Laparoskopik Myomektomi, İntramural Myomlarda Laparoskopi mi ? Histeroskopi mi?

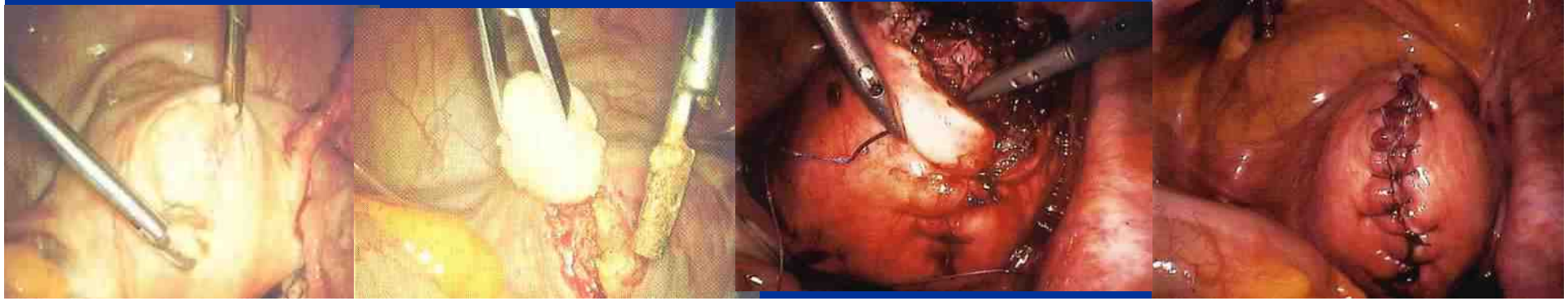
Prof.Dr.Erol TAVMERGEN

E.Ü.T.F.Kadın Hastalıkları ve Doğum ABD

E.Ü.Aile Planlaması-İnfertilite Araştırma ve Uygulama Merkezi

Bilimsel Direktörü

Bornova-İZMİR



“Since cure without deformity or loss of function must ever be surgery’s highest ideal, the general proposition that myomectomy is a greater surgical achievement than hysterectomy is incontestable”

Victor Bonney - 1931

Incidence

- Uterin myomas are the most common benign uterine tumor found in women

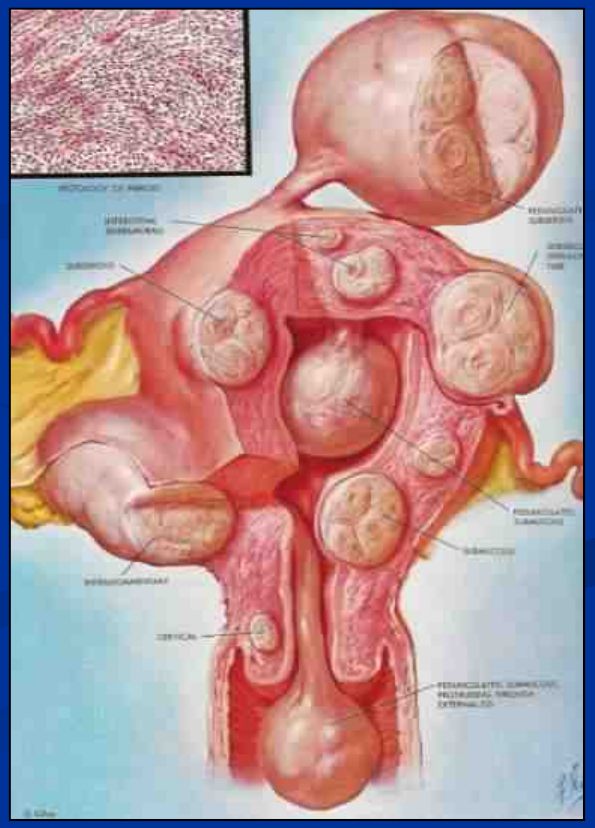
  Crammer et all 1995

- They are estimated to occur in 20-50% of women >30years
- Genetic predisposition seems to contribute to the development of myomas (black women) 3-9 times more than white women

  Wallach et all 1992

Symtoms of Myomas

- Usually asymtomatic
- Most common symptoms
  - Mass effect of the enlarged uterus on adjacent pelvic organs
  - Severity of symptoms depends on the size, position, and number of fibroids.



- Abnormal uterine bleeding
- Pelvic pain
- Dyspareunia
- Infertility
- Abortion

Myoma Uteri ve İnfertilite

- Fibroidlerin komplikasyonları;
  - Abortus oranları
  - Erken doğum eylemi
  - Ektopik gebelik
  - IUGR
  - Plasenta dekolmanı
  - Malprezantasyon
  - Distosi
  - Postpartum hemoraji

J Donnez, Hum Rep 2002

Myoma Uteri ve İnfertilite

- Myomların reprodüktif dönemde insidansı % 20-30
- İnfertilite'de fibroid insidansı %1 -2.4
  - Sperm transportu bozuklukları,
  - Artmış kavite ve uterin yüzey düzensizlikleri,
  - Endoservikal ve tuba uterina ostiumları obstrüksiyonu,
  - Prostaglandinle indüklenmiş uterin kontraksiyonlar,
  - Endometrial değişiklikler (atrofi, ülserasyon, fokal hiperplazi ve polipler),
  - Vasküler değişiklikler (venöz konjesyon, vb),
  - Anovulatuar sikluslar.

