

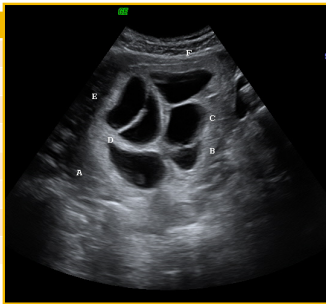
Management of High Order Multiples

Anthony Johnson, D.O.,



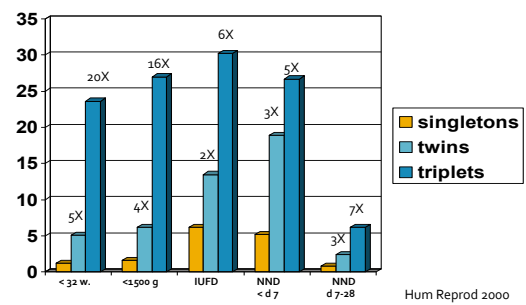
Background: Trends in multifetal pregnancies

Year	Quints
2011	41
2009	80
2006	67
2003	85
2001	85
1996	81
1989	40
Increases	2.5%



Martin JA et al Nat Vital Stats Report. 62 No1. 2013

Perinatal Morbidity and Mortality



Death rate by fetal plurality

Mortality per 1,000 live births by plurality

	Neonatal deaths (birth to d. 28)	Postneonatal death (d. 29 – 1 year)
Singletons	7.8	3.4
Twins	55.9	10.5
Triplets+	168.8	21.6

Complications with Multifetal

NEONATAL

- Low Birth Weight
- Respiratory,
- GI,
- Long-term neurologic impairment

	CP /1,000 Survivors
Singleton	1.6-2.3
Twins	7-12
Triplets	28-45

MATERNAL

- Preeclampsia,
- DM,
- Anemia,
- Abruption,
- Hemorrhage,
- Miscarriage,
- C/S,
- Rx. PTL

Comparative study of perinatal outcome of Dichorionic and Trichorionic iatrogenic triplets

- Incidence of monochorionicity 7-8X greater after ART than spontaneous conception
- Multicenter retrospective study in pregnancies delivered > 20 weeks
- 106 TCTA triplets and 34 DCTA triplets

Bajoria et al AJOG 2006

Characteristics of Dichorionic and Trichorionic triplets

Parameter	DCTA (n=34)	TCTA (n=106)	P value
GA delivery (wk)	30	33	<.001
≤ 30 wks.	50%	15%	<.01
≥ 30 wks.	50%	85%	<.01
BW < 1000 gm.	50%	85%	<.01
RDS	46%	13%	.001
IVH	30%	3%	.001
NEC	5%	1%	NS
Perinatal death			
Total infants	102	318	
Intrauterine death	10%	1%	.05
Neonatal death	29%	7%	.001
Survivors	61%	92%	.05

Bajoria et al AJOG 2006

"When reducing one to zero is permissible, what is wrong in reducing high order to lesser number"

MI Evans

MPR: pre-procedure considerations

- Ultrasound
 - Chorionicity
 - Anatomy
 - Nuchal
- Consult

First Trimester MFPR: Evaluation of technical aspects and risks ~ 2,756

Procedure	N	GA Procedure	Mean # Initial	Mean # Final	Total Loss	GA Delivery
TA	2,145	11.2	3.9	2.1	16.7	35
TC	363	9.2	3.5	1.6	24.8	35.3
TV	248	9.1	3.7	2	10.9	35.7
P		NS	NS	NS	0.03	

Trancervical approach higher loss rate ~ should be excluded
Transvaginal seems to be "safer procedure"

Dechaud H et al Fetal Diagn Ther 1998

Pregnancy Loss < 24 wks post MFPR: Comparison TA vs TV approach

Starting #	TA	TV*	P
2	0/32	2/10	NS
3	3/110	7/42	0.006
4	1/42	0/14	NS
5	2/13	1/8	NS
6	1/6	0/1	NS
All	7/203 (3.5%)	10/75 (13.3%)	0.004
Finishing #			
1	0/58	4/20	< 0.004
2	7/144	6/53	
3	0/1	0/2	

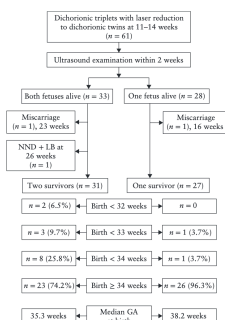
*Obesity & Previous Cesarean

MFPR success rate with TA higher than TV
TV should be reserved for cases where TA not possible

