



Part diferit del segon bessó

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1880 Carson

Delayed Interval Delivery

Stop contraccions després expulsiu del primer fetus



“delayed delivery”
“delayed interval delivery (DID)”
“Intentional delayed delivery”



Pocs casos
No estudis randomitzats
No treballs mal resultats



Comparar primer / segon bessó
Comparar DID / no DID

HVH : 2009-2012

	tipus	Sem ingres	cultiu	amnio	cerclatge	AB	Tocolisi	DID	Sem 2 part	Morbilitat
1	BC/BA	17+2	Neg	No	No	Si	Si	138	37	0
2	BC/BA	26+6	U.urealyt	No	No	Si	Si	1	27	0
3	BC/BA	21+3	S aureus MARSA	Si	No	Si	Si	9	22+6	HPP, CID. PG+balon +6CCHH
4	TC/TA (r10 w)	22	Neg	No	No	Si	Si	56	30	DPPNI. HPP 2 CCHH
5	MC/BA	21+6	Neg	No	No	Si	Si	1	22	0

Autor any	estudi	Twin triplets	setm	any	Part 1 twin	Part 2 twin	DID rang	Cerclatge %	Tocolisis %
Fayad 2002	Retrospectiu multicentric	28 7	15-30	1990-2000	20.8	27.9	47 3-140	61	47
Zhang 2004	Retrospectiu Cohort (US MMBF)	200	17-29	1995-1998	23		6 2-107		
Watson 2008	Retrospectiu Case series (dila + evaq)	4	16-21		21	32	81 42-133	100	100
Arabin 2009	prospective cohort	38 12	16-31	1991-2007			19 1-106	0	100
Roman 2011	Prospective observational	19	16-28	1993-2004	20.2	25.1	16 0-152	47	100
Petousis 2012	retrospective	5	<24	2004-2010	20.2	28.8	72 3-141	100	100
Reinhard 2012	Retrospective cohort	5 2	22-25	2005-2011	23.3	24.6	9.7 1-18	100	100
HVH	retrospective	4 1	17-26	2009-2012	22	27	41 1-138	0	100

Part diferit del segon bessó

Quan està indicat?

A qui? BC BA, MC BA, TC, BC TA, ...
A quines setmanes?

Quina és la millor tècnica?

Com s'ha de lligar el cordó?
S'ha de fer cerclatge?
S'ha d'utilitzar tocolisi?
S'ha de donar antibiòtic?

Complicacions maternes

Resultats perinatals

Quan està indicat?

Condicions prèvies

-Normalitat fetus restant:

- absència anomalia congènita
- No amniorrexis
- No corioamnionitis
- No hemorràgia activa (DPPNI, CID)

-Condicions cervicals

-Consentiment informat de la pacient :

- Alt risc de complicacions: sèpsia materna o neonatal
- hemorràgia severa
- possible histerectomia
- risc de mort
- Alt risc gran prematur

-Necessitat de repós domicili/Hospital



Quan està indicat?

A qui? BC BA, MC BA, TC, BC TA, ...

Críteris exclusió:

>30 setm

Monocorionicitat

Preeclampsia severa

DPPNI

Requerir histerotomia

Chorionicity (n)

DCDA (twins) TC (triplets)	34 (89%)	11 (92%)
MCDA (twins) DCTA (triplets)	4 (11%)	9 (8%)

DID x= 9 (3-16) dies

United States twin births, 1995–1998

Delivery interval (wk)	Gestational age of first twin: 22–23 wks				Gestational age of first twin: 24–28 wks			
	Number of twins	Perinatal mortality*		Adjusted RR (95% CI) [†]	Number of twins	Perinatal mortality*		Adjusted RR (95% CI) [†]
		First	Second			First	Second	
0	1450	851.0	888.3	1.00 (Ref)	2549	282.1	302.5	1.00 (Ref)
1	68	852.9	691.2	0.28 (0.16, 0.49)	56	339.3	303.6	1.11 (0.60, 2.04)
2	23	739.1	521.7	0.12 (0.05, 0.30)	42	381.0	309.5	0.90 (0.44, 1.84)
3	9	666.7	444.4	0.08 (0.02, 0.35)	18	277.8	111.2	0.31 (0.07, 1.38)
≥ 4	14	928.6	857.1	0.66 (0.14, 3.05)	28	464.3	214.3	0.65 (0.24, 1.75)
Any interval ≥ 1 wk	114	824.6	657.9	0.29 (0.15, 0.35)	144	368.1	263.9	0.83 (0.55, 1.25)

* Perinatal mortality rates are expressed per 1000 total twin births, separately for first and second twins.

