



Health and Medical Research Fund Project no.: 06170286

**The incidence of intrauterine adhesion after ultrasound-guided
manual vacuum aspiration (USG-MVA):
a prospective randomized controlled trial**

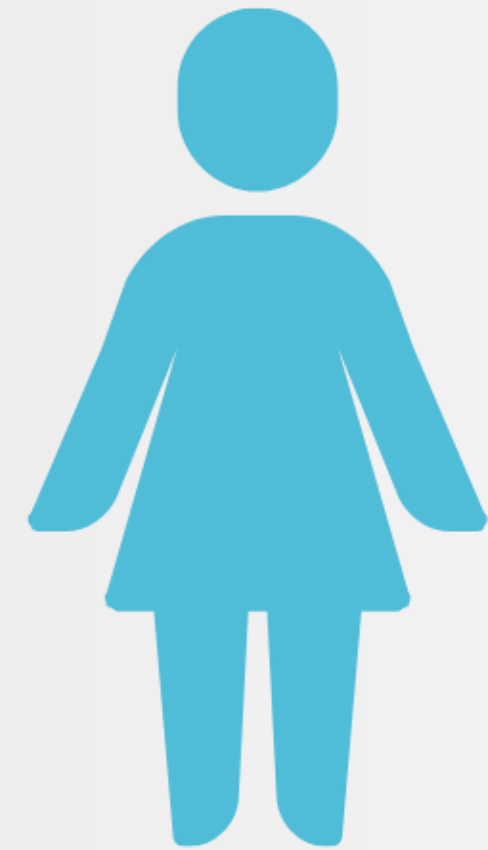


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Associate Professor

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CUHK - PWH

Early Pregnancy Loss



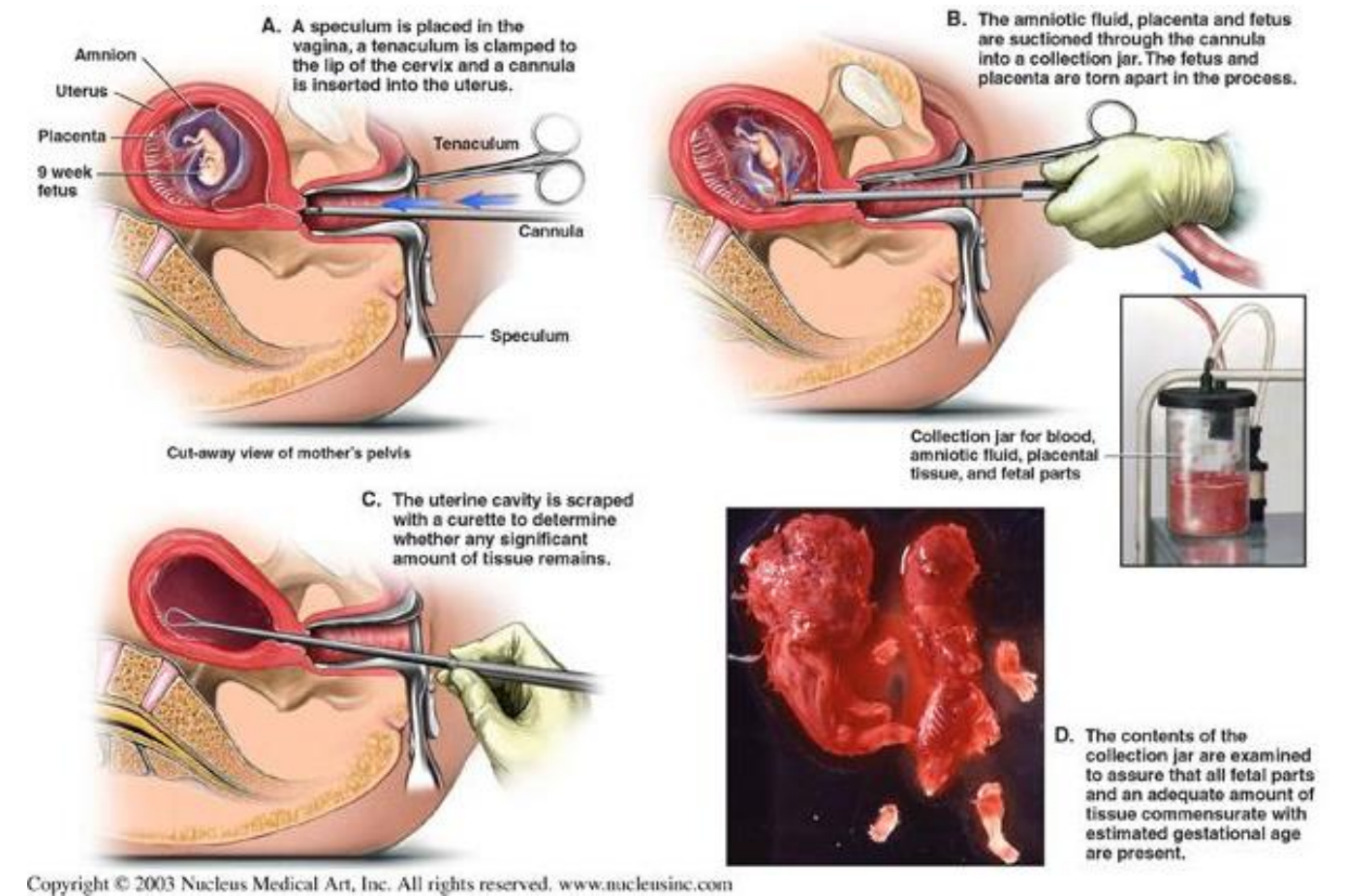
Surgical Management

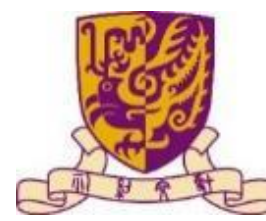
Traditional Electric Vacuum Aspiration (EVA)

- Performed under GA in operation theatre
- Using an electric vacuum aspiration +/- uterine curettage

Manual Vacuum Aspiration (MVA)

- Performed under local anaesthesia in out-patient setting
- Performed manually without use of electricity





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Manual Vacuum Aspiration

Manual Vacuum Aspiration

Methods and Devices

VERY EARLY ABORTION USING SYRINGE AS VACUUM SOURCE

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San Vicente Hospital, Los Angeles, California 90036, U.S.A.

MALCOLM POTTS

*International Planned Parenthood Federation,
London SW1 4YP*



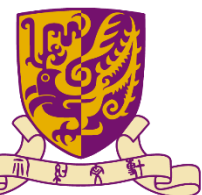
History

First introduced in 1972



Method

Performed in an out-patient setting by using a hand-held vacuum source (a 60ml syringe with barrel and plunger) attached to a uterine cannula.



Addition of Ultrasound guidance

- Reduce the discomfort during insertion of catheter
- Reduces the chances of uterine perforation
- Shorten the duration procedure
- Ensure the miscarriage process is complete and avoids further unnecessary aspiration or curettage
- Theoretically, can reduce the formation of future intrauterine adhesion (IUA).



DOI: 10.1111/ajo.12811

ORIGINAL ARTICLE

Efficacy, feasibility and patient acceptability of ultrasound-guided manual vacuum aspiration for treating early pregnancy loss

Jacqueline Pui Wah Chung , Cathy Hoi Sze Chung, Jennifer Sze Man Mak, Tin Chiu Li and Grace Wing Shan Kong

- We have shown that USG-MVA is an effective, feasible and safe treatment option for the management of early pregnancy loss in an outpatient setting.
- Complete evacuation rate of USG-MVA was comparable to that of traditional suction evacuation (97.5%) reported in a previous systemic review.

