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VARIABLES THAT AFFECT EMBRYO TRANSFER SUCCESS

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Embryo Transfer

- Ideally , consists of placing the embryos transvaginally, close to the uterine fundus in an atraumatic manner.
- Clinicians understand that without healthy embryos capable of implanting, a technically superb ET is almost sure to fail, but they also know, that a poorly performed ET may ruin the entire IVF cycle.

Embryo Transfer

- **Therefore, it is of utmost importance for clinicians to do their part , spend as much time as needed and be as meticulous as possible in following the steps leading to a gentle and atraumatic ET, that will optimize this step of the ART procedure.**

The Relative Importance of Factors for a Successful ET (Kovacs, 1999)

- Absence of blood or mucus
- Type of catheter
- Not touching the fundus
- Avoiding tenaculum
- CX mucus removal
- Leaving the catheter in place for 1 minute
- 30 minutes bed rest
- Trial transfer
- Ultrasound

Variables in Embryo Transfer

- Type of Catheter used for ET.
- Uterine Contractions during ET.
- Ultrasound guided ET.

Embryo Transfer Catheters

- **Soft (with introducers): WALLACE**
  SOFT PASS
  ECHO-TIP etc.
  (without introd): FRYDMAN
- **Stiff TOMCAT**
- **Sets WALLACE**
  FRYDMAN

Embryo Transfer Catheters

Frydman Catheter
(standard)

Embryo Transfer Catheters

Wallace Catheter

Endometrial Lesions Caused by Embryo Transfer Catheters

- Mock transfer followed by microhysteroscopy (glycine 1.5%) was done in 23 pts. with normal HSG, undergoing Dx LSC .
- Tomcat n=5
- Frydman Set n=3
- Frydman n=5
- Wallace n=10

Marconi,Vilela,Quintana, Sueldo.
Fertil Steril August 2003.

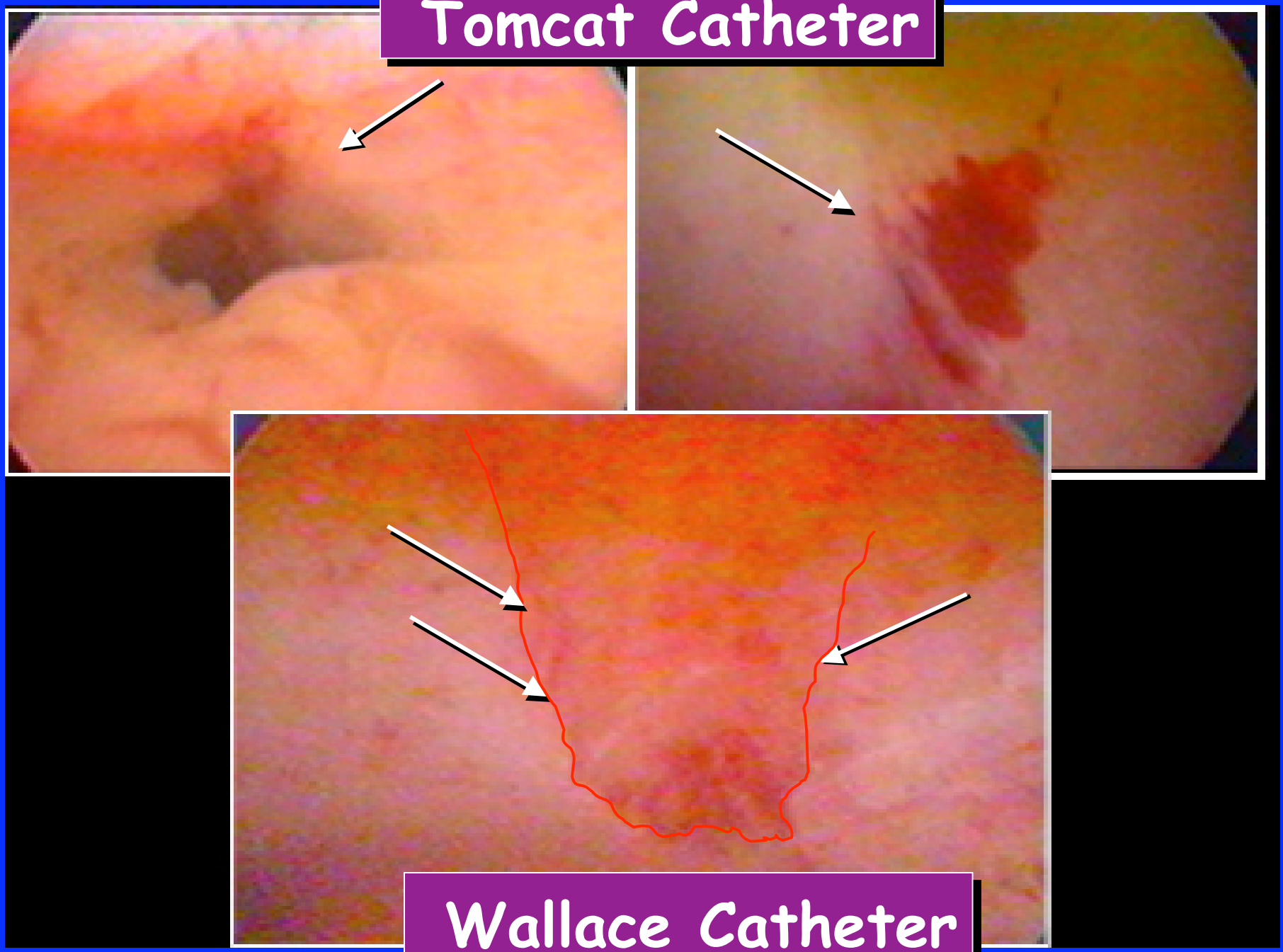
Is everybody using Wallace or Wallace-like Catheters for ET?

