

HYSTEROSCOPIC MX OF CONGENITAL UTERINE ANOMALIES

SURAN RAMPHAL

INTRODUCTION

Prevalence

- - general population – 4.3%
- - infertile -3.5%
- - recurrent pregnancy loss – 13%

Grimbizis et al 2001

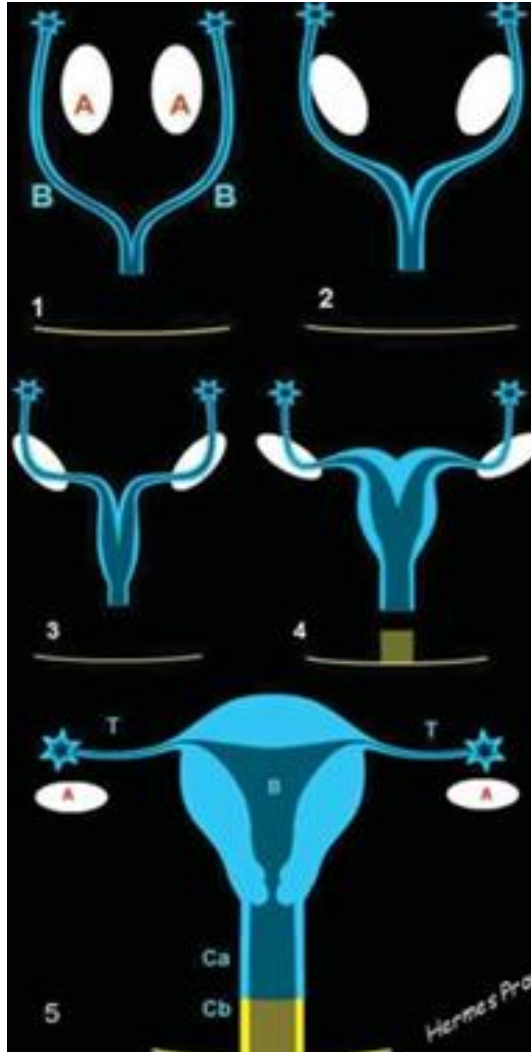
Adverse perinatal outcome

- - recurrent miscarriage
- - preterm labour and births
- - IUGR
- - malpresentations
- - cervical incompetence
- - postpartum bleeding

MDA: INFERTILITY

MDA typically does not prevent conception and implantation but the abnormal uterine cavity is thought to impair the reproductive performance of the patient

EMBRYOLOGY



- Mullerian ducts extend medio-caudally and fuse
- Inferior ducts develop into uterus, cervix and upper 2/3 of vagina
- Resorption of medial wall of septum

EMBRYOLOGY

- The fallopian tubes are derived from a different cellular origin and are rarely involved in MDA
- The ovaries arise from the mesenchyme and epithelium of the gonadal ridge and are not influenced by the formation of the mesonephric or paramesonephric ducts

ABNORMALITIES

- 4 major disturbances in the development, formation or fusion of the Mullerian or paramesonephric ducts during fetal life

A failure of one or more Mullerian ducts to develop (agenesis, unicornuate uterus without rudimentary horn)

B failure of the ducts to canalize (unicornuate uterus with rudimentary horn without proper cavities)

C failure of or abnormal fusion of the ducts (uterine didelphys, bicornuate uterus)

D failure of reabsorption of the midline uterine septum (septate uterus, arcuate uterus)