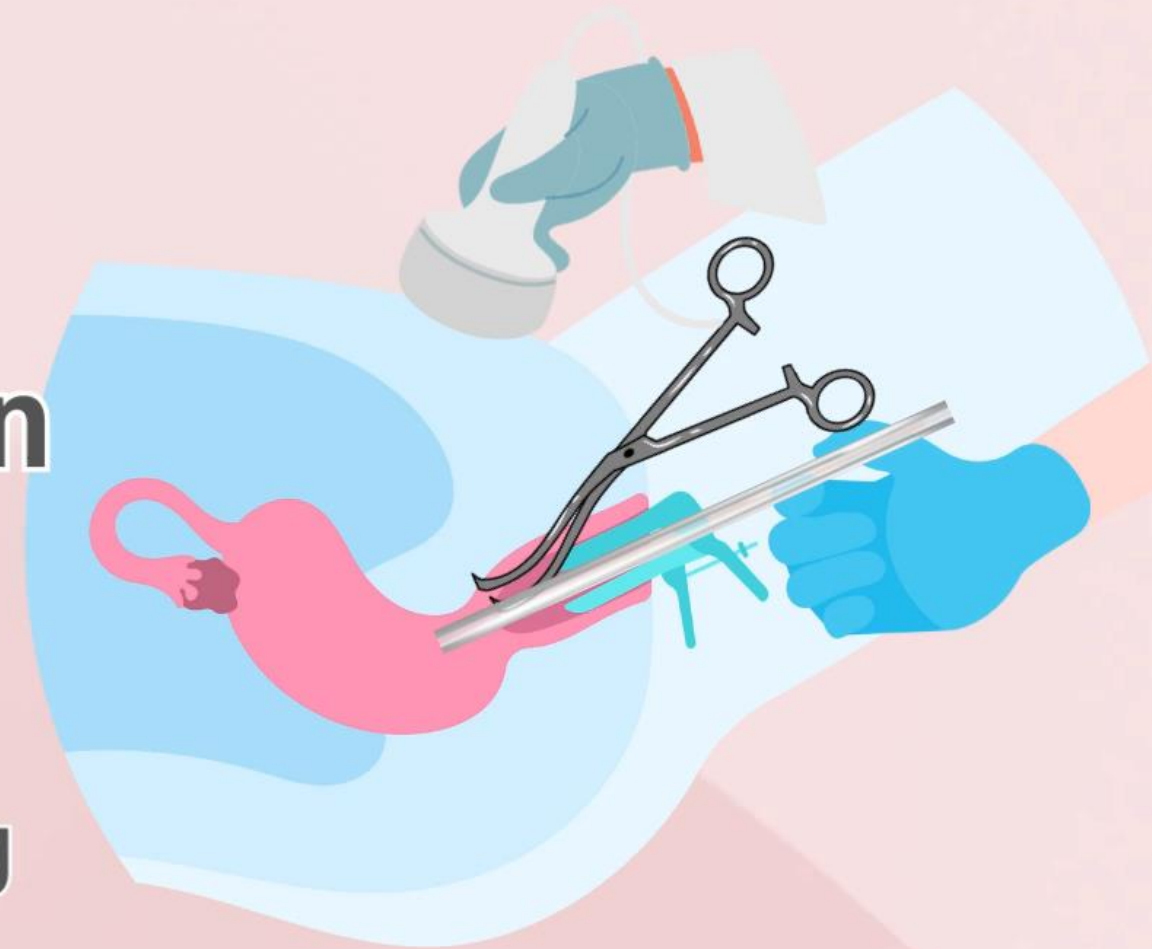


USG-MVA



Ultrasound-Guided Manual Vacuum Aspiration (USG-MVA)

The Chinese University of Hong Kong



What cases are suitable for MVA?



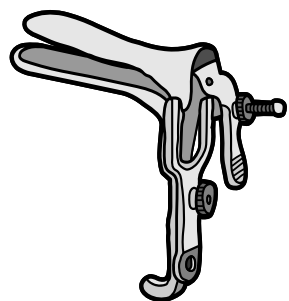
Patient's background



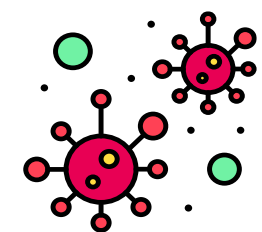
Haemodynamically stable



Parous woman



nulliparous women who can tolerate speculum examination



No clinical signs of infection



Size of uterine contents



USG: early fetal demise with **CRL < 25 mm**



USG: an incomplete miscarriage with **RPOG < 5 cm** (mean diameter)



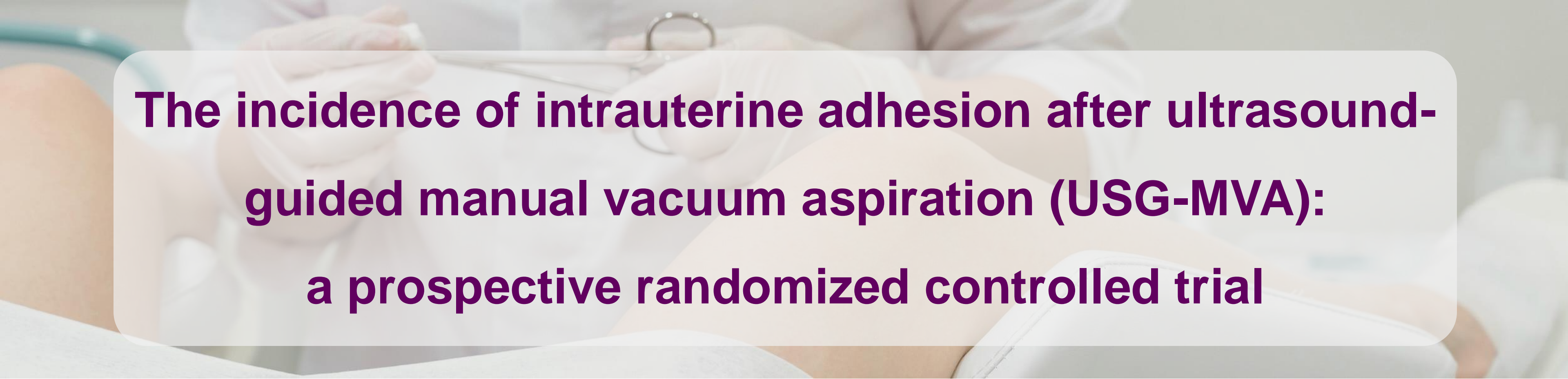


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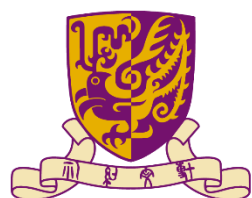
Our research



**The incidence of intrauterine adhesion after ultrasound-guided manual vacuum aspiration (USG-MVA):
a prospective randomized controlled trial**

**Professor Jacqueline P.W. Chung,
Professor T.C. Li**

Assisted Reproductive Unit
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The Chinese University of Hong Kong