Buttram and Reiter 1981

J Donnez, Hum Rep 2002

Myomlar ve Obstetrik Sonuçlar

Kontrollara göre myomlu olgularda:

- 3.5 misli IUGR (%6.5 vs %1.9)
- 4 misli ablatio placentae (% 2.8 vs %0.7)
- 5 misli transvers/makat prez. (%16.9 vs %2.4)
- 5 misli S/C (%57.7 vs %10.8)
- %70 artmış prematürite (%9.6 vs %5.5)
- 3 misli fazla kan tranfüzyonu (%4.2 vs %1.4)

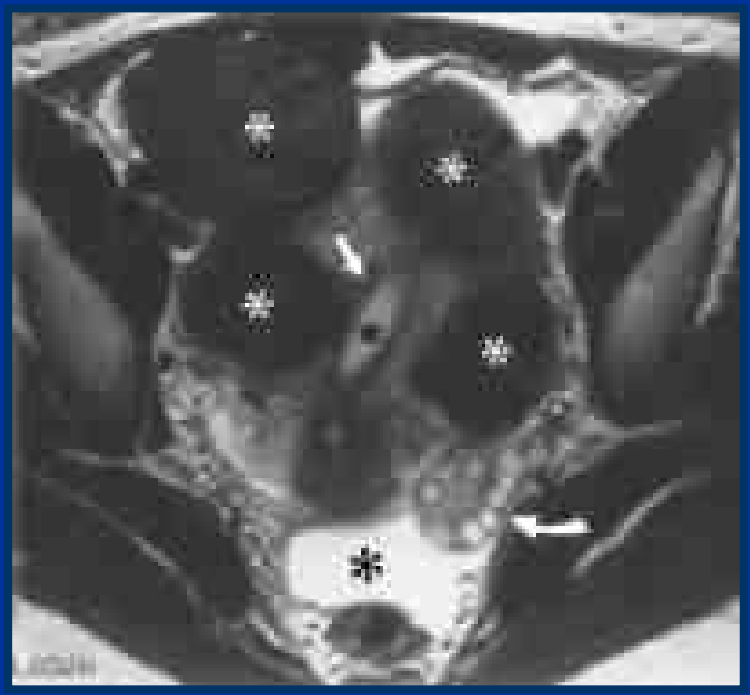
p<.001

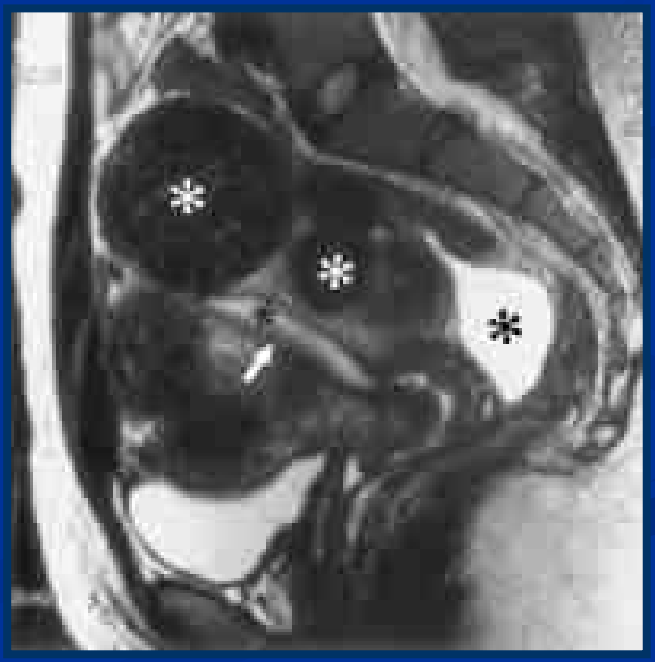
Sheiner E et al.:J.Reprod Med. 49,182-6,2004

Myomlar tedavi edilmeli mi?

Myomlar implantasyon hatalarına yol açar mı?

- **Hangi myomlar extirpe edilmelidir?**





Myomlar fertiliteyi nasıl etkilerler (teorik düşünceler)

- Endometrial kavite konturlarını distorsiyona uğratarak
- İmplantasyonu olumsuz etkileyerek
- Disfonksiyonel uterin kontraksiyonlara neden olarak ve sperm migrasyonunu bozarak
- Endometrial kavite içerisindeki mikro çevreyi değiştirerek

Mukhopadhaya N. Obstetrics, Gynaecology and Reproductive Medicine 2007 : 17 (11): 311- 317

Myomlar fertiliteyi etkiler mi?