- **Tom-Cat catheter:**
- **"The choice of ET catheters affects embryo implantation after IVF" Univ of Toronto, Fertil Steril Oct-2000, also ESHRE 2003.**

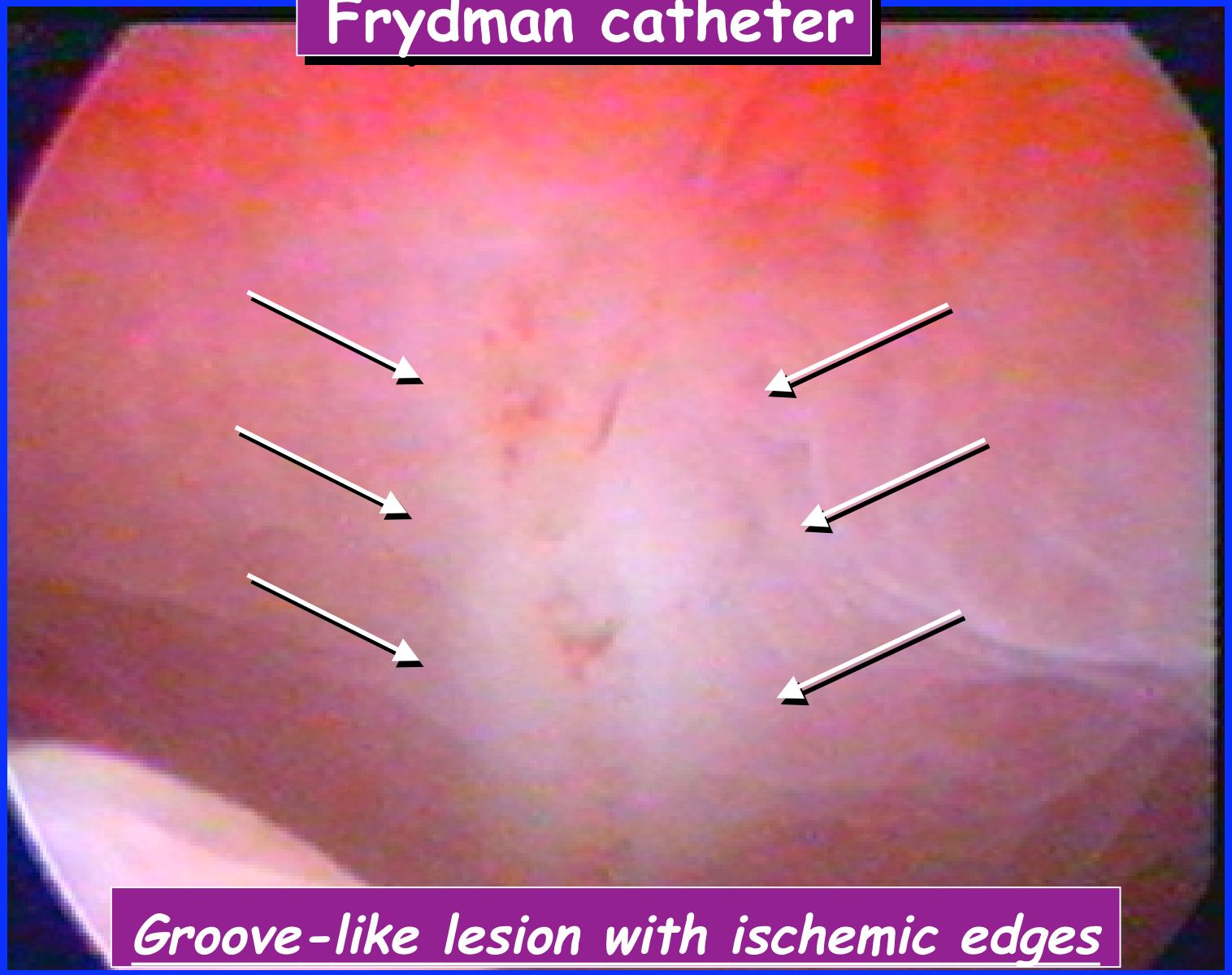
- **Frydman Catheter:**
- **"Impact of technical differences,choice of catheter and blood in the catheter in the results of IVF" Sallam et al. J Ass Reprod and Genet. April 2003**

Endometrial lesions/Catheters

- Tunnel-shape lesion through the subendometrium.
- Groove-type lesion with ischemic edges and of variable length.
- Punch-out pattern or crater-like lesions.
- Hemorrhagic lesions.