[†] Relative risks denote comparison of perinatal mortality rates in second twins with delayed interval, relative to those with an interval of 0 weeks. Relative risks were adjusted for maternal age, gravidity, maternal education, marital status, lack of prenatal care, maternal race/ethnicity, and gestational age at delivery of first twin.

Peterson SE et al. Delayed interval delivery in the setting of placental abruption. A case report. J Reprod Med 2010;55:75-77

Accidet trànsit. 23 +3 setm.

DPPNI 1er bessó + òbit, expulsió als 3 dies

2 () sang, 10 (crioprecipitats)

Part segon bessó als 6 dies 24 +6

Quan està indicat?

A qui? BC BA, MC BA, TC, BC TA, ...

Críteris exclussió:

>30 setm

Monocorionicitat

Preeclampsia severa

DPPNI

Requerir histerotomia

Berghella V, et al. Prolongation of pregnancy and survival of remaining fetuses after operative evacuation of one triplet at 18 weeks' gestation.

evacuació quirúrgica 18 setm (prolapse parts fetals)
antibiòtic + toco lític: parts bessons 34+2

Beck L, et al. Twin pregnancy, abortion of one fetus with Down's syndrome by sectio parva, the other delivered mature and healthy.

T21 Part a terme segon bessó

Porreco RP, et al. Selective delivery in a twin gestation.

cesària per RCIU sever: va sobreviure
3 setm: dehicencia, oligohidramnis i
desceleracions: va sobreviure

Quan està indicat?

A qui? BC BA, MC BA, TC, BC TA, ...

Criteris exclusió:

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Preeclampsia severa

DPPNI

Requerir histerotomia



Quadruplets:

•Fignon et al. 1992

first quadruplet pregnancy delivered on three separate days by means of delayed interval delivery. All fetuses survived

•Olatunbosun et al. 1995

Primer 26 setm i mort prematuritat

Segon + 8 dies

Tercer i quart: cesarea a les 36 setm

Quin és la millor tècnica?

- Inici toco lisis abans expulsió primer bessó
- desinfecció vaginal acurada
- lligadura i secció cordó umbilical el més proximal a OCI
- placenta in situ
- cerclatge Mc -Donald
- monitoratge pacient: sagnat, infecció, coagulopatia
- antibioticoteràpia ampli espectre (ceftriaxona 4gr/24h)
- toco lisis (Rithodrine 150 mcgr/h)
- Clindamicina vaginal crema/12h durant 14 dies
- Control Leucocitosis/mes i PCR/setm
- maduració pulmonar 28 i 32 setm
- Hospitalització fins 36.6 setm

Quin és la tècnica millor?

- lligadura i secció cordó umbilical el més proximal a OCI

Vicryl No. 1 Polyglactin 910

Endoloop: synthetic absorbable
monofilaments
menys risc infecció



Petousis S et al. Emergency cervical cerclage after miscarriage of the first fetus in dichorionic twin pregnancies: obstetric and neonatal outcomes of delayed delivery interval. Arch Gynecol Obstet 2012;286:613–617

Surico et al. Dichorionic pregnancy: delayed interval delivery with endoloop ligation. Twin Research and Human Genetics 2012;4:537-540

Quin és la tècnica millor?

Antibiòtic i toco lisis

Twins <24 setm

supervivència	twins	
0%	3	antibiòtic
50%	2	cerclatge
73%	11	Antibiòtic + toco lisis
83%	18	Cerclatge + antibiòtic + toco lisis



ient 1 cervix after delivery of the first twin. The umbilical cord is protruding into the

Quin és la tècnica millor?

