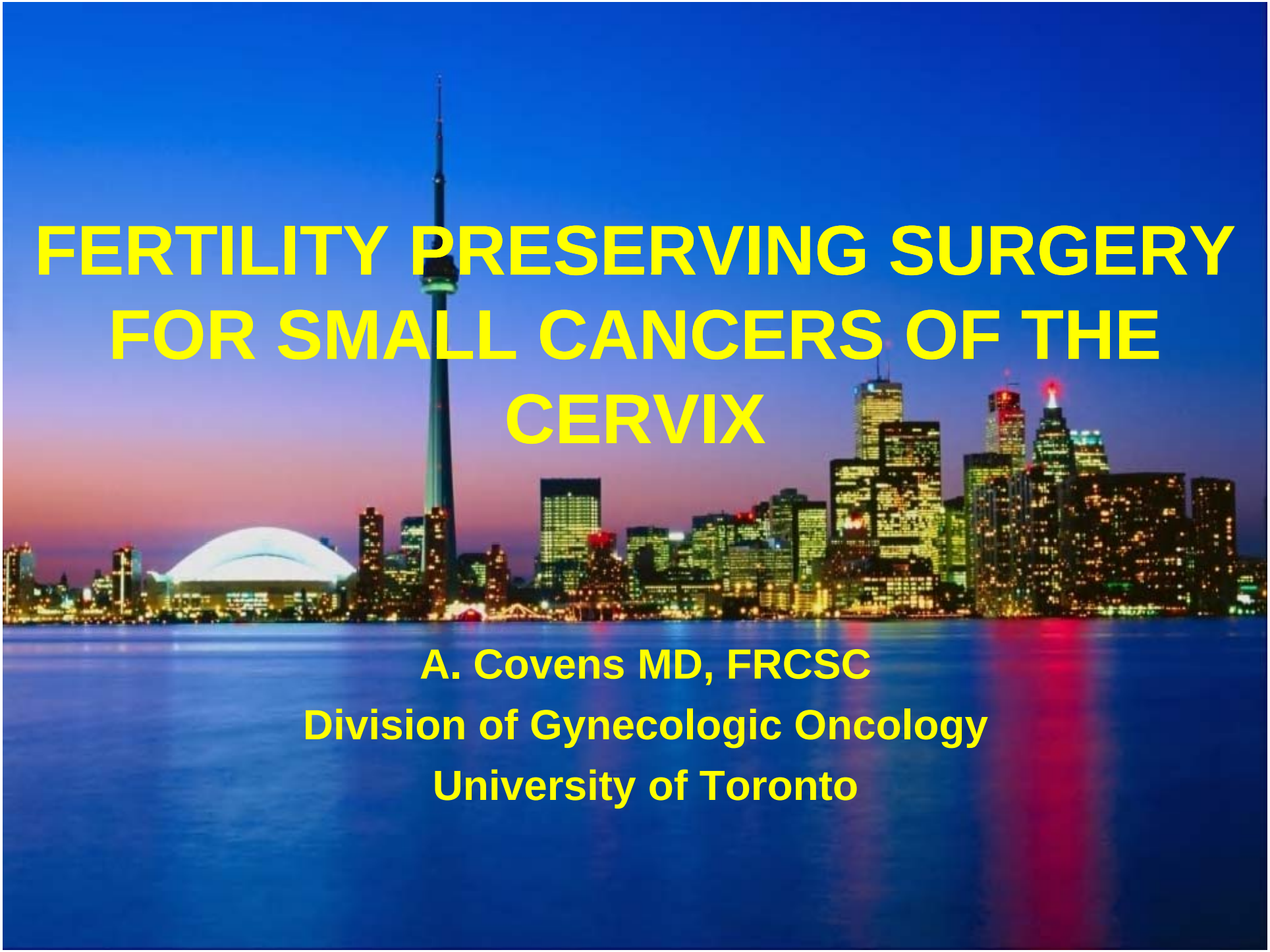

FERTILITY PRESERVING SURGERY FOR SMALL CANCERS OF THE CERVIX

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Division of Gynecologic Oncology
University of Toronto

PRESENT DAY PERSPECTIVES

- Delay of pregnancy- incidence of first birth increased 31% for women age 35-39, and 51% ages 40-45 between 1990-2002
- Reduction in # of pregnancies
- 45% of Stage I pts undergoing Rad Hyst <40 yrs
- Relapse rate ~10% in node negative pts

CHANGES IN SURGICAL ONCOLOGY OVER THE PAST 100 YRS

- Halstead philosophy abandoned
- greater attention to organ function, body image, quality of life including fertility preservation
- Wide radical local excision of primary + regional node assessment incl sentinel lymph node concept
- prognostic factors other than margins (size, grade, depth, CLS, etc)
- Multi-modal therapy (radiation and chemotherapy)

PERSPECTIVES ON RADICAL TRACHELECTOMY

- Originally described in 1940's in Romania
- Vaginal approach repopularized with advent of laparoscopy in 1980's by Dr. Dargent
- Publications by Lyon, Quebec City, London, Toronto- ~ 500 pts reported
- Efficacy appears to be validated by survival data
- Abdominal approach popular in US, Eastern Europe- MSKCC, Budapest

Rationale for Radical Trachelectomy

Small Cervical cancers IB_1:

- **Tend to spread laterally to parametria**
- **Occasionally spread to upper vagina**
- **Rarely spread to body of uterus**
- **Therefore, removal of cervix, parametria and upper vagina in small IB tumors should be safe and preserve fertility**

METHODS OF FERTILITY PRESERVATION FOR CERVICAL CA

- **Lpsc Pelvic lymphadenectomy +ovarian transposition + IC rads IVF.**

  (*Covens et al, Eur J Gyn Oncol, 17:177, 1996)*

- **Lpsc Pelvic lymphadenectomy,+ radical vaginal trachelectomy.**

  (Dargent et al, SGO 1994)

- **Lpsc pelvic and paramet nodes + Cone/simple trach**

  (Rob et al, Gyn Oncol 2008)

- **NACT X3 followed by Lpsc pelvic and paramet nodes + Cone/simple trach**

  (Rob et al, Gyn Oncol 2008)

Cone/Simple Trachelectomy

<2cm tumours

- **Lpsc PLN and parametrial node dissection. If positive, rad hyst**
- **If negative nodes → 7 days later cone (stage IA2), or simple trachelectomy (stage IB1)**
- **NAC for >2cm, or >50% stromal involvement (<66%)**
- **Then above schema.**

Rob et al, Gyn Oncol 2008

Cone/Simple Trachelectomy

	Stage 1A1/1A2	Stage IB1	NAC
N	13	27	9
+ nodes	3	3	
Cone	10		
Simple trach		24	7
Median fup	47 mos		
Recurrence	1 (central)		

Rob et al, Gyn Oncol 2008

Cone/Simple Trachelectomy

Pregnancy Outcomes	
Attempted preg	24 of 32 women
# preg	23 in 17 women
TAB/ectopic	2
SA T1	2
T2 loss	3
24-34	1
34-35	2
37-39	9