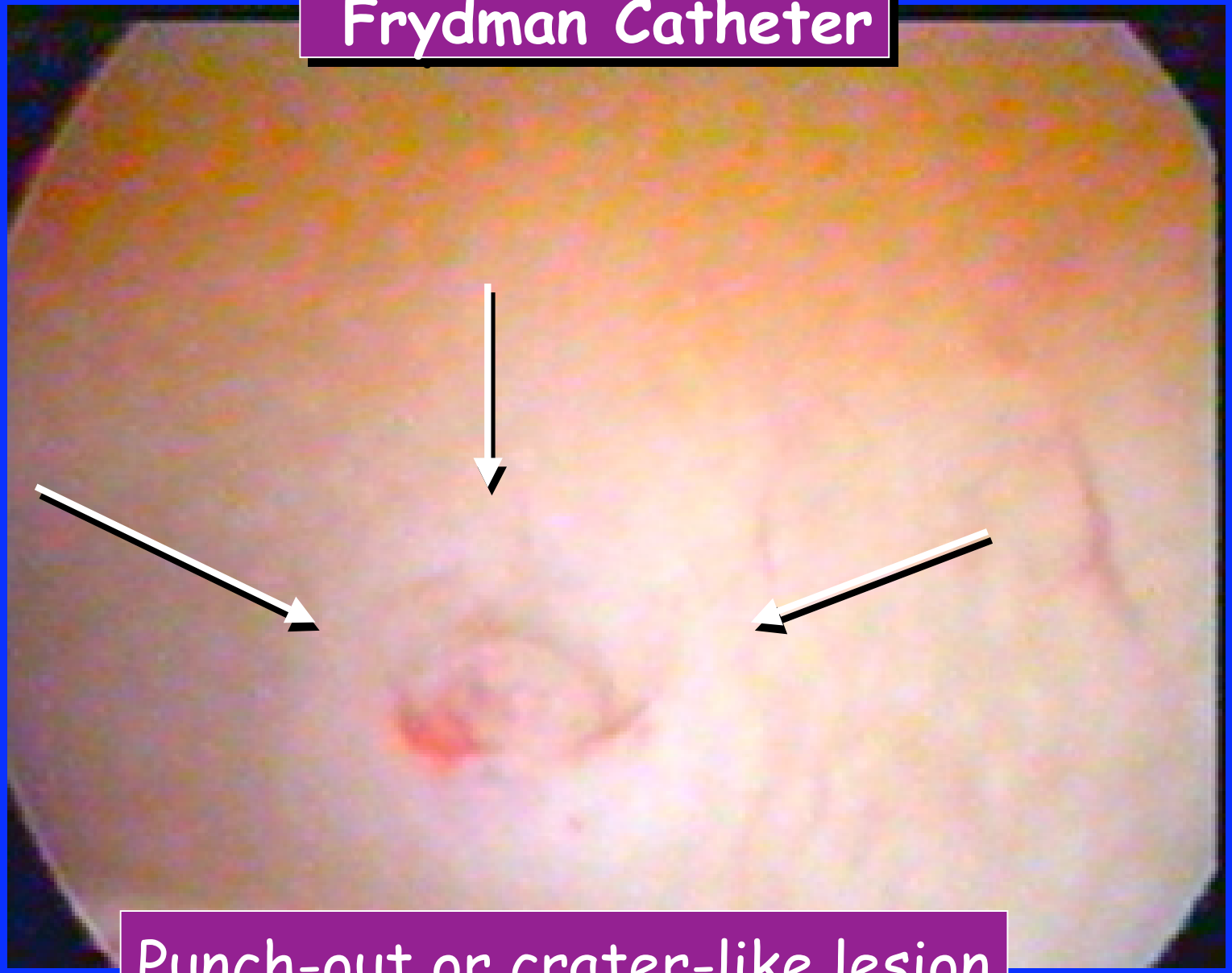

Tomcat Catheter
Wallace Catheter

Frydman catheter



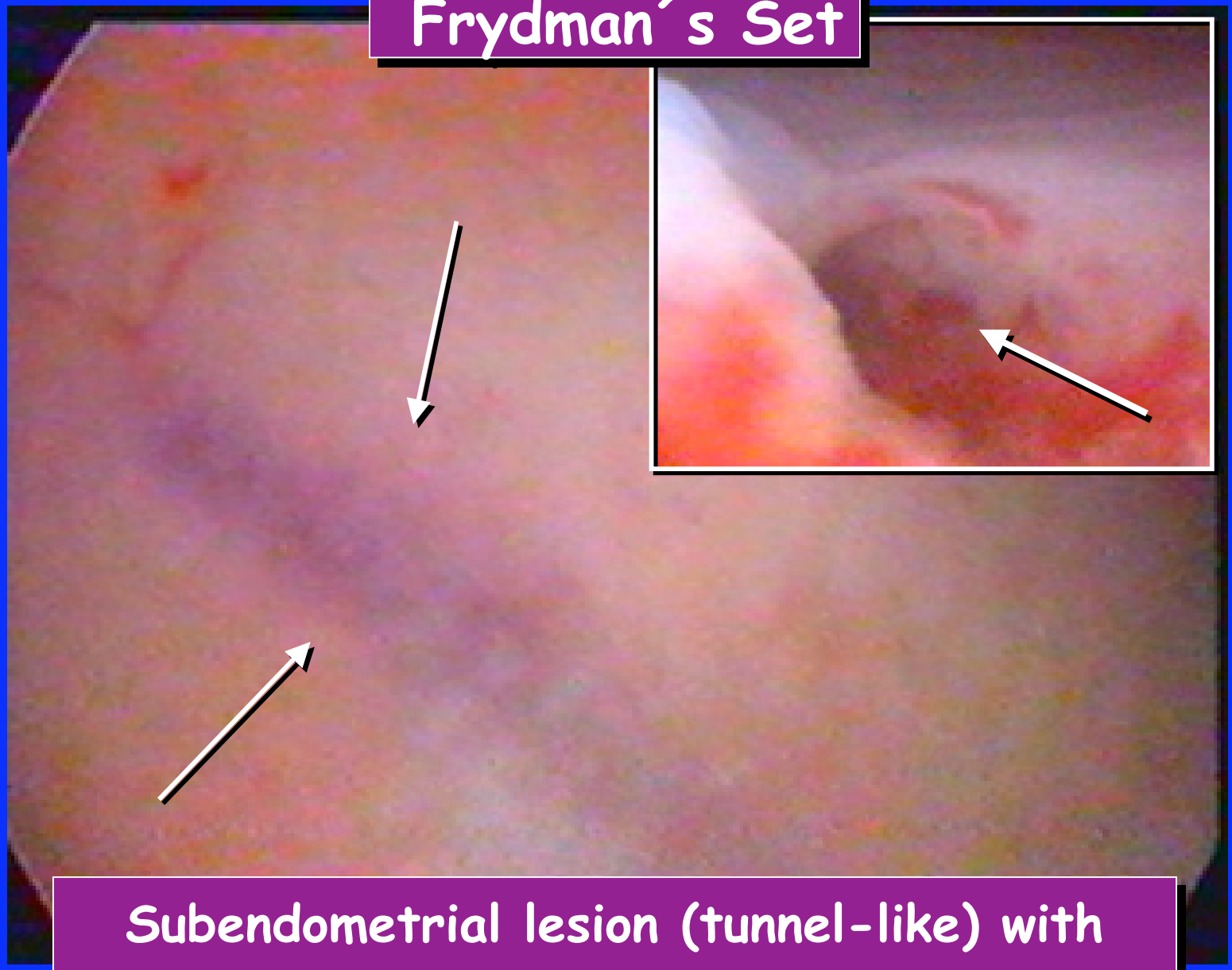
Groove-like lesion with ischemic edges

Frydman Catheter



Punch-out or crater-like lesion

Frydman´s Set



Subendometrial lesion (tunnel-like) with hemorrhage

Endometrial Lesions/Catheters