Cerclatge

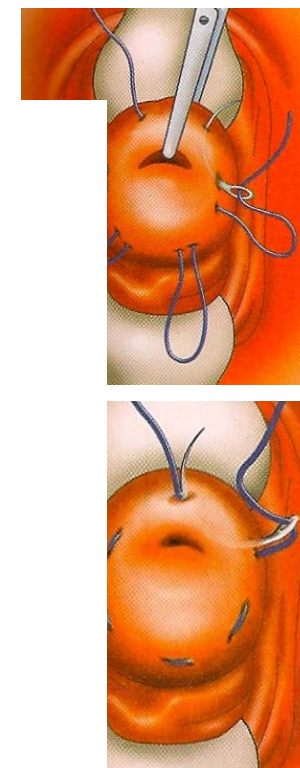
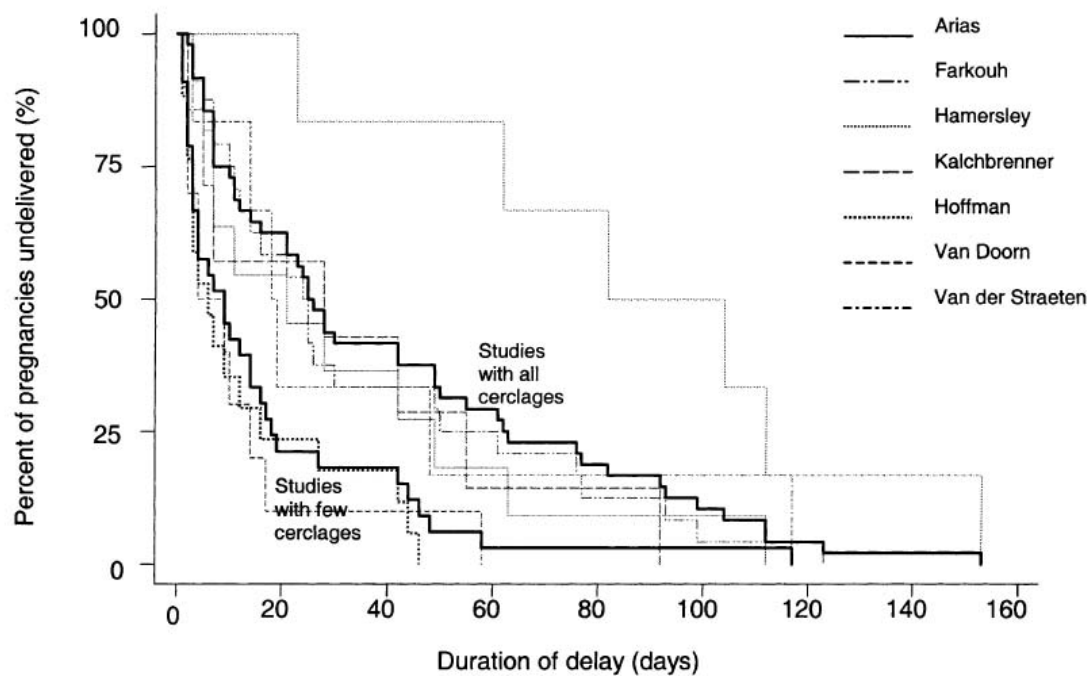


Fig. 1. Survival curves of inter-delivery intervals in seven case series on delayed interval delivery in a multifetal pregnancy. Two highlighted curves represent the combined curves from studies in which cerclage was applied in all cases or in few cases.

Quin és la tècnica millor?

Cerclatge

Table 2 Detailed presentation of the obstetric and neonatal outcomes of the cases included in the study

Outcomes	Emergency cervical cerclage (n = 5)				
	Case 1	Case 2	Case 3	Case 4	Case 5
<i>Obstetric</i>					
PPROM	Yes	Yes	No	No	No
Vaginal bleeding	No	No	No	No	Yes
Cervical dilatation (at admission) (cm)	3.0	4.0	2.5	3.0	6.0
Gestational age (weeks) (at admission)	17 weeks + 1 day	19 weeks + 2 days	20 weeks + 3 days	21 weeks + 5 days	21 weeks + 5 days
Gestational age (weeks) (at delivery of the first twin)	17 weeks + 2 days	19 weeks + 3 days	22 weeks + 2 days	21 weeks + 5 days	22 weeks + 4 days
Birth weight (g) ^a	185	270	490	410	510
Delivery interval (days)	141	3	72	75	16
Mode of delivery ^a	CS	VD	CS	VD	VD
<i>Neonatal</i>					
Gestational age (weeks) (at delivery) ^a	37 weeks +3 days	19 weeks + 6 days	32 weeks + 4 days	32 weeks + 3 days	24 weeks + 2 days
Birth weight (g) ^a	2,720	280	1,790	1,670	910
Stillbirth ^a	No	Yes	No	No	No
<i>Apgar score^a</i>					
First minute	8	0	6	4	1
Fifth minute	9	0	7	6	4
NICU admission ^a	No	–	Yes	Yes	Yes
Alive after 1 month of life	Yes	–	Yes	Yes	Yes

CS cesarean section, VD vaginal delivery, NICU Neonatal Intensive Care Unit, PPROM preterm premature rupture of membranes

^a Of the second twin

Quin és la tècnica millor?