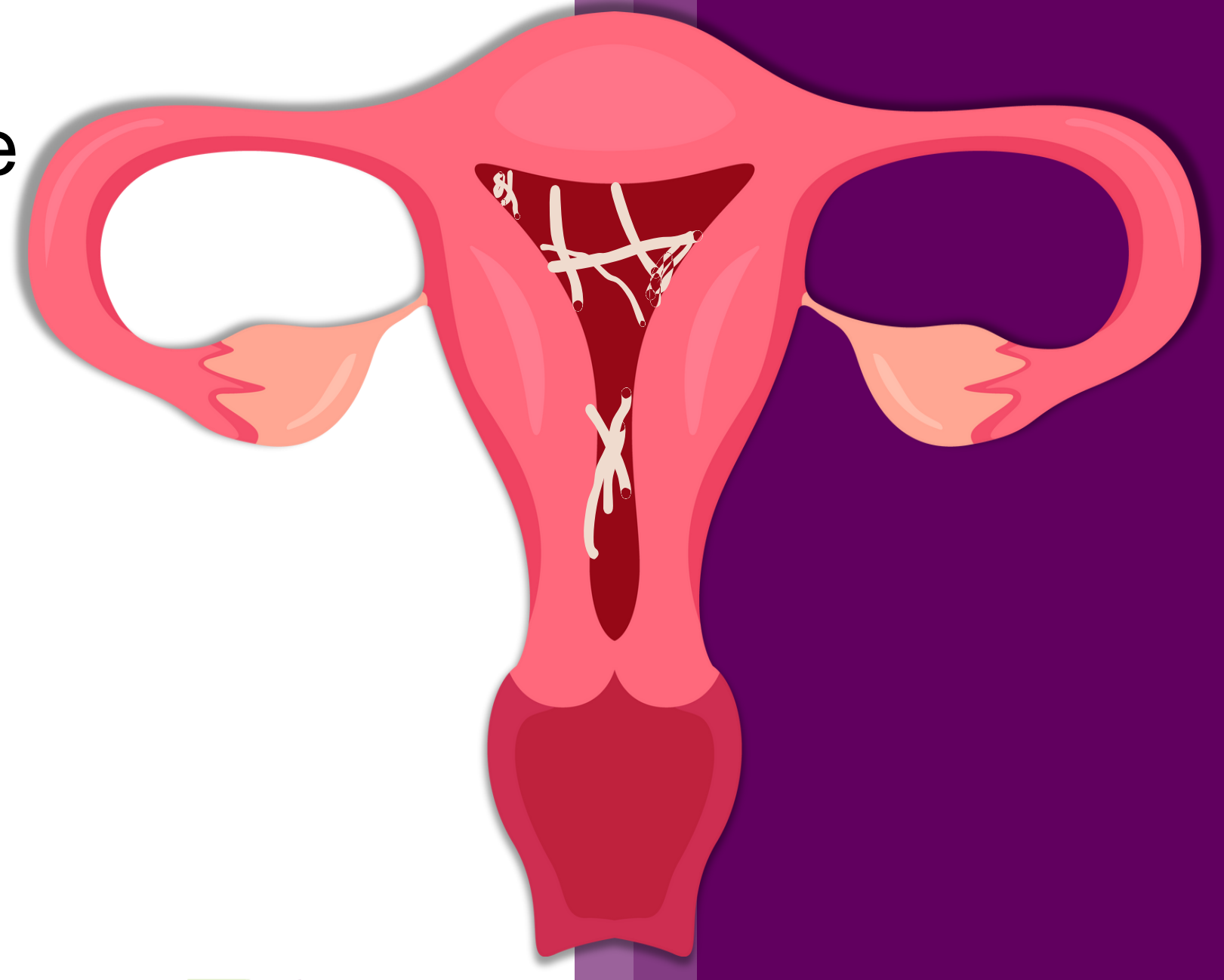
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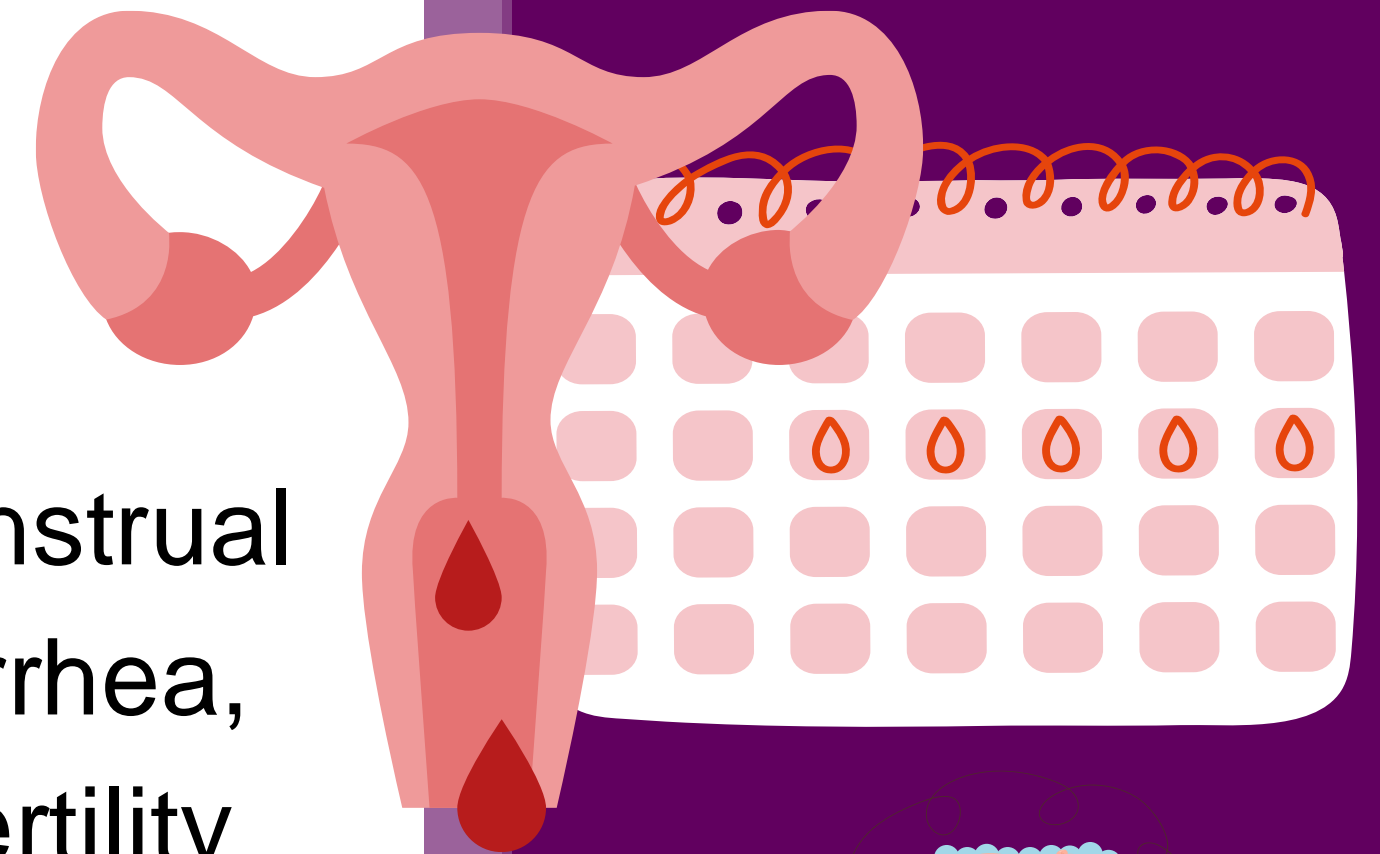
Study Background

Intrauterine adhesion (IUA) is a possible complication after uterine surgery, especially after sharp curettage curette for miscarriages as it destroys the endometrial stratum basalis.



