Obstetric outcomes in women with congenital uterine anomalies

Leroy Edozien

Objectives of this presentation

- Outcomes of pregnancy in affected women
- Possible causes of poor outcomes
- Is there anything we can do to improve outcomes?

Pregnant Despite Uterus Didelphys

Filed in archive Pregnancy by Gloria Gamat on January 6, 2009

Photo courtesy of iStockphoto, Image# 4264496

Uterus didelphys is a condition wherein a woman has a double uterus and consequently a pair of cervices. Most often double vagina too.

With this condition pregnancy may be difficult as conception will depend on whether the sperm reaches the right uterus containing the woman's egg.

In London, a woman has been told she has two uterus and two cervices after finding out the she is pregnant.

> *Lindsay Hasaj had no idea she had two wombs and two cervixes until doctors made the unexpected diagnosis five weeks after she found out she was having a baby.*

Classification

- Agenesis/hypoplasia
- Lateral fusion defects
- Vertical fusion defects

- ASRM classification
- Acien classification
- VCUAM classification


Individual Cinical Expertise
Patient's Values & Expectations
Improved Patient Outcomes
Best Available Clinical Evidence

Pedro Acien, Reproductive performance of women with uterine malformations. *Human Reproduction* 1993;8:122-126

1980-91

176 women with uterine malformations

- arcuate 40
- bicornuate 49
- Bicornis bicollis 17
- didelphys 15
- unicornuate 24
- subseptus 14
- septate uterus 17

28 women with other genital and/or urinary anomalies but with a normal uterus

Diagnosis: clinical examination, ultrasound, HSG and IVP

Outcome of first pregnancy

	malformation n (%)	normal uterus n (%)
Pregnancy achieved	142/161	26/26
Ectopic pregnancy	2 (1)	0
Miscarriage	49 (35)	4 (16)
Preterm delivery	28 (20)	1 (4)
Term delivery	64 (45)***	21 (81)

Breech presentation and transverse lie significantly more frequent in term deliveries of subseptus and bicornuate uterus groups

PROM, IUGR and SB were not statistically more common

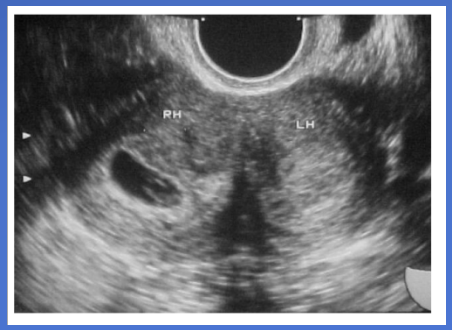
Neonatal survival

	malformed uterus	normal uterus	
Child surviving > 7 days	53	89	(P < 0.0001)

In the bicornis-bicollis, didelphys, unicornuate and subseptus uterus groups, about 70% of pregnancies ended with child surviving >7 days.

Outcome of first pregnancy

	Arcuate	Bicorn	Bicorn bicol	Didelphys	Unicornis	Subsept	Septate
Pregnancy achieved	30/38	47/48	10/12	10/11	21/23	9/14	15/15
Ectopic pregnancy	2	0	0	0	0	0	0
Miscarriage	11 (36)	24 (51)*	2 (20)	2(20)	4(19)	2 (22)	2 (27)
Preterm delivery	4 (13)	11 (23)	3 (30)	2(20)	7(33)*	1 (11)	0
Term delivery	13(43)**	12(26)****	6 (60)	6(60)	10(48)*	6 (67)	11 (73)



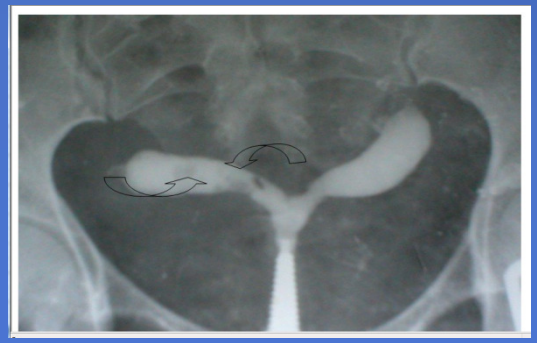


Table I. Number of patients experiencing various reproductive outcomes from their first pregnancy in relation to different uterine malformations