NO Cerclatge



TABLE 2

Outcome in terms of interval of delay, birthweight, mode of delivery, and outcome in the cohort with asynchronous delivery included in the 4-step protocol

Variable	Twin pregnancies (n = 38)	Triplet pregnancies (n = 12)
Interval (days) between delivery of first and second twin/triplet	19 (1-106)	18 (1-118)
Respectively of second/third triplet (mean/range)		1 (0-2)
Mode of delivery		
First and remaining vaginally	29 (76%)	9 (75%)
First vaginally/second (plus third), CS	9 (24%)	3 (25%)
Birthweight (g) (mean/range)		
Twin 1/triplet 1	690 (140-1660)	413 (180-830)
Twin 2/triplet 2	1060 (250-3000)	630 (150-1000)
Triplet 3		734 (280-1200)
Mortality until discharge		
Twin 1/triplet 1	25/38 (66%)	9/12 (75%)
Twin 2/triplets 2 and 3	10/38 (26%)	18/24 (75%)

CS, cesarean section.

Arabin. Delayed-interval delivery in twin and triplet pregnancies. *Am J Obstet Gynecol* 2009.

Complicacions maternes

Table 2 Pregnancy Outcome Characteristics

Median GA at delivery of firstborn, wk (range)	20 ² / ₇ (16 ³ / ₇ –25 ⁵ / ₇)
Median GA at delivery of last born, wk (range)	25 ¹ / ₇ (17 ³ / ₇ –40 ³ / ₇)
Median latency, d (range)	16 (0–152)
Survival of firstborn	3/19 (15.8%)
Survival of retained fetuses	14/26 (53.8%)
Major maternal morbidity	6/19 (31.6%)

GA, gestational age.

2 HPP (transfusió) (AP: corioamnionitis)
4 sèpsies
2 colitis *clostridium difficile*
1 Histerectomia per atonia (AP: corioamnionitis)

4 amniocentesis
negativa

Complicacions maternes

number of literature	Interval range (days)	number cases		origin of pregnancies			tocolytic treatment	antibiotic treatment	cerclage	follow-up period (m/y)	outcomes	
		twin	triplet	ART	IUI	spnts					Intrauterine infection	maternal sepsis
1*	2-75	23	6	not recorded			+ (100 %)	+ (100 %)	-	9 m	+ (22-52 %)	-
2	23-153	6	-	not recorded			+ (100 %)	+ (100 %)	+ (100%)	-	not recorded	not recorded
3	134	1	-	+ (1)	-	-	+ (100 %)	+ (100 %)	+ (100%)	-	not recorded	not recorded
4	41-143	4	-	not recorded			+ (100 %)	+ (75 %)	+/- 50%)	-	not recorded	not recorded
5*	1-153	61	20	not recorded			+ (100 %)	+ (100 %)	+/- 65%)	-	+ (36 %)	+ (4.9)
6	5	1	1	+ (1)	-	+ (1)	+ (100 %)	+ (100 %)	+ (100%)	-	+	-
9	8-67	2	-	-	+ (1)	+ (1)	+ (100 %)	+ (100 %)	+/- 50%)	4 y	+	-
10	3-140	28	7	not recorded			+ (82 %)	+ (100%)	+/- (32%)	-	not recorded	not recorded
11	2-93	6	-	not recorded			+ (79 %)	+ (71 %)	+/- 60%)	-	not recorded	not recorded
13	1-107	38	12	+ (20)	+ (8)	+ (22)	+ (100%)	+ (100%)	-	-	+ (17-24%)	+ (22%)
14	3-123	20	12	not recorded			+ (100%)	+ (100%)	+/- 58%)	-	+ (29%)	+ (4.1%)

Temur I. A twin pregnancy provided with ICSI, an abortion of the first fetus at the 18th week and live birth of the second fetus at the end of the 36th week; Case report and literature review. 2013 J Matern Fetal Neonatal Med

Complicacions maternes

TABLE 3

Maternal morbidity within the study population (n = 50)

Variable (n/%)	Twin pregnancies (n = 38)	Triplet pregnancies (n = 12)
Morbidity I (high chance associated with management)		
Clinical signs of chorioamnionitis	9 (24%)	2 (17%)
Abruption	2 (5%)	1 (8%)
Postpartum hemorrhage > 1 l	4 (11%)	1 (8%)
Manual removal of placenta	4 (11%)	1 (8%)
Urosepsis	—	1 (8%)
Morbidity II (low chance associated with management)		
Transient atrium fibrillation	1 (3%)	—
Appendectomy 3 d postpartum	1 (3%)	—

Arabin. Delayed-interval delivery in twin and triplet pregnancies. Am J Obstet Gynecol 2009.