Rob et al, Gyn Oncol 2008

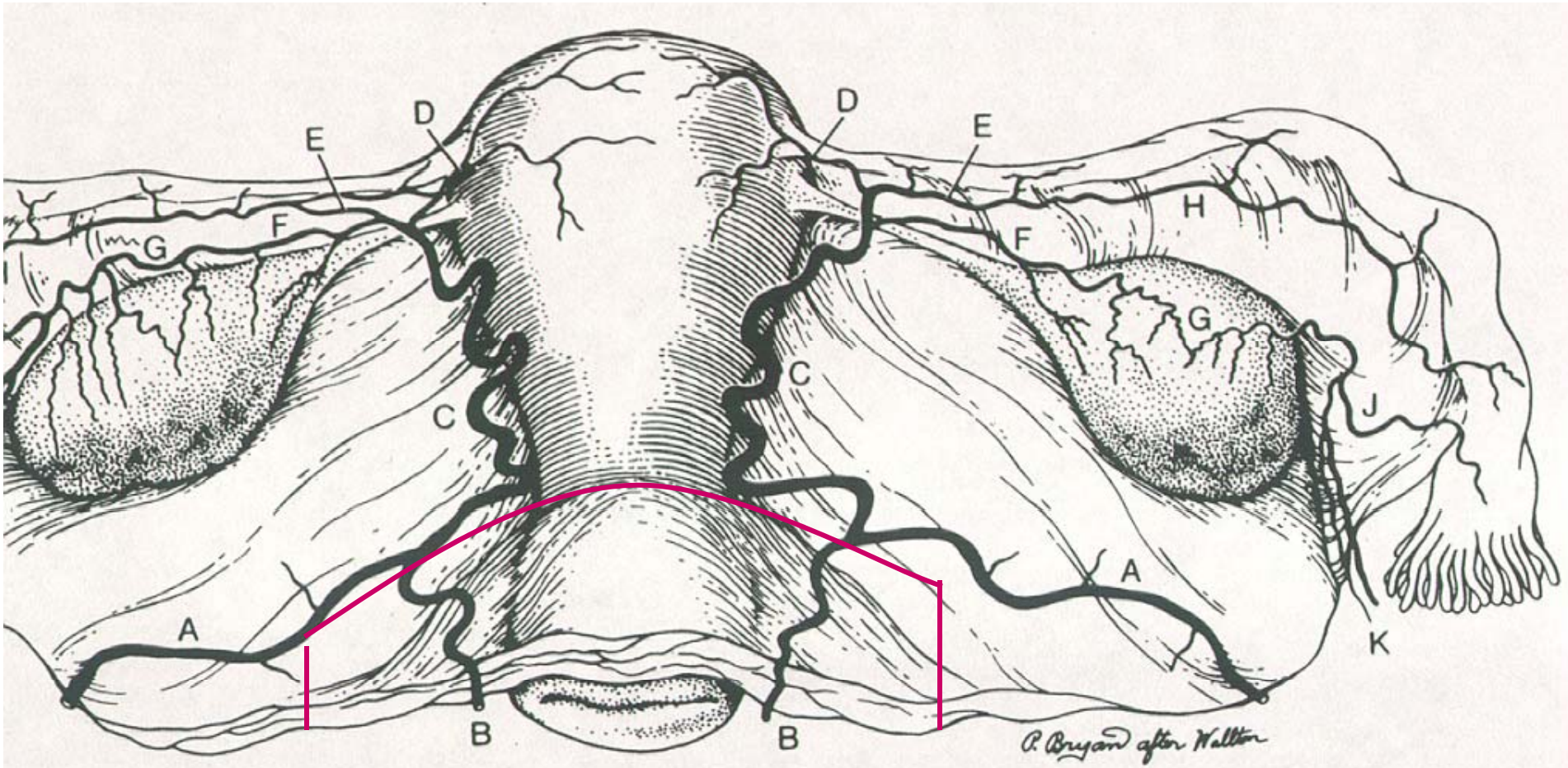
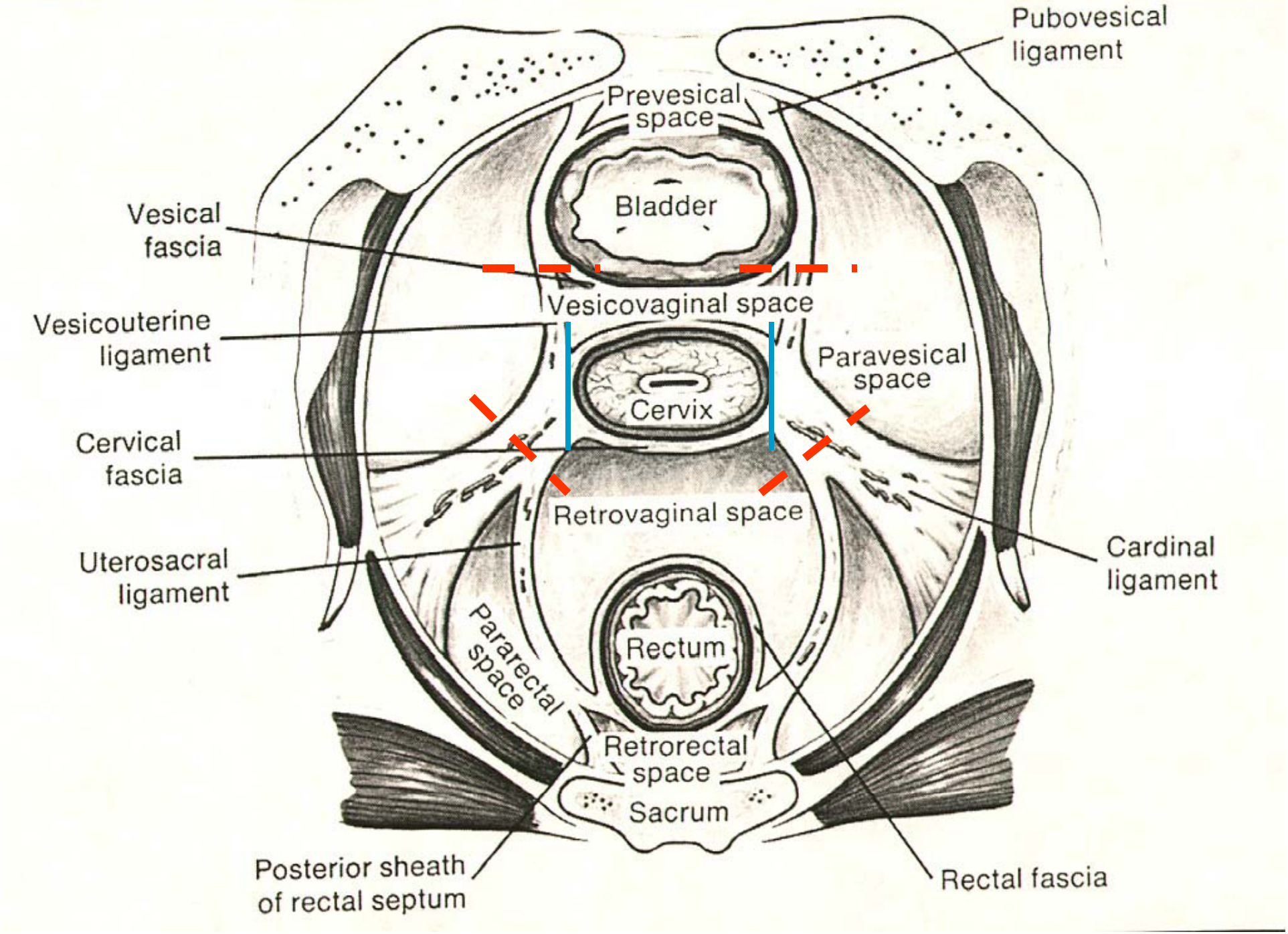


FIG. 11–7 Normal uterus and adnexa with schematic representation of the usual ovarian and uterine artery branches. Many variations exist.

