

Conservative surgery in early-stage cervical cancer

Dr Marie Plante

Gynecologic Oncologist

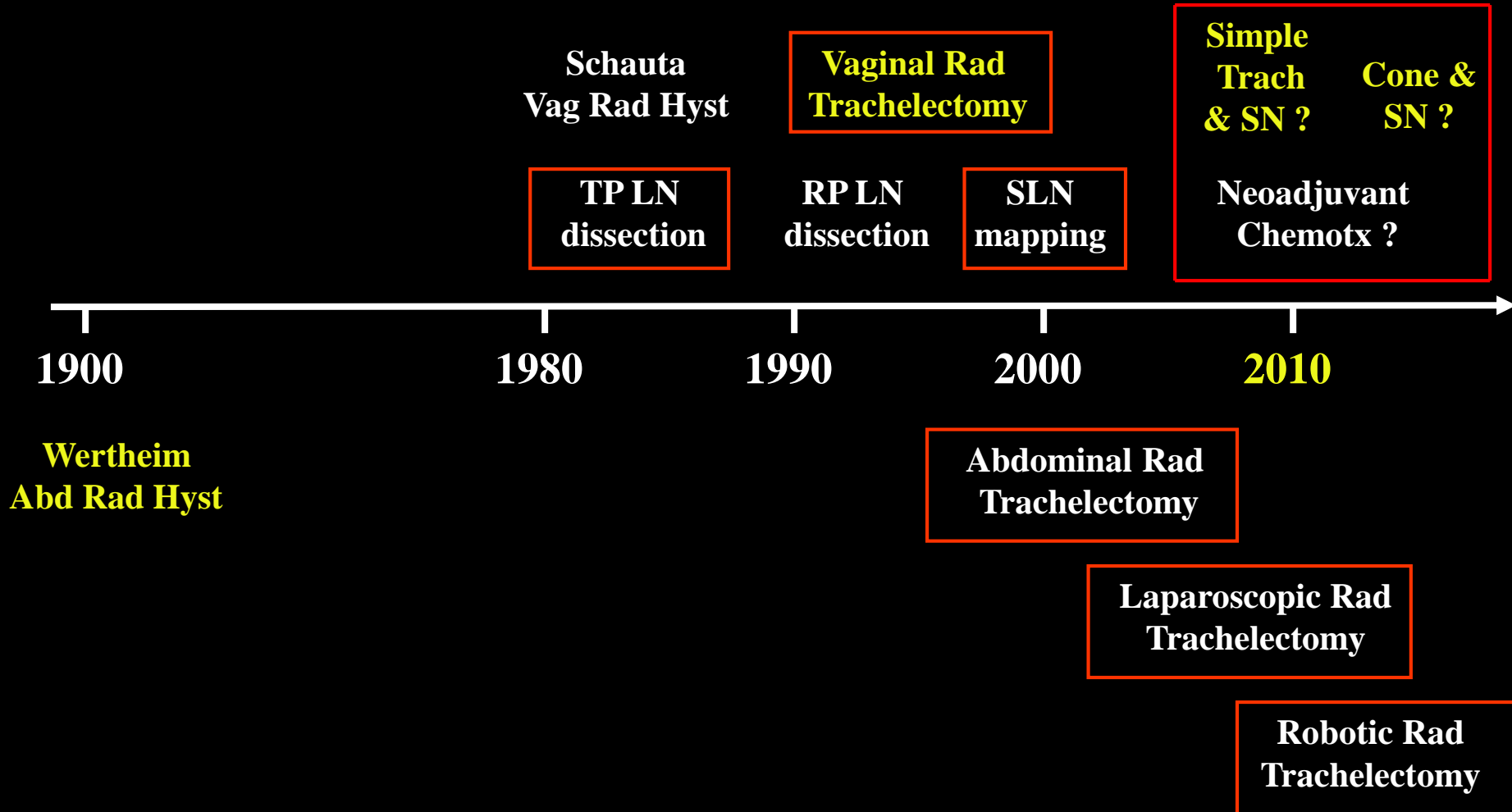
Full Professor

L'Hôtel-Dieu de Québec

Université Laval, Canada

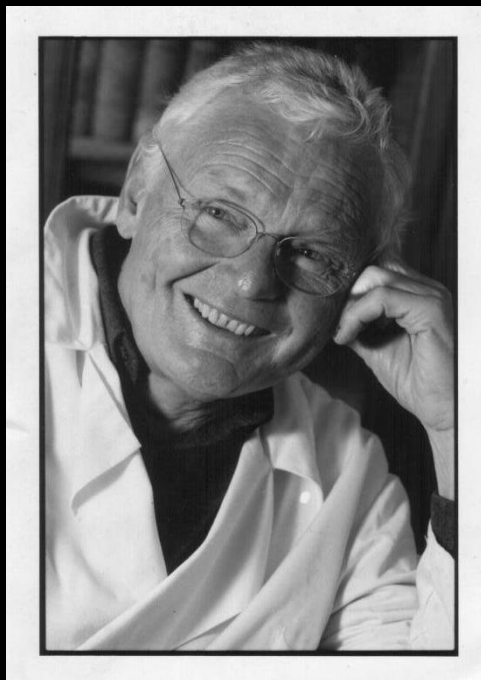
Cervix Cancer Education Symposium, February 2018