Arabin et al. 2009

Corioamnionitis	22%
PPH, retained placenta	10%
DPPNI	6%

Complicacions maternes

auterine infection after the first delivery and inter-delivery interval in four case series ($N = 70$)

Characters	Number of cases	Incidence of infection (%)	P^a	Duration of delay (median in days)	P^b
Number of fetuses					
Twins	52	37	0.86	17	0.20
triplets+	18	39		11	
Gestational age at the first delivery					
15–20 weeks	18	28	0.46	39	0.03
21–23 weeks	18	39		20.5	
24–25 weeks	21	43		11	
26–30 weeks	13	38		7	
Cause of the first delivery					
Fetal death	10	20	0.37	25.5	0.10
PROM	33	42		12	
Preterm labor	23	30		14	
Cervical incompetence	1 ^c				
Intrauterine infection	3 ^c				
Perinatal outcomes of the first fetus					
Stillbirth	18	33	0.84	24	0.28
Neonatal death	33	33		18	
Discharged alive	17	41		9	
Unknown	2 ^c				
Intrauterine infection at the first delivery					
Yes	4 ^c		0.62		0.75
No	47	38		16	
Unknown	19	32		17	
Cerclage after the first delivery					
Yes	42	38	0.84	25	0.002
No	28	36		8	
Intrauterine infection at the second delivery					
Yes	24			7	0.003
No	46			26.5	

^a Chi-square test.

^b Wilcoxon rank sums test.

^c The number of subjects is too small to provide a meaningful percentage or median.

Zhang et al. 2003

Corioamnionitis 36%

Sèpsies 4.9%

Resultats perinatals

Prospectiu unicèntric, no randomitzat
1991-2007

38 twins x: 19 dies (1-107)

supervivència

	primer	segon
<20 setm	0%	0%
<25 setm	6%	50%
>25 setm	65%	95%

12 triplets

<25 setm	0%	14%
>25 setm	60%	40%
		(2-13 dies)



Resultats perinatals

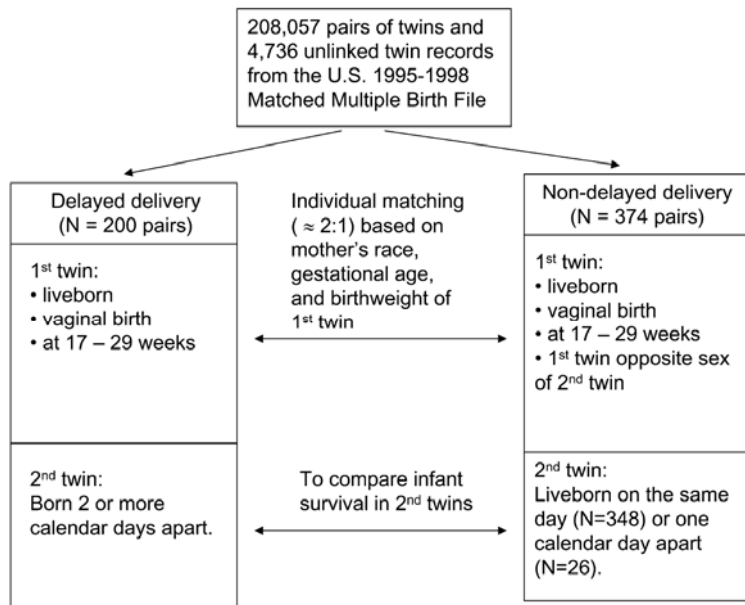


Figure 1 Selection of the study population.

Table II Perinatal outcomes for delayed and nondelayed twin pregnancies by gestational age

