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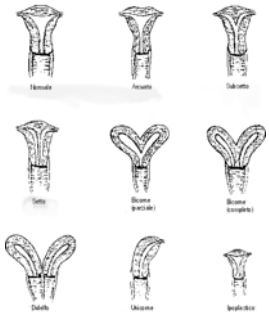
ESHRE Special Interest Group for Early Pregnancy (SIGEP)
Winter Symposium
Milan, Italy - 18-19 Dec. 2008

Detection of uterine anomalies

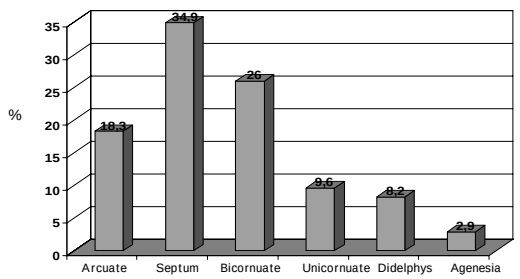
C. Exacoustos

Anatomic anomalies

- Uterine Agenesis-ipoplasia
- Unicornuate uterus
- Didelphys uterus
- Bicornuate uterus
- Septum uterus
- Arcuate uterus

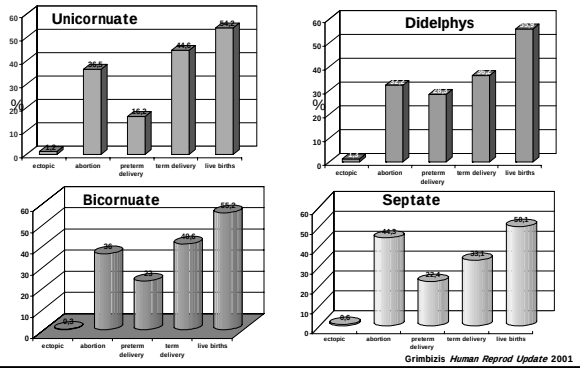


UTERINE MALFORMATIONS



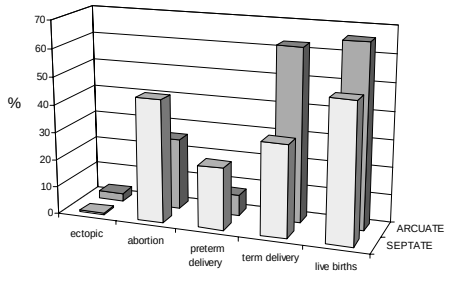
Grimbizis *Human Reprod Update* 2001

Pregnancy outcome in untreated patients



Grimbizis *Human Reprod Update* 2001

Pregnancy outcome in patients with untreated septate and arcuate uterus



Grimbizis *Human Reprod Update* 2001

UTERINE MALFORMATIONS

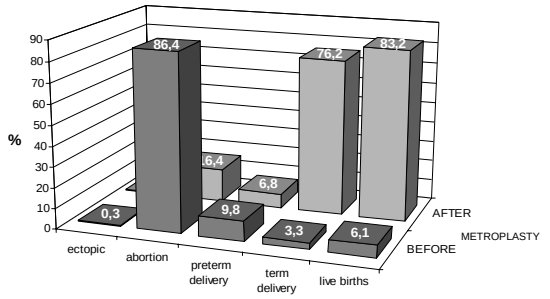
Diagnostic Tecnique

HYSTEROSCOPY:
- uterine cavity

HYSTEROSALPINGOGRAPHY:
- uterine cavity
- tubal patency

No more information on the external surface of the uterus

Pregnancy outcome in patients with septate uterus before and after hysteroscopic metroplasty



Grimbizis *Human Reprod Update* 2001

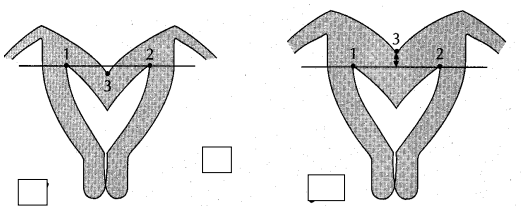
Pregnancy outcome in untreated bicornuate uterus