	Uterine malformations							All	
	Arcuatus No. (%)	Bicornis No. (%)	Bicornis-bicollis No. (%)	Didelphys No. (%)	Unicornis No. (%)	Subseptus No. (%)	Septate No. (%)	Malformations No. (%)	Normal uterus No. (%)
No. of studied patients	40	49	17	15	24	14	17	176	28
Single women or women avoiding pregnancy	2 (5)	1 (2)	5 (29)	4 (27)	1 (4)	0 –	2 (12)	15 (9)	2 (7)
Patients that have experienced infertility:									
With other causes	11 (28)	2 (4)	1 (6)	1 (7)	3 (13)	5 (36)	1 (6)	24 (14)	3 (11)
Without other causes	2 (5)	3 (6)	0 –	1 (7)	2 (9)	1 (7)	1 (6)	10 (6)	0 –
Patients who have achieved pregnancy	30	47	10	10	21	9	15	142	26
First pregnancy ending in:									
Ectopic	2 (7)	0 –	0 –	0 –	0 –	0 –	0 –	2 (1)	0 –
Early abortion	9 (30)	17 (36)*	2 (20)	2 (20)	4 (19)	1 (11)	4 (27)	39 (28)	3 (12)
Late abortion	1 (3)	3 (6)	0 –	0 –	0 –	0 –	0 –	4 (3)	0 –
Immature delivery	1 (3)	4 (9)	0 –	0 –	0 –	1 (11)	0 –	6 (4)	1 (4)
Pre-term delivery:	4 (13)	11 (23)	3 (30)	2 (20)	7 (33)*	1 (11)	0 –	28 (20)	1 (4)
Breech or transverse lie	1 (25)	5 (45)	1 (33)	0 –	5 (71)	0 –	0 –	12 (43)	0 –
Cephalic	3 (75)	6 (56)	2 (67)	2 (100)	2 (29)	1 (100)	0 –	16 (57)	1 (100)
Term delivery:	13 (43)**	12 (26)****	6 (60)	6 (60)	10 (48)*	6 (67)	11 (73)	64 (45)***	21 (81)
Breech or transverse lie	1 (8)	7 (58)*	3 (50)	1 (17)	4 (33)	4 (67)*	4 (36)	24 (38)	3 (14)
Cephalic	12 (92)	5 (42)	3 (50)	5 (83)	6 (67)	2 (33)	7 (63)	40 (63)	18 (86)

Differences in relation to the normal uterus group were significant at the following probability levels: *$P < 0.05$, **$P < 0.01$, ***$P < 0.001$, ****$P < 0.0001$.

Acien, 1993

Pregnancy outcome in untreated unicornuate uterus

Study	Patients *n*	Conceiving *n*	Pregnancies *n*	Ectopics *n* (%)	Abortions *n* (%)	Preterm deliveries *n* (%)	Term deliveries *n* (%)	Live births *n* (%)
Baker *et al.* (1953)	4	4	5	0	0	0	5 (100.0)	4 (80.0)
Wajntraub *et al.* (1975)	1	1	3	0	2 (66.7)	0	1 (33.3)	1 (33.3)
Beernink *et al.* (1976)	5	4	8	0	1 (12.5)	3 (37.5)	4 (50.0)	6 (75.0)
Andrews and Jones (1982)	5	5	13	0	7 (53.8)	2 (15.4)	4 (30.8)	6 (46.1)
Heinonen *et al.* (1982)	13	10	15	0	7 (46.7)	3 (20.0)	5 (33.3)	6 (40.0)
Buttram (1983)	31	?	60	0	29 (48.3)	10 (16.7)	21 (35.0)	24 (40.0)
Fedele *et al.* (1987)	19	13	29	1 (3.5)	17 (58.6)	3 (10.3)	8 (27.6)	11 (37.9)
Stein and March (1990)	12	12	16	0	0	5 (31.2)	11 (68.8)	16 (100.0)
Moutos *et al.* (1992)	29	20	40[a]	1 (2.8)	13 (36.1)	3 (8.3)	19 (52.8)	21 (58.3)
Acien (1993)	24	21	55	1 (1.8)	12 (21.8)	9 (16.4)	33 (60.0)	39 (70.9)
Raga *et al.* (1997)	8	?	16	0	7 (43.7)	4 (25.0)	5 (31.3)	7 (43.7)
Total	151	90/112[b]	260	3 (1.2)	95 (36.5)	42 (16.2)	116 (44.6)	141 (54.2)