Evolution in the management of cervical cancer



Radical Trachelectomy

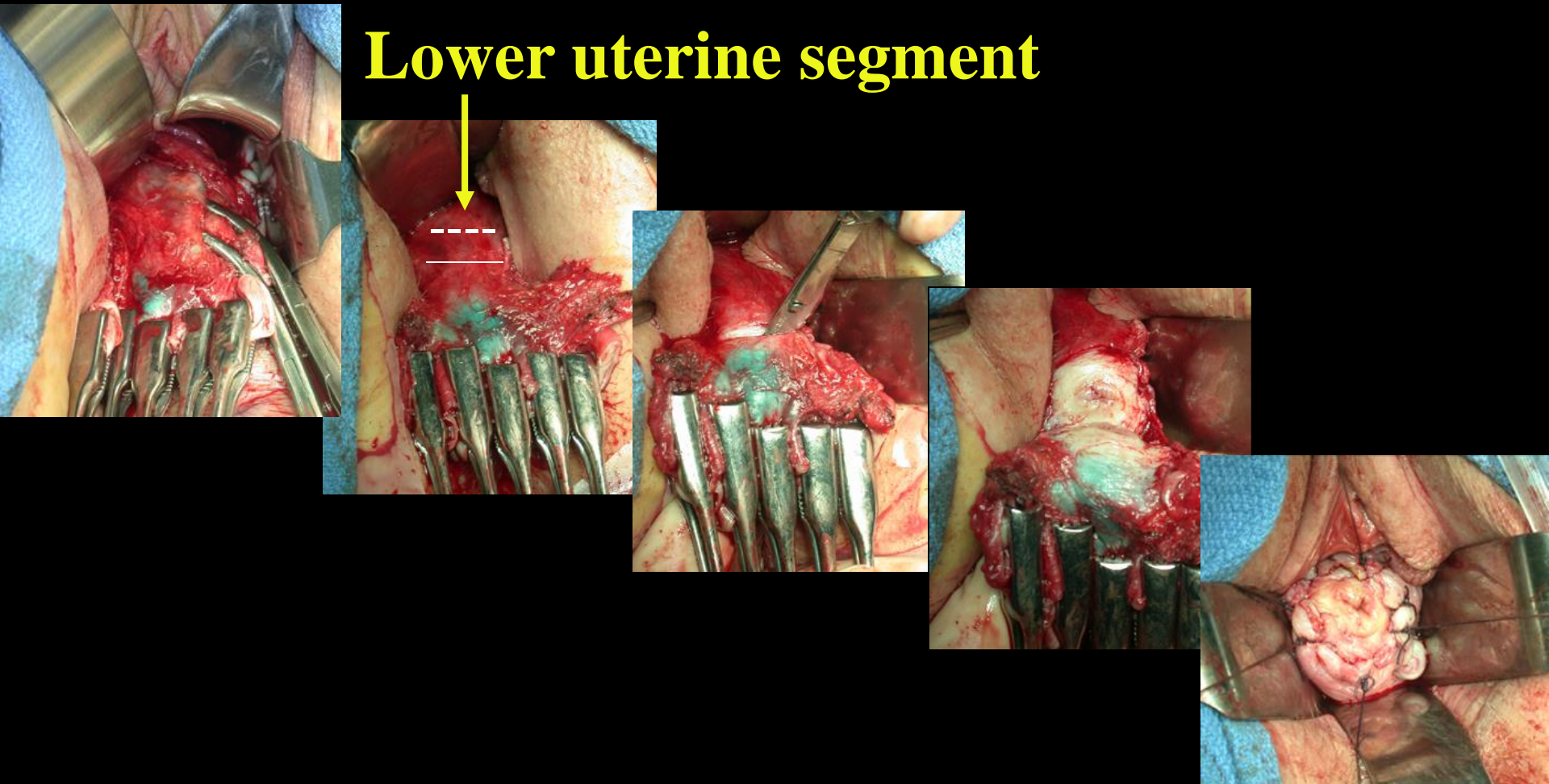
✧ VAGINAL approach



Professor Daniel Dargent

Radical Vaginal Trachelectomy

Lower uterine segment



Abdominal Trachelectomy

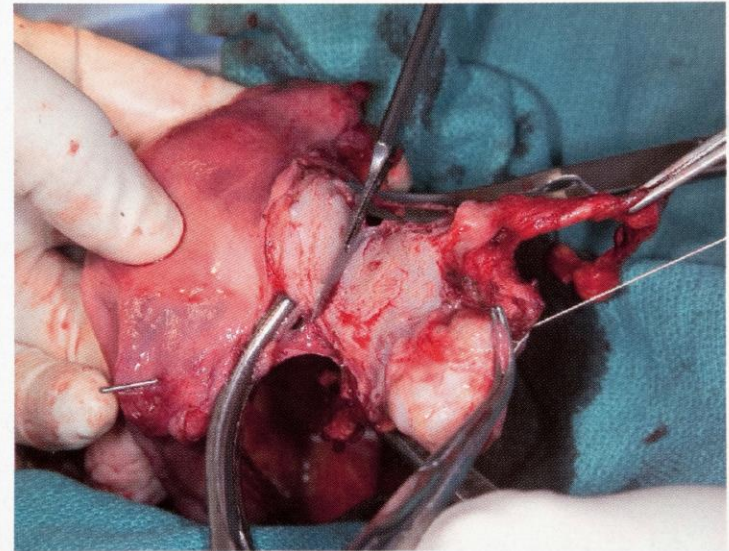
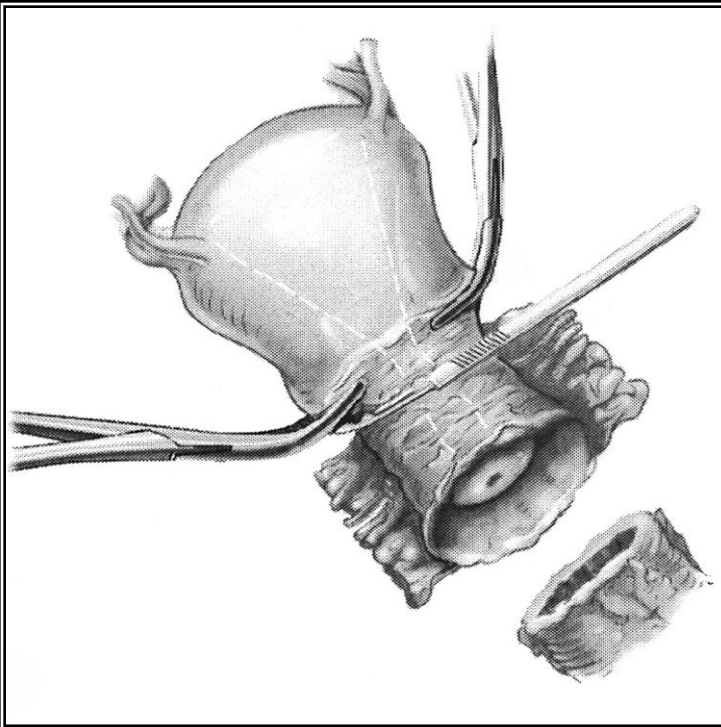


Fig. 5. The radical abdominal trachelectomy incision is done at or just below the internal os, ideally preserving 5 mm or so of upper endocervix (patient has a right-sided paracervical myoma removed with the trachelectomy).

Abdominal Trachelectomy

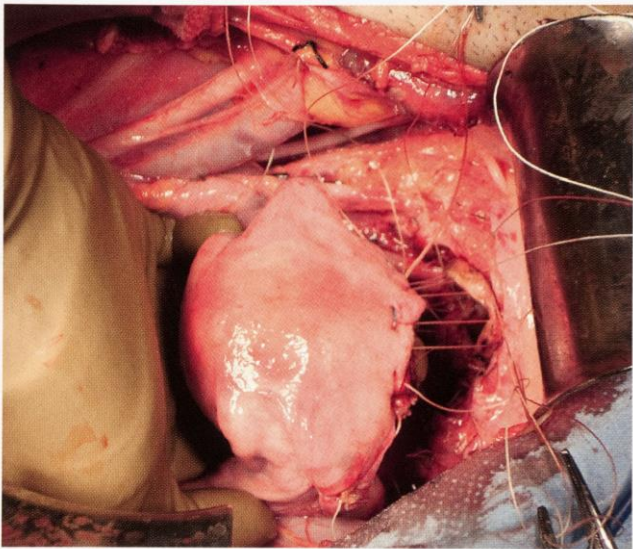


Fig. 10. The uterine fundus is reattached to the vaginal apex with 6–8 interrupted #2-0 absorbable sutures.

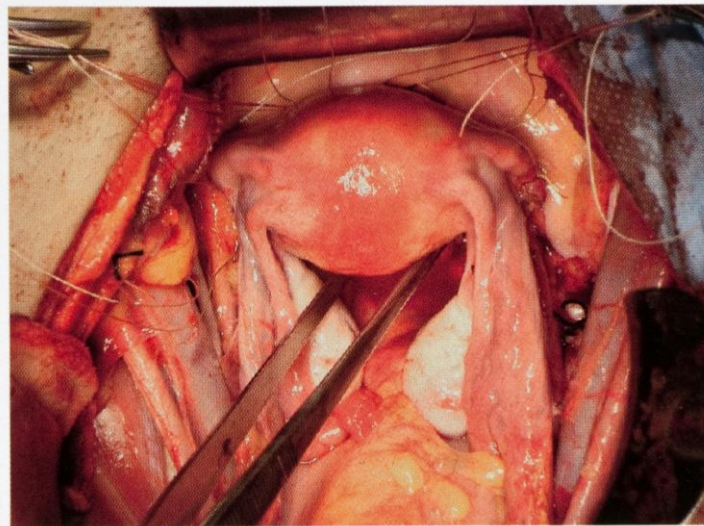


Fig. 11. The reconstructed fundus with remaining blood supply from the intact utero-ovarian ligaments—uterine serosa without evidence of fundal ischemia.