A = Uterine artery in parametrium
B = Cervico-vaginal branch
C = Uterine artery along lateral margin of the uterus
D = Fundal branch
E = Medial tubal branch
F = Medial ovarian branch
G = Ovarian arcade
H = Tubal arcade
I = Lateral tubal branch
J = Infundibular branch
K = Ovarian artery


Pubovesical ligament
Prevesical space
Bladder
Vesical fascia
Vesicovaginal space
Vesicouterine ligament
Paravesical space
Cervix
Cervical fascia
Retrovaginal space
Cardinal ligament
Uterosacral ligament
Pararectal space
Rectum
Retrorectal space
Sacrum
Posterior sheath of rectal septum
Rectal fascia

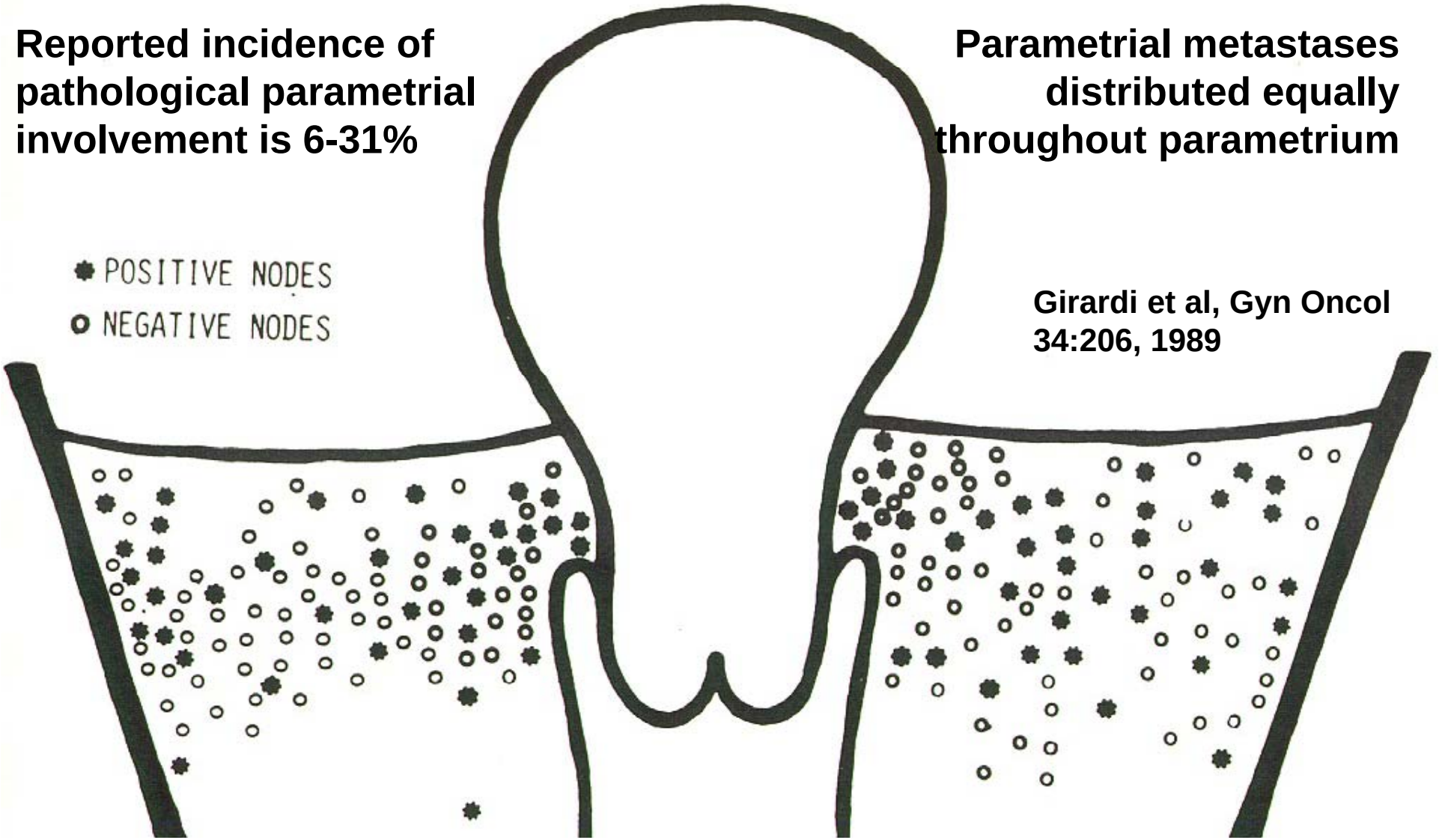
IMPORTANCE OF REMOVING ALL/PART OF PARAMETRIUM?

- As a means of obtaining wide local excision and tumour-free margins
- Removal of site of spread

PARAMETRIAL LYMPH NODES

Reported incidence of pathological parametrial involvement is 6-31%

Parametrial metastases distributed equally throughout parametrium



Girardi et al, Gyn Oncol 34:206, 1989

RVT+LSLND

Criteria:

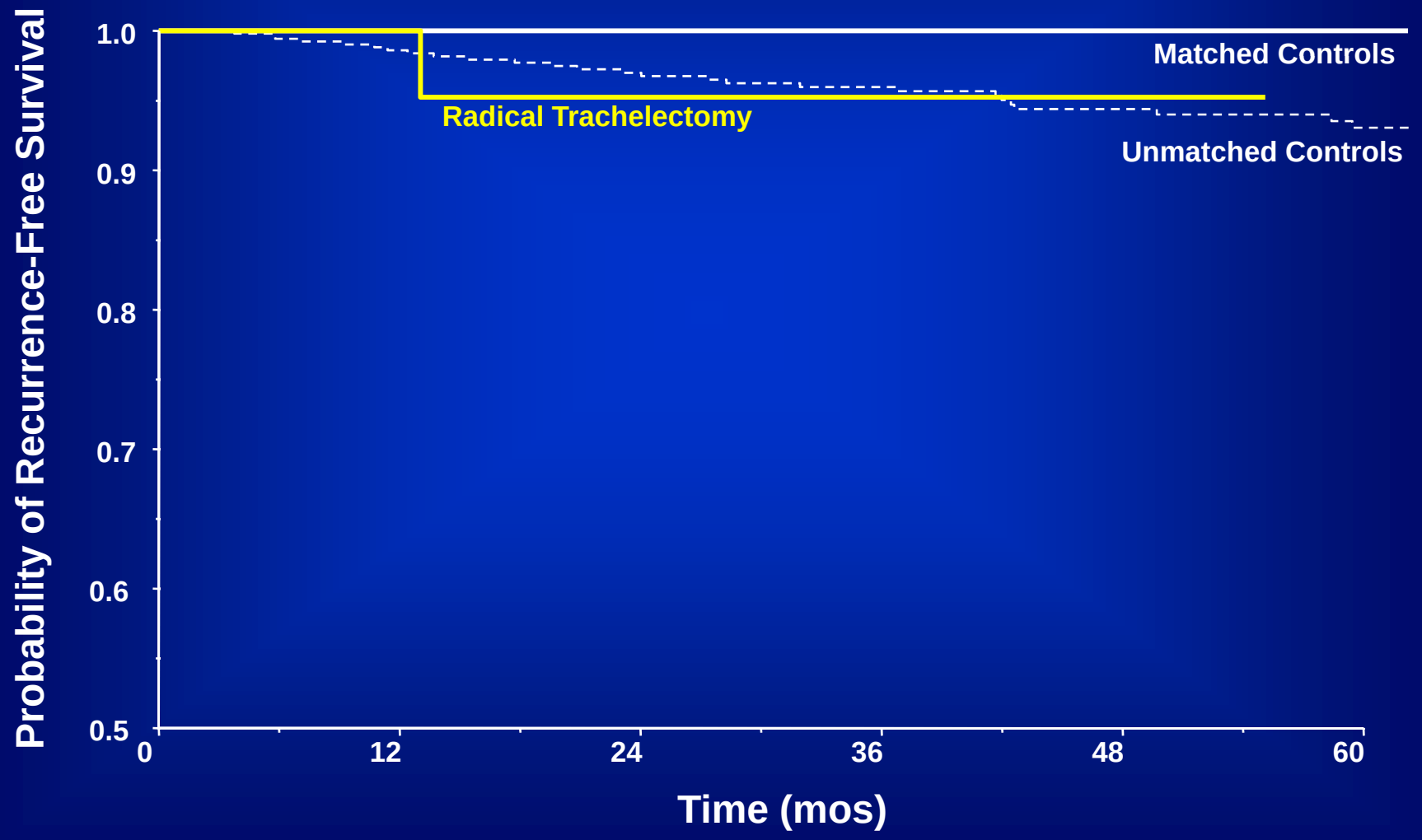
1. ≤ 2 cm tumour
2. desires fertility preserv'n
3. ≠ SGO def'n of microinvasion