Grimbizis *et al*, 2001

Pregnancy outcomes in unicornuate uteri

Reichman *et al*, 2009
20 studies; 1953-2006
468 pregnancies

Ectopic pregnancy	2.7%
First trimester miscarriage	24.3%
Second trimester miscarriage	9.7%
Preterm delivery	20.1%
Live birth	49.9%

Pregnancy outcome in untreated didelphys uterus

Study	Patients *n*	Conceiving *n*	Pregnancies *n*	Ectopics *n* (%)	Abortions *n* (%)	Preterm deliveries *n* (%)	Term deliveries *n* (%)	Live births *n* (%)
Michalas *et al.* (1976)	3	3	5	0	3 (60.0)	2 (40.0)	0	2 (40.0)
Heinonen *et al.* (1982)	21	13	25	0	8 (32.0)	6 (24.0)	11 (44.0)	16 (64.0)
Buttram (1983)	4	3	5	0	3 (60.0)	1 (20.0)	1 (20.0)	2 (40.0)
Fedele *et al.* (1988)	13	11	29	0	20 (69.0)	7 (24.1)	2 (6.9)	7 (24.1)
Stein and March (1990)	25	25	27	0	0	7 (25.9)	20 (74.1)	22 (81.5)
Moutos *et al.* (1992)	25	13	28[a]	1 (4.1)	6 (25.0)	9 (37.5)	8 (33.3)	17 (70.8)
Acien (1993)	15	10	18	0	5 (27.8)	3 (16.7)	10 (55.5)	13 (72.2)
Raga *et al.* (1997)	8	?	15	1 (6.7)	4 (26.7)	8 (53.3)	3 (20.0)	6 (40.0)
Total	114	78/106[b]	152	2 (1.3)	49 (32.2)	43 (28.3)	55 (36.2)	85 (55.9)

Grimbizis *et al*, 2001

Pregnancy outcome in women with untreated septate uterus

Study	Patients	Conceiving	Pregnancies	Ectopics	Abortions	Preterm deliveries	Term deliveries	Live births
Heinonen *et al.* (1982)	52	41	81	0	21 (25.9)	7 (8.6)	55 (67.9)	61 (68.5)
Buttram (1983)	72	?	208	0	139 (67.0)	69 (33.0)	0	58 (28.0)
Acien (1993)	31	24	65	0	15 (23.0)	15 (23.0)	35 (54.0)	41 (63.1)
Raga *et al.* (1997)	43	?	145	3 (2.1)	46 (31.7)	21(14.5)	75 (51.7)	90 (62.0)
Total[a]	198	65/83[b]	499	3 (0.6)	221 (44.3)	112 (22.4)	165 (83.1)	250 (50.1)

Grimbizis *et al*, 2001

Pregnancy outcomes in women with untreated arcuate uterus

Study	Patients	Conceiving	Pregnancies	Ectopics	Abortions	Preterm deliveries	Term deliveries	Live births
Heinonen *et al.* (1982)	20	18	46	0	13 (28.3)	6 (13.0)	27 (58.7)	30 (65.0)
Acien (1993)	40	30	85	4 (5.0)	33 (39.0)	7 (8.0)	38 (48.0)	38 (48.0)
Raga *et al.* (1997)	42	?	110	3 (2.7)	16 (14.5)	5 (4.5)	86 (78.3)	91 (82.7)
Total	102	48/60[a]	241	7 (2.9)	62 (25.7)	18 (7.5)	151 (62.7)	159 (66.0)

Edozien *et al*, unpublished population data

	Births	Q51 (all)	Q51. 0	Q51. 1	Q51. 2	Q51. 3	Q51. 4	Q51. 5	Q51. 8	Q51. 9
2000	512,350	44	0	3	5	18	10	0	8	1
2001	517,142	59	0	5	6	22	11	0	13	2
2002	529,443	88	0	5	10	44	14	0	15	1
2003	560,901	69	0	4	11	33	12	0	7	2
2004	567,099	77	0	3	10	28	15	0	21	1
2005	582,310	64	0	2	12	30	12	0	8	0
2006	601,614	105	0	4	23	56	13	0	10	0
2007	624,256	113	0	4	22	60	20	0	9	0
2008	572,780	116	1	11	21	54	18	0	8	3
Total cases	**5,067,895**	**735**	**1**	**41**	**120**	**345**	**125**	**0**	**99**	**10**

(Q51.) Congenital malformations of uterus and cervix

(Q51.0) Agenesis and aplasia of uterus
(Q51.1) Doubling of uterus with doubling of cervix and vagina
(Q51.2) Other doubling of uterus
(Q51.3) Bicornate uterus
(Q51.4) Unicornate uterus
(Q51.5) Agenesis and aplasia of cervix