Abdominal Trachelectomy

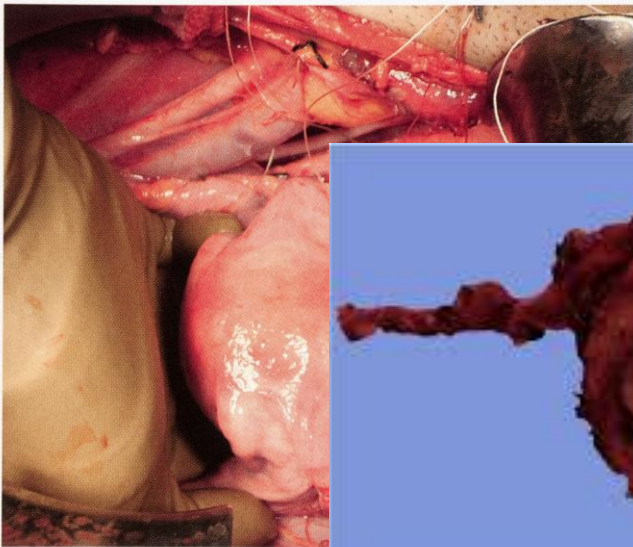


Fig. 10. The uterine fundus is reattached to the vaginal apex with 6–8 interrupted #2-0 absorbable sutures.

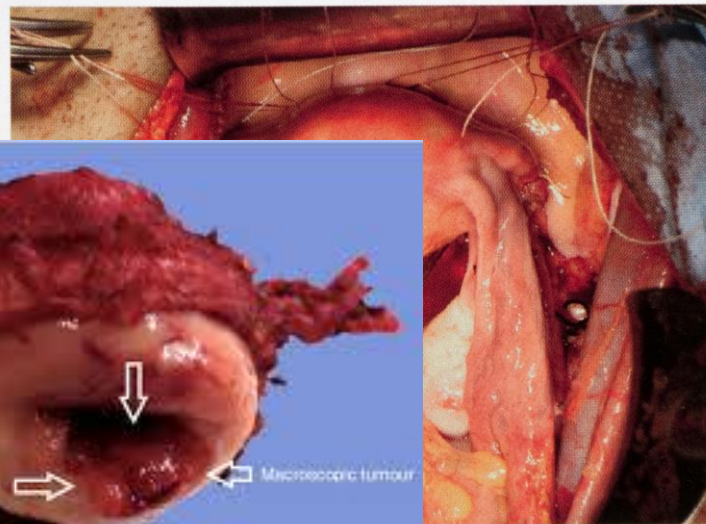
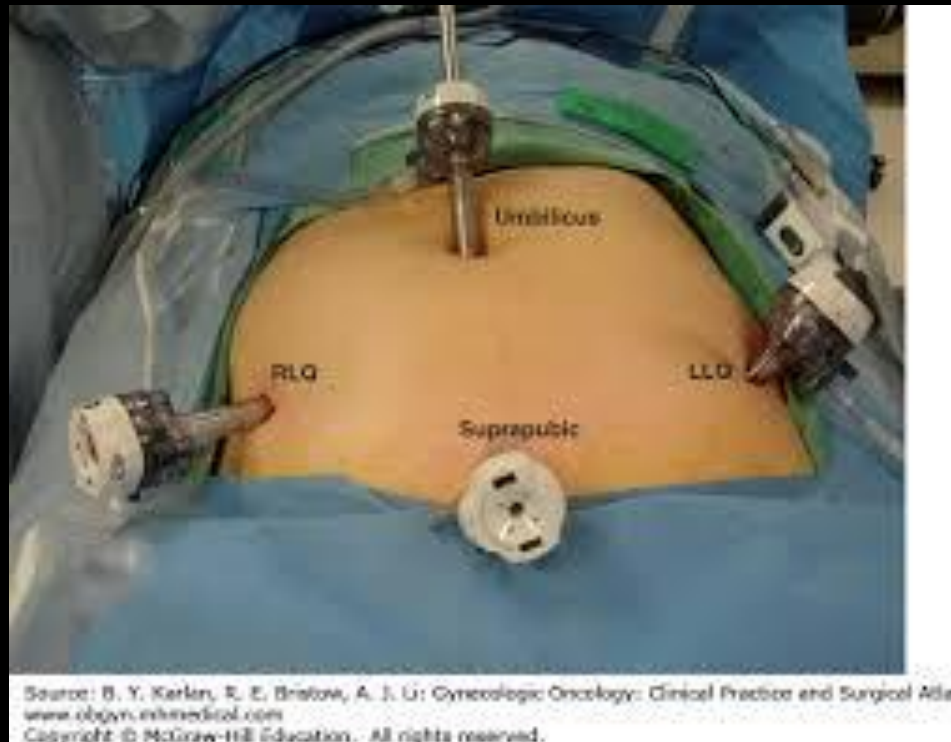


Fig. 11. The reconstructed fundus with remaining blood supply from the intact utero-ovarian ligaments—uterine serosa without evidence of fundal ischemia.

Laparoscopic Trachelectomy



Robotic Trachelectomy

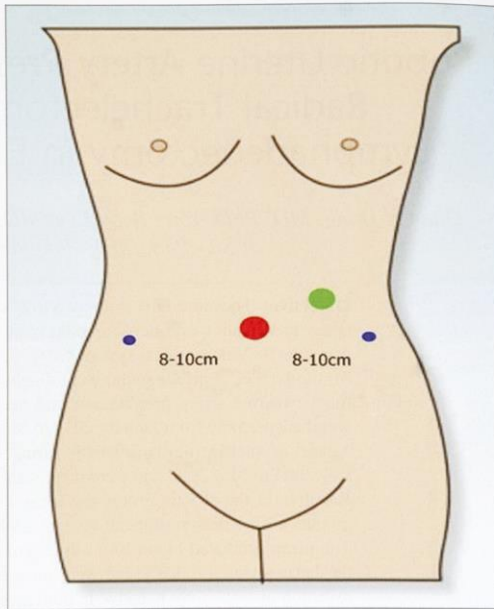
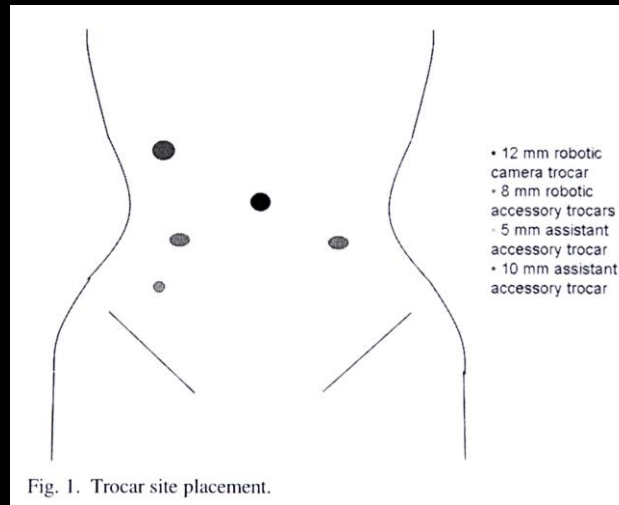


FIGURE 1. da Vinci port replacement: the 12-mm primary trocar for the camera was placed in the umbilicus, and the 8-mm trocars were placed 8 to 10 cm laterally to the umbilicus for the 2 robotic arms. The accessory 12-mm trocar was placed in the left upper quadrant.

Hong 2010



Chuang 2008



Fig. 2. Placement of trocars and instruments during robot-assisted abdominal radical trachelectomy. 1: Robot ("Monopolar curved scissors", "Permanent cautery spatula", "Large needle driver"). 2: Robot ("PK dissecting forceps"). 3: Robot ("Cadiere Forceps"). 4: Assistant trocar, 15 mm (retrieval of nodes, grasper). 5: Assistant trocar, 12 mm (grasper, suction-irrigation). 6: Optics trocar.

