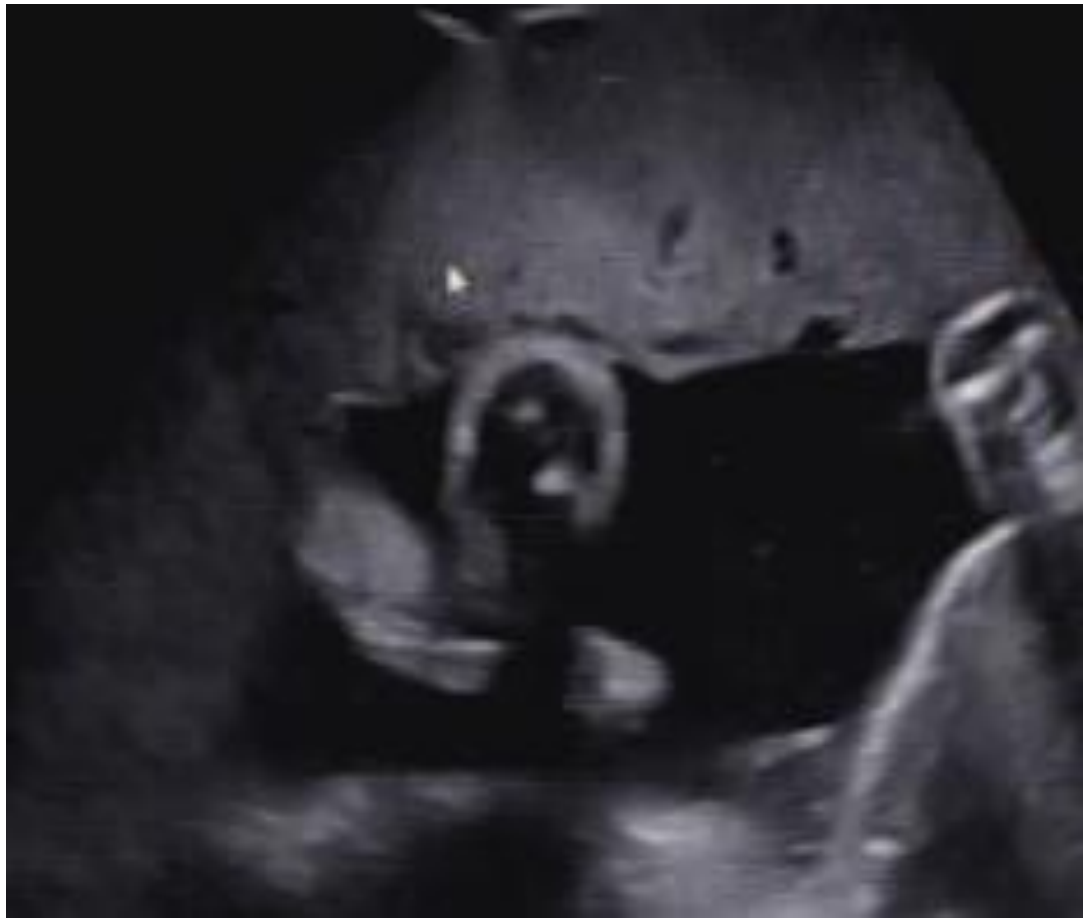
Hct: 74.4 %

Chênh lệch Hb: 16.3 g/dl

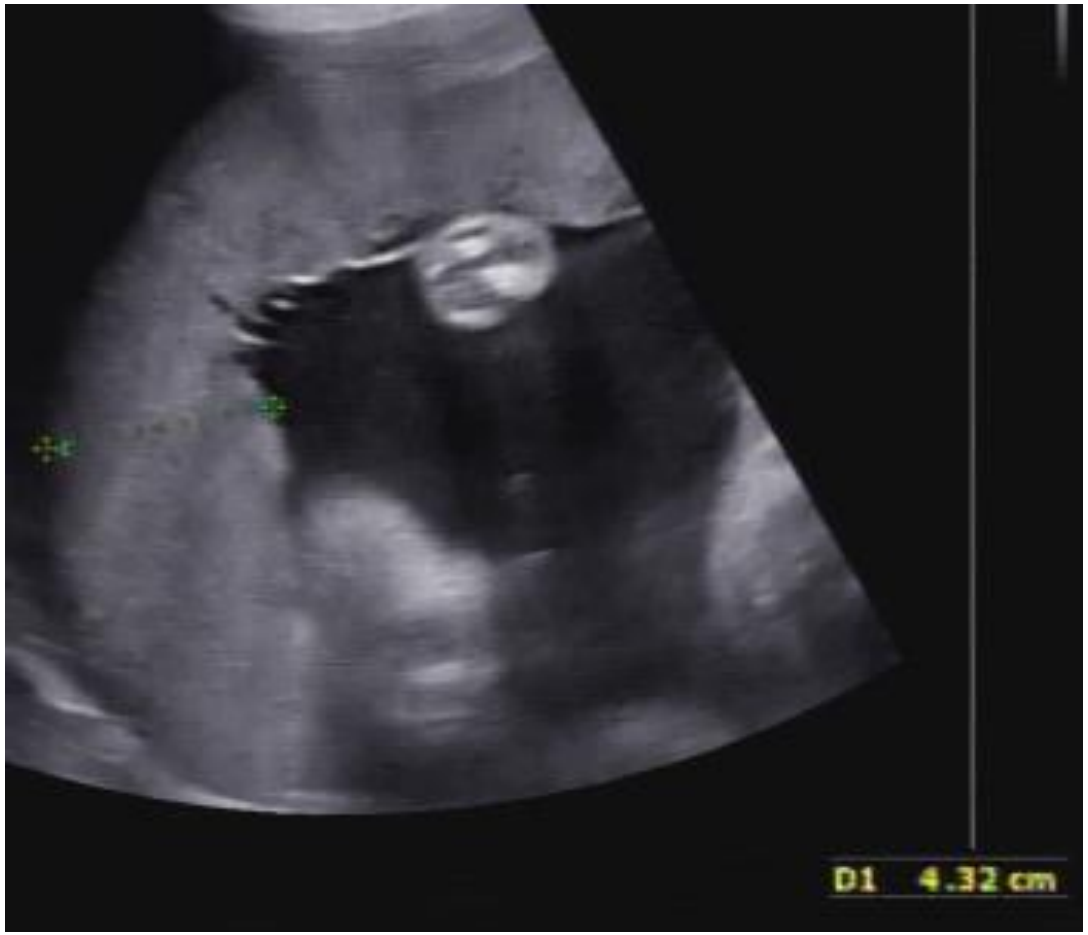
⇒ Bé cho: được truyền máu ngay

⇒ Bé nhận: được trích máu ngay

TRƯỜNG HỢP 2:
Song thai 31.5 tuần MCDA