(Q51.8) Other congenital malformations of uterus and cervix
(Q51.9) Congenital malformation of uterus and cervix, unspecified

Edozien *et al*, unpublished population data

Complications of labour and delivery (n=735)

		Cases	%
dx_o60	Preterm delivery	128	**17.4%**
dx_o62	Abnormalities of forces of labour	17	2.3%
dx_o63	Long labour	50	6.8%
dx_o64	Obstructed labour due to malposition and malpresentation of fetus	56	**7.6%**
dx_o65	Obstructed labour due to maternal pelvic abnormality	13	1.8%
dx_o68	Labour and delivery complicated by fetal stress (distress)	102	13.9%
dx_o71	Other obstetric trauma	7	1.0%
dx_o710	*Rupture of uterus before onset of labour*	*1*	*0.1%*
dx_o713	*Obstetric laceration of cervix*	*1*	*0.1%*
dx_o714	*Obstetric high vaginal laceration alone*	*3*	*0.4%*
dx_o718	*Other specified obstetric trauma*	*1*	*0.1%*
dx_o719	*Obstetric trauma, unspecified*	*1*	*0.1%*
dx_o72	Postpartum haemorrhage	101	**13.7%**
dx_o73	Retained placenta and membranes, without haemorrhage	21	**2.9%**
dx_o730	*Retained placenta without haemorrhage*	*18*	*2.4%*
dx_o731	*Retained portions of placenta and membranes, without haemorrhage*	*3*	*0.4%*

* No cases of dx_o711 (Rupture of uterus during labour), dx_o712 (Postpartum inversion of uterus), dx_o715 (Other obstetric injury to pelvic organs), dx_o716 (Obstetric damage to pelvic joints and ligaments), dx_o717 (Obstetric haematoma of pelvis)

Complications of labour and delivery (All births, except malformations, n= 5,067,743)

		Cases	%
dx_o60	Preterm delivery	262,481	**5.2%**
dx_o62	Abnormalities of forces of labour	131,230	2.6%
dx_o63	Long labour	553,117	10.9%
dx_o64	Obstructed labour due to malposition and malpresentation of fetus	124,286	**2.5%**
dx_o65	Obstructed labour due to maternal pelvic abnormality	12,786	0.25%
dx_o68	Labour and delivery complicated by fetal stress (distress)	1,046,695	20.7%
dx_o71	Other obstetric trauma	70,483	1.4%
dx_o710	*Rupture of uterus before onset of labour*	*347*	*0.01%*
dx_o711	*Rupture of uterus during labour*	*1,935*	*0.04%*
dx_o712	*Postpartum inversion of uterus*	*397*	*0.01%*
dx_o713	*Obstetric laceration of cervix*	*2,040*	*0.04%*
dx_o714	*Obstetric high vaginal laceration alone*	*36,702*	*0.72%*
dx_o715	*Other obstetric injury to pelvic organs*	*5,282*	*0.1%*
dx_o716	*Obstetric damage to pelvic joints and ligaments*	*1,493*	*0.03%*
dx_o717	*Obstetric haematoma of pelvis*	*4,192*	*0.08%*
dx_o718	*Other specified obstetric trauma*	*15,647*	*0.31%*
dx_o719	*Obstetric trauma, unspecified*	*3,646*	*0.07%*
dx_o72	Postpartum haemorrhage	394,084	**7.8%**
dx_o73	Retained placenta and membranes, without haemorrhage	52,498	**1.0%**
dx_o730	*Retained placenta without haemorrhage*	*41,143*	*0.8%*
dx_o731	*Retained portions of placenta and membranes, without haemorrhage*	*11,405*	*0.2%*

Edozien *et al*, unpublished population data

Mode of delivery (n=735)

	Singleton		**Multiple**	
	n	%	n	%
Vaginal	139	19.1%	1	16.7%
Forceps	15	2.1%	0	0.0%
Vacuum	16	2.2%	0	0.0%
Elective CS	296	40.6%	3	50.0%
Emergency CS	263	36.1%	2	33.3%
All	**729**		**6**	

Mode of delivery (n= 5,067,743)

	Singleton		Multiple	
	Cases	%	Cases	%
Vaginal	3,292,620	66.0%	20,719	27.0%
Forceps	204,572	4.1%	2,973	3.9%
Vacuum	359,518	7.2%	5,448	7.0%
Elective CS	449,629	9.0%	21,664	28.2%
Emergency CS	684,603	13.7%	25,997	33.9%
All	**4,990,942**		**76,801**	

Mode of delivery

- Stein & March, 1990

  186 pregnancies in 150 women

  CS incidence of 83%, of which 80% were due to malpresentation

  Preterm delivery 25%

Vaginal birth after CS

- 25 women with Müllerian anomaly v 1788 with normal uterus
- CS rates 20% and 25.1% respectively
- Rate of uterine rupture:

  8% in MA group v. 0.61% in NU group (P =.013).