Persson 2008

Oncological outcomes after fertility-sparing surgery for cervical cancer: a systematic review



Enrica Bentivegna, Sebastien Gouy, Amandine Maulard, Cyrus Chargari, Alexandra Leary, Philippe Morice

159 studies
3098 patients

	Dargent's procedure	Abdominal radical trachelectomy		
		Laparotomic	Laparoscopic	Robot-assisted
Series and case reports				
Number series or case reports*	21	28	18	9
Number of patients	1523	866	252	101
Patients excluded†	159	206	14	12
Tumour characteristics				
Stage‡				
IA	316	153	55	25
IB1				
All	1065	559	215	54
>2 cm	At least 84	At least 167	At least 42	Unknown
IB2	3	19	2	1
IIA	9	4	1	0
Tumour type				
Squamous-cell carcinoma	892	549	167	37
Adenocarcinoma	432	168	50	29
Other, mixed, or unknown	199	44	35	35
LVSI positive	401	At least 198	At least 52	At least 5
Oncological outcomes				
Recurrent disease	58 3.8%	31 3.6%	15 6.0%	2
Died from disease	24	9	3	0

Oncological outcomes after fertility-sparing surgery for cervical cancer: a systematic review

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		Dargent's procedure	Abdominal radical trachelectomy		
		Laparotomic	Laparoscopic	Robot-assisted	
Series and case reports					
Number series or case reports*	21	28	18	9	
Number of patients	1523	866	252	101	
Patients excluded†	159	206	14	12	
Fertility outcomes					
Pregnancies	487	175	55	20	
Fetal loss (trimester 1 or 2)	103	37	16	2	
Preterm delivery	104	21	19	5	
Pregnancy rate¶	216/343 (63%)	114/235 (49%)	25/52 (48%)	17/21 (81%)	



The vaginal radical trachelectomy: An update of a series of 125 cases and 106 pregnancies

Marie Plante*, Jean Gregoire, Marie-Claude Renaud, Michel Roy

Recurrences: 6/125 (4.8%)

Deaths: 2/110 (1.6%)

Risk factor associated with recurrence

Size of the lesion > 2 cm (p=0.001)

- 10% of ptes had lesions > 2 cm
- Represent **50%** of the recurrences



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Vaginal Radical Trachelectomy for early stage cervical cancer. Results of the **Danish** National Single Center Strategy

L. Hauerberg^{a,*}, C. Høgdall^a, A. Loft^b, C. Ottosen^a, S.F. Bjoern^a, B.J. Mosgaard^a, L. Nedergaard^c, H. Lajer^a

N=120

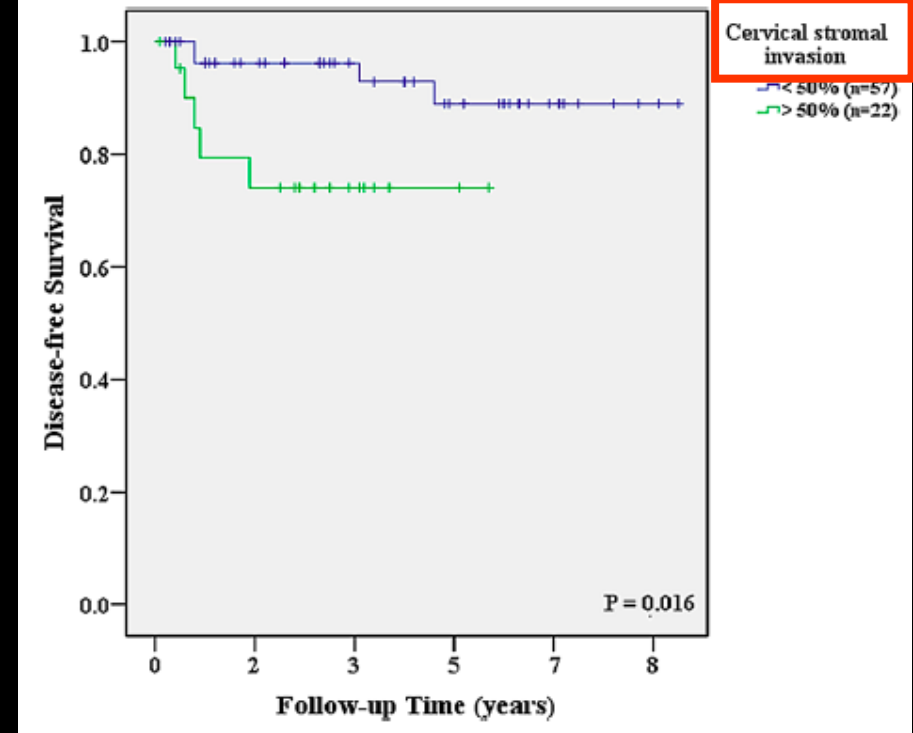
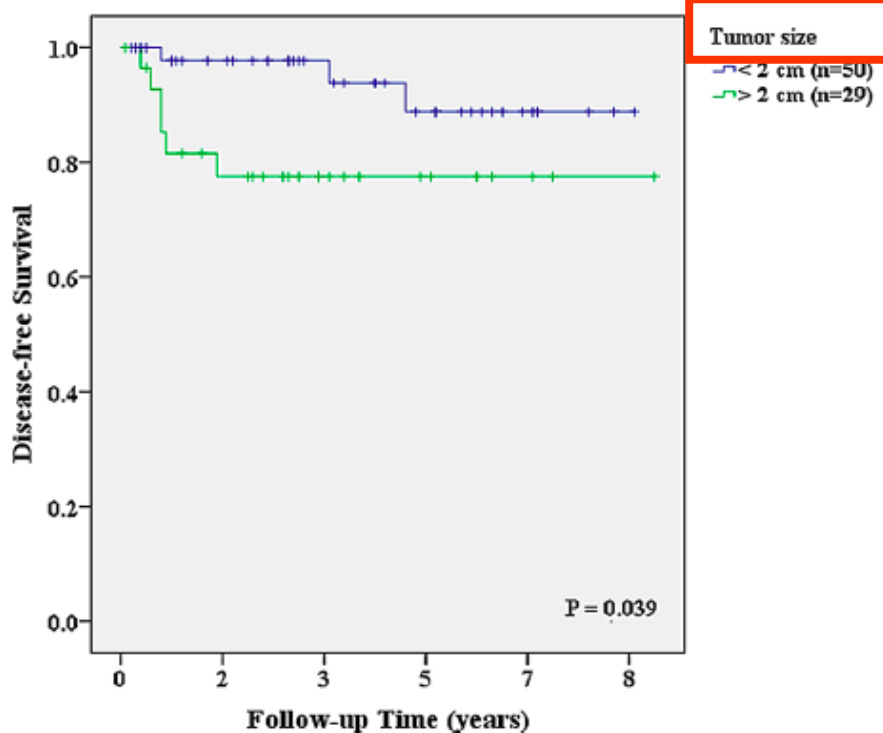
6 recurrences (5.1%); 2 deaths (1.7%)

7 patients had lesions >2 cm (5.8 %)

3 recurrences (50%)

Long-Term Outcomes After Fertility-Sparing **Laparoscopic** Radical Trachelectomy in Young Women With Early-Stage Cervical Cancer: An Asan Gynecologic Cancer Group (AGCG) Study

JEONG-YEOL PARK, MD, PhD,¹ WON DEOK JOO, MD, PhD,² SUK-JOON CHANG, MD, PhD,³
DAE-YEON KIM, MD, PhD,¹ JONG-HYEOK KIM, MD, PhD,¹ YONG-MAN KIM, MD, PhD,¹
YOUNG-TAK KIM, MD, PhD,¹ AND JOO-HYUN NAM, MD, PhD^{1*}



Intention-to-Treat Analysis of Radical Trachelectomy for Early-Stage Cervical Cancer With Special Reference to Oncologic Failures

Single-Institutional Experience in Hungary

Robert Póka, MD, PhD, Szabolcs Molnár, MD, Péter Daragó, MD, János Lukács, MD, Rudolf Lampé, MD, PhD, Zoárd Krasznai, MD, PhD, and Zoltán Hernádi, MD, PhD