Study	Patients	Conceiving	Pregnancies	Ectopics	Abortions	Preterm deliveries	Term deliveries	Live births
Heinonen *et al.* (1982)	59	44	98	0	27 (27.5)	22 (22.5)	49 (50.0)	62 (62.1)
Buttram (1983)	110	?	313	0	110 (35.0)	72 (23.0)	131 (42.0)	178 (57.0)
Acien (1993)	66	57	160	2 (1.3)	73 (46.0)	36 (22.0)	49 (31.0)	71 (44.4)
Raga *et al.* (1997)	26	?	56	0	16 (28.6)	14 (25.0)	26 (46.4)	35 (62.5)
Total	261	101/125*	627	2 (0.3)	226 (36.0)	144 (23.0)	255 (40.6)	346 (55.2)

- The high chances of having a term pregnancy of about 60%, with a take-home baby rate of 60%, currently suggest to perform the Strassman procedure only on selected cases wih recurrent pregnancy losses

✓Background

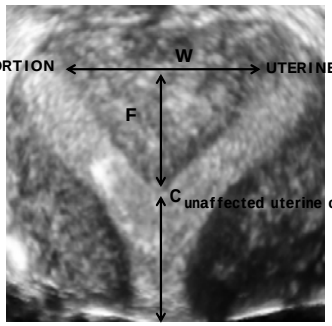
Septate uterus may cause decreased live birth rate.
Since hysteroscopic metroplasty improves gestational outcome up to 60%, a correct differential diagnosis between septate and bicornuate uterus is mandatory.



Bicornuate uteri are sometimes suitable of hysteroscopic metroplasty
Vercellini et al 1999

3D UTERINE MORPHOLOGY

Salim Ultrasound Obstet Gynaecol2003



FUNDAL DISTORTION

The depth of fundal indentation or the septum length

UTERINE CAVITY WIDTH

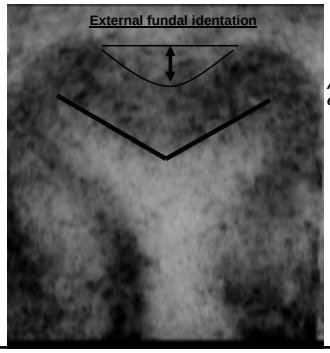
The distance between the two internal tubal hostia

unaffected uterine cavity LENGTH

Distance from the distal tip of the fundal indentation or uterine septum to the level of the internal os

3D UTERINE MORPHOLOGY

Salim Ultrasound Obstet Gynaecol2003

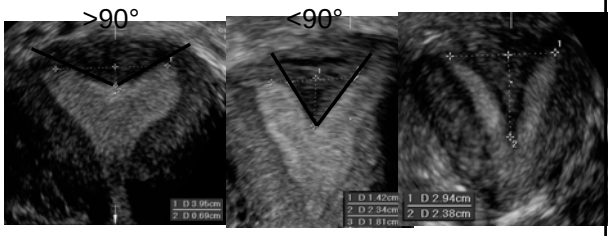


Angle between the two endometrial layers

CRITERIA FOR THE CLASSIFICATION

Salim Ultrasound Obstet Gynaecol 2003

Uterine Morphology	Fundal contour	External contour
Normal	Straigh or convex	Convex With indentation < 10 mm
Arcuate	Concave fundal indentation with central point of indentation at obtuse angle (>90°)	Convex With indentation < 10 mm
Subseptate	Presence of septum, wich does not extend to cervix, with central point of septum at acute a.(< 90°)	Convex With indentation < 10 mm
Septate	Presence of septum that completely divides cavity from fundus to cervix	Convex With indentation < 10 mm
Bicornuate	Two well-formed uterine cornua	Fundal indentation > 10 mm dividing the two cornua
Unicornuate with or without rudimentary horn	Single well-formed uterine cavity with a single interstitial portion of tube and concave fundal contour	Fundal indentation > 10 mm dividing the two cornua if rudimentary horn present

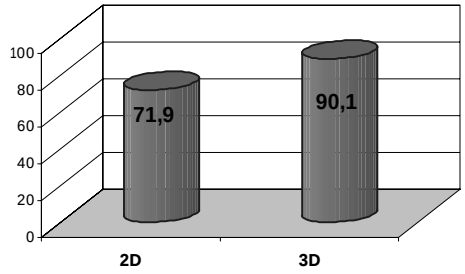


Uterine malformations: TVS 2D-3D diagnostic accuracy

%	Arcuate 2D	Arcuate 3D	Septate 2D	Septate 3D	Bicornuate 2D	Bicornuate 3D
Sensitivity	69	100	50	80	86	100
Specificity	74	84	76	100	88	98
PPV	64	81	65	100	46	88
NPV	78	100	63	85	98	100
K index	40	68	35	100	40	86

Exacoustos *Ultrasound Obstet Gynecol 2005*

Uterine malformations:
TVS 2D- 3D concordance rate



CONCLUSIONS:

3D TVS allows accurate differentiation between uterine anomalies and is useful for a preoperative surgical planing.