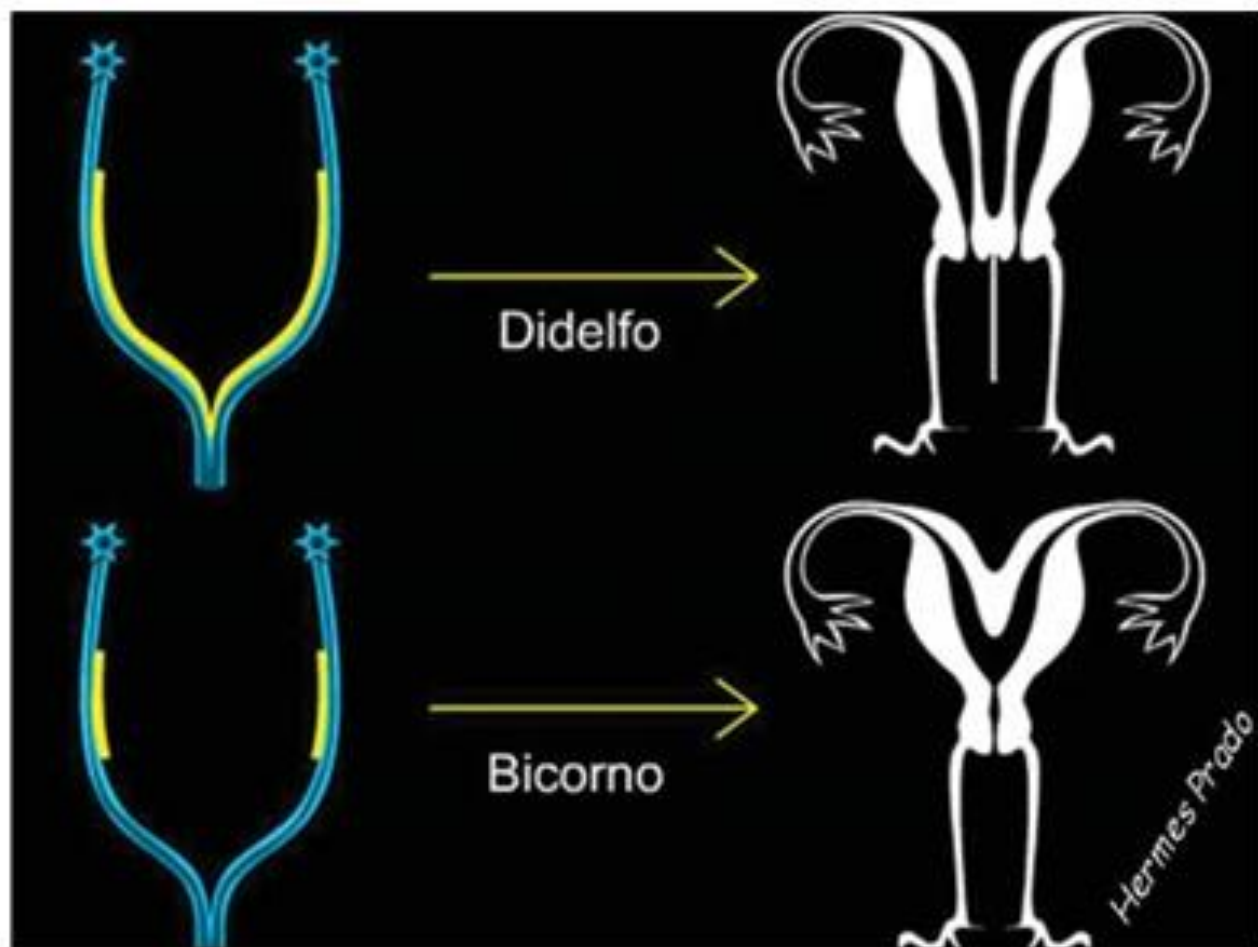


Figure 16. Schemes showing failures in complete (didelphys uterus) and partial (bicornuate uterus) fusion of the Müllerian ducts.



Figure 17. Double cavity uterus. Final diagnosis: didelphys uterus. Transabdominal 2D ultrasound is the method of choice for the correct diagnosis of this anomaly. Observe the complete separation between uterine bodies.



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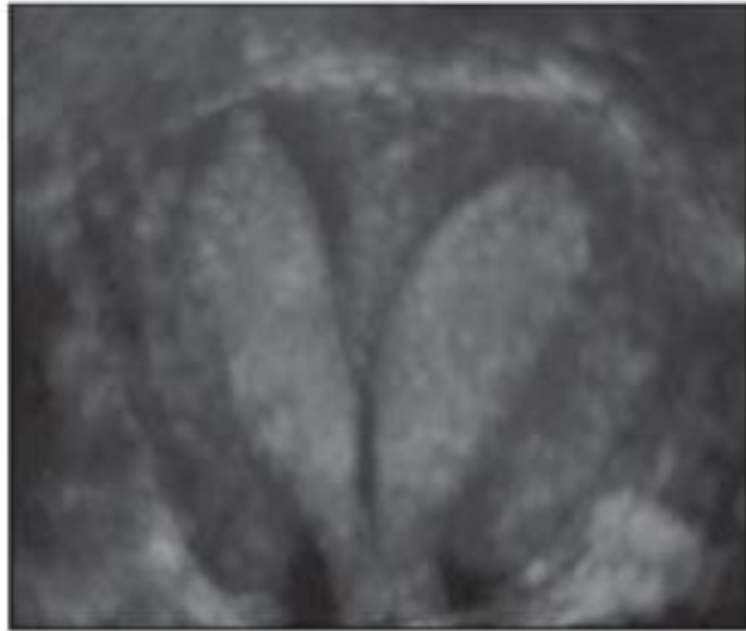