N=24, 15 VRT, 9 ART

TABLE 4. Cases who died of their disease following initial RT

Patient	Age, y	Stage	Therapy	Tumor Size, mm	Histology	Grade	Stromal Invasion, mm	LVSI	Nodes +/- Total	Follow-up, mo
1	26	1B1	ART + PLDN, local and distant recurrence at 1 y	14 × 12 × 10	Adeno with clear cell elements	3	10	0	0/19	28
2	30	1B2	3 BIP NACT, ART + PLDN, CDDP + VEP for pelvic wall and distant recurrence at 3/12	30 × 20 × 20	Squamous with neuroendocrine elements	3	10	1 + V1	0/12	16
3	34	1B1	ART, conversion to WM, chemoradiotherapy, pelvic side wall recurrence at 7 mo	25 × 20 × 15	Squamous	3	3/3	1 + V1	1/14	29
4	39	IIA1	VRT + LSC PLDN, brachytherapy, WM, chemoradiotherapy, pulmonary recurrence at 58 mo, 6 TC	40 × 40 × 40	Squamous	3	3/3	1	1/16	121

Most cases of oncologically insufficient trachelectomies including those with fatal outcome RT were converted to radical abdominal hysterectomy during the primary intervention. After these operations, additional treatment modalities were also required. Poor prognostic factors could be identified in all cases.

BIP, bleomycin-ifosfamide-cisplatin; CDDP, cisplatin; VEP, vepesid; WM, radical abdominal hysterectomy; TC, taxol-cisplatin.

Radical Trachelectomy

- ∞ Careful patient selection

 - ∞ **SIZE** of the lesion

 - ∞ Most important prognostic factor

- ∞ Meticulous preoperative evaluation: critical

 - ∞ **MRI**: high quality

 - ∞ **Pathology review**: expert pathologist

Radical Trachelectomy

- **Considerable evolution** in the radical trachelectomy technique (last 30 years)
- **« Proof of concept »**
- Radical Trachelectomy now considered **« standard of care »** in young women who wish to preserve fertility



CLINICAL STAGE^b

PRIMARY TREATMENT (FERTILITY SPARING)^e

Stage IA1
(no lymphovascular
space invasion
[LVSI])

Cone biopsy^f with negative margins^g
(preferably a non-fragmented specimen with 3-mm negative margins^g)
(If positive margins, repeat cone biopsy or perform trachelectomy)

[See Surveillance \(CERV-10\)](#)

Stage IA1
(with LVSI)
and
Stage IA2

Cone biopsy^f with negative margins^g
(preferably a non-fragmented specimen with 3-mm negative margins^g)
(if positive margins, repeat cone biopsy or perform trachelectomy)
+ pelvic lymph node dissection
± para-aortic lymph node sampling (category 2B)
(Consider sentinel lymph node [SLN] mapping)^h
or
Radical trachelectomy + pelvic lymph node dissection^h
~~± para-aortic lymph node sampling [category 2B]~~
(Consider SLN mapping)^h

[See Surveillance \(CERV-10\)](#)

Stage IB1^d

~~Radical trachelectomy~~
~~+ pelvic lymph node dissection^h~~
± para-aortic lymph node sampling
(Consider SLN mapping)^{h,i}

[See Surveillance \(CERV-10\)](#)

^b[See Principles of Imaging \(CERV-A\).](#)

^dFertility-sparing surgery for stage IB1 has been most validated for tumors ≤2 cm. Small cell neuroendocrine histology and adenoma malignum are not considered suitable tumors for this procedure.

^eNo data to support a fertility-sparing approach in small neuroendocrine tumors, gastric type adenocarcinoma, or adenoma malignum (also known as minimal deviation adenocarcinoma). Total hysterectomy after completion of childbearing is at the patient's and surgeon's discretion, but is strongly advised in women with continued abnormal pap smears or chronic persistent HPV infection.

^fCold knife conization (CKC) is the preferred method of diagnostic excision, but loop electrosurgical excision procedure (LEEP) is acceptable, provided adequate margins and proper orientation are obtained. Endocervical curettage (ECC) may be added as clinically indicated.

^gNegative for invasive disease or histologic high-grade squamous intraepithelial lesion (HSIL) at margins.

^h[See Principles of Evaluation and Surgical Staging \(CERV-B\).](#)

ⁱFor SLN mapping, the best detection rates and mapping results are in tumors <2 cm.

Note: All recommendations are category 2A unless otherwise indicated.

Clinical Trials: NCCN believes that the best management of any patient with cancer is in a clinical trial. Participation in clinical trials is especially encouraged.

Radical Trachelectomy

⌘ Is radical surgery necessary in low risk small volume disease (< 2 cm) ?

Less radical surgery

Table 2

Carcinoma of the cervix uteri.

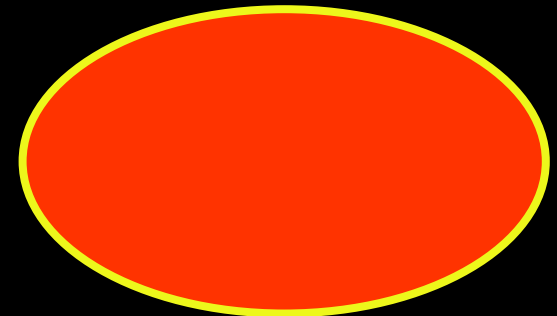
Stage I	The carcinoma is strictly confined to the cervix (extension to the corpus would be disregarded)
IA	Invasive carcinoma which can be diagnosed only by microscopy, with deepest invasion ≤ 5 mm and largest extension ≥ 7 mm
IA1	Measured stromal invasion of ≤ 3.0 mm in depth and extension of ≤ 7.0 mm
IA2	Measured stromal invasion of > 3.0 mm and not > 5.0 mm with an extension of not > 7.0 mm
IB	Clinically visible lesions limited to the cervix uteri or pre-clinical cancers greater than stage IA *

IB1 Clinically visible lesion ≤ 4.0 cm in greatest dimension

	the lower third of the vagina
IIA	Without parametrial invasion
IIA1	Clinically visible lesion ≤ 4.0 cm in greatest dimension
IIA2	Clinically visible lesion > 4 cm in greatest dimension
IIB	With obvious parametrial invasion
Stage III	The tumor extends to the pelvic wall and/or involves lower third of the vagina and/or causes hydronephrosis or non-functioning kidney **
IIIA	Tumor involves lower third of the vagina, with no extension to the pelvic wall
IIIB	Extension to the pelvic wall and/or hydronephrosis or non-functioning kidney
Stage IV	The carcinoma has extended beyond the true pelvis or has involved (biopsy proven) the mucosa of the bladder or rectum. A bullous edema, as such, does not permit a case to be allotted to Stage IV
IVA	Spread of the growth to adjacent organs
IVB	Spread to distant organs