Adjuvant rads:

1. + lymph nodes
2. + margins
3. deep invasion (>66%) + cls

Covens et al, Cancer 86:2273,1999

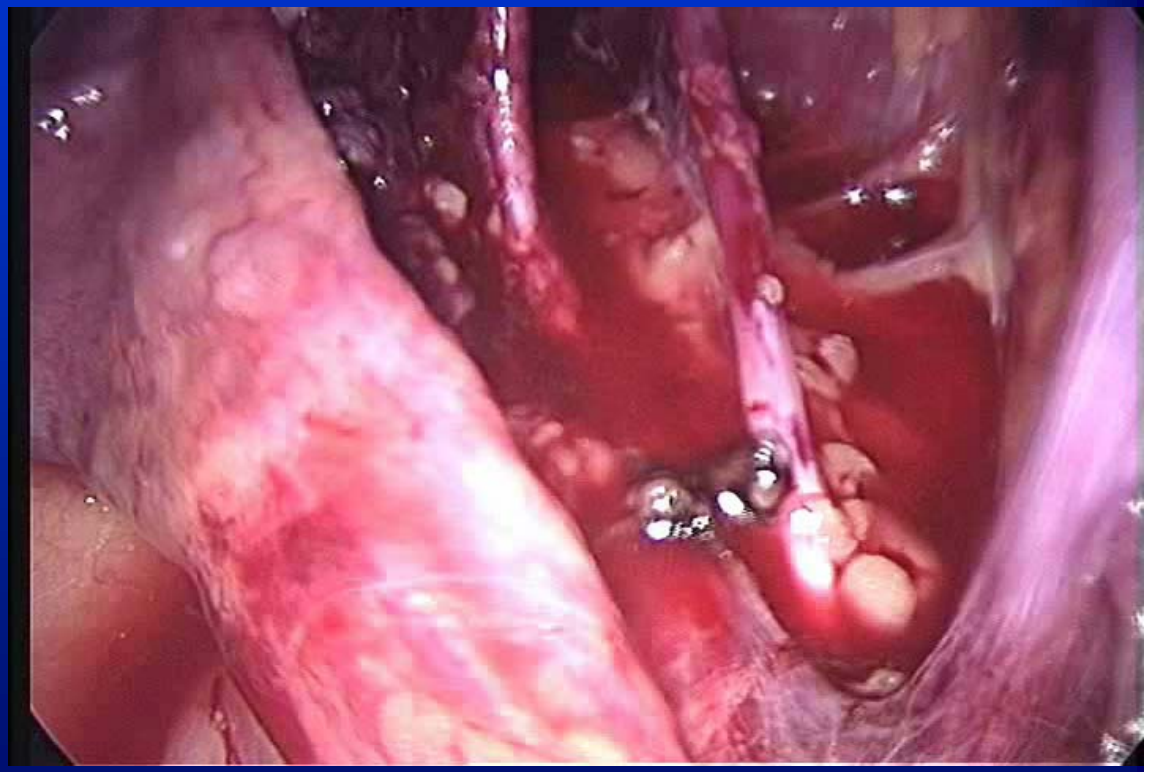
RECURRENCE-FREE SURVIVAL



SURGICAL PROCEDURE (historical)

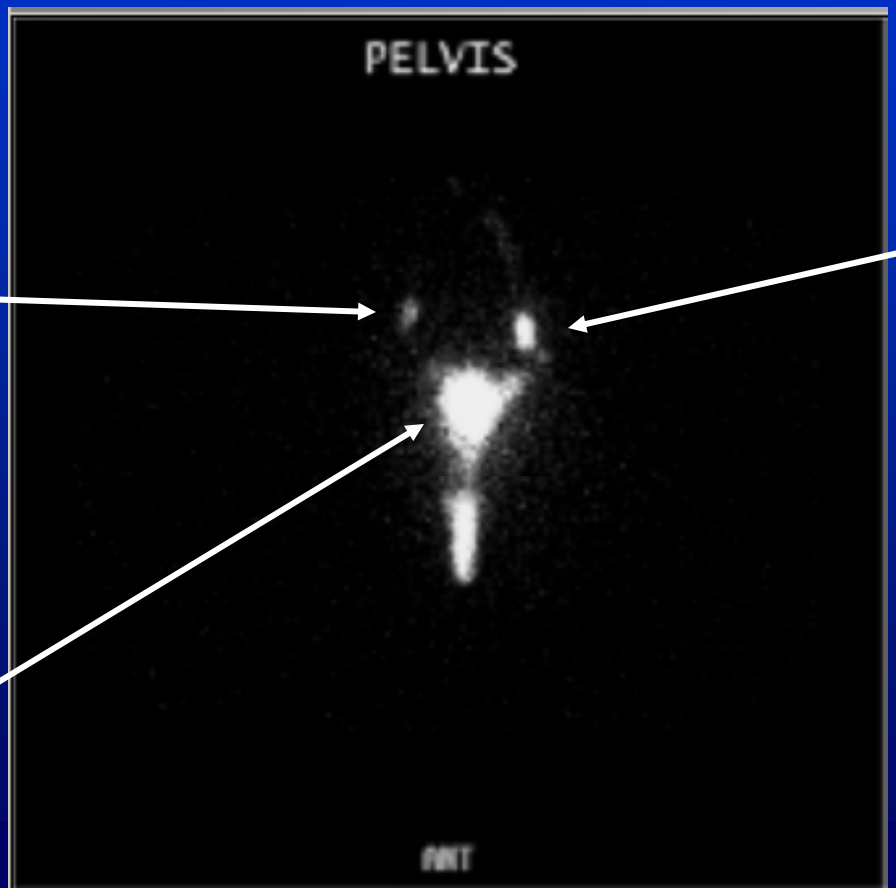
Complete Transperitoneal Pelvic Lymphadenectomy:

- **bifurcation of the common iliac artery (superiorly)**
- **circumflex vein (inferiorly)**
- **psoas muscle (laterally)**
- **ureter (medially)**
- **obturator nerve (posteriorly).**



SENTINEL LYMPH NODE DISSECTION IN CERVIX CANCER

- Inject 2-4 sites with Technetium (preop) and lymphazurin (intraop if bilateral sentinel nodes not found on Scintogram), superficially into stroma at periphery of tumour