Figure 14. Double cavity uterus. Final diagnosis: septate uterus. Evaluation by multiplanar, transvaginal 3D ultrasound. Observe the symmetrical endometrial cavities.

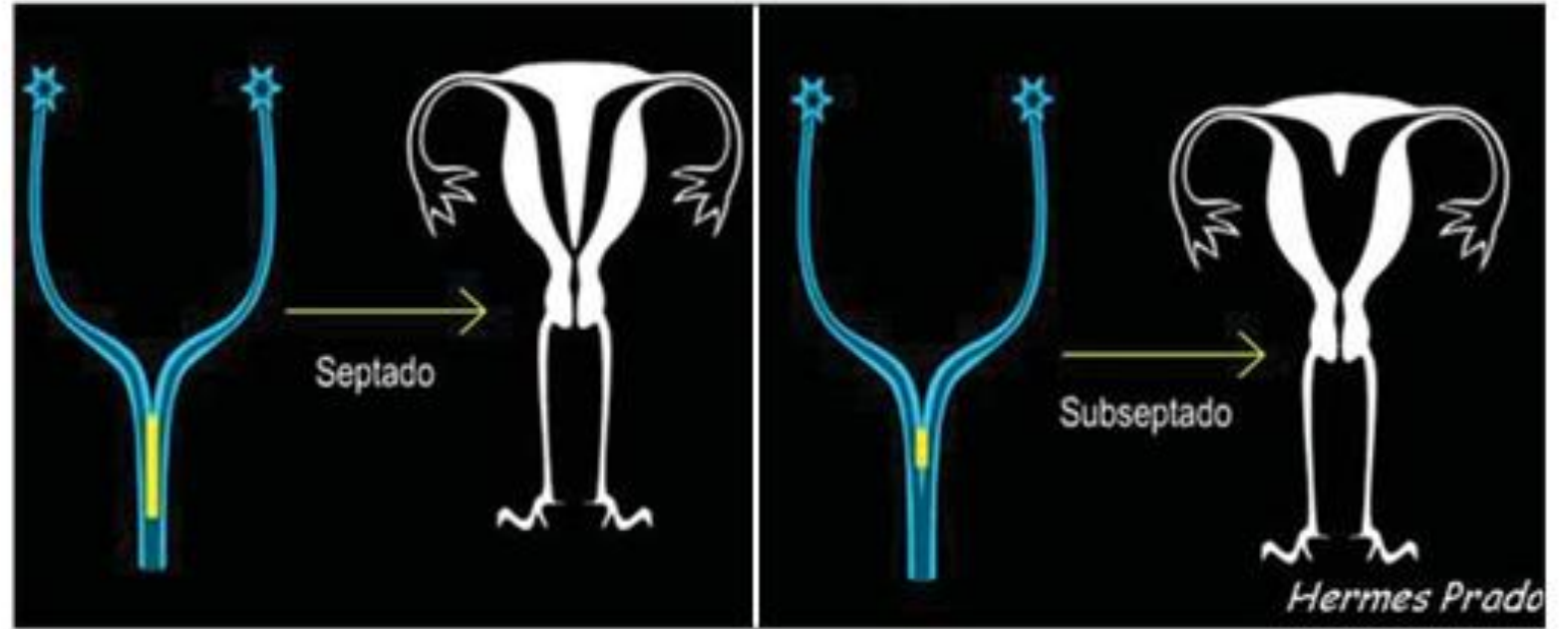
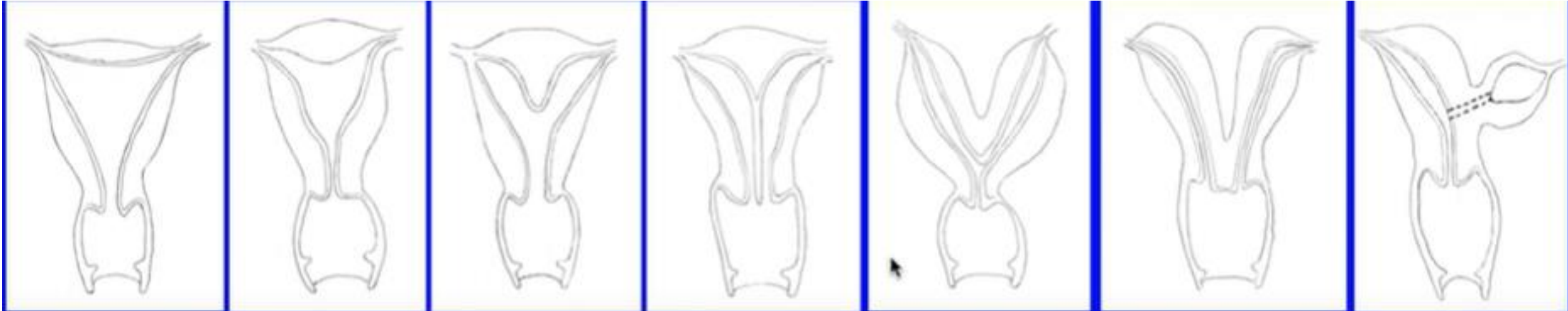