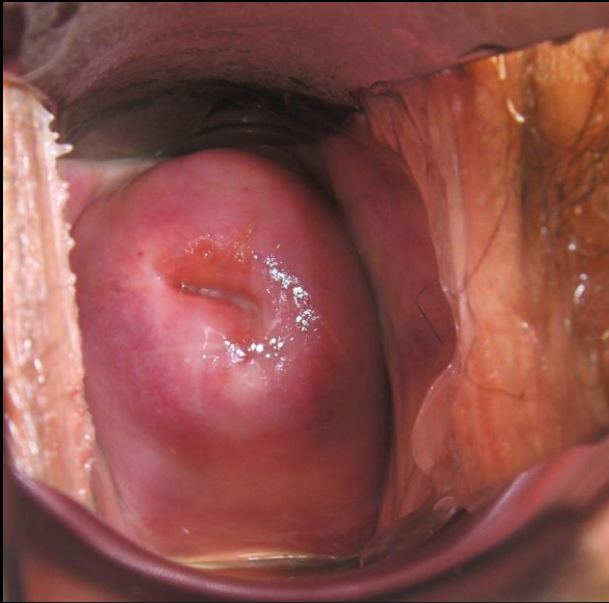
IA2



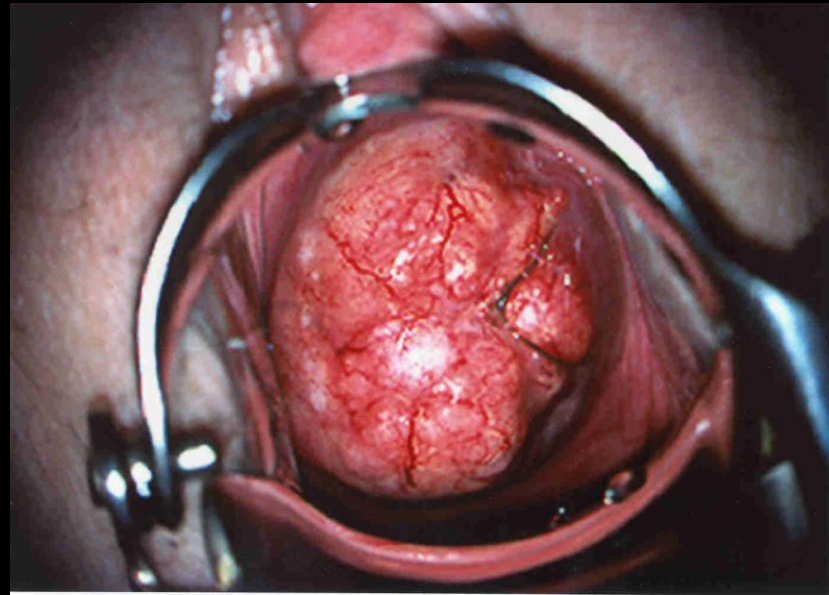
IB1

FIGO Staging

Less radical surgery



IA2



IB1, 3 cm

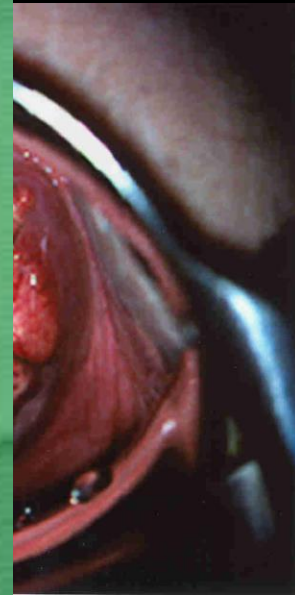
Less radical surgery



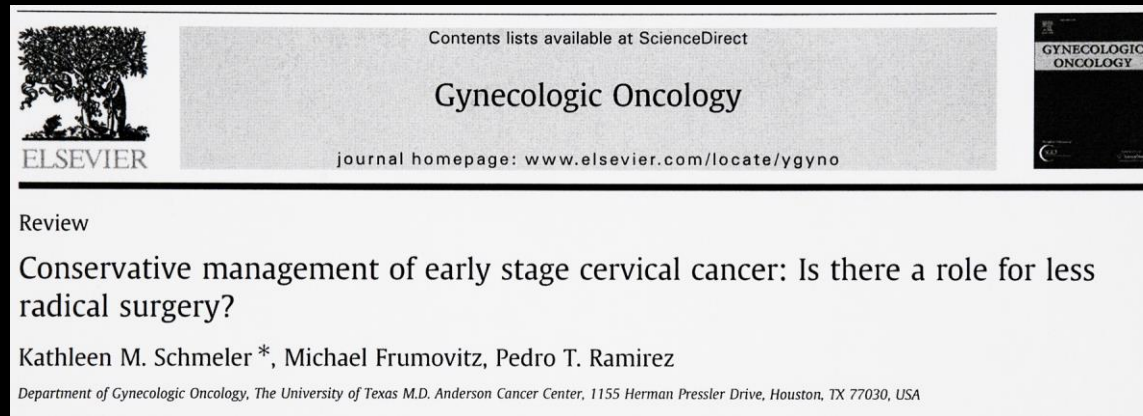
IA2



IB1, 3 cm



Less radical surgery



Review

Conservative management of early stage cervical cancer: Is there a role for less radical surgery?

Kathleen M. Schmeler *, Michael Frumovitz, Pedro T. Ramirez

Department of Gynecologic Oncology, The University of Texas M.D. Anderson Cancer Center, 1155 Herman Pressler Drive, Houston, TX 77030, USA

Author	Year	Low-risk criteria	N	Parametrial involvement in low-risk group (%)
Kinney [13]	1995	Squamous histology only, tumor <2 cm, no LVSI*	83	0.0%
Covens [14]	2002	All histologies, tumor <2 cm, DOI** <10 mm, negative pelvic lymph nodes	536	0.6%
Stegeman [15]	2007	Squamous, adenocarcinoma, adenosquamous or clear cell histology, tumor <2 cm, DOI** <10 mm, no LVSI*, negative pelvic lymph nodes	103	0.0%
Wright [16]	2008	All histologies, tumor <2 cm, no LVSI*, negative pelvic lymph nodes	270	0.4%
Frumovitz [19]	2009	Squamous, adenocarcinoma or adenosquamous histology, tumor <2 cm, no LVSI*	125	0.0%

*LVSI: lymphovascular space involvement

**DOI: depth of invasion

All retrospective data

N=1117 < 1%

Risk of Parametrial Spread in Small Stage I Cervical Carcinoma

*Pathology Review of 223 Cases With a Tumor Diameter
of 20 mm or Less*

Boris Vranes, MD, Svetlana Milenkovic, MD,† Milos Radojevic, MD,* Ivan Soldatovic, MD,‡
and Vesna Kesic, MD, PhD**

Conclusions: Our data show a risk of parametrial spread of 0.45% for tumors less than 20 mm in diameter, no LVSI, and a depth of invasion within the inner third.

Less radical surgery

∞ All retrospective data

∞ No prospective randomized trials

The **SHAPE** Trial

Comparing **radical hysterectomy** and pelvic node dissection against **simple hysterectomy** and pelvic node dissection in patients with **low risk cervical cancer**

Chair: Marie Plante

Laval University, Quebec City

A **CCTG** Clinical Trials Group proposal for the
Gynecological Cancer Inter Group (**GCIIG**)

Trial Schema

Low-risk cervical cancer as defined by:

- squamous cell, adenocarcinoma, adenosquamous carcinoma
- Stage **IA2** and modified **IB1**
- < 10mm stromal invasion on LEEP/cone
- < 50% stromal invasion on MRI
- max dimension of **≤ 20 mm**
- Grade 1-3 or not assessable

R
A
N
D
O
M
I
Z
E

↗

↘

ARM 1 (Control)
Radical Hysterectomy*

Arm 2 (Experimental)
Simple Hysterectomy*

→ → Pelvic relapse

* Regardless of treatment assignment, surgery will include pelvic lymph node dissection with optional sentinel lymph node (SN) mapping. If SN mapping is to be done, the mode is optional, but the laparoscopic approach is preferred.

Planned sample size: **700** (non-inferiority at 0.05 level with 80% power)

Less radical surgery

⌘ Perhaps **radical surgery is NOT necessary** is small volume lesions...