Ravasia *et al*, 1999

Trial of labor and vaginal birth after cesarean section in patients with uterine Müllerian anomalies: a population-based study Erez et al, 2007

TABLE 3
Peripartum complications according to study groups

	MA (n = 165)	NU (n = 5406)	*P*
PROM	8.5 (14)	6.9 (375)	.442
Malpresentation	38.8 (64)	7.8 (421)	< .001
Preterm delivery	20.0 (33)	11.0 (595)	< .001
PPROM	3.0 (5)	1.4 (75)	.081
Arrest of 1st stage of labor	3.0 (5)	9.5 (515)	.003
Arrest of 2nd stage of labor	1.8 (3)	3.8 (203)	.194
Abruption of placenta	3.0 (5)	1.2 (65)	.055
NRFHR	4.2 (7)	5.4 (294)	.503
Prolapse of cord	1.2 (2)	0.7 (37)	.322
Placenta previa	0	1.07 (58)	.41
CS	62.4 (103)	24.3 (2666)	.001
Uterine rupture	0	0.2 (10)	.580

Data are presented as percent (numbers).
CS, cesarean section; *NRFHR*, nonreassuring fetal heart rate; *PROM*, prelabor rupture of membranes; *PPROM*, preterm prelabor rupture of membranes.

Trial of labor and vaginal birth after cesarean section in patients with uterine Müllerian anomalies: a population-based study Erez et al, 2007

Perinatal outcome according to study groups

	MA (n = 165)	NU (n = 5406)	*P*-value
Neonatal gender			
Male	49.7 (82)	51.6 (2789)	.63
SGA	11.5 (19)	7.1 (382)	.029
LGA	4.8 (8)	13.2 (711)	.002
APD	1.8 (3)	1.2 (65)	.45
IPD	0	0.1 (5)	>.99
PPD	0	0.8 (43)	.63
Total perinatal mortality	1.8 (3)	2.1 (113)	>.99
1-min Apgar ≤5	5.6 (9)	8.2 (443)	.238
5-min Apgar ≤7	1.2 (2)	2.1 (113)	.456
Birthweight (g)	2847 ± 612	3145 ± 612.0	<.001
Birthweight (g)			
<1500	4.2 (7)	2.2 (108)	<.001
1500-2500	17.0 (28)	8.9 (481)	
≥2500	78.8 (130)	88.9 (4817)	
Gestational age at delivery (wks)			
<28	1.2 (1)	0.8 (8)	.017
28-32	2.4 (4)	1.4 (79)	
32-37	27 (16.4)	9.3 (503)	
≥37	80.0 (132)	88.5 (4784)	

Data are presented as percent (numbers) or mean ± SD.

Trial of labor and vaginal birth after cesarean section in patients with uterine Müllerian anomalies: a population-based study Erez et al, 2007