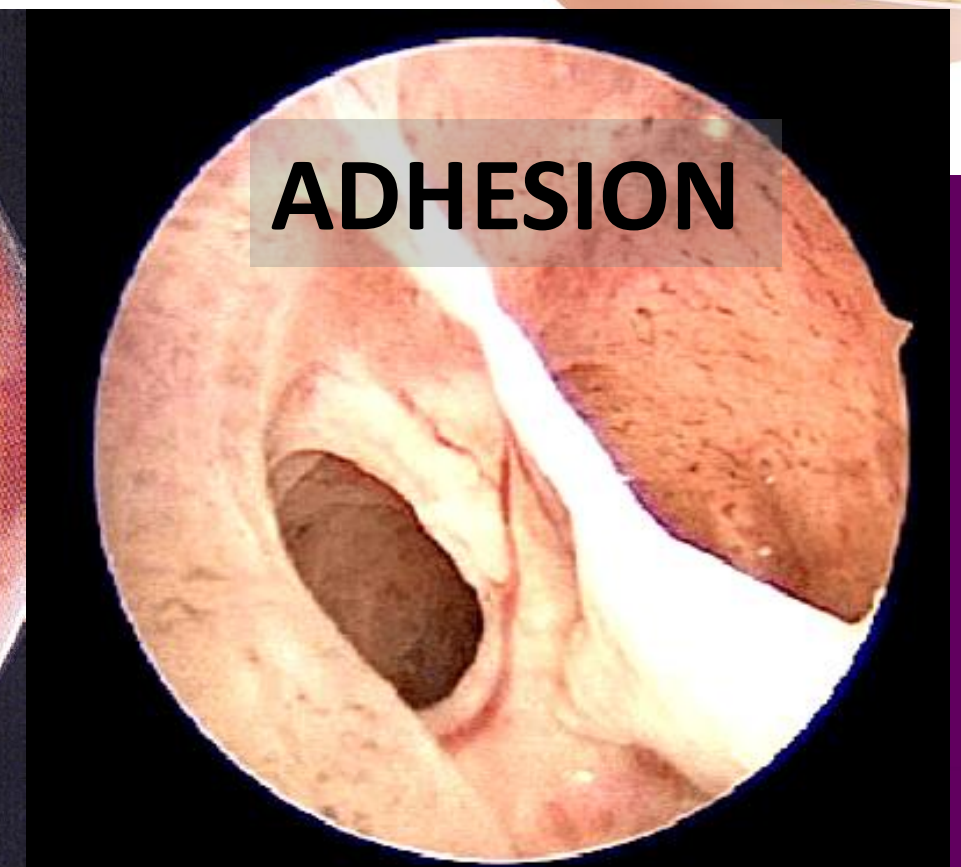
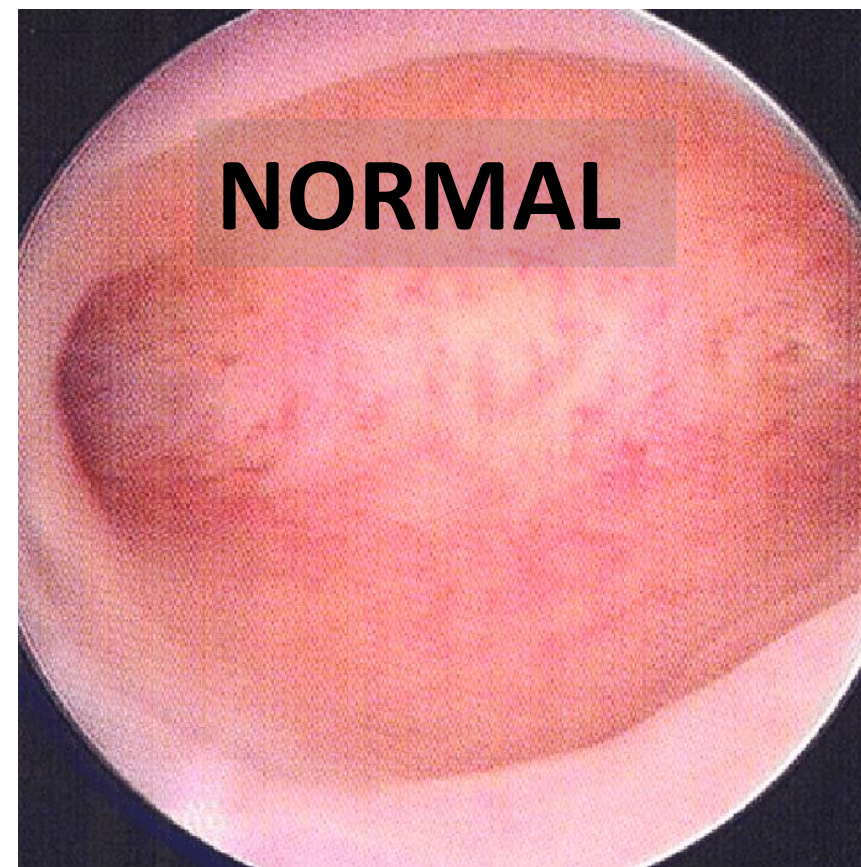
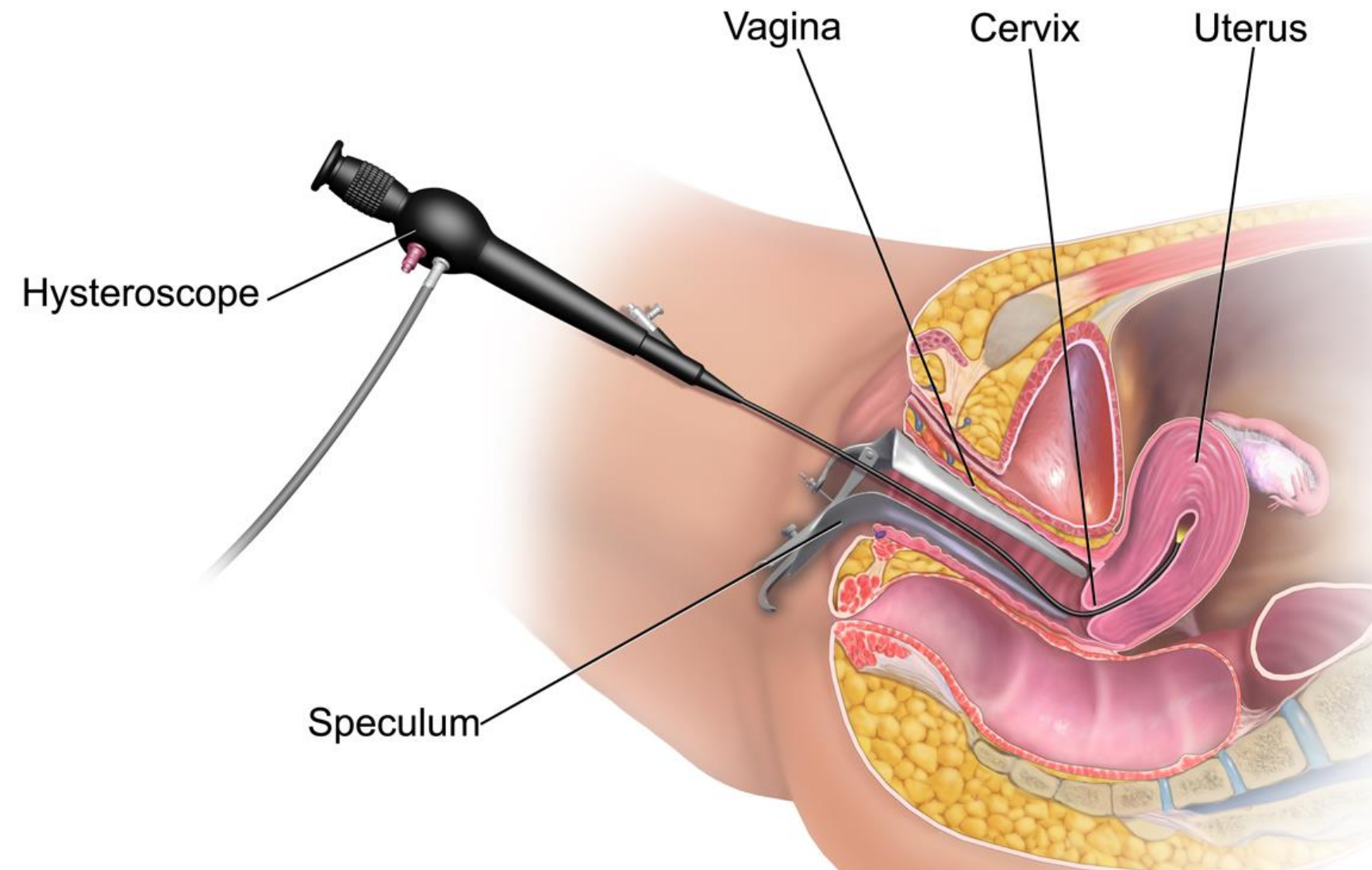
Study Background

- IUA can be asymptomatic or present with menstrual disturbances like amenorrhea or hypoamenorrhea, dysmenorrhea, recurrent miscarriages, or infertility
- IUA can affect embryo implantation.
- IUA increases the risk of further miscarriages, abnormal placentation, fetal growth restriction, preterm delivery, and post-partum hemorrhage.



Study Background

- Early detection of IUA is important as early treatment can prevent further complications
- Gold standard for the diagnosis of IUA is by hysteroscopy.



Aims & Objectives

To determine and compare the IUA in women who underwent ultrasound-guided manual vacuum aspiration (USG-MVA) as opposed to traditional surgical evacuation (EVA) for the management of their first-trimester miscarriage.



Hypothesis

USG-MVA is associated with a lower rate of IUA when compared to conventional surgical evacuation.



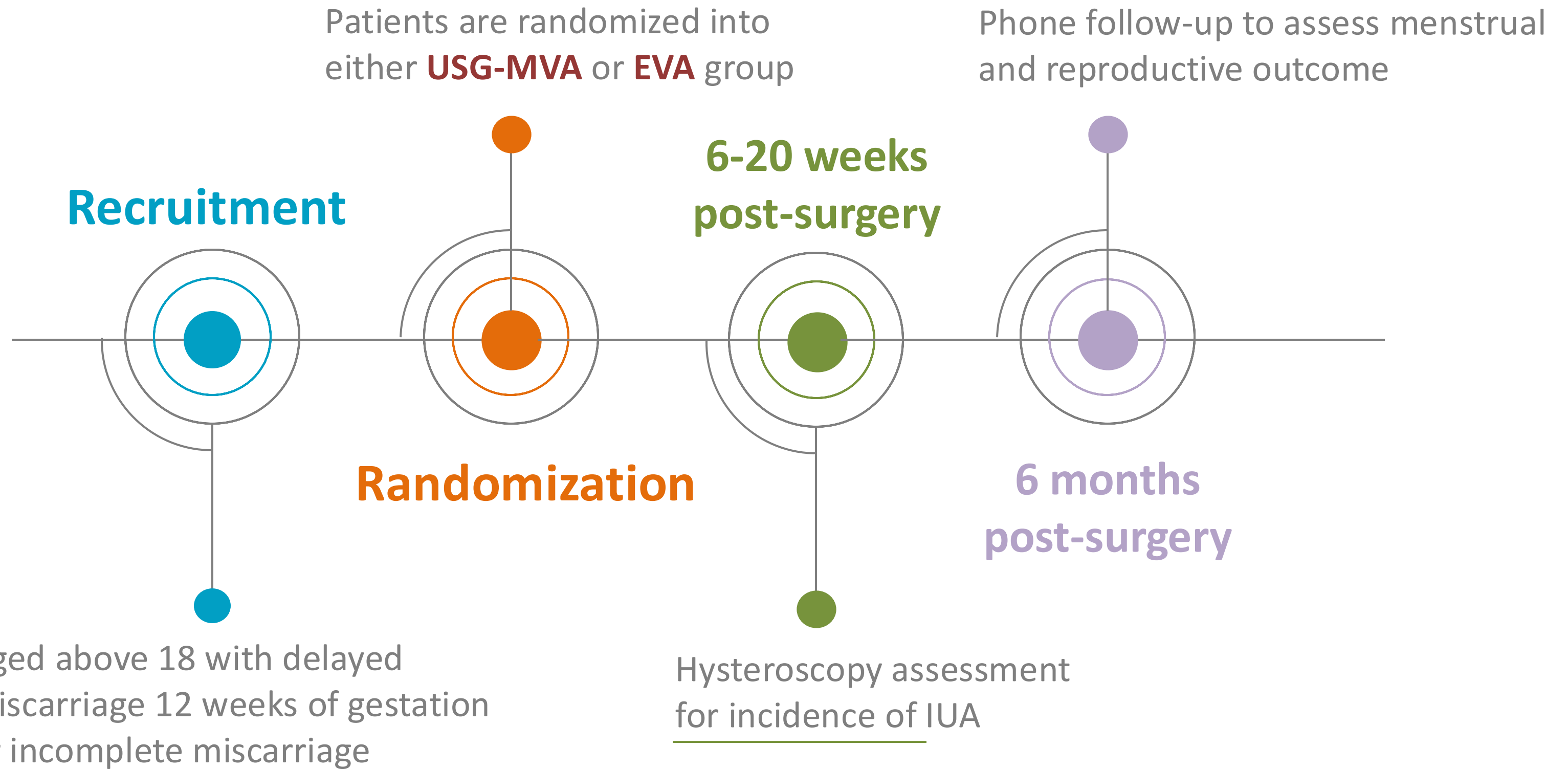
Study Design

This was a prospective single-centre, **randomised controlled trial** conducted in a university-affiliated tertiary hospital.