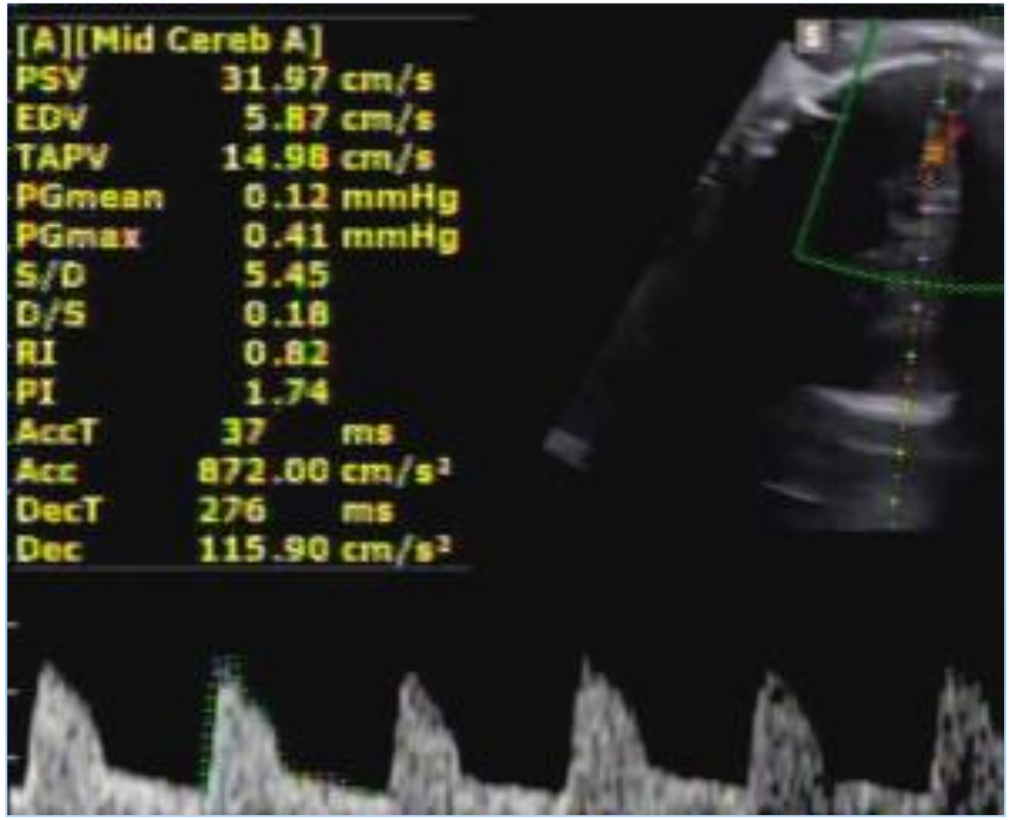


Bánh nhau có sự khác biệt lớn về phản âm và độ dày



Thai cho: bánh nhau dày 43 mm

TRƯỜNG HỢP 2:
Song thai 31.5 tuần MCDA



Thai cho:PSV MCA : 60.5 cm/s(1.39 MoM) Thai nhận:PSV MCA : 31 cm/s(0.71 MoM)