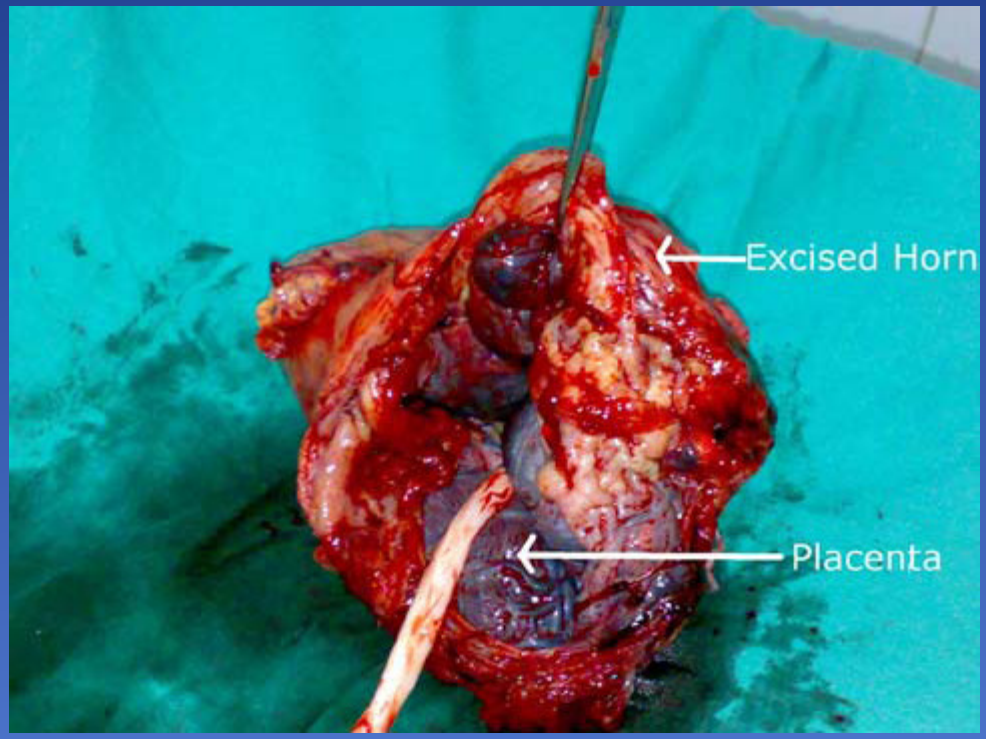
Comparison of pregnancy outcome of the study groups according to fetal presentations

	Malpresentation			Cephalic presentation		
	MA n = 64	NU n = 421	*P*	MA n = 101	NU n = 4985	*P*
Hydramnios	3.1 (2)	11.4 (48)	.046	3.0 (3)	6.5 (322)	.214
Oligohydramnios	1.6 (1)	5.0 (21)	0.337	4 (4%)	2.8 (138)	.367
PROM	9.4 (6)	5.9 (25)	.277	7.9 (8)	7.0 (350)	.910
Preterm delivery	20.3 (13)	24.7 (104)	.531	19.8 (20)	9.8 (491)	.002
PPROM	4.7 (3)	3.3 (14)	.480	2.0 (2)	1.2 (61)	.357
Arrest of 1st stage of labor	0	0.7 (3)	> .99	5.0 (5)	10.3 (512)	.094
Arrest of 2nd stage of labor	0	0.2 (1)	> .99	3.0 (3)	4.1 (202)	.799
Abruption of placenta	3.1 (2)	2.4 (10)	.664	3.0 (3)	1.1 (55)	.107
NRFHR	0	2.1 (9)	.519	6.9 (7)	5.7 (258)	.519
Prolapse of cord	0	0.5 (2)	> .99	2.0 (2)	0.7 (35)	.167
CS	93.8 (60)	91.4 (385)	.806	42.6 (43)	45.8 (2281)	.546
Uterine tear	0	0	NA	0	0.2 (10)	> .99
1-min Apgar ≤ 5	6.3 (4)	19.2 (76)	.011	5.1 (5)	7.3 (357)	.554
5-min Apgar ≤ 7	0	6.3 (25)	.035	2.0 (2)	1.8 (86)	.691
Birthweight (g)	2877 ± 554	2833 ± 819	.679	2827 ± 647	3171 ± 583	< .001

Other obstetric problems

APH from other horn
Secondary PPH from shedding of decidual cast
Rudimentary horn obstructing labour
Risk of uterine rupture – even if metroplasty was uncomplicated.
Risk of retained placenta with uterine septum

Heterotopic pregnancy



Nanda *et al,* 2009

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Risks associated with rudimentary horn

Uterine rupture

Haematometra

Nahum GG, 2002

588 cases of rudimentary horn pregnancy.

The pregnancy resided in a non-communicating horn in 83%

30% progressed to term or beyond.

50% of pregnant uterine horns ruptured, with 80% of these events occurring before the third trimester.

Causes of adverse outcomes

- Morphology
- Muscle mass
- Vascular supply
- Cervical incompetence
- Biochemistry

How may pregnancy outcomes be improved?

- Metroplasty?
- Cervical cerclage?