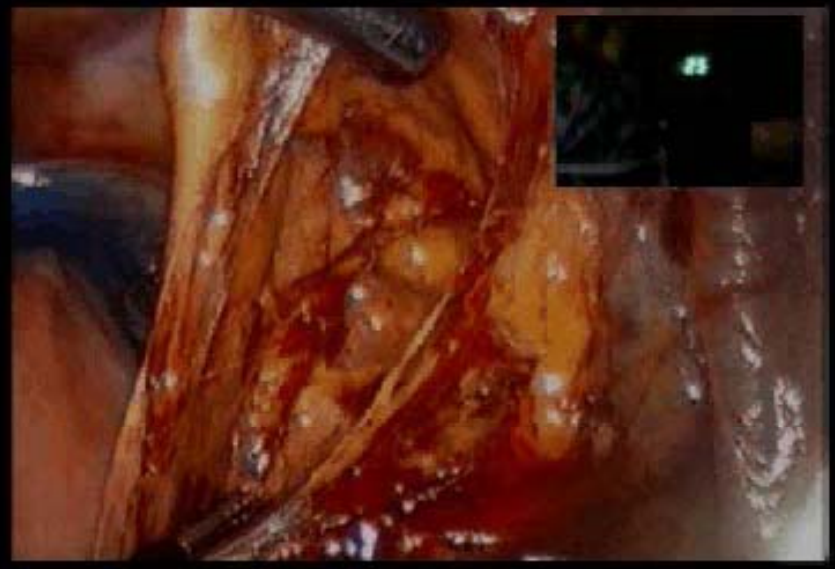
Right obturator sentinel node

Left obturator sentinel node

Cervix &

Parametrium

LPSC Rt Obturator Sentinel Lymph Node Dissection



MICROMETS IN CERVIX CANCER

- 894 surgically treated Cervix cancer patients
- Compared micromets (<2mm) vs macromets vs neg nodes
- 22% of node positives were micromets

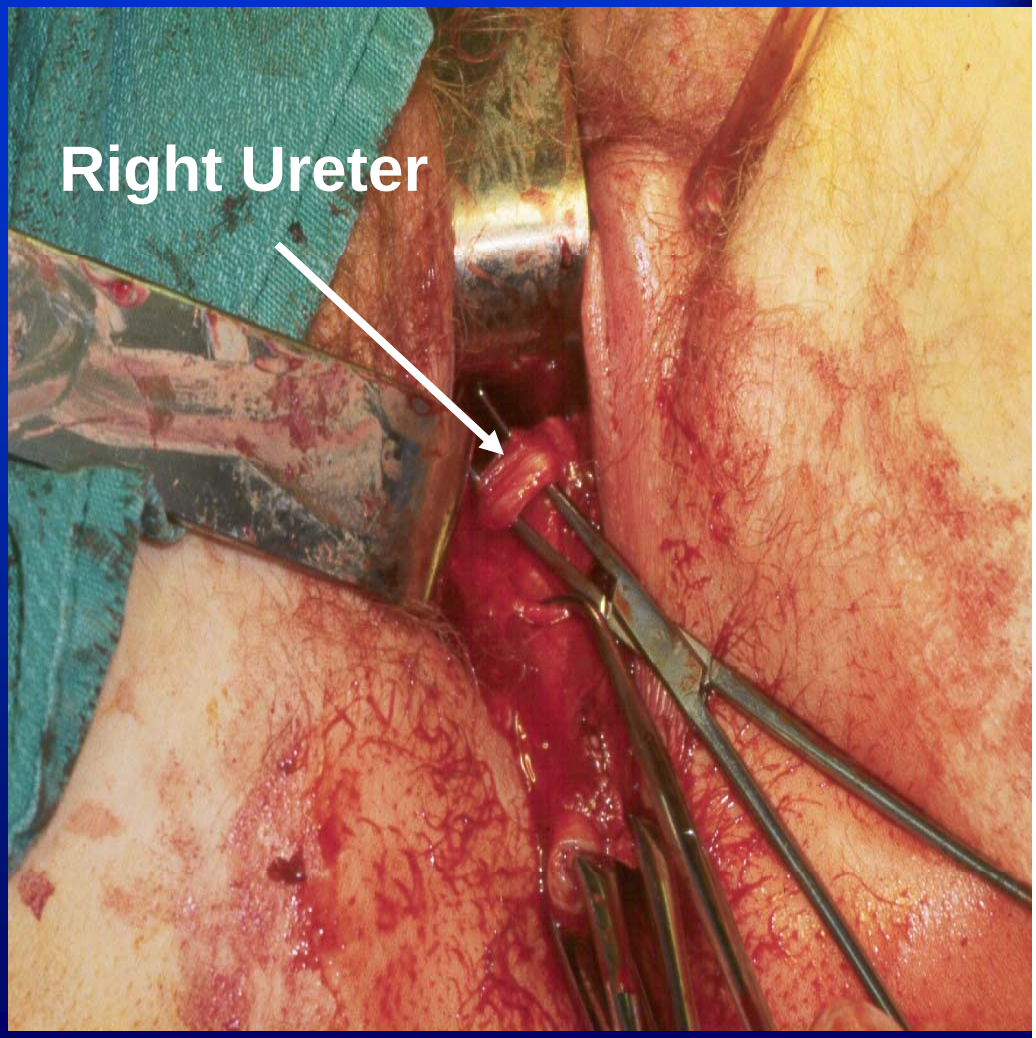
	Neg nodes	Micro mets	Macro mets
5 yr RFS*	91%	69%	62%
5 yr OS*	87%	64%	48%

*P<0.001

Horn et al, Gyn Oncol 2008

SURGICAL TECHNIQUE

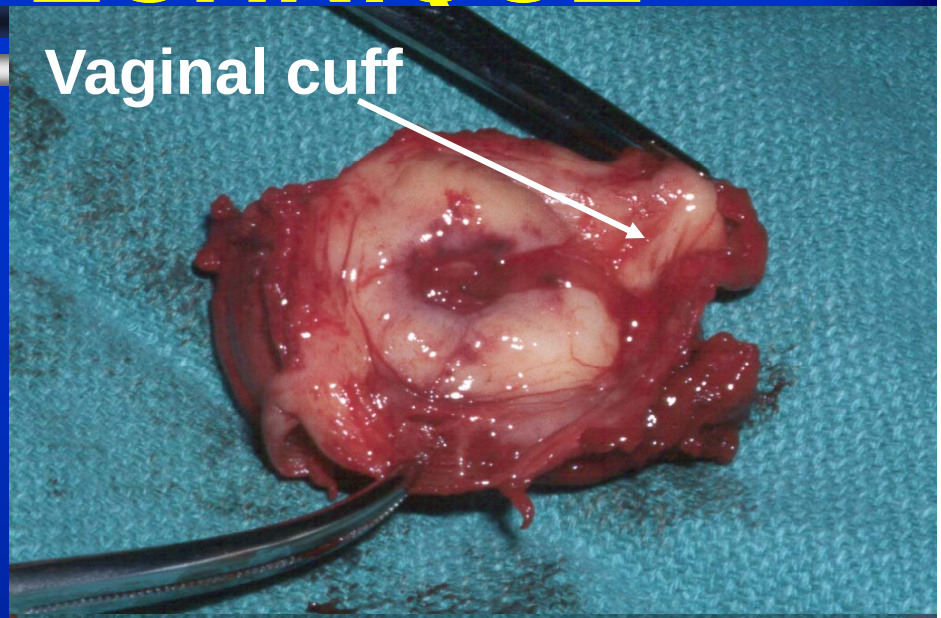
- open para-vesical and para-rectal spaces vaginally
- identification of ureter in utero-vesical ligament
- ligate vaginal branch of uterine artery