Figure 15. Schemes demonstrating failure both in complete and partial absorption of Müllerian ducts.



Normal

Arcuate

Subseptate

Septate

Bicornuate

Didelphys

Unicornuate

PREVALENCE

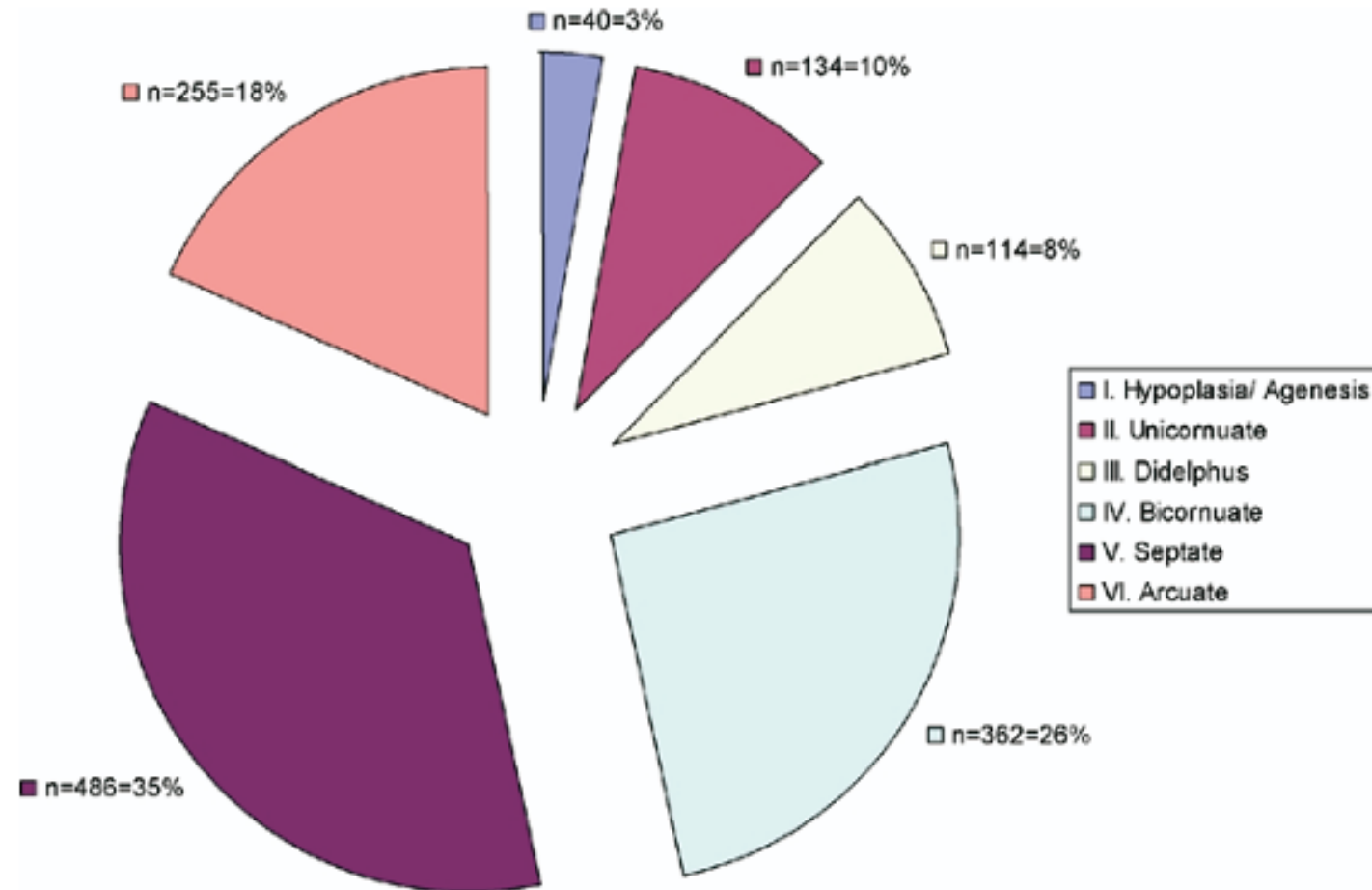
- 679 fertile women who underwent laparoscopy /laparotomy prior to T/L , then HSG