Less radical surgery

≈ Simple Trachelectomy / Cone

Types of fertility sparing surgery

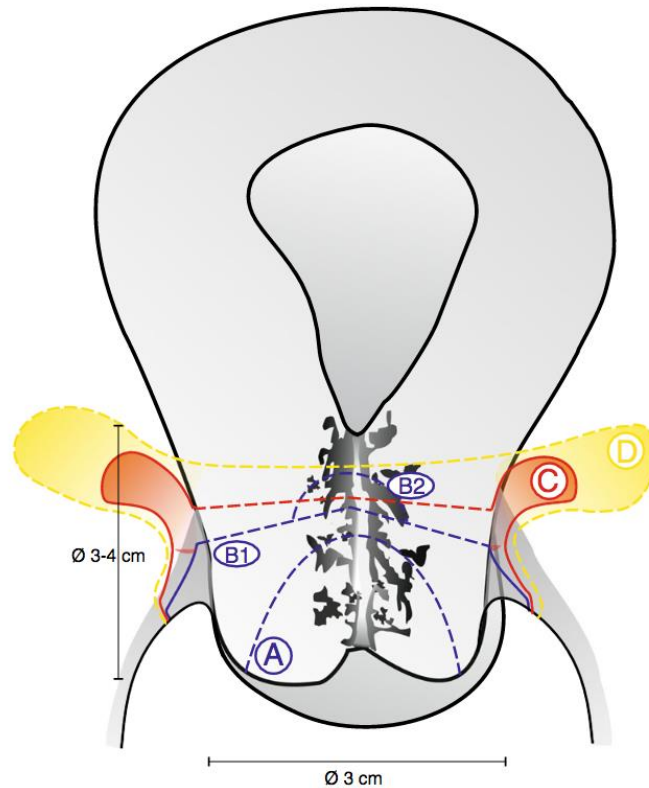
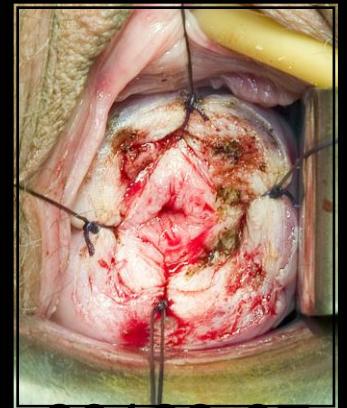


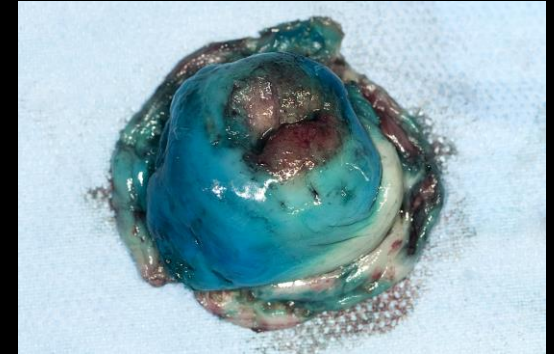
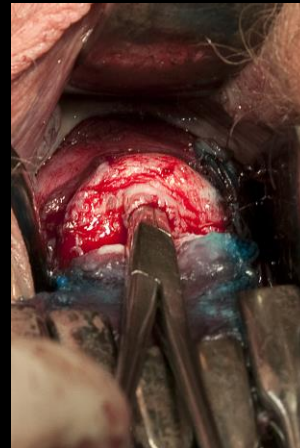
Fig. 1 Types of fertility-sparing surgery: *A* large cone, *B1* simple trachelectomy, *B2* endocervical loop, *C* vaginal radical trachelectomy and *D* abdominal radical trachelectomy or laparoscopic radical trachelectomy

Simple trachelectomy



25 year old woman G0
Very early cervical cancer
Minimal endocervical involvement

Simple trachelectomy



Simple Vaginal Trachelectomy

A Valuable Fertility-Preserving Option in Early-Stage Cervical Cancer

Marie Plante, MD, Marie-Claude Renaud, MD, Alexandra Sebastianelli, MD, and Jean Gregoire, MD

N=35

Nodes : negative except 2 with ITC

2/3 had NRD or in situ disease only

1 recurrence & death

25 pregnancies

72% delivered > 36 weeks

Oncological outcomes after fertility-sparing surgery for cervical cancer: a systematic review

Enrica Bentivegna, Sebastien Gouy, Amandine Maulard, Cyrus Chargari, Alexandra Leary, Philippe Morice

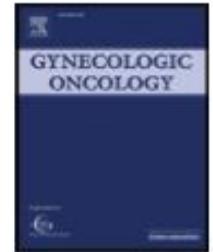
Simple trachelectomy or cone resection	
Series and case reports	
Number series or case reports*	13
Number of patients	242
Patients excluded†	12
Tumour characteristics	
Stage‡	
IA	Not included
IB1	
All	228
>2 cm	0
IB2	0
IIA	0
Tumour type	
Squamous-cell carcinoma	60
Adenocarcinoma	25
Other, mixed, or unknown	157
LVI positive	At least 71
Oncological outcomes	
Recurrent disease	4
Died from disease	0
Fertility outcomes	
Pregnancies	105
Fetal loss (trimester 1 or 2)	15
Preterm delivery	13
Pregnancy rate¶	15/26 (57%)



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Review

Management of low-risk early-stage cervical cancer: Should conization, simple trachelectomy, or simple hysterectomy replace radical surgery as the new standard of care? ☆

Pedro T. Ramirez ^{a,*}, Rene Pareja ^b, Gabriel J. Rendón ^b, Carlos Millan ^c,
Michael Frumovitz ^a, Kathleen M. Schmeler ^a

^a Department of Gynecologic Oncology and Reproductive Medicine, The University of Texas MD Anderson Cancer Center, Houston, TX 77030, USA

^b Department of Gynecologic Oncology, Instituto de Cancerología Las Américas, Medellín, Colombia

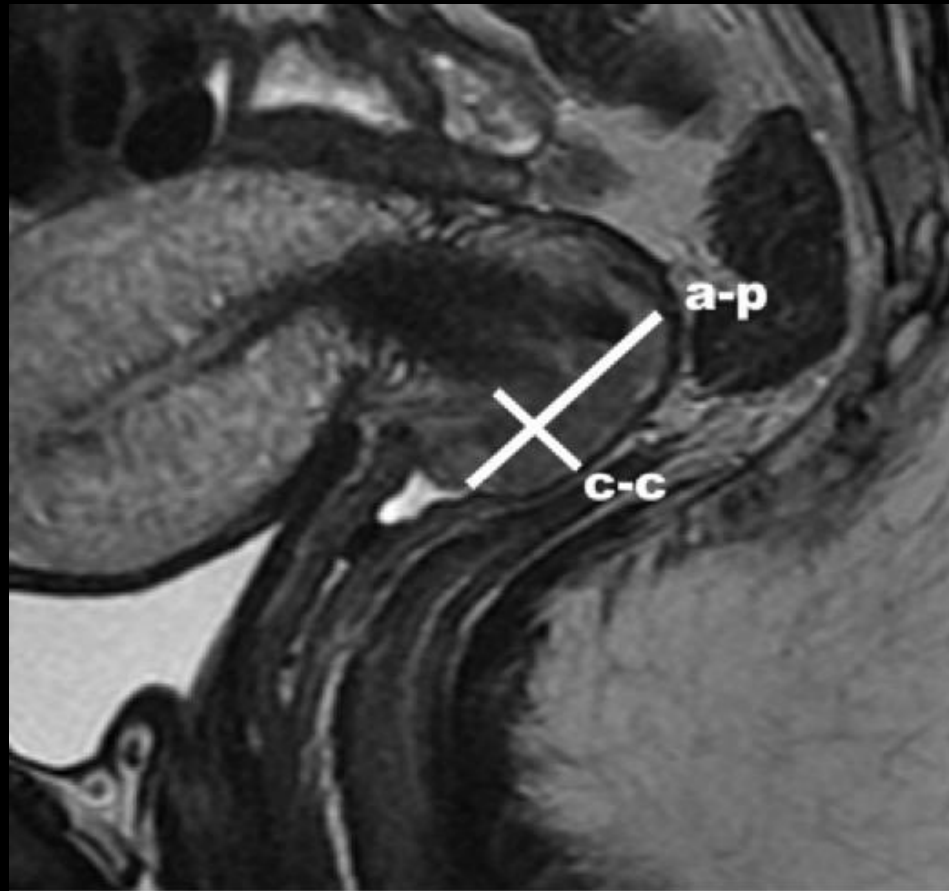
^c Department of Gynecology, Hospital Quiron, Murcia, Spain