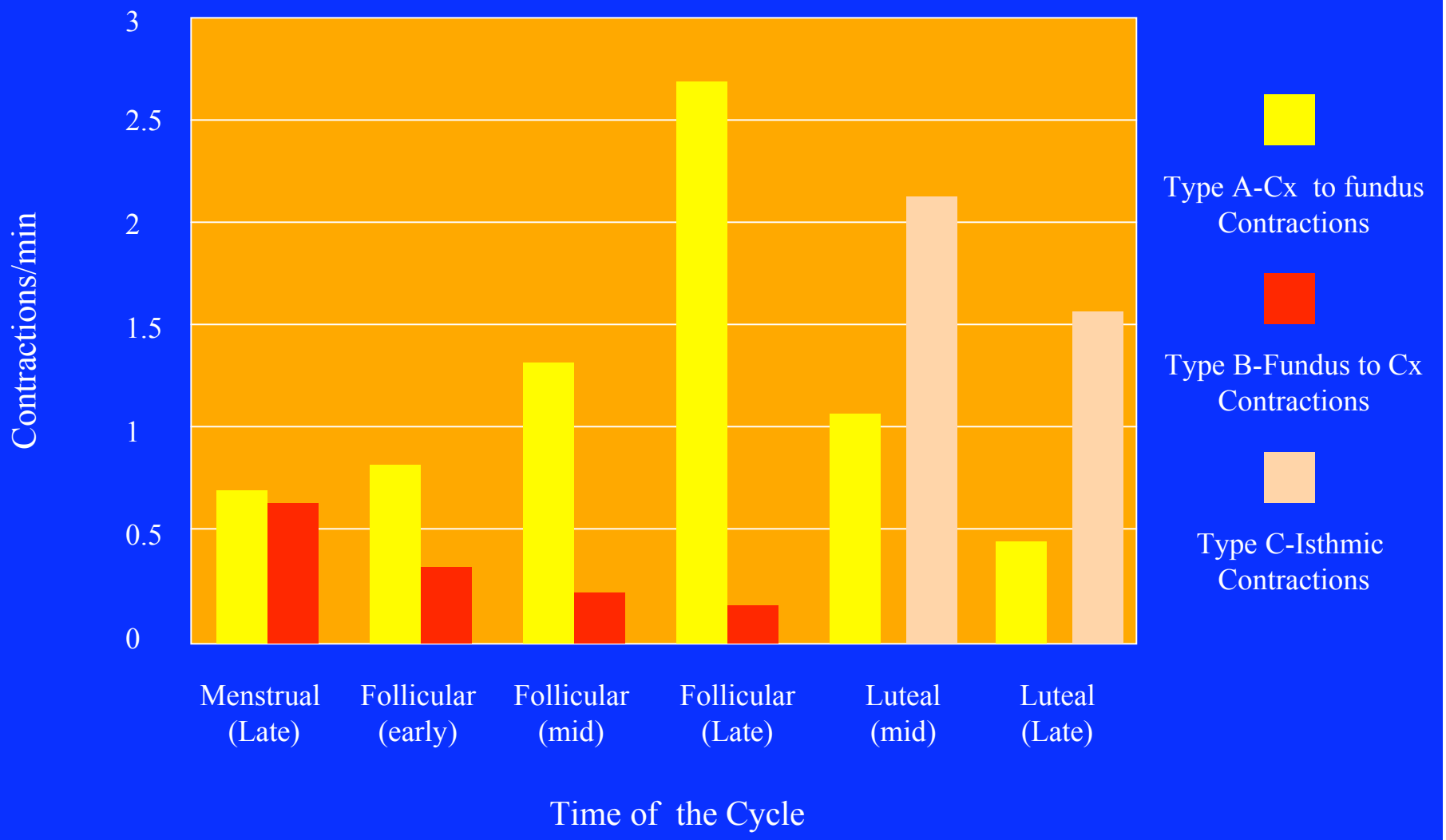
RESULTS

- In this preliminary experience the Wallace catheter appears to be less traumatic on the endometrium, but care in not passing the internal os with the outer sheath seems important, unless it is absolutely necessary.
- The Tomcat cath. and the Frydman´s set caused the more significant lesions observed.

Endometrial Lesions/Catheters Conclusions

- This is the first study on direct visualization of endometrial lesions immediately after a mock or trial transfer.
- The severity of some of the lesions observed may explain the low pregnancy rate associated with difficult or traumatic embryo transfers.