Delta MCA PSV: 0.68 MoM

TRƯỜNG HỢP 2:
Song thai 31.5 tuần MCDA

2 bé gái, 1500 gr-1800 gr

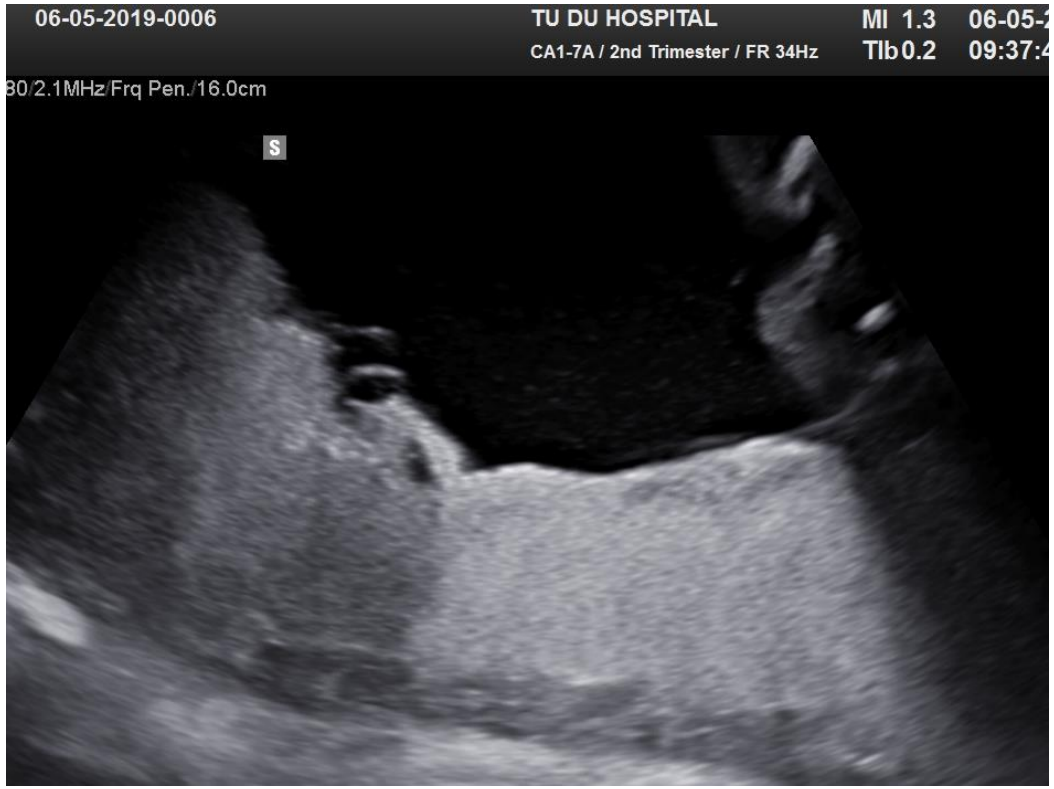
Bé cho (thiếu máu nhẹ): da hồng nhạt