22/679 (3.2%) had MDA

90% septate, 5% bicornuate, 5% didelphys

Simon et al 1991

FREQUENCY OF ANOMALIES – 1392 PATIENTS



SEPTATE-35%

ARCUATE -18%

BICORNUATE -26%

UNICORNUATE 10%

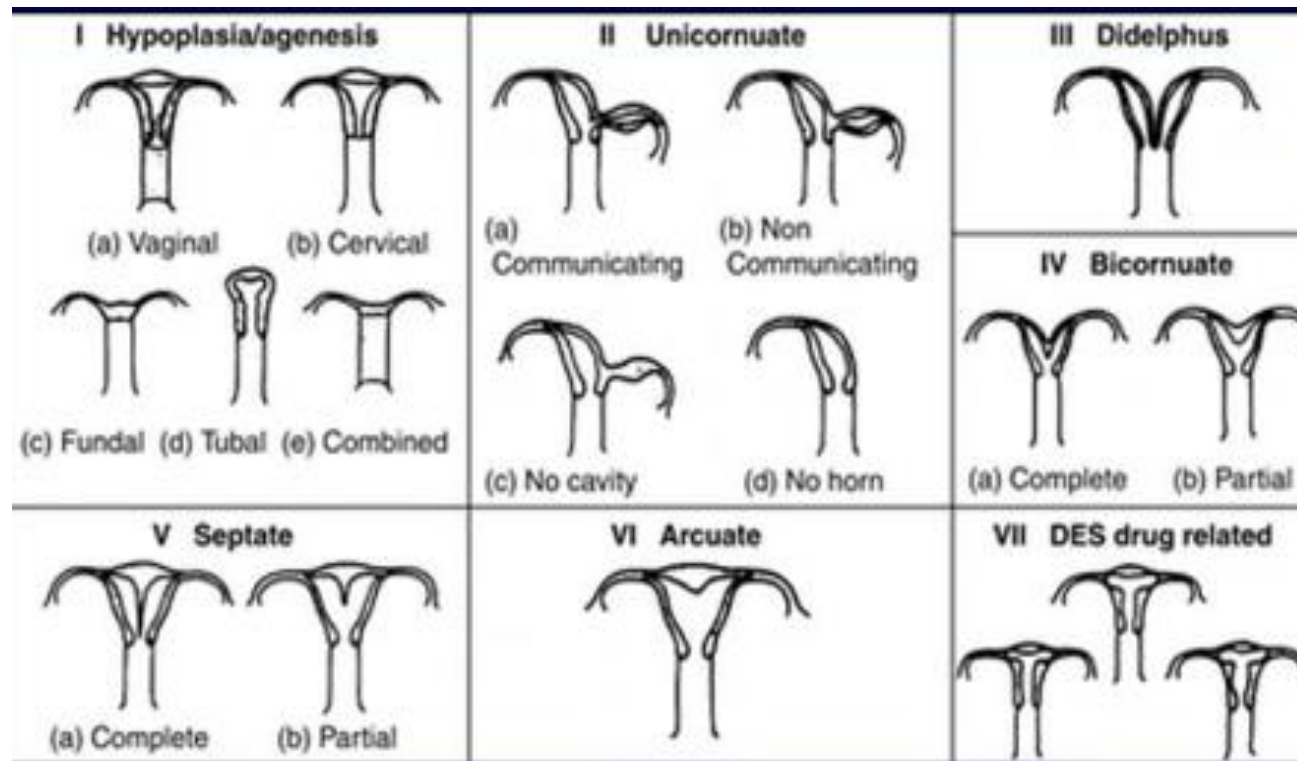
DIDELPHYS – 8%

AGENESIS -3%

CLASSIFICATION

American Society of Reproductive Medicine (1988)

based on the degree of failure from normal development, symptomology, treatment and prognosis