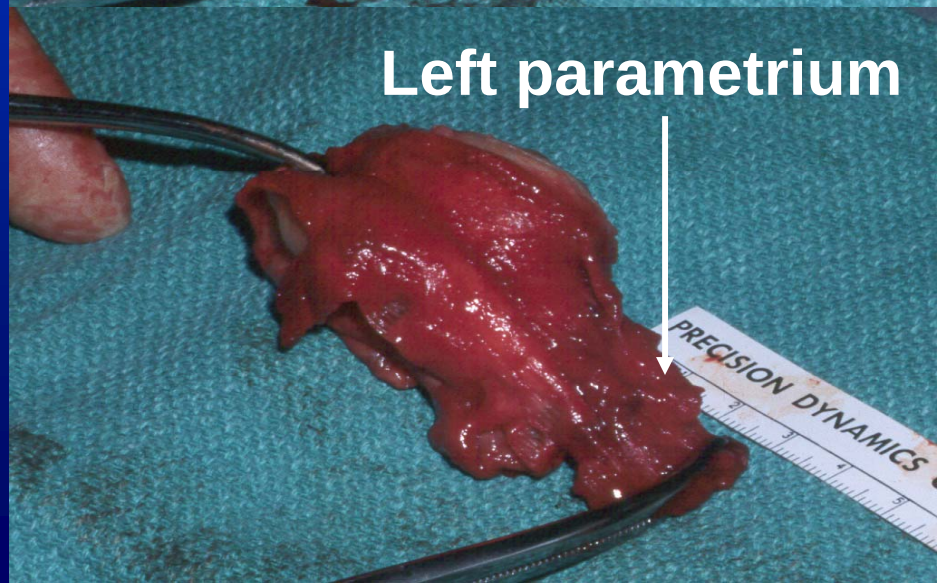


SURGICAL TECHNIQUE

- resection of 1-2 cm vaginal cuff

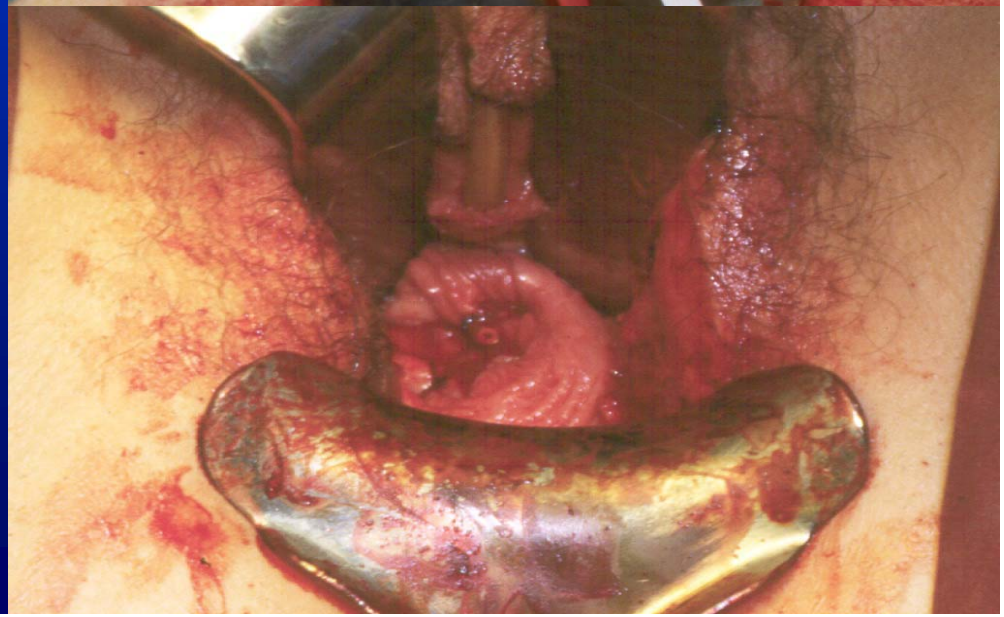
- resect medial 1/2 of cardinal and uterosacral ligaments





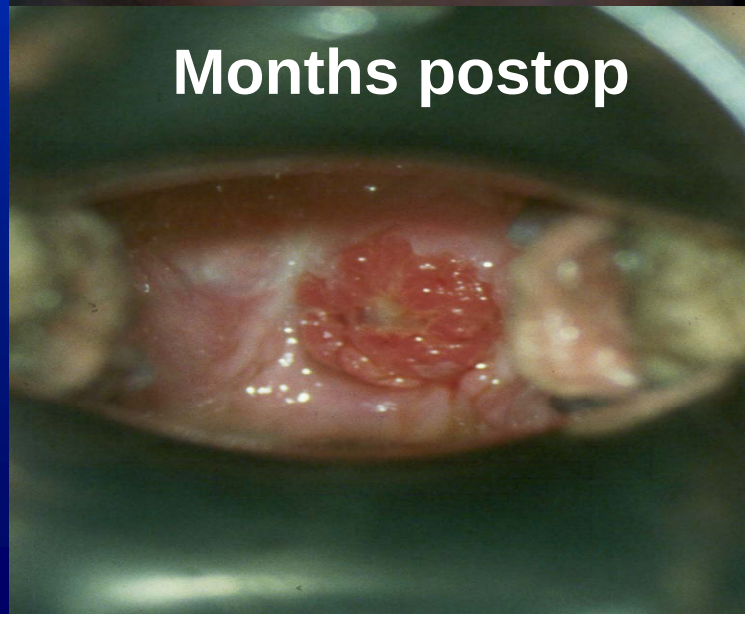
SURGICAL TECHNIQUE

- transect cervix at lower uterine segment
- frozen section of superior margin
- mersilene suture placed around lower uterine segment
- vaginal mucosa sutured to cervical stump
- 8 French rubber catheter placed in endocervical canal



FOLLOW-UP

- Q 3 mos for 2 yrs, Q 6 mos for 3 yrs, then yearly
- physical and pelvic exam, pap smear, colposcopy
- no prohibition of conceiving for any specified amount of time postop
- Cesarean section required for delivery due to cerclage



March 1994- August 2008

Beiner et al, Gyn Oncol 10:168,2008

RESULTS

	RT	RH	P-value
N	141	1002	
Age (yrs)	31	41	p<0.001
Quetelet Index	23.4	24.5	n.s.
Depth Inv (mm)			
SCC	5.0	6.0	n.s.
Adeno	3.0	5.0	p<0.001
+ CLS	37%	46%	P<0.05
+ PLN	5%	7%	n.s.