- Prince of Wales Hospital
- May 2019 to September 2022



Methods



Outcomes



Primary Outcome

- The incidence of intrauterine adhesion (IUA) between USG-MVA and EVA



Secondary Outcomes

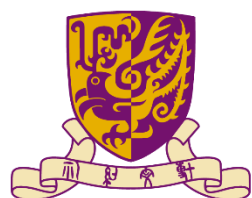
- Rate of complications from the hysteroscopy,
- The type and extent of the IUA
- Subsequent menstrual and reproductive outcomes at 6 months from the initial operation.



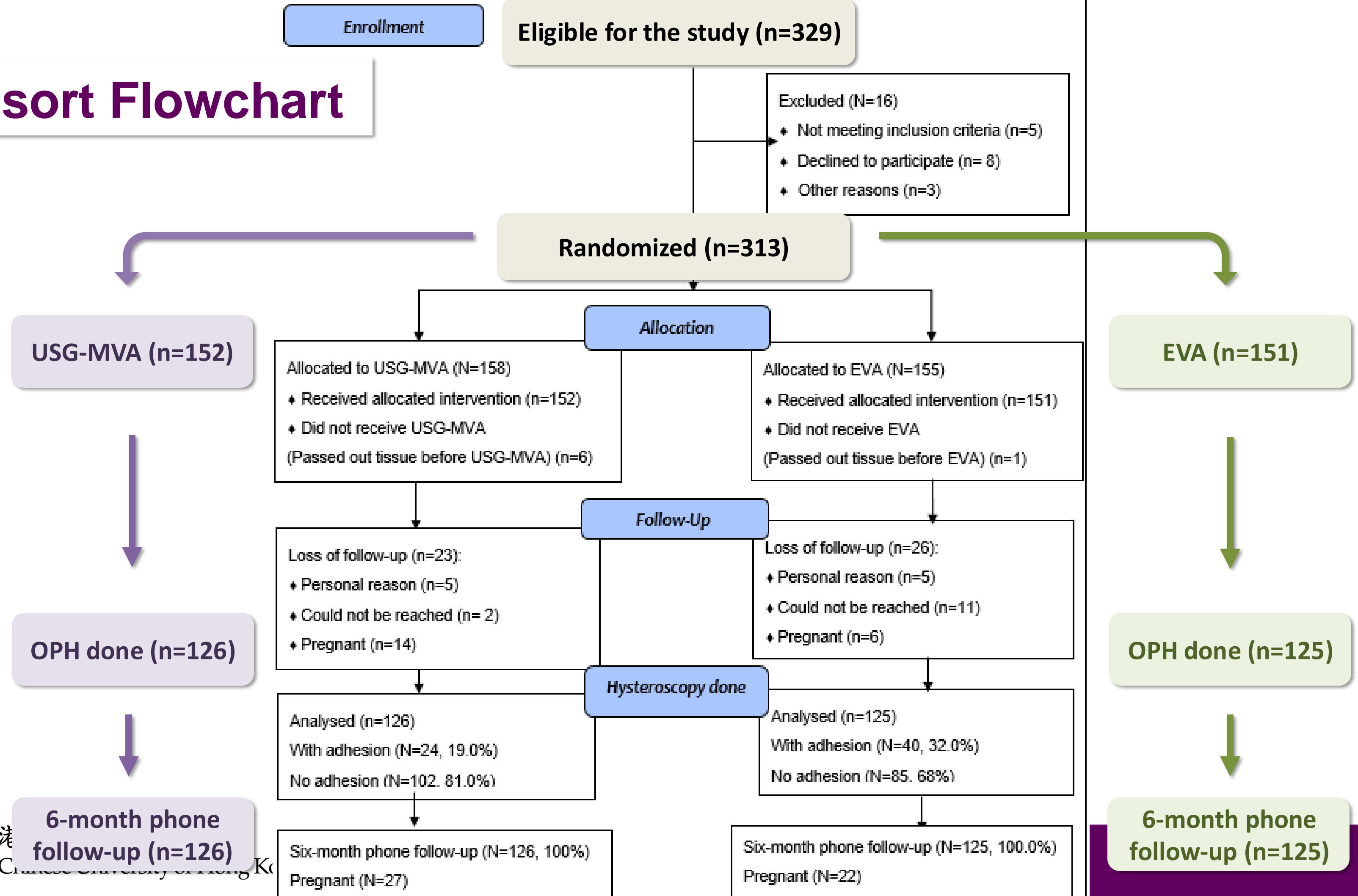
Baseline characteristics in women between MVA and EVA group

Characteristic	USG-MVA (n = 126)	EVA(n =125)	P
Age (years)	36 (32 -39)	36 (32 -39)	0.93
Body Mass Index (kg/m ²)	22.2 (20.6 -24.4)	22.5 (20.5 - 24.7)	0.96
Gravida			0.31
1	27 (21.4%)	25 (20.0%)	
2	43 (34.1%)	33 (26.4%)	
≥3	56 (44.4%)	67 (53.6%)	
Previous uterine surgery			0.35
No	72 (57.1%)	64 (51.2%)	
Yes	54 (42.9%)	61 (48.8%)	
Previous pregnancy loss			0.76
None	58 (46.0%)	54 (43.2%)	
1	31 (24.6%)	34 (27.2%)	
2	24 (19.0%)	20 (16.0%)	
> or more than 3	13 (10.3%)	17 (13.6%)	
Gestation at Presentation (days)	70 (63-78)	70 (63-81)	0.84
Menstruation Flow			0.28
Light	9 (7.1%)	16 (12.8%)	
Normal	106 (84.1%)	101 (80.8%)	
Heavy	11 (8.7%)	8 (6.4%)	
Menstruation Regularity			0.27
Regular	99 (78.6%)	105 (84.0%)	
Irregular	27 (21.4%)	20 (16.0%)	

Data are given as n (%) or median (Interquartile range)



Consort Flowchart



Hysteroscopic findings and adhesion assessment using AFS scoring in women underwent USG-MVA or EVA

- USG-MVA had **significantly less severe IUA** on AFS scoring and prognostic classification
- **Significantly less** patients complained of hypomenorrhea

Characteristic	USG-MVA (n = 24)	EVA (n = 40)	P
Time to hysteroscopy (weeks)	10.36 (8.07-13.0)	10.57 (7.88-16.3)	0.75
AFS* assessment in those with adhesions			
Hysteroscopic Score	2.0 (2.0-3.75)	3.0 (2.0-6.0)	0.02
Extent of Cavity Involved			0.08
< one third	22 (91.7%)	27 (67.5%)	
One third to two thirds	2 (8.3%)	12 (30.0%)	
> two thirds	0 (0.0%)	1 (2.5%)	
Type of IUA			0.24
Flimsy	16 (66.7%)	19 (47.5%)	
Flimsy and dense	6 (25.0%)	12 (30.0%)	
Dense	2 (8.3%)	9 (22.5%)	
Menstrual pattern			0.04
Normal	22 (91.7%)	25 (62.5%)	
Hypomenorrhea	2 (8.3%)	14 (35.0%)	
Amenorrhea	0 (0.0%)	1 (2.5%)	
Prognostic classification			0.01
Stage 1 (Mild)	22 (91.7%)	24 (60.0%)	
Stage 2 (Moderate)	2 (8.3%)	16 (40.0%)	
Stage 3 (Severe)	0 (0.0%)	0 (0.0%)	

Data are given as n (%) or median (Interquartile range) *AFS: American Fertility Society

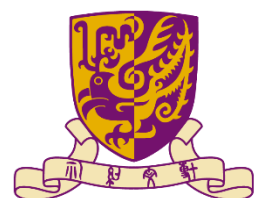


Secondary outcomes of women between USG-MVA and EVA groups \pm IUA at 6 months postoperatively

- **Miscarriage was higher** in those with adhesion in the EVA group when compared to the USG-MVA group.