Perinatal outcomes	Gestational age at delivery of the first twin									
	17-23 wks			24-29 wks						
	First twin in delayed deliveries (n = 130)	Second twin in delayed deliveries (n = 130)	Second twin in nondelayed deliveries (n = 237)	First twin in delayed deliveries (n = 70)	Second twin in delayed deliveries (n = 70)	Second twin in nondelayed deliveries (n = 137)				
Gestational age at delivery (mean ± SD)‡	21.5 ± 1.4	.01	23.0 ± 2.4	.01	21.7 ± 1.4	25.4 ± 1.6	.01	27.1 ± 2.8	.01	25.5 ± 1.6
Duration of delay (days)‡										
2-7	—		56%	—	—	—	60%	—	—	—
8-14	—		22%	—	—	—	19%	—	—	—
15-21	—		13%	—	—	—	6%	—	—	—
22 or more	—		9%	—	—	—	16%	—	—	—
Birth weight (mean ± SD)‡	452 ± 120	.01	598 ± 318	.01	467 ± 117	736 ± 275	.01	975 ± 487	.01	747 ± 275
5-min Apgar score‡										
< 4	71%	.01	43%	.01	75%	22%	ns	6%	.05	22%
4-6	15%		19%		14%	24%		23%		22%
7+	13%		38%		11%	55%		71%		57%
Fetal death‡	—		11%	—	—	—		1%	—	—
Infant death§	87%	.01	63%	.01	88%	39%	.01	17%	.01	42%
Fetal/infant combined survival rate‡	13%	.01	33%	.01	12%	61%	.01	82%	.01	58%

ns, Not significant.
* Comparison between first and second twins in the delayed deliveries.
† Comparison between delayed and nondelayed second twins; analysis of variance for continuous variables and Mantel-Haensel χ^2 test for categorical variables.
‡ Includes fetal deaths.
§ Excludes fetal deaths.
— Category not applicable.

Resultats perinatals

Table II Perinatal mortality (fetal plus neonatal deaths) in first- and second-born twins in relation to interval between deliveries: United States twin births, 1995–1998

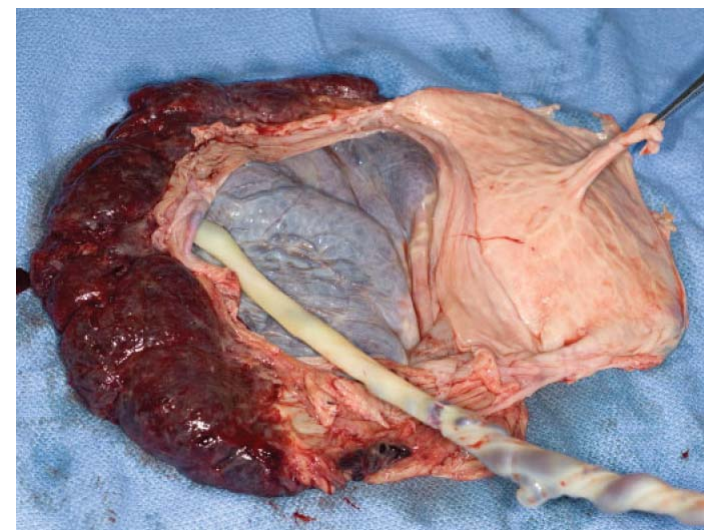
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[†] Relative risks denote comparison of perinatal mortality rates in second twins with delayed interval, relative to those with an interval of 0 weeks. Relative risks were adjusted for maternal age, gravidity, maternal education, marital status, lack of prenatal care, maternal race/ethnicity, and gestational age at delivery of first twin.

Resultats perinatals

References	Survival rates			
	n	Firstborn, percent	Retained, percent	<i>p</i>
Farkouh AJOG 2000*[¹] (>24 weeks)	30	53	100	0.0063
Zhang AJOG 2004[²] (>24 weeks)	140	61	82	0.01
Oyelese AJOG 2005[³] (>24 weeks)	144	63	74	NS
Arabin AJOG 2009[⁴] (>25 weeks)	55	64	77	0.03 (twins) NS (triplets)



PROPOSTA PROTOCOL

Consentiment informat

- Criteris inclusió:
 - Gestacions BC BA, TC
 - <28 setm
- Descartar infecció fetus restant
 - Amniocentesis
 - gram: presència bacteris
 - leucòcits: >50 cels/mm³
 - glucosa: <20 mg/dL
 - cultiu: +
- Secció i lligadura cordó OCI
- Placenta in situ
- Toco lisis immediata/prèvia
- Cultius
- Rentat solució antisèptica cèrvix
- Antibioticoteràpia:
 - gentamicina-clindamicina 3 dies + cefalosp- metro vo 4 dies
 - o ampicilina-sulbactam 3 dies + cefalosp- metro vo 4 dies
- Cerclatge: Mc Donald
- Hospitalització 7 dies
 - monitoratge fetal
 - monitoratge matern
 - g-globulina anti D si Rh -
- Domicili:
 - no RS
 - repòs
 - control seriat materno-fetal
- Maduració pulmonar
- Neuroprotecció



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Gràcies