..in order to consider prophylactic treatment as reasonable, patients with uterine malformations should have high chances for pregnancy loss starting even from their first pregnancy

- Grimbizis et al, 2001

Pregnancy outcome in first and all pregnancies

	Arcuate ($n=40$)		Septate ($n=31$)		Bicornuate ($n=66$)		Total[a] ($n=137$)		Malformed uterus[b] ($n=176$)		Normal uterus ($n=28$)	
	1st preg *n* (%)	All preg *n* (%)	1st preg *n* (%)	All preg *n* (%)	1st preg *n* (%)	All preg *n* (%)	1st preg *n* (%)	All preg *n* (%)	1st preg *n* (%)	All preg *n* (%)	1st preg *n* (%)	All preg *n* (%)
Pregnancies	30	85	24	65	57	160	111	310	142	383	26	47
Ectopics	2 (7)	4 (5)	0	0	0	2 (1)	2 (2)	6 (2)	2 (1)	7 (2)	0	0
Abortions	10 (33)	33 (39)**	5 (21)	15 (23)*	22 (38)*	73 (46)*	37 (33)*	121 (39)**	43 (31)	138 (36)**	3 (12)	4 (8)
Early	9	29	5	15	19	67	33	111	39	126	3	0
Late	1	4	0	0	3	6	4	10	4	12	3	1
Preterm delivery	5 (13)	7 (8)	2 (8)	15 (23)*	18 (31)*	36 (22)*	25 (22)	58 (19)*	34 (24)	70 (18)*	2 (8)	3 (6)
22–28 weeks	1	2	1	1	4	5	6	8	6	9	1	1
29–37 weeks	4	5	1	14	14	31	19	50	28	61	1	2
Term delivery	13 (43)*	41 (48)**	17 (71)	35 (54)**	18 (31)**	49 (31)**	48 (43)**	125 (40)**	64 (45)**	168 (44)**	21 (81)	40 (85)

Acien 1993,; Grimbizis et al, 2001

Comparison of reproductive outcome before and after hysteroscopic metroplasty for the septate uterus in selected series.

		Before metroplasty				After metroplasty			
Author (ref.)	No. of patients	No. of pregnancies	No. of miscarriages (%)	No. of preterm deliveries (%)	No. of term deliveries (%)	No. of pregnancies	No. of miscarriages (%)	No. of preterm deliveries (%)	No. of term deliveries (%)
Chervenak and Neuwirth (72)	2	3	3 (100)	0	0	2	0	0	2 (100)
Daly et al.* (70)	17	40	34 (85)	5 (12.5)	1 (2.5)	9	2 (22)	1 (11)	6 (67)
De Cherney and Polan* (81)	15	NR	>30	NR	NR	11	2 (18)	0	9 (82)
Israel and March* (71)	12	28	26 (93)	0	2 (7)	2	1 (50)	0	1 (50)
De Cherney et al. (79)	103	NR	>206	NR	NR	>71	>8	1	NR
Valle and Sciarra* (18)	12	42	30 (71)	12 (29)	0	10	2 (20)	2 (20)	6 (60)
Fayez (20)	12	21	19 (90)	2 (10)	0	16	2 (13)	0	14 (87.5)
March and Israel (16)	57	240	212 (88)	21 (9)	7 (3)	56	8 (14)	4 (7)	44 (79)
Perino et al. (33)	24	27	24 (89)	3 (11)	0	15	1 (7)	0	14 (93)
Daly et al. (69)	55	150	130 (87)	13 (9)	7 (5)	75	15 (20)	5 (7)	55 (73)
Choe and Baggish (17)	14	38	31 (82)	6 (16)	1 (3)	12	1 (8.3)	1 (8.3)	10 (83.3)
Fedele et al. (73)	71	>139	>139	NR	NR	65	10 (16)	10 (16)	45 (69.2)
Cararach et al. (74)	62	176	160 (91)	11 (6)	5 (3)	41	12 (29)	0	29 (48)
Pabuccu et al. (76)	49	108	96 (89)	11 (10)	1 (1)	44	2 (4.5)	2 (4.5)	40 (9.1)
Valle (77)	115	299	258 (86.3)	28 (9.4)	13 (4.3)	103	12 (12)	7 (7)	84 (81)
Mencaglia and Tantini† (40)	94	NR	>94	NR	NR	62	4 (6)	0	58 (94)
Total	658	1,062	933 (88)	95 (9)	34 (3)	491	67 (14)	29 (6)	395 (80)

Note: NR = not recorded.

* Not included in total to avoid duplication of patients.

† Not included in total because of incomplete data.

Homer. The septate uterus. Fertil Steril 2000.