✓Aim of the study

➔ **to evaluate uterine cavity morphology by 3D trasvaginal sonography (TVS) before and after hysteroscopic metroplasty, and to correlate these findings to gestational outcome.**

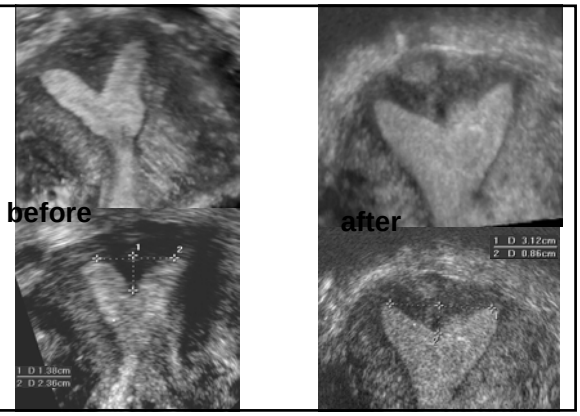
✓Study population

21 premenopausal patients with septate uterus

- 15 **recurrent miscarriage**
- **6 inferility**
- **mean age: 32.4±3.7years**

✓Methods

- **3D TVS was performed**
  - **during the secretive phase of the cycle (day 20-24)**
  - **at within 3 months before metroplasty**
  - **at least 3 months after metroplasty**
- **Measurements on the coronal view of the uterus**
  - **width of the septum**
  - **length of the septum**



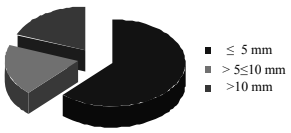
✓Results

21 patients	metroplasty	
Septum	**before** mean ± SD mm	**after** mean ± SD mm
length	**19.8±7.7**	**6.2±4.6***
width	**27.6± 9.9**	**25.3±8.8**

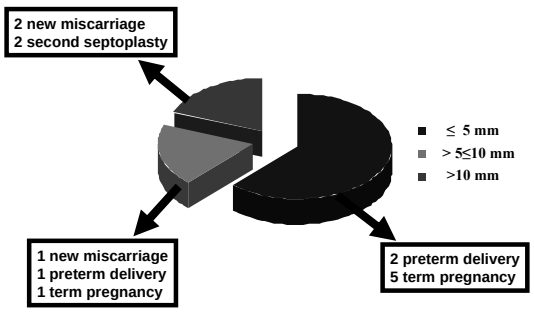
✓Results

21 patients

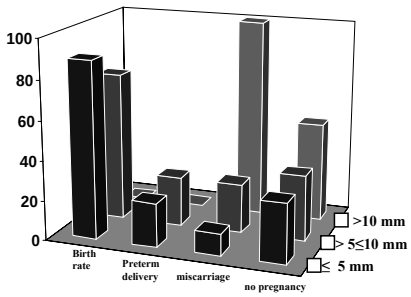
- 13 pts with septum residual tissue ≤ 5mm
- 8 pts with septum residual tissue > 5mm
  - 4 pts with septum residual tissue > 10 mm
  - 4 pts with septum residual tissue > 5≤10 mm



✓Results



✓Results



✓Results

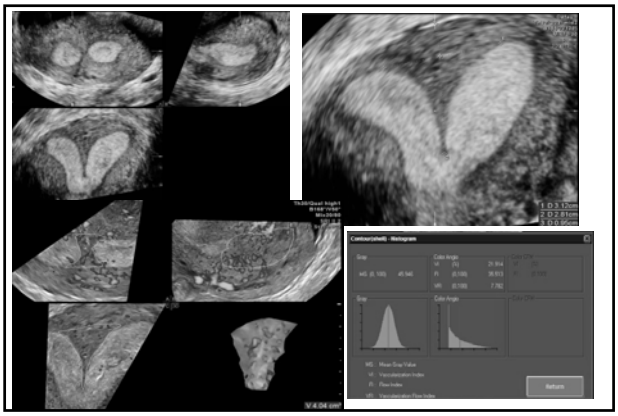
21 patients who underwent hysteroscopic septoplasty