Characteristic	USG-MVA		P	EVA		P
	No Adhesion (N=102)	Adhesion (N=24)		No Adhesion (N=85)	Adhesion (N=40)	
Menstruation						
Regularity			0.76			0.53
Regular	61 (75.3%)	13 (72.2%)		51 (71.8%)	21 (65.6%)	
Irregular	20 (24.7%)	5 (27.8%)		20 (28.2%)	11 (34.4%)	
Flow			0.78			0.23
Light	25 (30.9%)	6 (33.3%)		27 (38.0%)	14 (43.8%)	
Normal	47 (58.0%)	11 (61.1%)		38 (53.5%)	18 (56.3%)	
Heavy	9 (11.1%)	1 (5.6%)		6 (8.5%)	0 (0.0%)	
Reproductive outcome						
Contemplation of pregnancy			0.59			0.89
Yes	49 (48.0%)	13 (54.2%)		33 (38.8%)	15 (37.5%)	
No	53 (52.0%)	11 (45.8%)		52 (61.2%)	25 (62.5%)	
Successful conception	21 (21.4%)	6 (26.1%)	0.63	14 (16.5%)	8 (20.0%)	0.63
Time to pregnancy (weeks)	13 (8.67 - 17.33)	10.83 (8.67 - 19.5)	1.00	13 (4.33 - 26.0)	13 (9.75 - 13)	0.35
Pregnancy outcome			0.33			0.02
Miscarriage	3 (14.3%)	0 (0.0%)		2 (14.3%)	5 (62.5%)	
On-going pregnancy	18 (85.7%)	6 (100%)		12 (85.7%)	3 (37.5%)	

Data are given as n (%) or median (Interquartile range)



Results



Primary Outcomes

The incidence of intrauterine adhesion (IUA) was **19%** (24/126) in the USG-MVA group and 32% (40/125) in the EVA group. ($p < 0.02$)

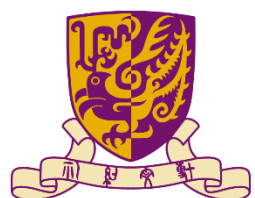


Secondary Outcomes

All patients undergone hysteroscopic with **no complications**.

The intrauterine adhesions from USG-MVA group **was significantly milder** ($p = 0.01$) than those in the EVA group.

No significant difference in the menstrual outcomes at 6 months from the initial operation. **More miscarriages** among those who attempted pregnancy in the **EVA**.



Main findings

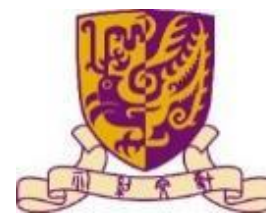
- IUA can occur after USG-MVA without curettage, but at a lower rate (13%) compared to EVA.
- USG-MVA is a better surgical option for those with future fertility wishes.
- EVA group has more moderate-severity IUA, mostly involving less than one-third of the cavity.
- Some patients in the EVA group experienced hypomenorrhea, but no significant difference in menstrual outcomes at 6 months post-surgery.
- Miscarriages were more common in the EVA group with IUA at 6 months post-surgery



Conclusions

‘USG-MVA should be offered as an **alternative surgical option** to EVA during the treatment of first-trimester miscarriage.’





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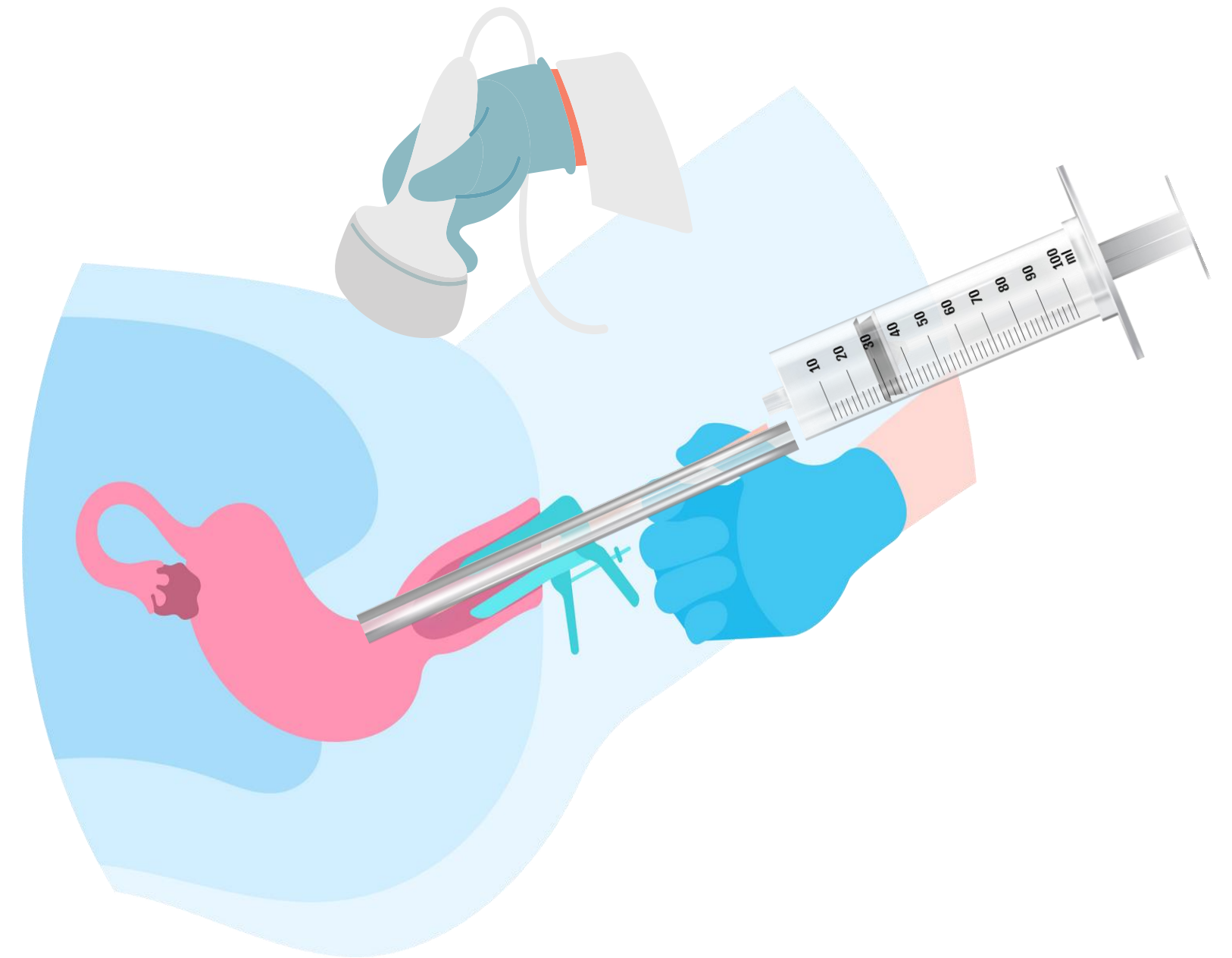
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Implications