March 1994- August 2008

Beiner et al, Gyn Oncol 10:168,2008

RESULTS

	RT	RH	P-value
N	141	1002	
Tumour Size (cm)	2.0	2.0	n.s.
OR time (hrs)	2.8	2.75	n.s.
Blood Loss (mls)	300	550	p<0.001
Hospital Stay (days)	1.0	6.5	p<0.001
Time-postvoid Resid<100cc (days)	3.0	6.0	p<0.001
+ margins	2%	3%	n.s.
Adj Rads	5%	15%	p<0.006

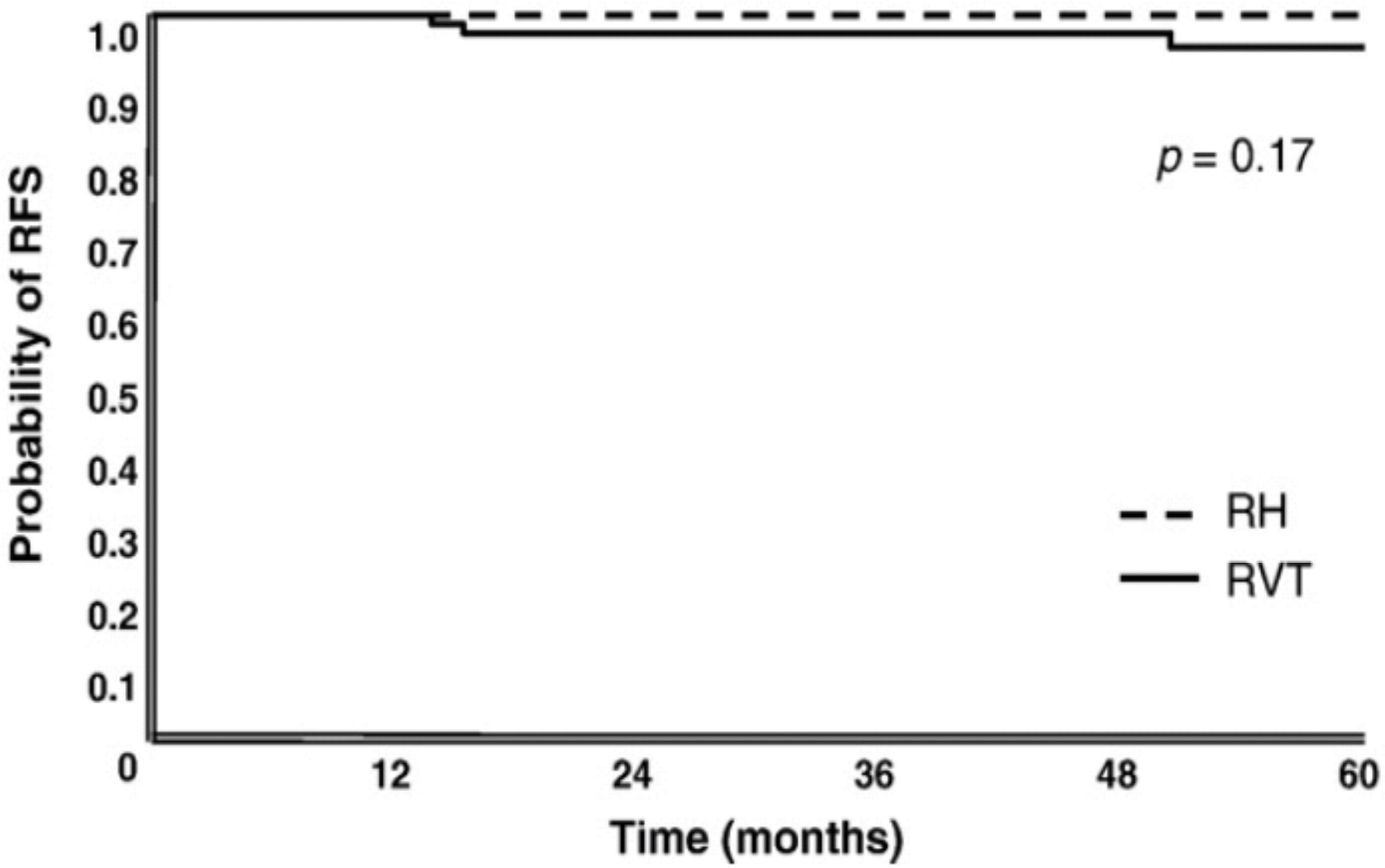
March 1994- August 2008 *Beiner et al, Gyn Oncol 10:168,2008*

RESULTS

	RT	RH	P-value
N	141	1002	
Compl'ns			
Intraop	11%	5%	P<0.02
Postop			
Infect	4%	13%	P<0.006
Non-Infect	1%	6%	p,<0.02
Peri-op allogeneic blood transfusion	4%	23%	p<0.001
Rec-Free Surv			n.s.
2yr	98%	94%	
5yr	96%	90%	

RECURRENCE-FREE SURVIVAL

Beiner et al, Gyn Oncol 110:168, 2008



LITERATURE

Beiner and Covens, Nature Clin Prac Oncol 4:353-361, 2007

	Toronto	Lyon	Quebec City	London	Pasadena	Ger	Total
Age	31	32	31	31	30	32	31
Size							
<2 cm	95%	70%	90%			100%	88%
>2 cm	6%	30%	10%			0	12%
Hist							
Scc	41%	80%	60%	67%	57%	69%	64%
Adeno	59%	20%	40%	33%	43%	31%	36%
+ CLS	37%	24%	21%	32%	14%	35%	28%
+ PLN	4%	7%	6%	6%	5%	4%	5%

LITERATURE

Beiner and Covens, Nature Clin Prac Oncol 4:353-361, 2007

	Toronto	Lyon	Quebec City	London	NYC	Ger
N	134	118	115	123	40	108
EBL (cc)	300		254		150	
OR time (mins)	165	161	252		300	253
Hosp Stay (days)	1	7	4			8

LITERATURE

Beiner and Covens, Nature Clin Prac Oncol 4:353-361, 2007

	Toronto	Lyon	Quebec City	London	NYC	Ger
N	134	118	115	123	36	108
FUP	44	95	74	45	21	29
Recur	5.2%	6.0%	3%	4%	3%	3.7%
Death	2.9%	4.0%	2%	4%	0	1.9%

LITERATURE

Beiner and Covens, Nature Clin Prac Oncol 4:353-361, 2007

	Tor	Lyon	QC	Lond	NYC	Ger	Total
central	1	2	1	2	1	3	34%
Sidewall	1	1		2		1	19%
Nodes	4	1	1				19%
distant	1	0	2				12%

12% site not reported

RADICAL ABDOMINAL TRACHELECTOMY

All stage IB1

N	Age	Adeno/ Scc	+ CLS	+ PLN	OR time	Blood loss	Hosp stay
22	33 (23-43)	59%/ 41%	41%	27%	298 (180-425)	250ml (50-700)	4 (3-6)