Timor-Tritsch I et al AJOG 2004

Intrafetal laser ablation for fetal reduction in DCTA triplets to DCDA twins

- Lower miscarriage rate compared to expected management (3.3% vs 9%)
- Preterm birth < 33 weeks reduced
- Removes unique complications to MC twins
- 50% of pregnancies will end with singleton pregnancy



Chaveira P et al UOG 2017

Transabdominal Technique

- Ultrasound guide
- Intracardiac / intrathoracic
- KCL (or Lidocaine)
- 10.5-14 weeks
- 20-22 g spinal needle (BMI dependent)
- 3-5 meq KCL
- Procedural time ~ 2-5 minutes

Evolving trends in 2000 cases

2nd 1000 patients

Starting number	1 st 1000 cases (%)	2 nd 1000 cases (%)
2	4.0	15.6
3	54.9	60.8
4	29.4	17.6
5	8.6	3.3
6+	3.1	2.5

Finishing no.	1 st 1000 cases (%)	2 nd 1000 cases (%)
4	0	0.3
3	1.8	0.3
2	86.4	67.6
1	11.8	31.8

Stone et al AJOG 2007

Contemporary outcomes in last 1000 patients undergoing MPR

Starting no. (n)	Loss (%)
2 (145)	2.1
3 (512)	5.1
4 (148)	5.5
6+ (38)	11.0

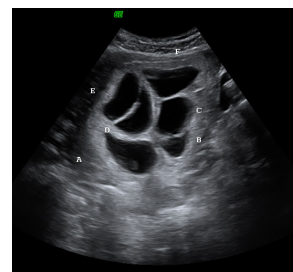
Finishing no. (n)	Loss (%)
1 (292)	3.8
2 (547)	5.3
3 (2)	0

Incidence of chromosomal abnormalities in at least 1 fetus is a multifetal gestation

Maternal age (yrs)	Singleton	Twin	Triplet
20	1/526	1/263 (age 34)	1/175 (age 36)
25	1/476	1/238 (age 34)	1/150 (age 36)
30	1/385	1/192 (age 35)	1/128 (age 37)
35	1/192	1/96 (age 38)	1/64 (age 40)
40	1/66	1/33 (age 43)	1/22 (age 45)

CVS in multiple gestations

- Technical issues
 - >99% success rate
 - 1% risk cross contamination
 - Proper mapping of fetuses is critical for later MFPR



Evolving trends in 2000 cases

- When analyzed in chronologic groups of 200, significant proportion reducing to singletons
- Increase in CVS in 2nd group (1.5% vs. 43.7%)
- Decrease in number ET and increase in day of transfer
- Increase in MC component (2.1% vs. 5.7%)

CVS prior to MPR

- 437 had CVS (58%) vs. 321 no CVS (42%)
- CVS group older (36.2 y vs. 33.7 y)
- Overall loss rate:
 - CVS group 4% vs. non-CVS group 7%
 - Significant lower loss rate in singleton CVS group

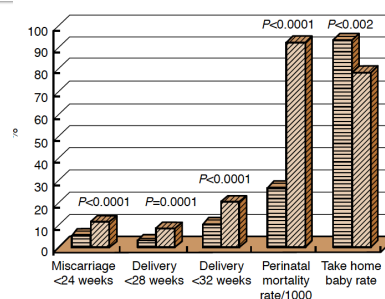
Finishing no.	No CVS	CVS	P-value
2	6%	5%	0.747
1	9%	2%	0.025

Ferrara et al AJOG 2008

Contemporary outcomes in last 1000 patients undergoing MPR

- Mean GA delivery 36.2 w
 - Decreasing GA with increasing finishing numbers (38.0, 35.2, 30.0) for singletons, twins, triplets
- Decrease in PTD with MPR to 1 vs. 2
 - 24-27/9 weeks: 1.1% vs. 2.9%
 - 28-31.9 weeks: 2.9% vs. 8.1%
- Mean BW inversely proportional to finishing numbers and starting numbers

Meta-analysis: Perinatal Outcomes MFPR 3-2 vs expectant observation triplets



triplets to twins (▨) compared with conservatively managed triplets (■) undertaken between 1984-2001.
Wimalasundera et al Best Pract Res Clin Obstet Gynaecol 2003; 17: 309

Comparison of outcomes of unreduced triplets, MPR 3 to 2, and unreduced twins

- Triplets reduced to twins had outcomes comparable to unreduced twins
- GA delivery for unreduced triplets, 3 to 2 and twins:
 - 33, 36, 35 weeks
- Spontaneous loss for unreduced triplets, 3 to 2 and twins:
 - 14%, 7%, 6%