Implications

Alternative management of first-trimester miscarriage

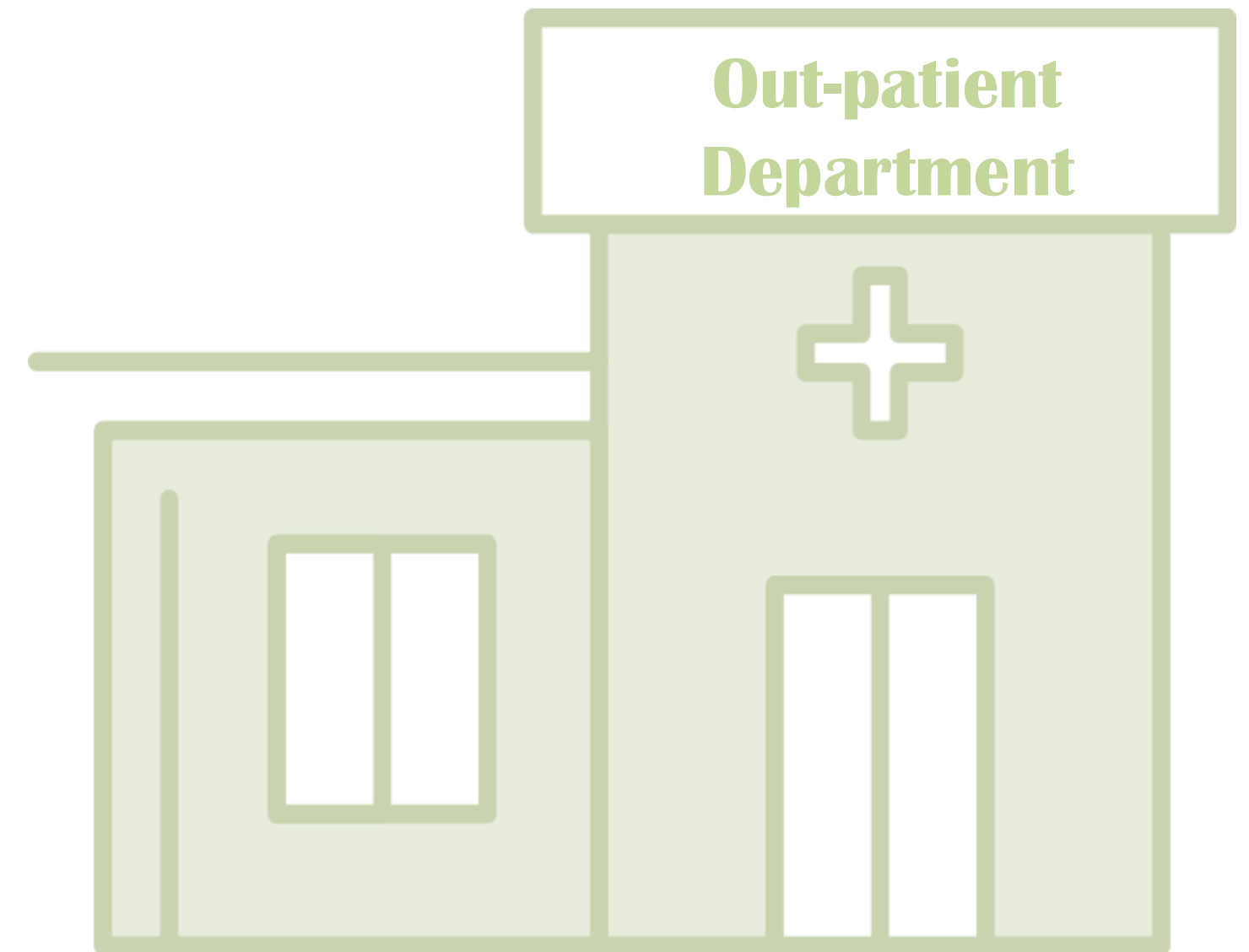
Feasible, effective and safe surgical treatment for the management of first-trimester miscarriage



Implications

Shift the miscarriage management from OT to outpatient setting

- **Save costs**
- **Save OT slots** for urgent operations
- **Simplify schedule**
- **Avoid use of general anesthesia**



Implications

Collect the research samples from USG-MVA

Chorionic villi

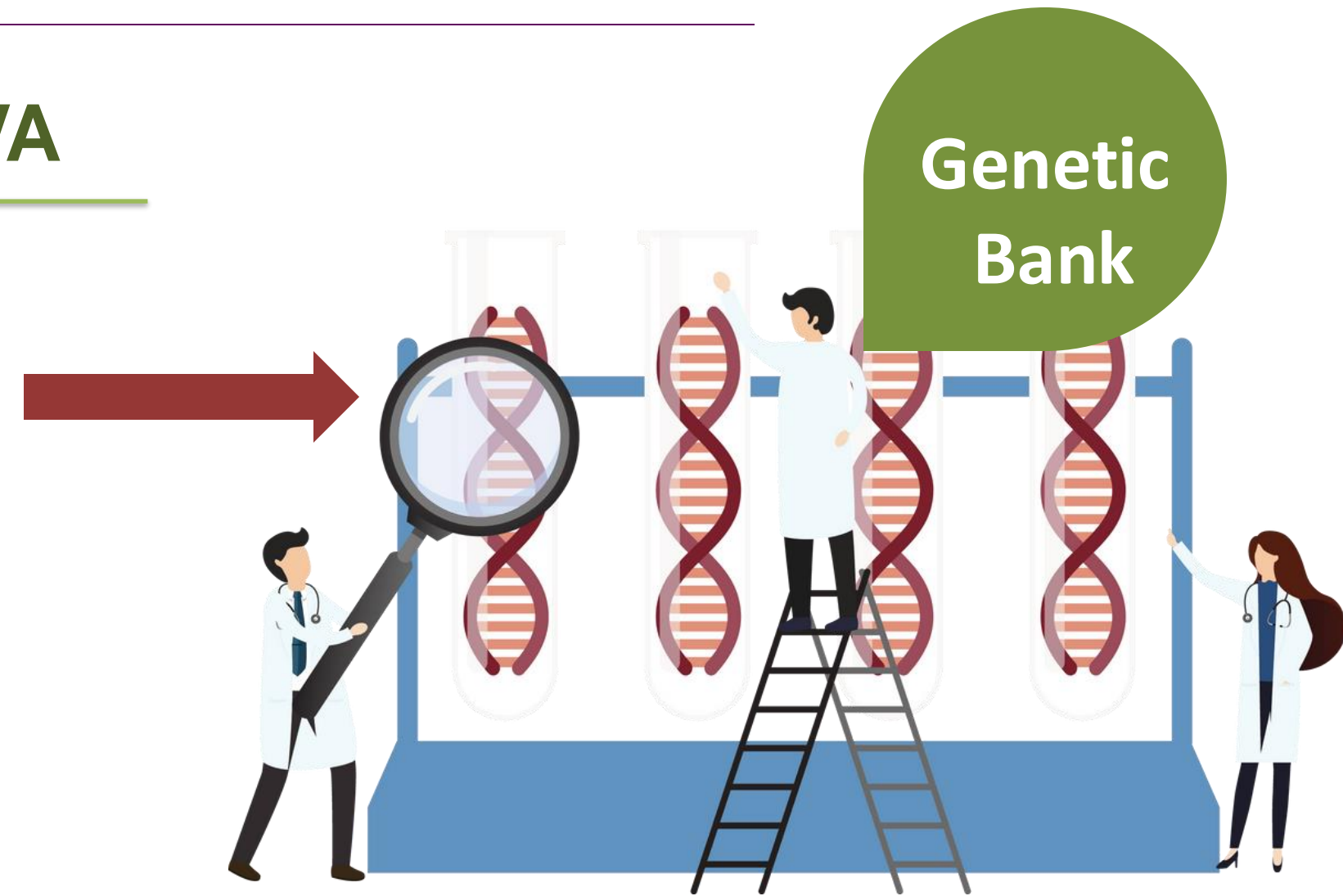
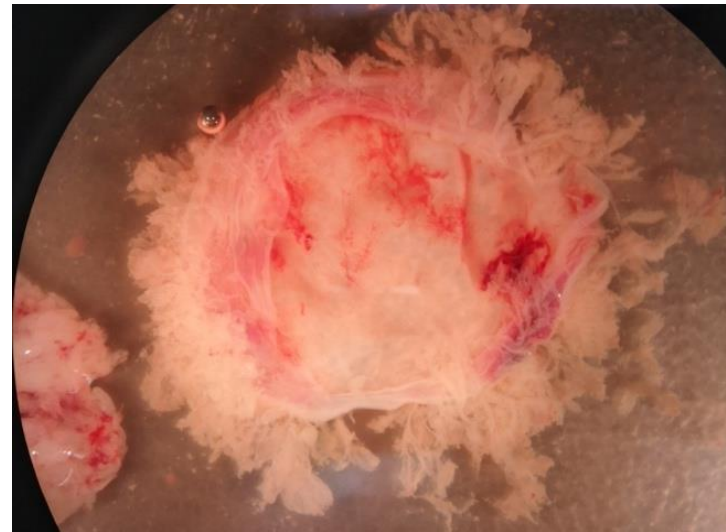
Product of gestation

Decidua after miscarriage

Fetus if gestation large enough

Blood samples can be taken if required from miscarriage patients

Opportunity for psychological research for miscarriage patients

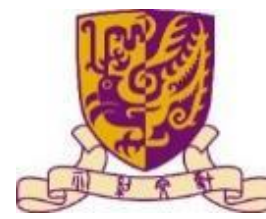


Implications

Counselling the choice of USG-MVA

Patient **should be counselled** about this surgical alternative during management of first-trimester miscarriage.