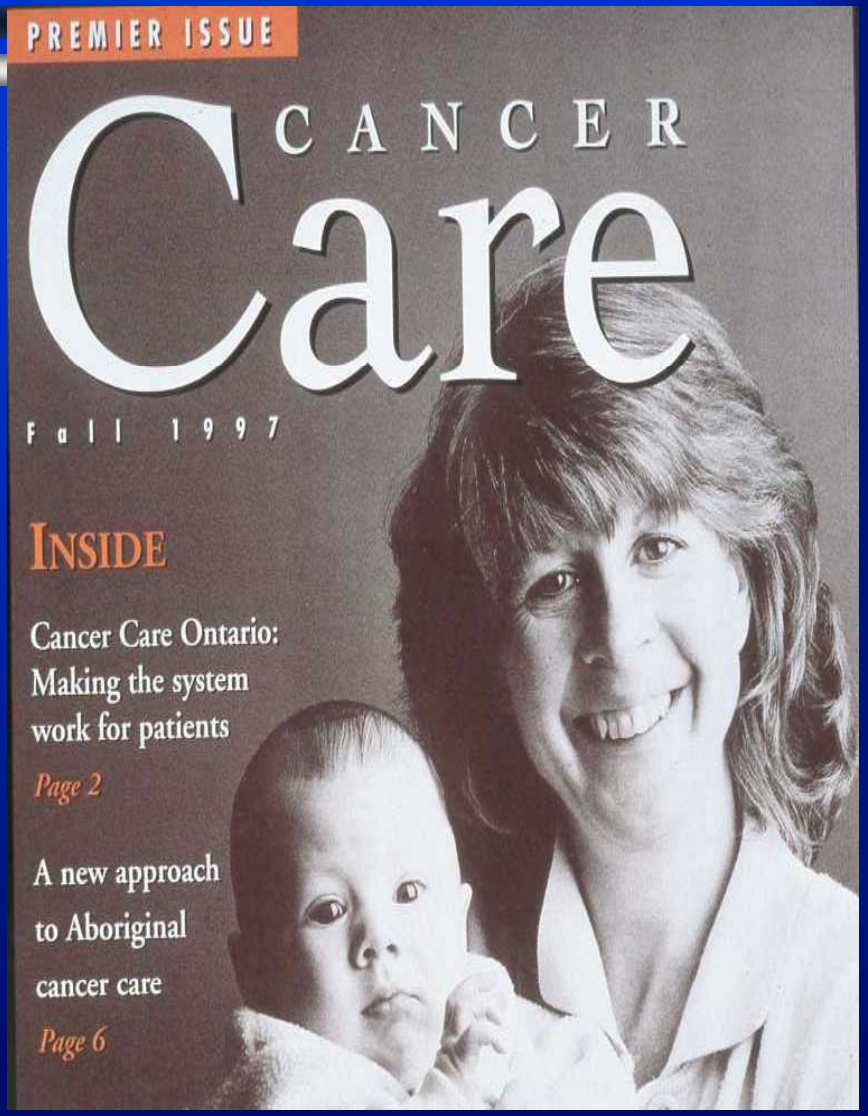
Abu-Rustum et al, Gyn Oncol 2008

PREGNANCY AND RADICAL TRACHELECTOMY

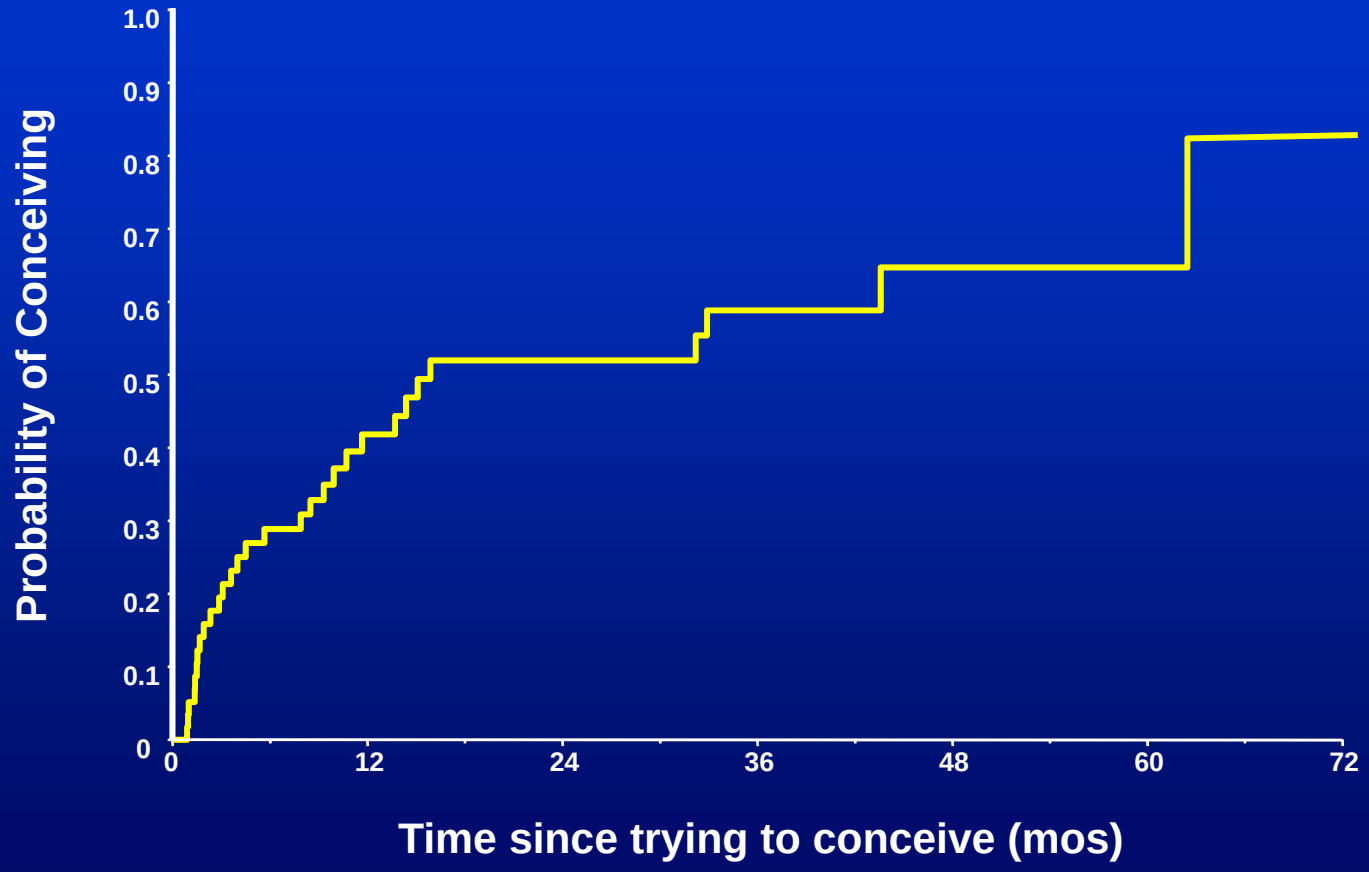
- **Number of pregnancies after trachelectomy few ~200 reported**
- **Fertility rate post trachelectomy unknown**
- **Outcomes of pregnancies not well characterized**
- **Optimal method of management of pregnancies unknown**

FERTILITY

- 76 patients have/are attempting conception for a median of 12 mos (range 1.0-88.0)
- 59 pregnancies have occurred in 39 patients (median time 6 mos)
- 67% of the pregnant patients- nulligravid at time of trachelectomy



ACTUARIAL CONCEPTION RATE



LITERATURE

Beiner and Covens, Nature Clin Prac Oncol 4:353-361, 2007

	Toronto	Lyon	Quebec City	London	NYC	Ger
Preg	59	56	87	55	11	18
SA	15%	16%	20%	25%	27%	5%
T2 Loss	7%	14%	4%	13%	1	0
T3						67%
24-32	18%	6%	5%	29%	0	
33-36	18%	9%	14%	43%	0	
≥37	63%	85%	81%	29%	100%	

CONCLUSIONS

1) RVT+ LSLND is feasible and safe to perform

2) Blood loss, transfusion rates, hospital stay and time to normal urine residual are significantly decreased with RVT+ LSLND

3) No difference in recurrence-free survival noted in comparison to radical hysterectomy

4) Fertility rate appears to be lower than general population

CONCLUSIONS

Bernardini M et al. Am J Obstet Gynecol 189: 1378–1382, 2003

5) First Trimester spontaneous abortion rate- 14%, likely no different than expected

6) Premature Delivery is very high, most due to Preterm/Premature ROM- 33% (may be high secondary to 2 sets of twins)

7) Twin Pregnancies are associated with high rate of extreme prematurity, and may be deleterious after this procedure

8) These pregnancies are high risk, and should be managed by obstetricians/teams familiar with such

CONCLUSIONS

- This procedure has become an acceptable alternative to radical hysterectomy for patients with small carcinomas of the cervix wishing preservation of fertility

THE FUTURE

- wide conization + sentinel lymph node dissection?