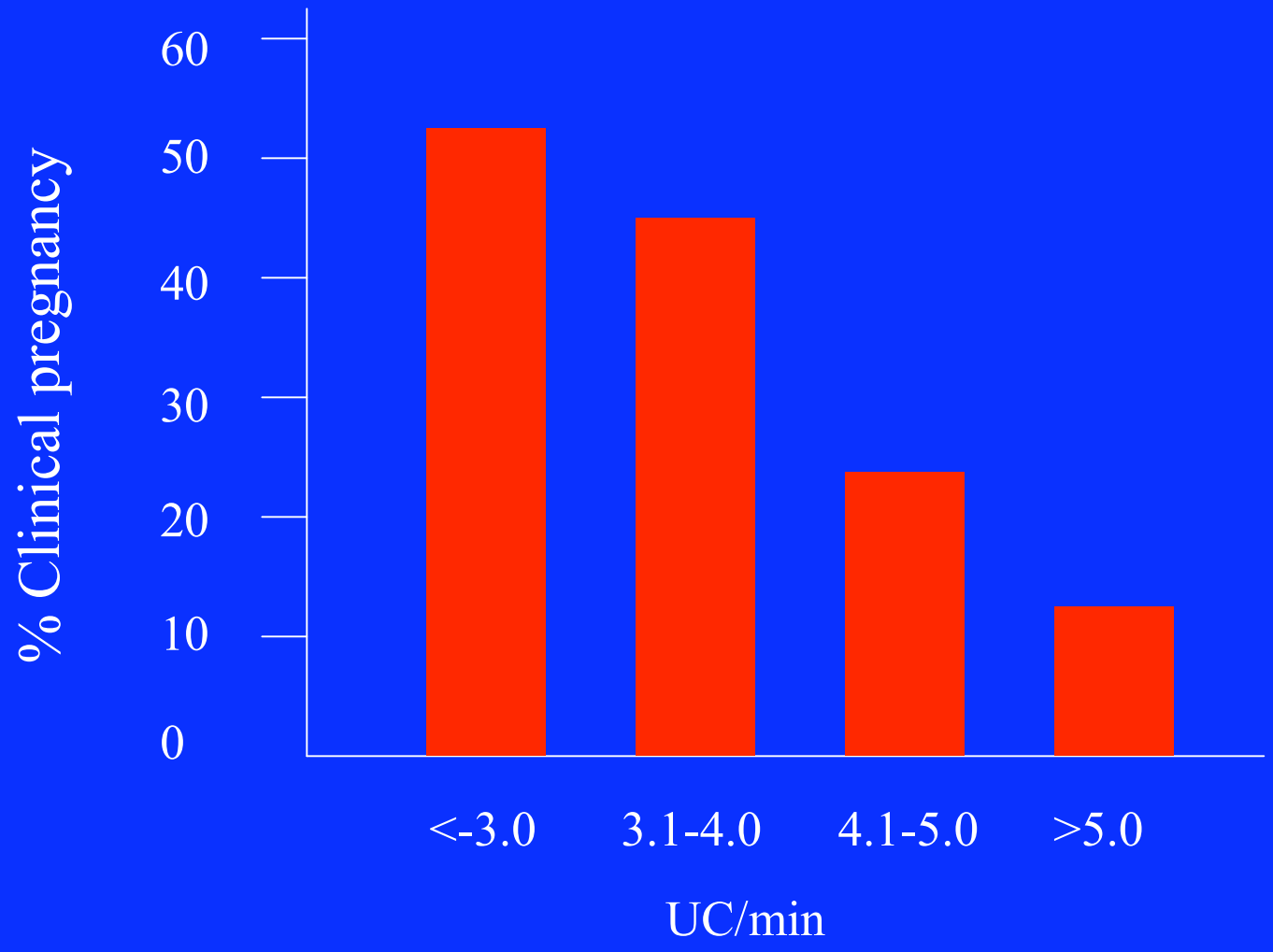
Uterine peristalsis



Uterine Contractions During ET

- Difficult embryo transfers are known to be associated with more frequent and stronger uterine contractions (isthmic and fundocervical) Lesny et al., 1998.
- Fanchin et al., (1998) showed that pregnancy and implantation rates decrease as the frequency of uterine contractions increased.

Uterine Contractions During ET



Uterine Contractions During ET

- The use of tenaculum or the need of cervical dilation increase the number of UC.
- The same is true when firm stylets (sets) are introduced into ET catheters to pass the internal os.
- It is not known if different ET catheters (and the potential lesions caused by them) are associated with changes in UC.
- It is known that difficult ET causes relocation of the fluid (and embryos) from the fundus into the cervix or fallopian tubes. (Lesny 1999).

Uterine Contractions During ET

CONCLUSIONS

- Uterine contractions during ET appear to be an important variable affecting results.
- A number of factors , most of them associated to difficult ET, are known to increase the frequency and amplitude of UC, negatively impacting on the results of the procedure.
- A gentle, atraumatic ET should avoid the deleterious effect of UC.

Ultrasound Guided ET

- First described by Strickler in 1985.
- Facilitates placement of soft catheters
- Avoids touching the fundus
- Determines exact placement of the embryos in relation to the fundus.
- Full bladder straightens the cervical-uterine access facilitating the cath. passage/internal os.
- Improves implantation and pregnancy rates?