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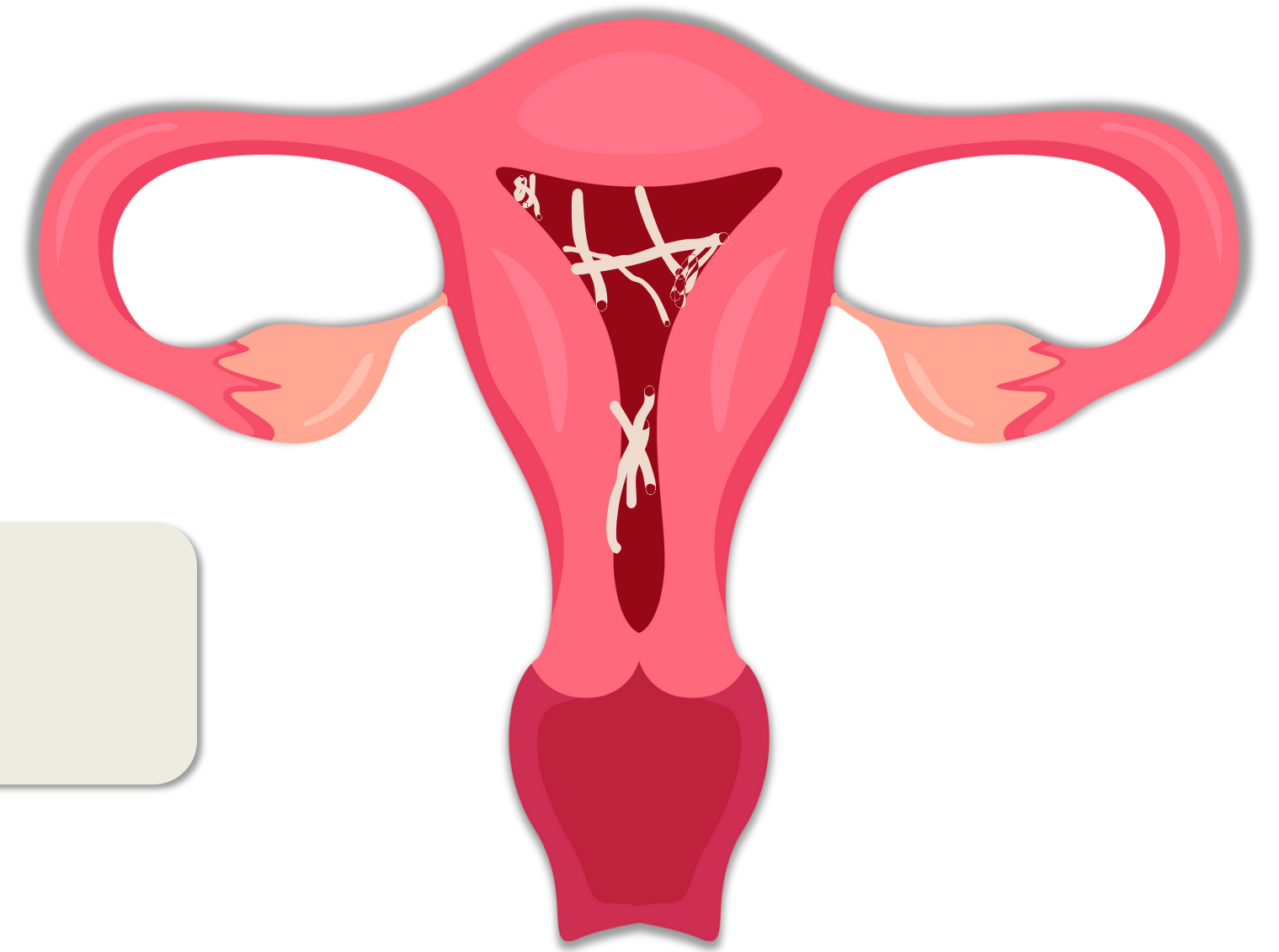
Future studies

Future studies

- IUA may still occur in women undergoing USG-MVA even the occurrence rate is lower than those undergone EVA

Further researches on methods or materials are needed to investigate how to prevent adhesion after USG-MVA

The efficacy and safety of a new cross-linked hyaluronan gel to prevent adhesion after ultrasound-guided manual vacuum aspiration (USG-MVA): a prospective randomized controlled trial



Future studies

- USG-MVA procedure can induce a cramping pain when the uterus contracts
- Current pain management may not completely eliminate the pain during procedure

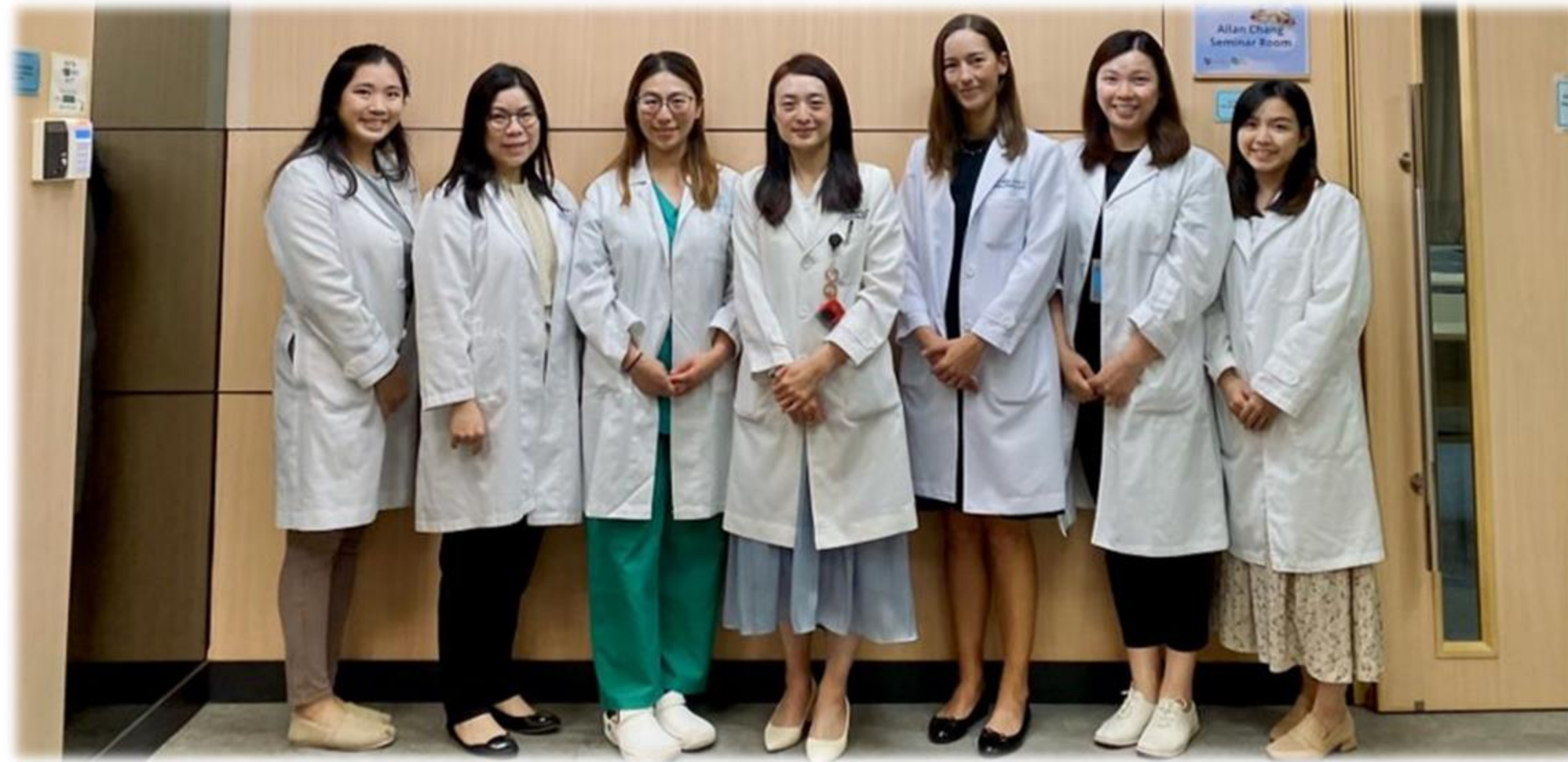
Further studies on pain management techniques is needed to better understand the improved pain control used throughout the USG-MVA procedure.

The efficacy of music as an adjunct analgesic in reducing pain during ultrasound-guided manual vacuum aspiration (USG-MVA):
A randomized controlled trial

The efficacy of acupuncture-type transcutaneous electrical nerve stimulation as an adjunct analgesic in reducing pain during USG-MVA:
A prospective, single-blinded two-arm randomized controlled trial.



Thank you to my USG- MVA team



Clinical Doctors

- Prof. TC LI
- Dr. Karen Ng
- Dr. Patricia Ip
- Dr. Olivia Chau
- Dr. Nikki Lee

Research Nurses:

- Ms. Mandie Ho
- Ms. Stacey Wong
- Ms. Elaine Ng
- Ms. Tiffany Lau

Genetic and Psychology team:

- Prof. Richard Choy
- Dr. LI Ying
- Dr. Cosy Cheung



Special acknowledgements

Health and Medical Research Fund,

Health Bureau,

Hong Kong SAR Government



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