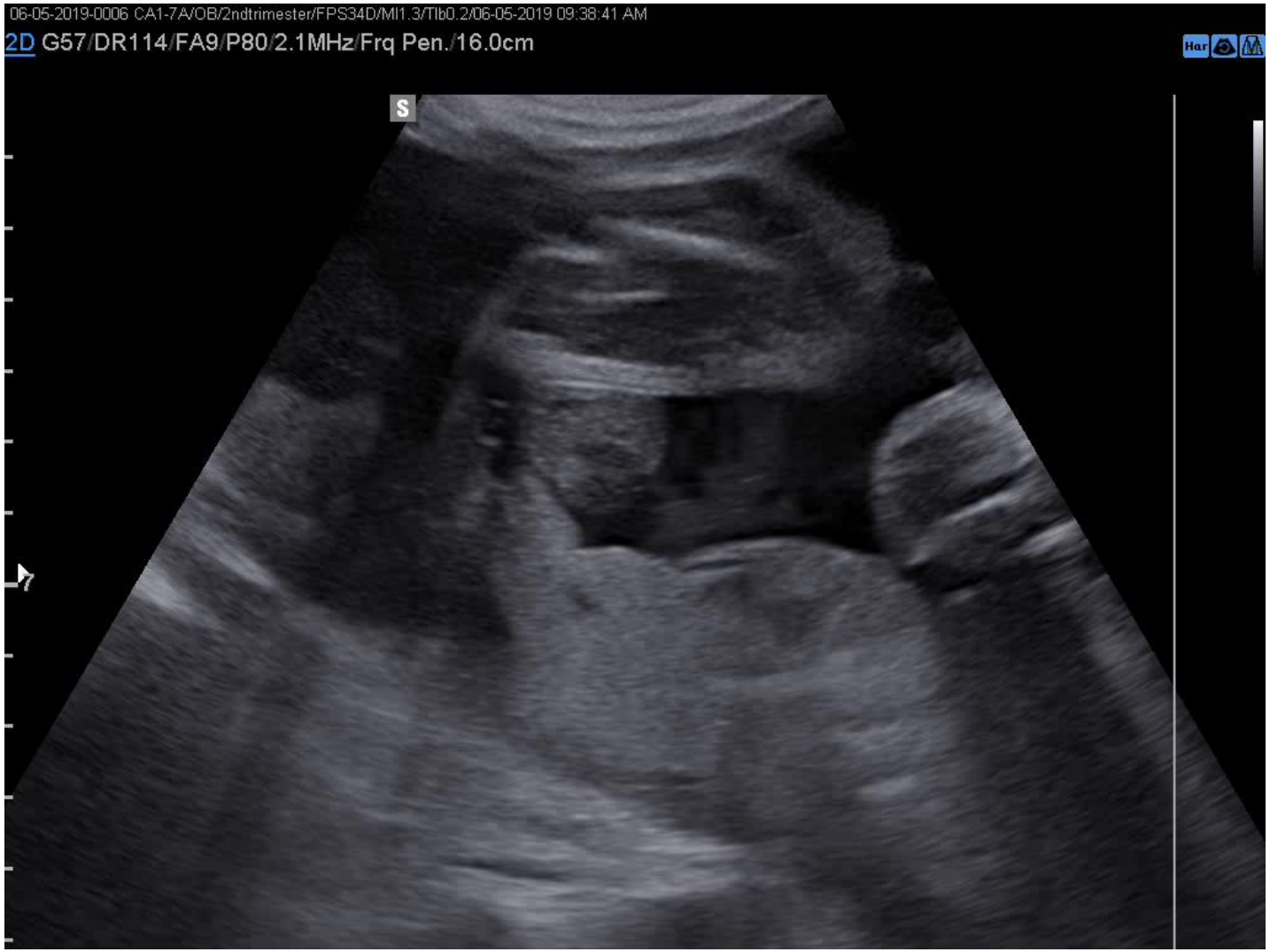
Hct: 36 %

Bé nhận (đa hồng cầu): da đỏ sậm

Hct: 61 %

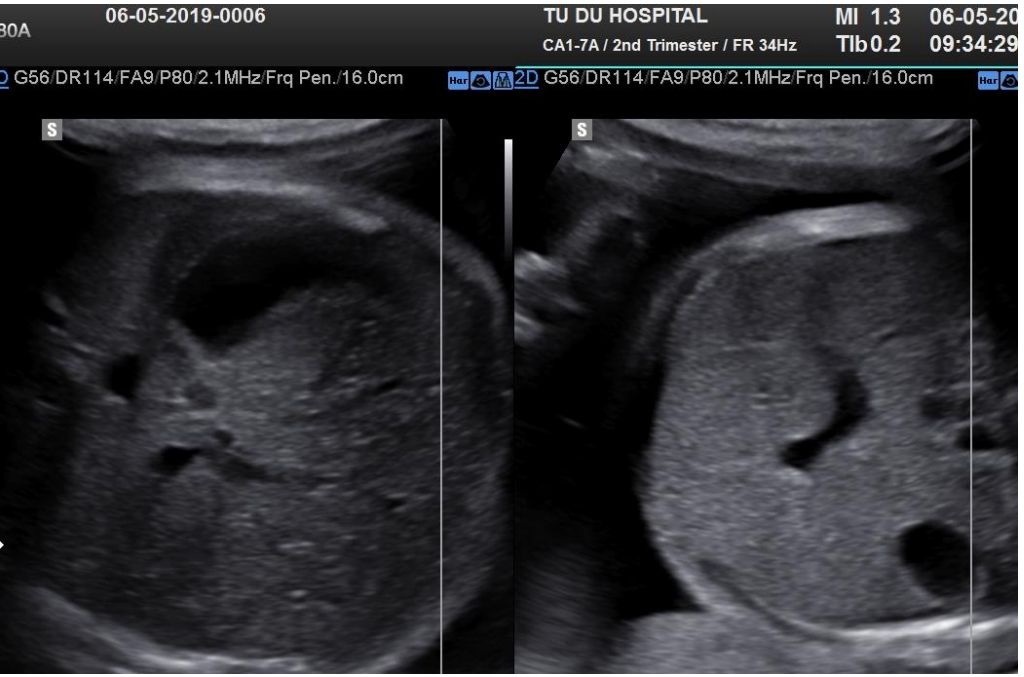
TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA

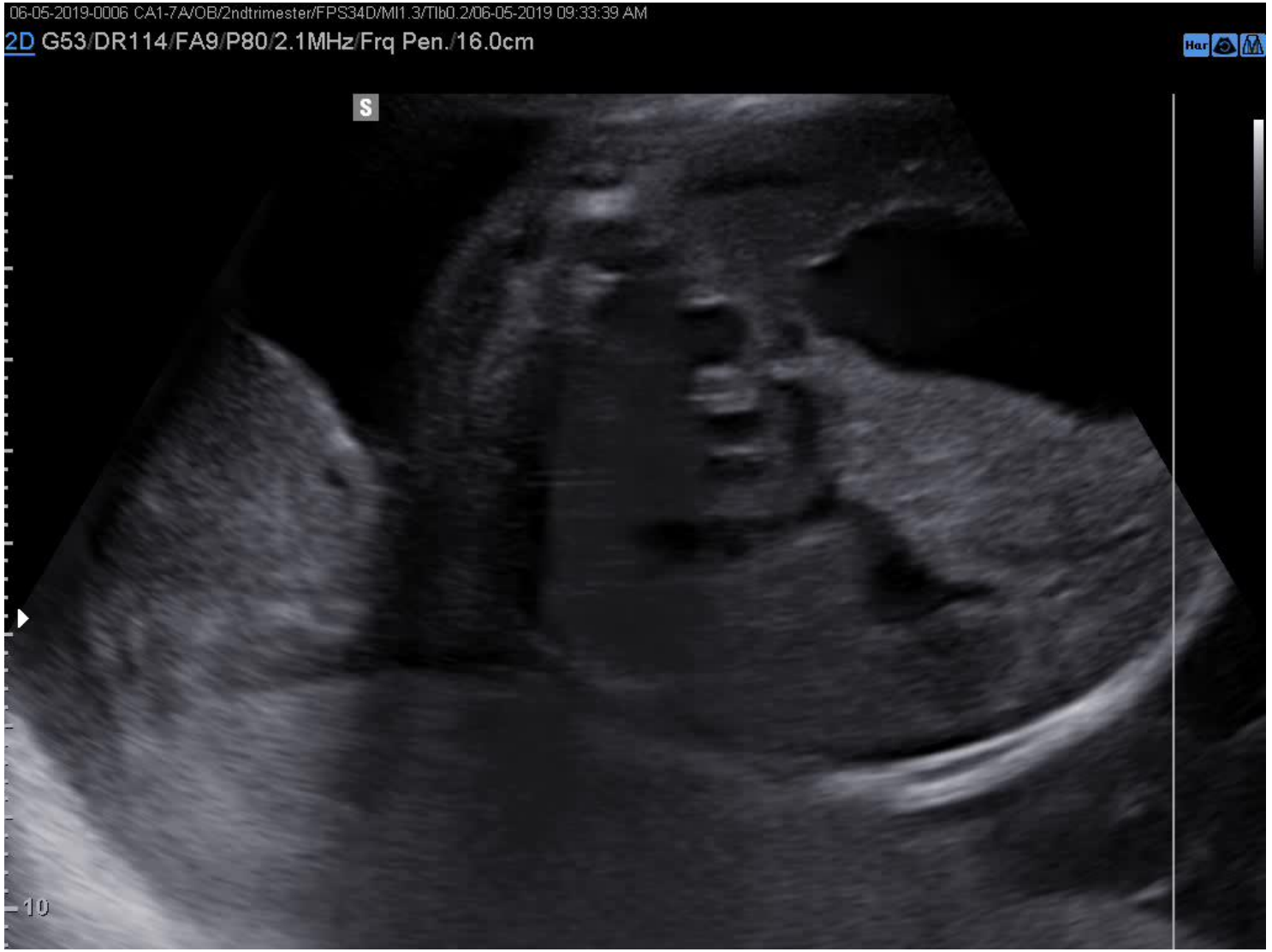




Thai nhận: bánh nhau mỏng, echo kém
Thai cho: bánh nhau dày, cho dày
Có sự khác biệt rõ giữa 2 phần bánh nhau

TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA

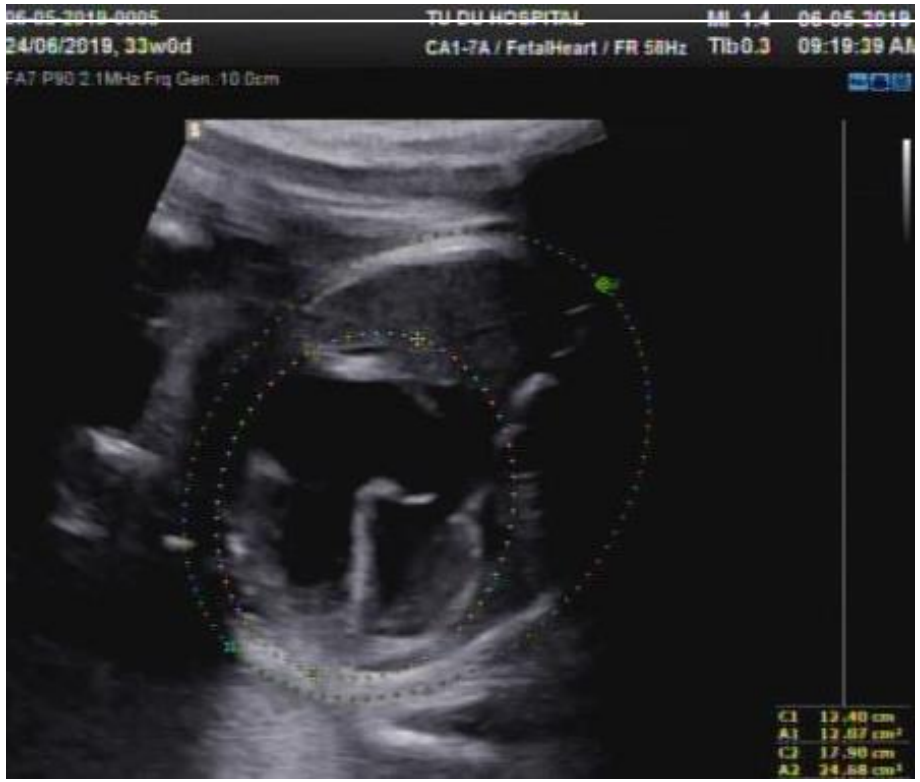




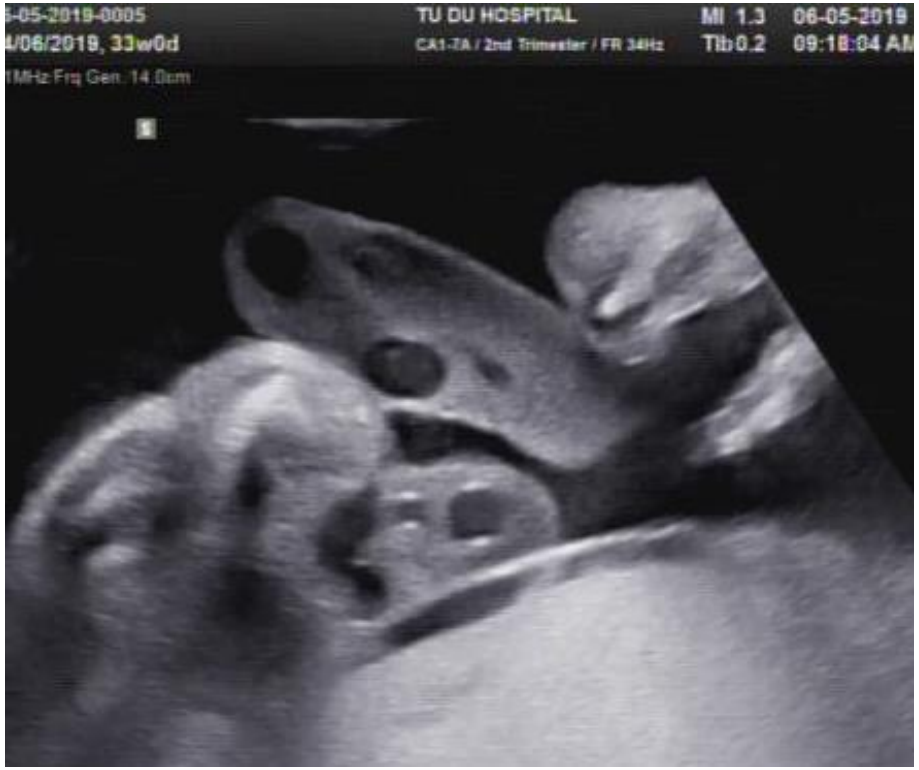
Thai cho: gan có echo dày nhẹ
Thai nhận: gan có dấu hiệu “ starry sky”