Pregnancy outcome before hysteroscopic metroplasty

Study	Patients *n*	Conceiving *n*	Pregnancies *n*	Ectopics *n* (%)	Abortions *n* (%)	Preterm deliveries *n* (%)	Term deliveries *n* (%)	Live births *n* (%)
Fayez (1986)[a]	19	12	21	0	19 (90.5)	2 (9.5)	0	0
Valle and Sciarra (1986)	12	12	42	0	30 (71.4)	12 (28.6)	0	3
March and Israel (1987)[a]	91	79	240	0	212 (88.3)	21 (8.8)	7 (2.9)	12
Perino *et al.* (1987)[a]	24	16	27	0	24 (88.9)	3 (11.1)	0	3
Daly *et al.* (1989)[a]	70	55	150	0	130 (86.7)	13 (8.7)	7 (4.7)	10
Choe and Baggish (1992)[a]	19	18	41	3	31 (81.6)	6 (15.8)	1 (2.6)	4
Grimbizis *et al.* (1998)[a]	57	33	78	2 (2.6)	69 (88.4)	2 (2.6)	5 (6.4)	NM
Total	292	225	599	2 (0.3)	515 (86.4)	59 (9.8)	20 (3.3)	32/521 (6.1)

Pregnancy outcome in women with septate uterus after hysteroscopic metroplasty

Study	Patients *n*	Conceiving *n*	Pregnancies (+ ongoing) *n*	Ectopics *n* (%)	Abortions *n* (%)	Preterm deliveries *n* (%)	Term deliveries *n* (%)	Live births *n* (%)
DeCherney *et al.* (1986)[a]	72/72	67	67 (+3)	0	~8 (11.9)	1 (1.5)	58 (85.6)	58 (85.6)
Fayez (1986)[a]	19/19	16	16	0	2 (12.5)	0	14 (87.5)	14 (87.5)
Valle and Sciarra (1986)	12/12	10	10 (+3)	0	2 (20.0)	2 (20.0)	6 (60.0)	8 (80.0)
March and Israel (1987)[a]	91/66	57	56 (+7)	0	8 (14.3)	4 (7.1)	44 (78.6)	48 (85.7)
Perino *et al.* (1987)[a]	24/24	16	11 (+5)	0	1 (9.1)	0	10 (90.9)	10 (90.9)
Daly *et al.* (1989)[a]	70/66	54	84 (+4)	0	17 (20.2)	5 (6.0)	62 (73.8)	65 (77.4)
Choe and Baggish (1992)[a]	19/14	13	12 (+3)	0	1 (8.3)	1 (8.3)	10 (83.4)	10 (83.4)
Fedele *et al.* (1993)	102/?	66	66	0	10 (15.2)	10 (15.2)	45 (68.2)	55 (83.3)
Grimbizis *et al.* (1998)[a]	57/42	30	44	1 (2.3)	11 (25.0)	2 (4.5)	30 (68.8)	NM
Total[a]	466/315	329	366	1 (0.3)	60 (16.4)	25 (6.8)	279 (76.2)	268/322 (83.2)

Unicornuate uterus
Arcuate uterus
Didelphys

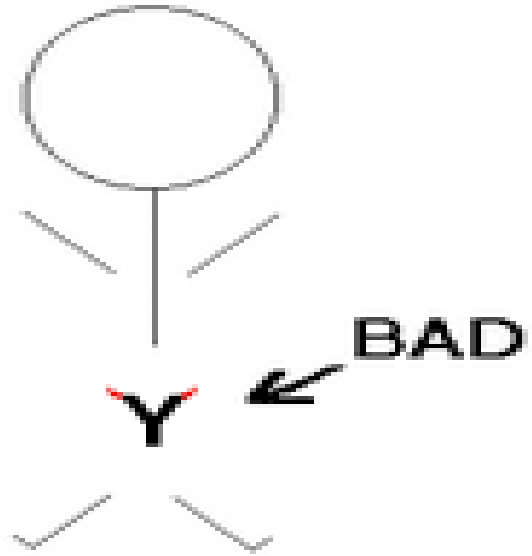
Surgery not shown to improve pregnancy outcomes

Bicornuate uterus

- Cervical cerclage recommended

Conclusions

- Various types of uterine anomaly are associated with different outcomes (but more robust data needed)
- Hysteroscopic resection of septum substantially increases term delivery and live birth rates
- Mode of delivery is CS in most cases
- Obstetric complications such as postpartum haemorrhage and rupture of the uterus should be anticipated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