Ultrasound Guided ET

- **Better ART results with ultrasound:**
  - **Lindheim: Int.J. Gyn-Ob 1999**
  - **Wood et al.:Hum Reprod 2000**
  - **Coroleu et al: Hum Reprod 2000**
- **Same results:**
  - **Kan et al:Human Reprod 1999**
  - **Garcia Velasco et al. Fertil Ster 2002**

Ultrasound Guided ET

	Ultrasound ET (n=187)	Blind ET (n=187)	P
CPR	59.9	55.1	NS
Impl. Rate	30.6	26.3	NS
SAB	10.7	9.1	NS
Ectopic	0/187	5/187	NS

Garcia Velasco et al.

Ultrasound Guided ET

Power enough? Confidence intervals for uncertainty (letters to the editor)

David Meldrum

H. Sallam

Garcia Velasco

Paul Mc Donough

Fertil Steril April 2003

Prospective Comparison of an Ultrasound-guided ET vs a Blind Catheter Placement

Objective: to evaluate the performance of an ultrasound guided echodense tip (Echo-tip, Cook, USA) catheter vs. a commonly used soft semirigid catheter (Frydman, CCD, France) placed without ultrasound in good prognosis IVF patients.

Marconi, Young (Jr), Vilela, Belló, Young, Sueldo

IFER 2003

Echo-tip ET catheter

Prospective Comparison of an Ultrasound-guided ET vs a Blind Catheter Placement

- 82 IVF patients, all under age 38 and with normal D3 FSH and Estradiol.
- ET performed on Day 3 post aspiration.
- 40 patients with Echo-tip (Cook,USA) under ultrasound guidance.
- 42 patients with Frydman Cath (Lab. CCD,Paris ,France) without ultrasound.

Echo-Tip vs Frydman : Results

- Age, stimulation days,number of ampules, number of oocytes,number and quality of embryos transferred were similar.
- Clinical and ongoing pregnancy rates were significantly higher in Echo-tip
- There was a higher trend in implantation rate with the Echo-tip.

	(ECHOTIP)N=40	(FRYDMAN)N =42	P
Age	31.8±2.67	32.5 ±3.88	NS
Stimulation days	9.14 ±1.73	8.50 ±1.39	NS
Nº ampoules (75UI)	28.4 ±9.31	25.6 ±9.76	NS
Retrieved oocytes	9.96 ±4.34	10.31 ±5.22	NS
Fertilized oocytes in 2 PN	6.83 ±3.04	6.69 ±3.86	NS
Number of transferred embryos/patient	3.48 ±0.67	3.65 ±0.69	NS
Clinical pregnancy rate	60.0%	35,7%	P<0.05
Implantation rate	25.6%	11.8%	NS
Ongoing pregnancy rate	52,5%	28.5%	P<0.05

Echo-tip vs. Frydman: Conclusions

- Our data in this prospective study shows that embryo transfers in good prognosis IVF patients performed under ultrasound guidance with an echo-dense tip catheter offers a significantly higher clinical and ongoing pregnancy rates in comparison to a soft semirigid catheter without ultrasound.
- Also, there was a trend toward a higher implantation rate with the Echo-tip.

Routine ET: how do we do it?

- Irrigate the ectocx and endocx with buffer
- Remove the endocervical mucus
- Place the catheter (Wallace or Echo-Tip) fully assembled, guided by abdominal sono and deliver the embryo/s 1.5-2 cm from the fundus.
- Keep the pressure on the plunger and remove the catheter slowly after 30 seconds

Difficult ET:what to do ?

Disassemble the catheter and place the outer guide against the internal os and try again.

Avoid the tenaculum and manipulate the Cx instead with the speculum. If needed, “pull” on the Cx with a ring forceps placed on the anterior fornix.

Consider using the Frydman catheter (standard).

Place the stylet that comes in the Wallace Set.

Overall Conclusions

- We conclude from the data presented here, that meticulous attention by clinicians to the many details involved in embryo transfers, appears to be as important for IVF-ET success as the efforts required and expected from embryologists in the IVF laboratory.