ESHRE CLASSIFICATION

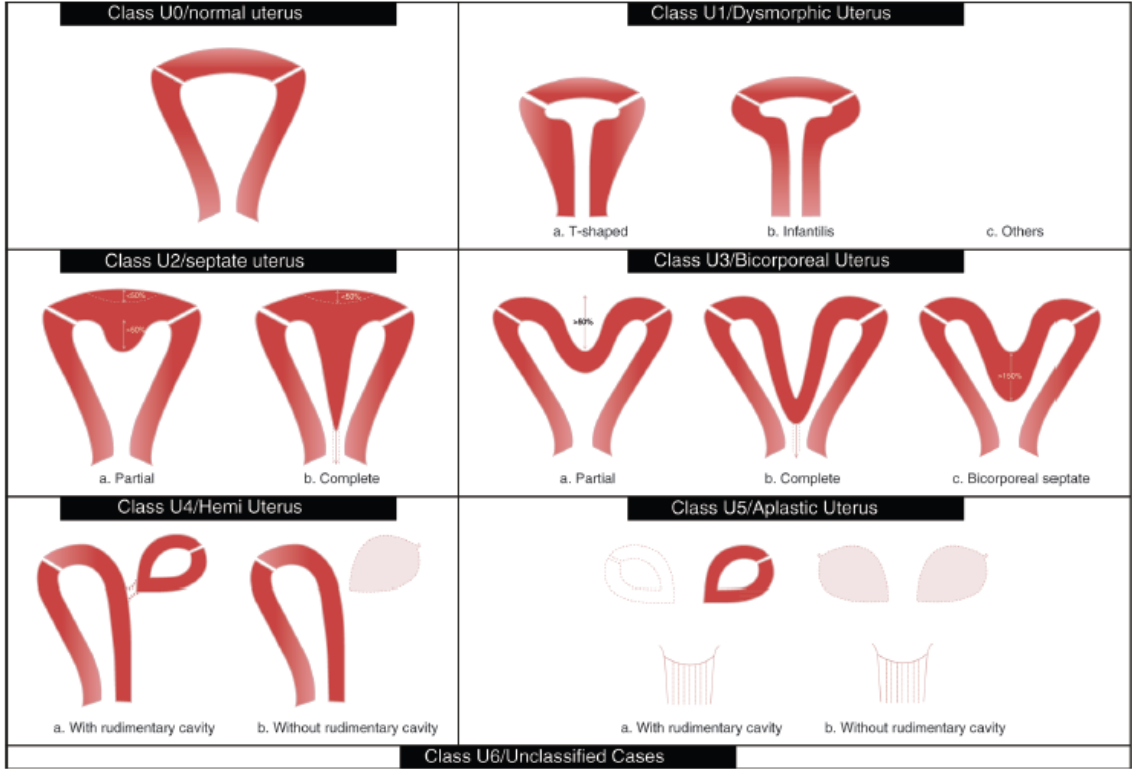


Figure 2 ESHRE/ESGE classification of uterine anomalies: schematic representation (Class U2: internal indentation >50% of the uterine wall thickness and external contour straight or with indentation <50%, Class U3: external indentation >50% of the uterine wall thickness, Class U3b: width of the fundal indentation at the midline >150% of the uterine wall thickness).