Yaron et al AJOG 1999

Comparing pregnancy outcome and loss rates in MFPR 2 to 1 to ongoing twins in large contemporary cohort

Outcomes	2-to-1 Reduced Singleton (n = 250)	Ongoing Twins (n = 405)	p-value
	Mean ± SD	Mean ± SD	
GA at Delivery, weeks	39 [37 - 39]	36 [34 - 38]	<0.001
Birthweight	3051.45 ± 567.9	2379.91 ± 519.3	<0.001
Preterm Delivery	N (%)	N (%)	
<37 weeks	43 (17.7)	324 (80.6)	<0.001
<34 weeks	17 (7)	102 (25.2)	<0.001
<32 weeks	10 (4.1)	50 (12.3)	0.03
<28 weeks	7 (2.9)	25 (6.2)	0.39
WGA*	13 (3.8)	81 (20.0)	<0.001
Cesarean delivery	111 (46.8)	467 (116.2)	<0.001
Pre-eclampsia	10 (4.2)	99 (24.4)	<0.001
PPROM	14 (5.9)	115 (28.4)	<0.001
BW Percentile*			
< 10%	35 (15)	215 (53.1)	<0.001
< 5%	20 (8.4)	125 (30.9)	<0.001

Vieira et al AJOG 2018

Comparing pregnancy outcome and loss rates in MFPR 2 to 1 to ongoing twins in large contemporary cohort

Outcomes	2-to-1 Reduced Singleton (n = 250)	Ongoing Twins (n = 605)	p-value
Total Pregnancy Loss <24 wks	10/250 (4)	15/605 (2.5)	0.230
Unintended	Unintended loss rate < 24 weeks 6/250 = 2.4%	Unintended loss rate < 24 weeks 14/605 = 2.3%	
Complete/Selective termination (intended)	4/10 (40)	1/15 (6.7)	0.121
Total Pregnancy Loss <20 wks	9/250 (3.6)	10/605 (1.7)	0.079
IUFD >24 wks	3/250 (1.2)	4/605 (0.7)	0.423

MFPR 2 to 1 higher gestational age of delivery with lower pregnancy complications

Vieira L et al AJOG 2018

Perinatal outcomes in multifetal pregnancy following fetal reduction

Perinatal outcome	Reduced to twin pregnancy v. unreduced triplet pregnancy			Reduced to singleton pregnancy v. unreduced twin pregnancy		
	All births		ART only	All births		ART only
	Crude rate ratio (95% CI)	Adjusted rate ratio* (95% CI)	Adjusted rate ratio† (95% CI)	Crude rate ratio (95% CI)	Adjusted rate ratio* (95% CI)	Adjusted rate ratio† (95% CI)
Preterm (< 37 wk)	0.62 (0.40-0.78)	0.66 (0.54-0.80)	0.68 (0.56-0.84)	0.40 (0.25-0.65)	0.43 (0.25-0.66)	0.43 (0.23-0.77)
Very preterm (< 32 wk)	0.37 (0.18-0.76)	0.40 (0.20-0.78)	0.92 (0.17-0.59)	1.24 (0.58-2.65)	1.36 (0.64-2.92)	1.44 (0.53-3.89)
Low birth weight (< 2500 g)	0.58	0.59	0.58	0.50	0.51	0.38
MFPR Substantial improvement in preterm birth and low birthweight Not associated with reduction in severe neonatal morbidity or perinatal death						
5-min Apgar score ≤ 7	0.58 (0.28-1.19)	0.60 (0.28-1.30)	0.37 (0.15-0.92)	1.06 (0.50-2.25)	1.16 (0.55-2.46)	1.23 (0.51-2.94)
Serious neonatal morbidity or perinatal death	0.50 (0.24-1.02)	0.50 (0.24-1.07)	0.35 (0.18-0.67)	1.39 (0.65-2.95)	1.57 (0.74-3.33)	1.60 (0.64-3.98)

Razzaz N et al CMAJ 2017

MFPR

- Triplets or higher reduced to twins associated with
 - Lower fetal loss
 - Reduced antenatal complications including
 - preterm birth,
 - low birth weight,
 - cesarean sections and
 - neonatal deaths
- Twins to singleton
 - decreases risk of later preterm birth and birth weight < 10thtile.
 - Reduction in loss rate and severe complications has not been clearly established

Octomom's "8" Csec 30 weeks~ January 2009



Octomom's 8 January 2018



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