Less radical surgery

∞ Meticulous/careful **patient selection** is of utmost importance

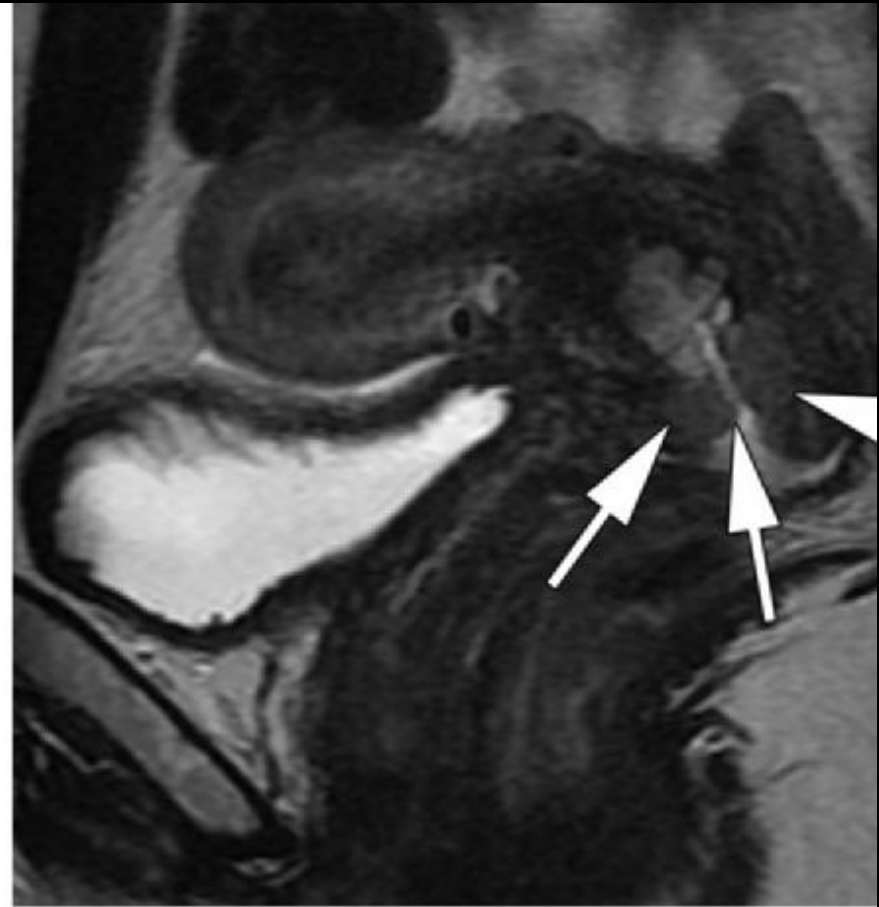
- ▣ Preoperative pelvic **MRI**
- ▣ Expert **pathology review**

Preoperative pelvic MRI



b.

Preoperative pelvic MRI



b.

Expert pathological assessment

⌘ Diagnostic LEEP and cone

- ▣ Several LEEPs...

⌘ Margins status

⌘ Several pieces

⌘ Is the lesion truly $< 2\text{cm}$ and $< 10\text{mm}$ deep ?

⌘ Danger is to perform conservative treatment in more extensive cervical cancer and end-up with cancer recurrence...

Fertility Conserving Management of Early Cervical Cancer

Our Experience of LLETZ and Pelvic Lymph Node Dissection

Rhona Lindsay, MRCOG, Kevin Burton, MD,* Smruta Shanbhag, MRCOG,*
Jenny Tolhurst, FRCPATH,† David Millan, FRCPATH,† and Nadeem Siddiqui, PhD**

43 cases
37 IB1
15 births

Conclusions: To our knowledge, this is the largest case series described and confirms the low morbidity and mortality of this procedure. However, even within our highly select group, there have been 2 cases of central recurrent disease. We, therefore, are urging caution in the global adoption of this technique and would welcome a multicenter multinational randomized controlled trial.

Conization in Early Stage Cervical Cancer

Pattern of Recurrence in a 10-Year Single-Institution Experience

Federica Tomao, PhD, MD,*† Matteo Maruccio, MD,*† Eleonora Petra Preti, MD,* Sara Boveri, MD,* Enzo Ricciardi, PhD, MD,*† Vanna Zanagnolo, MD,* and Fabio Landoni, PhD, MD*

TABLE 2. Recurrences

Patient Number	Age*	Stage*	Histotype	LVSI	DFS, mts	Site of Recurrence	Tests Positive	Treatment	Status
1	37	IA2	SCC	—	56	Cervix	SCC clinical examination biopsy	RT + BT	NED
2†	33	IB1	SCC	+	21	Cervix	Papanicolaou test biopsy	RS + CTRT + BT	NED
3	31	IB1	SCC	—	13	Cervix	Papanicolaou test biopsy	Re-coniz	NED
4	37	IB1	Adk	—	14	Cervix	HPV test Papanicolaou test biopsy, PET, MRI	Re-coniz + CTRT + BT	NED
5	24	IB1	Adk	—	22	Cervix	Papanicolaou test biopsy, PET, US, MRI	Reconiz	NED
6	34	IA2	Adenosq	—	21	Cervix	Papanicolaou test biopsy	CTRT	NED
7	34	IB1	SCC	focal	14	Pelvic lymph node	MRI, US, Biopsy	CT	ED

*After surgery she underwent adjuvant chemotherapy with carboplatin (AUC4) and paclitaxel 90 mg/mL on days 1 to 8 every 3 weeks.

†Margins of reconization were positive.

Adenosq, adenosquamous; Adk, adenocarcinoma; CT, chemotherapy; CTRT, chemoradiation; DFS, disease free survival; MRI, magnetic resonance imaging; mts, months; NED, not evident disease; RT, radiotherapy; SCC, squamous cell carcinoma; US, ultrasonographic examination.

N=54; 76% IB1

6/7 recurrence were local (cervix)



Results of less radical fertility-sparing procedures with omitted parametrectomy for cervical cancer: 5 years of experience

Jiri Slama^{a,*}, Andrej Cerny^a, Ladislav Dusek^b, Daniela Fischerova^a, Michal Zikan^a, Roman Kocian^a, Anna Germanova^a, David Cibula^a

N=44; 32 (73%) completed FSS; 9 had NAC
Simple Trach: 11 and cone: 21

Table 2
 Description of cases with recurrence. **6 recurrences (18%); 5 central; 3/9 after NAC**

Case	Age	Histotype	LVSI	Stage	Size of tumor	NAC	Type of local surgery	Type of recurrence	DFI (months)	Treatment of recurrence	Current status
1	35	SCC	No	IA2	<2 cm	no	Conization	HSIL	16	reconization	NED
2	33	SCC	No	IB1	<2 cm	no	Conization	LSIL	6	none	AWD
3	28	SCC	Yes	IB1	>2 cm	yes	Trachelectomy	Central	6	radical hysterectomy	NED
4	33	SCC	No	IB2	>2 cm	yes	Conization	Central	6	chemoradiation	NED
5	19	SCC	Yes	IB1	>2 cm	yes	Trachelectomy	Central	7	chemoradiation, chemotherapy	DOD
6	32	ADC	No	IB1	<2 cm	no	Conization	Ovarian mass	12	debulking surgery, chemotherapy	AWD

Conclusions. Nearly 27% of patients cannot complete FSS due to node positivity, progression during NAC, or involved margins. The total recurrence rate reached 18.8%, with the majority of invasive recurrences detected in patients after NAC followed by FSS. These patients represent cases at a higher risk of recurrence even if adequate free margins are reached by surgery. Nearly half of the cohort did not consider pregnancy in the near future because of personal reasons.