ESHRE/ESGE classification Female genital tract anomalies



Uterine anomaly		Cervical/vaginal anomaly	
Main class	Sub-class	Co-existent class	
U0	Normal uterus	C0	Normal cervix
U1	Dysmorphic uterus	C1	Septate cervix
U2	Septate uterus	C2	Double 'normal' cervix
U3	Bicornuate uterus	C3	Unilateral cervical aplasia
U4	Hemi-uterus	C4	Cervical aplasia
U5	Aplastic	V0	Normal vagina
U6	Unclassified malformations	V1	Longitudinal non-obstructing vaginal septum
		V2	Longitudinal obstructing vaginal septum
		V3	Transverse vaginal septum and/or imperforate hymen
		V4	Vaginal aplasia
U		C	V

CLINICAL IMPLICATIONS OF UTERINE MALFORMATIONS GRIMBIZIS ET AL 2001

	SEPTATE 198 WOMEN/499 PREG	ARCUATE 102 WOMEN/241 PREG	UNICORNUATE 151 WOMEN/260 PREG	BICORNUATE 261 WOMEN/627 PREG	DIDELPHYS 114 WOMEN/152 PREG
ECTOPIC	0.6%	2.9%	1.2%	0.3%	1.3%
SA	44.3%	25.7%	36.5%	36.0%	32.2%
PTD	22.4%	7.5%	16.2%	23.0%	28.3%
TERM	83.1%	62.7%	44.6%	40.6%	36.2%
LIVE BIRTHS	50.1%	66.0%	54.2%	55.2%	55.9%

UTERINE SEPTUM:INDICATIONS FOR SURGERY

- Repeated pregnancy losses(?2/?3/?more)
- Isolated pregnancy loss with no other risk factor
- Primary infertility?
- Secondary infertility with no history of pregnancy loss?
- Incidental diagnosis?

HYSTEROSCOPIC METROPLASTY TECHNIQUES

- Resectoscopy
 - monopolar
 - bipolar
- Hysteroscopic scissors
- Miscellaneous
 - abdominal metroplasty
 - radiographic

ENERGY SOURCE

- Resectoscope (Collin loop) or the needle electrode

- Principle

confirmed diagnosis (3D u/s; MRI)

laparoscopic control

GPS – uterine ostia

aim for horizontal line between ostia

combination of Collin loop and scissors at the end when close to fundus

?? resection versus incision (division)

HYSTEROSCOPIC SCISSORS

METROPLASTY TECHNIQUES AND OUTCOME

OUTCOME	HYSTEROSCOPIC SCISSORS (%)	MONOPOLAR RESECTOSCOPE (%)
PR	88.8	75.6
DELIVERY RATE	78.1	75
MISCARRIAGE RATE	21.8	27.1
PRETERM DELIVERY RATE	6.2	6.7
TERM DELIVERY RATE	71.8	66.1

POST-OPERATIVE ADHESIONS

- Denovo intrauterine adhesions occurred following septal metroplasty in 2% with mild adhesions 7%
- Second look hysteroscopy within 2 weeks (preferable) to 2 months of primary surgery

Yang JH et al 2013

ANTI-ADHESION BARRIERS

- No evidence favouring benefit of barrier gels following operative hysteroscopy with regards to fertility, live births, clinical pregnancy & miscarriages
- Reduced incidence of de novo adhesions at 1-3 months and lower mean adhesion score
- Foleys catheter, copper IUCD, hyaluronic acid

Bosteels J et al 2014

OTHER ANTI-ADHESION MEASURES

- Pregnancy rates with oestrogen alone 42-53% versus 51-100% with oestrogen combined with IUCD or foleys catheter
- No difference with varying dose of estradiol – 2/4/6/10 mg estradiol
- Balloon & IUCD equally effective and better than hyaluronic acid gel
- ?stem cells/triangular stents