CASE 3:
Twin 33 weeks MCDA

Thai cho:

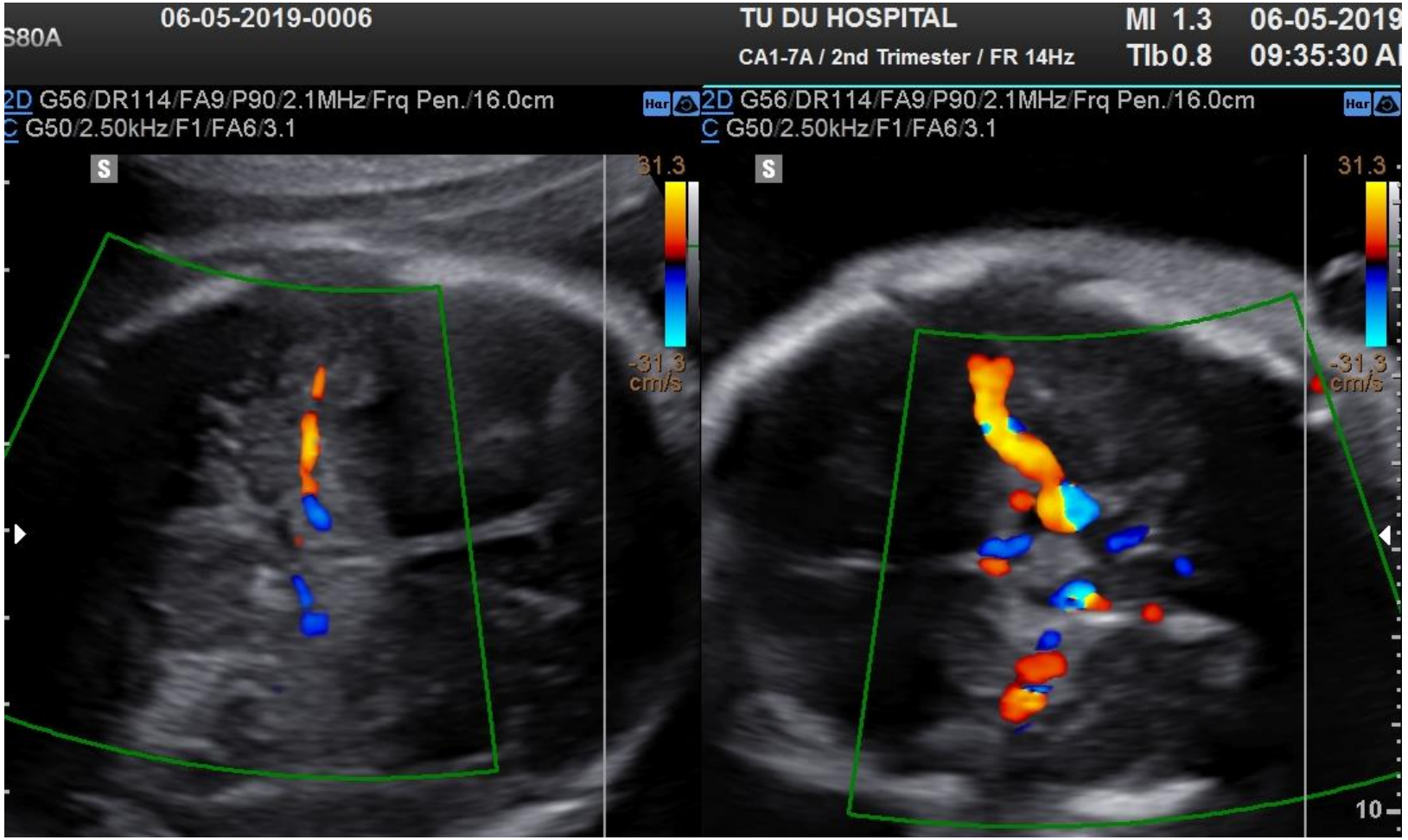


Tim to

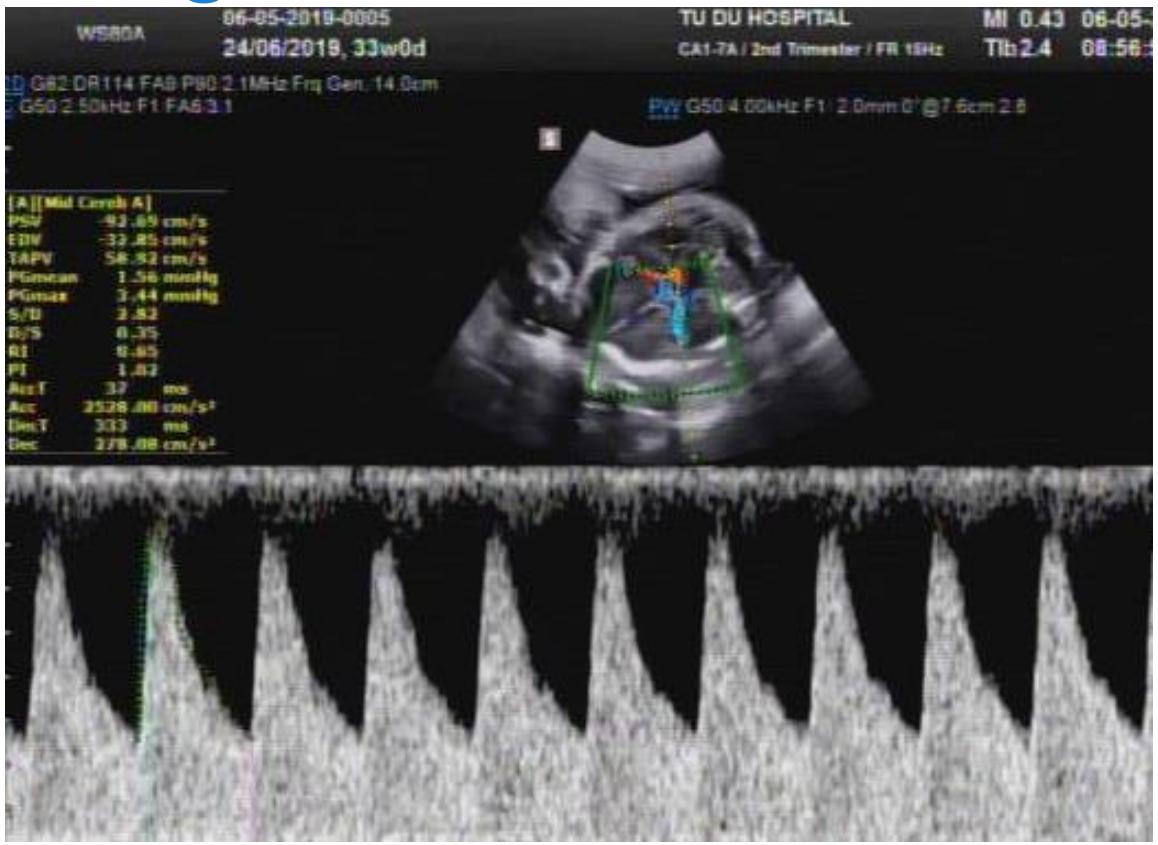


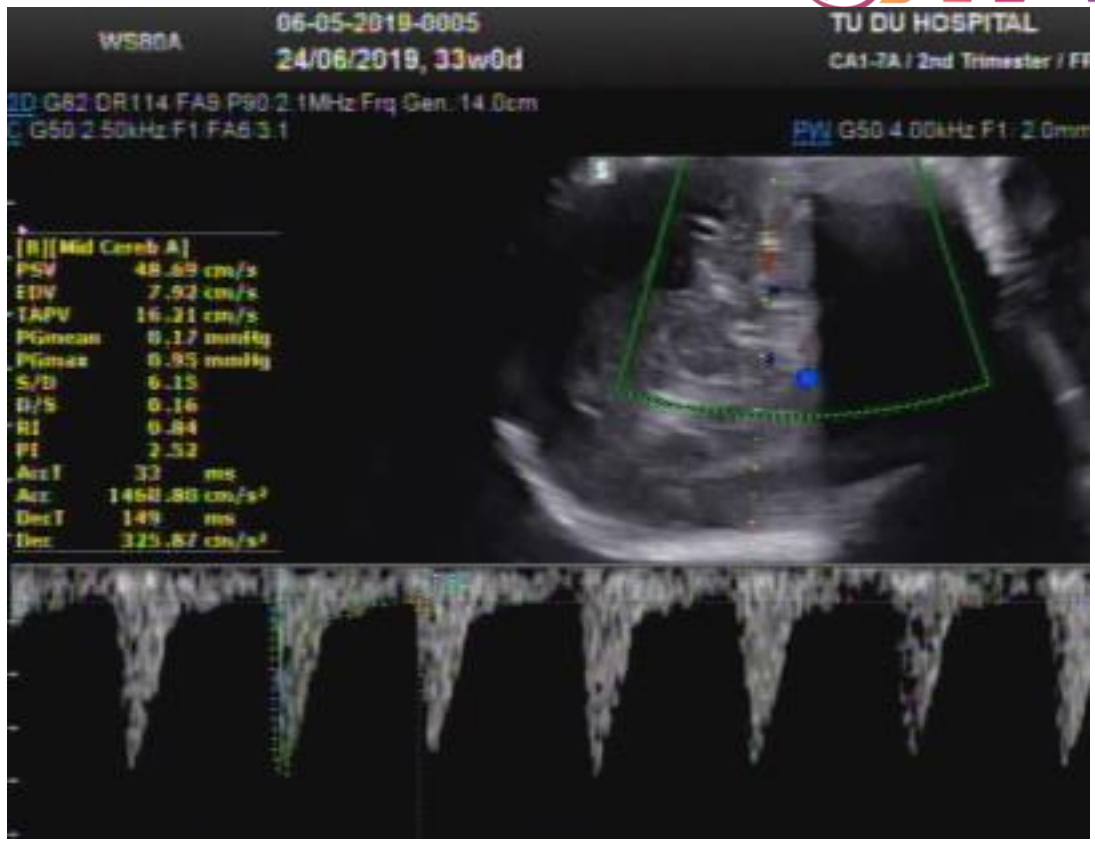
Dây rốn phù nề

TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA



TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA

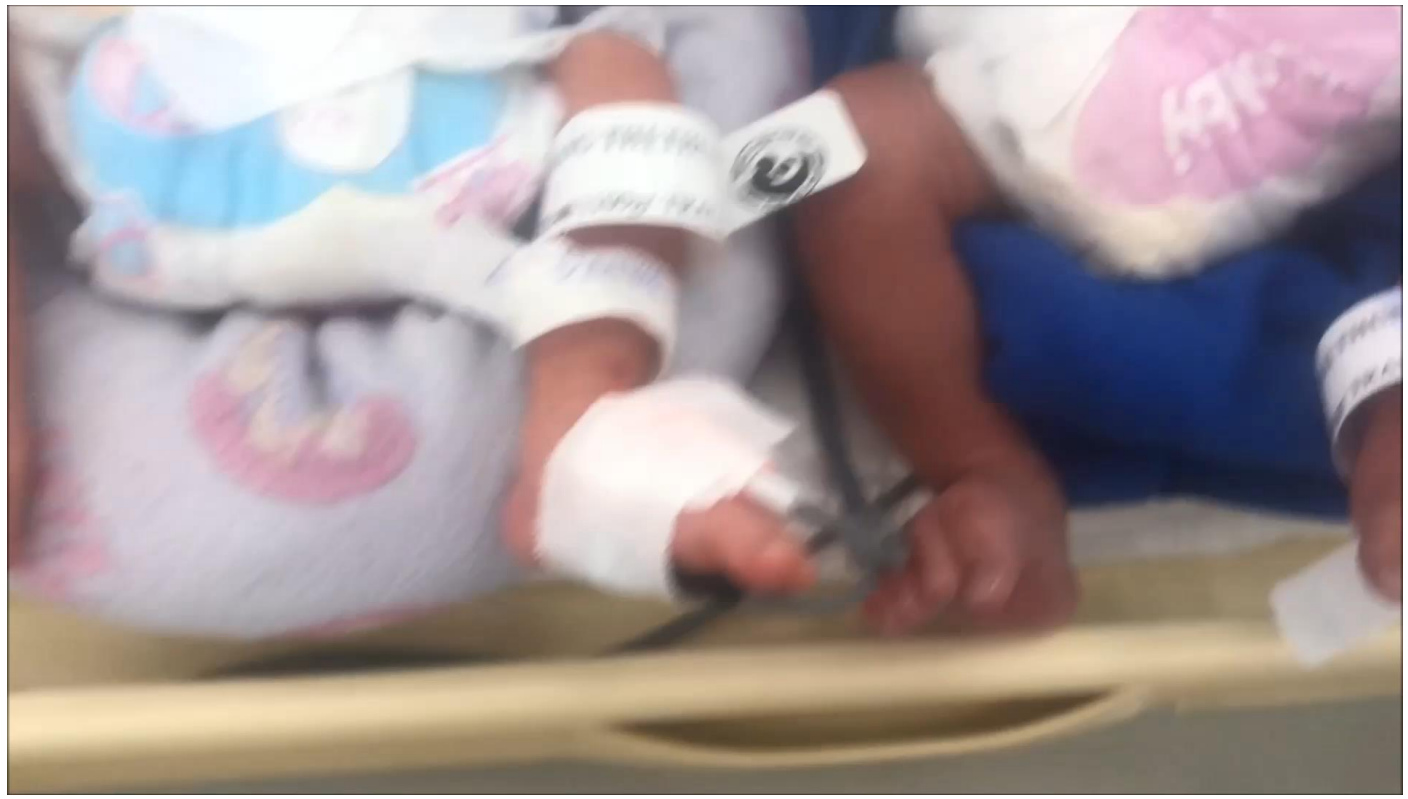




Thai cho:PSV MCA : 92.7 cm/s(1.99 MoM) Thai nhận:PSV MCA : 48 cm/s(1.04 MoM)

Delta MCA PSV: 0.95 MoM

TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA



2 bé trai, 1100 gr-1700 gr

Bé cho (thiếu máu nặng): da trắng tái

Hct: 22,6 %, Hb: 6,8g/ dl

Bé nhận (đa hồng cầu): da đỏ sậm

Hct: 63,2 %, Hb: 21,9 g/dl

TRƯỜNG HỢP 3:
Song thai 33 tuần MCDA

2 bé trai , sau sinh 2 ngày

Bé cho (thiếu máu nặng): da trắng tái

Hct: 22,6 %, Hb: 6,8g/ dl

⇒ được truyền máu ngay sau sinh

Sau truyền 2 ngày:

Hct: 39,6 %, Hb: 13,3g/ dl

Bé nhận (đa hồng cầu): da đỏ sậm

Hct: 63,2 %, Hb: 21,9 g/dl

⇒ được trích máu sau sinh

Sau 2 ngày:

Hct: 50% , Hb: 19,3g/ dl

XIN CHÂN THÀNH CÁM ƠN!