- 13 pts with septum residual tissue ≤ 5mm
  ➔ no abortion in 7 pregnancies
- 8 pts with septum residual tissue > 5mm
  ➔ 3 repeated abortion in 5 pregnancies
  ➔ 2 with a residual septum > 10mm

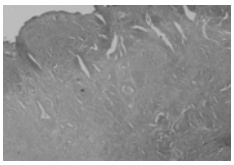
Uterine malformations and vascularity

Several mechanisms have been proposed to explain infertility and early pregnancy loss in case of septate uterus.

As possible etiological factors some authors suggest a poor vascularization in connective or fibro-elastic septal tissue, unable to provide adequate blood supply to the developing embryo.

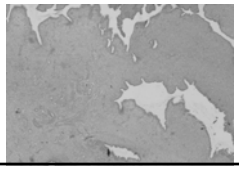


Hystology of the septal tissue



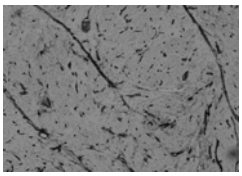
Hematoxylin-Eosine

Amount of muscle tissue
>50% normal myometrial tissue



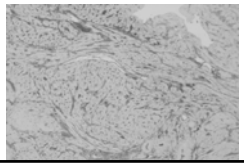
Amount of connective tissue
<50% normal myometrial tissue
>50% fibrotic tissue

Hystology of the septal tissue



CD 34
Immuno-histochemistry

normal vessels amount
>5 vessels in field of x 100



poor vessels amount
< 5 vessels in field of x 100

✓Results

SEPTUM	amount of vessels (CD 34 Immunohisto-chemistry)		
	poor	normal	p
length (mm)	*26.5 ± 6.8*	*22.3 ±9.6*	*0.30*
width (mm)	*23.9 ± 3,1*	*31.6 ± 3,1*	*>0.001*
Volume (cm3)	*2.35 ± 0.62*	*2,93 ±1.25*	*0.25*
VI (%)	*1.83 ± 1.26*	*17.49 ±8.40*	*>0.001*
FI	*26.36 ± 1.70*	*37.32 ±5.17*	*>0.001*
VFI	*0.51 ± 0.35*	*6.88 ±3.79*	*>0.001*
Normal amount of muscle tissue	1(13%)	8(73%)	0.03

✓Conclusions

- **3D TVS allows accurate differentiation between uterine anomalies and is useful for a preoperative surgical planing**
- **3D TVS should be included in the follow up after hysteroscopic metroplasty, to help the physician in the counseling of a new pregnancy or second surgery**

Difficult scan question (DISQ)

Ultrasound Obstet Gynecol 2007; **29**: 362

DISQ 6: Septate uterus and recurrent miscarriage

Prepared by: D. JURKOVIC† and Z. ALFIREVIC*‡

How best to diagnose and treat subseptate uterus in a woman with no history of recurrent miscarriage?

What do the experts say?

What diagnostic methods would you employ to provide a definitive diagnosis of subseptate uterus?

The majority of experts (64%) would use three-dimensional (3D) ultrasound imaging, with 17% using diagnostic hysteroscopy and 14% saline contrast sono-hysterography. The remaining 5% of experts would use two-dimensional ultrasound imaging or magnetic resonance imaging.

If the diagnosis of subseptate uterus is confirmed what would be your preferred management?

The panel was strongly in favor of surgical treatment, with 86% of experts opting for hysteroscopic resection of the septum.

Expert opinions show that 3D ultrasound imaging has been recognized in clinical practice as the method of choice for definitive diagnosis of congenital uterine anomalies. Once the diagnosis of subseptate uterus has been made, surgical correction should be offered to the patient.

The experts were almost unanimous in their opinion that subseptate uterus requires surgical correction even in women who have not suffered recurrent pregnancy loss.

✓Conclusions

- **3D TVS is actually the method of choice for uterine maformations**
- **To diagnose and differentiate**
- **To plan treatment**
- **To evaluate after treatment**