Salma U et al 2014

Guo et al 2017

COMPLICATIONS

- Uterine perforation 1%
- Intraoperative bleeding 1%
- Cervical laceration 1%
- Occasional obstetric complications (infection, placenta accrete syndrome)
- Reported case of uterine rupture at 29 weeks

REMODELLING POST METROPLASTY

- Significant remodeling of inner & outer profile 3 month post surgery
- Thickening of fundal myometrium post complete surgery requiring second step metroplasty in 72% cases
- Possibly due to uterine contraction triggered by muscle fibres in the septum
- No data regarding effect on pregnancy outcome

Casadio P et al. J Clin Med 2021

OPTIMAL WAITING TIME

- Septal incisions usually heal within 2 months compared to polypectomy (1 month), adhesiolysis (2 months), & myomectomy (2-3 months)
- Wait 2 -3 months before embarking on pregnancy

Guo et al 2017

SURGICAL OUTCOMES –ISOLATED VERSUS RPL

- Pregnancy rates similar after metroplasty in both groups.
- Spontaneous pregnancy loss rates reduced by as much as 80% after metroplasty in retrospective studies but evidence limited by bias and variable confounders
- RCT and cohort studies show no difference in loss rates even in women with prior loss

Rikken JFW et al 2020

Rikken JFW et al 2021

METROPLASTY - IMPACT ON INFERTILITY

- Data from 38 studies (systematic review/ meta-analyses)
- Untreated septum vs women without septum
- Treated septum vs untreated septum
- Women before and after septum removal

Septum vs no septum

- Lower PR (OR 0.45) and LBR (OR 0.21) with septum vs controls
- Higher SA (OR 4.29) and pregnancy loss (OR 2.56) with septum versus controls

Treated versus untreated septum

- PR (OR 1.10) & pregnancy loss (OR 0.81) not different
- Lower SA with metroplasty (OR 0.47)

Before and after metroplasty

- LBR higher with metroplasty (OR 49.58)
- Lower SA (OR 0.02) and pregnancy loss (OR 0.05) following metroplasty
- Detrimental effect of uterine septum on PR, LBR, SA & pregnancy loss
- Metroplasty reduces rate of SA

METROPLASTY & SECONDARY INFERTILITY

- Retrospective cohort study of 269 women
 - 1) with 169 women with secondary infertility with uterine septum undergoing 252 ET cycles following septum resection
 - 2) control group of 100 women & uterine septum undergoing 178 ET cycles

Statistically significantly higher cumulative pregnancy rate following septum resection (71% vs 59%)

No significant difference in clinical PR in ET cycles (54.9% vs 40.6%)

In FET, higher clinical PR (52.7% vs 38.2%) and delivery rate (38.2% vs 22.5%) compared to controls

HYSTEROSCOPIC METROPLASTY – OUTCOME AND RISK FACTORS

- Age > 35 years and primary infertility as independent risk factors for lower postoperative clinical pregnancy (OR 4.025 & 3.603 respectively) and ongoing pregnancy (OR 3.420 & 2.586 respectively)

Complete Uterocervicovaginal Septum

- Systematic review of **71 treated women** with H/O recurrent miscarriage or primary infertility
- 50% reported dyspareunia
- 47 pregnancies (66.2%) with 41 livebirths (87.3% with 1 preterm delivery), 6 miscarriages
- No malpresentations
- **15 untreated women** , 8 pregnancies (53.3%), 7 SA (87.5%), and 1 term pregnancy (12.5%)

T SHAPED UTERUS

- Varies from 0.2 to 10%
- Associated with miscarriages, preterm deliveries, and repeated implantation failure – related to reduced intrauterine volume
- Diagnosed with 3D u/s or MRI – lateral indentation angle $< 130^\circ$, lateral indentation depth $< 40^\circ$
- Bilateral metroplasty – bipolar /scissors – aim for visualization of both ostia
- Obstetric outcome: preg rates, LBR, and term delivery rates are improved – evidence is low

CONCLUSION

- Hysteroscopic metroplasty justified after RPL (2 or more SA or preterm deliveries) in the absence of other factors
- After one pregnancy loss, not justified by trials
- Since quality data not available, surgery only after informed consent of patient