Table I. Pregnancy rate (PR) in women with fibroids distorting the cavity, in women with fibroids not distorting the cavity and in a control group (women without myomas)

	Distorted cavity		Not distorted cavity		Control group	
	PR%	*n*	PR%	*n*	PR%	*n*
Eldgar-Geva *et al.*, 1998	10	1/10	16.4	9/55	30	98/318
Stovall *et al.*, 1998	37	34/91	53	48/91		
Farhi *et al.*, 1995	9	5/55	29	25/88	25	32/127
Ramzy *et al.*, 1998	39	15/39	34	123/367		
Surrey *et al.*, 2001	50.7	37/73	58.4	191/327		
Jun *et al.*, 2001	30.5	43/141	41.6	169/406		
Total	9	6/65	33.5	163/487	40.4	661/1636

What are the implications of myomas on fertility ?
J. Donnez and P. Jadoul Hum Reprod, 17(6):1424-30,2002.

Human Reproduction Update, Vol.13, No.5 pp. 465–476, 2007

Fibroids and female reproduction: a critical analysis of the evidence

E. Somigliana[1,2], P. Vercellini[1,2,3,4], R. Daguati[1,2,3], R. Pasin[1,3], O. De Giorgi[1,2] and P.G. Crosignani[1,3]

[1]Department of Obstetrics and Gynecology, Fondazione IRCCS Ospedale Maggiore Policlinico, Mangiagalli e Regina Elena, Via Commenda 12, 20122 Milan, Italy; [2]Center for Research in Obstetrics and Gynecology (C.R.O.G.), Milan, Italy;

Table 2: Selected studies evaluating the influence of fibroids on IVF outcome

Study	Study design	Number of cases	Number of controls	Fibroid dimension (cm)	Number of fibroids	Fibroid localization	Data presented separately for			
							SM	IM	SS	SS-IM
Seoud *et al.* (1992)	Retrospective	24	124	3.0 ± 1.5	n.r.	SS-IM				X
Farhi *et al.* (1995)	Retrospective	172	127	n.r.	n.r.	SM-IM-SS	X			X
Eldar-Geva *et al.* (1998)	Retrospective	106	318	2.6 ± 0.7	1.7 ± 0.4	SM-IM-SS	X	X	X	X
Stovall *et al.* (1998)	Retrospective	91	91	n.r.	n.r.	IM-SS				X
Ramzy *et al.* (1998)	Retrospective	39	367	3.5 ± 0.9	1.1 ± 0.5	IM-SS				X
Dietterich *et al.* (2000)	Prospective	9	11	n.r.	2.8 ± 1.4	IM-SS				X
Hart *et al.* (2001)	Prospective	112	322	2.3 ± 1.1	1.8 ± 0.8	IM		X		
Jun *et al.* (2001)	Retrospective	114	406	Median 1.5 (IQR = 1.0–2.3)	n.r.	SM-IM-SS				
Surrey *et al.* (2001)	Retrospective	73	327	n.r.	n.r.	IM		X		
Check *et al.* (2002)	Prospective	61	61	1.5 ± 0.7	2.1 ± 1.4	IM		X		
Ng and Ho (2002)	Prospective	77	312	Median 2.1 (range 1.0–6.1)	n.r.	IM-SS				X
Yarali and Bukulmez (2002)	Retrospective	77	271	Range: 0.5–10.0	Range: 1–8	IM-SS		X	X	X
Oliveira *et al.* (2004)	Retrospective	245	245	1.9 ± 1.3	2.0 ± 0.4	IM-SS		X	X	X
Wang and Check (2004)	Prospective	49	73	Below 30 mm	n.r.	IM-SS				X
Ng *et al.* (2005)	Prospective	48	47	Median 2.4 (range: 1.8–6.1)	n.r.	IM-SS				X
Gianaroli *et al.* (2005)	Retrospective	129	129	1.8 ± 1.4	2.5 ± 2.8	IM		X		

IM, intramural; IQR, interquartile range; SM, submucosal; SS, subserosal; n.r., not reported.

Table 3: Meta-analyses on the influence of fibroids on IVF outcome according to the localization of the lesions

Localization	Number of studies included[a]	Breslow–Day test (*P*-value)	Common OR (95% CI)
Clinical pregnancy rate			
Submucosal	2	0.92	0.3 (0.1–0.7)
Intramural	7	0.38	0.8 (0.6–0.9)
Subserosal	3	0.92	1.2 (0.8–1.7)
Intramural and/or subserosal	11	0.30	1.0 (0.8–1.2)
All types	16	0.24	0.8 (0.7–1.0)
Delivery rate			
Submucosal	2	0.79	0.3 (0.1–0.8)
Intramural	7	0.09	0.7 (0.5–0.8)
Subserosal	3	0.94	1.0 (0.7–1.5)
Intramural and/or subserosal	11	0.68	0.9 (0.7–1.1)
All types	16	0.43	0.8 (0.6–0.9)

[a] Included studies are reported in Table 2.

Submukozal lezyonlar gebelik şansını ciddi anlamda etkiler (CPR doğum oranları) . İstatistiksel olarak anlamlı olsa bile intramural myomların etkisi daha azdır. Subserosal lezyonların IVF sonuçlarına etkisinin olmadığı bilinmektedir.

Do intramural myomas have a negative effect on fertility outcomes?

TABLE 5

Effect of fibroids on fertility: intramural fibroids.

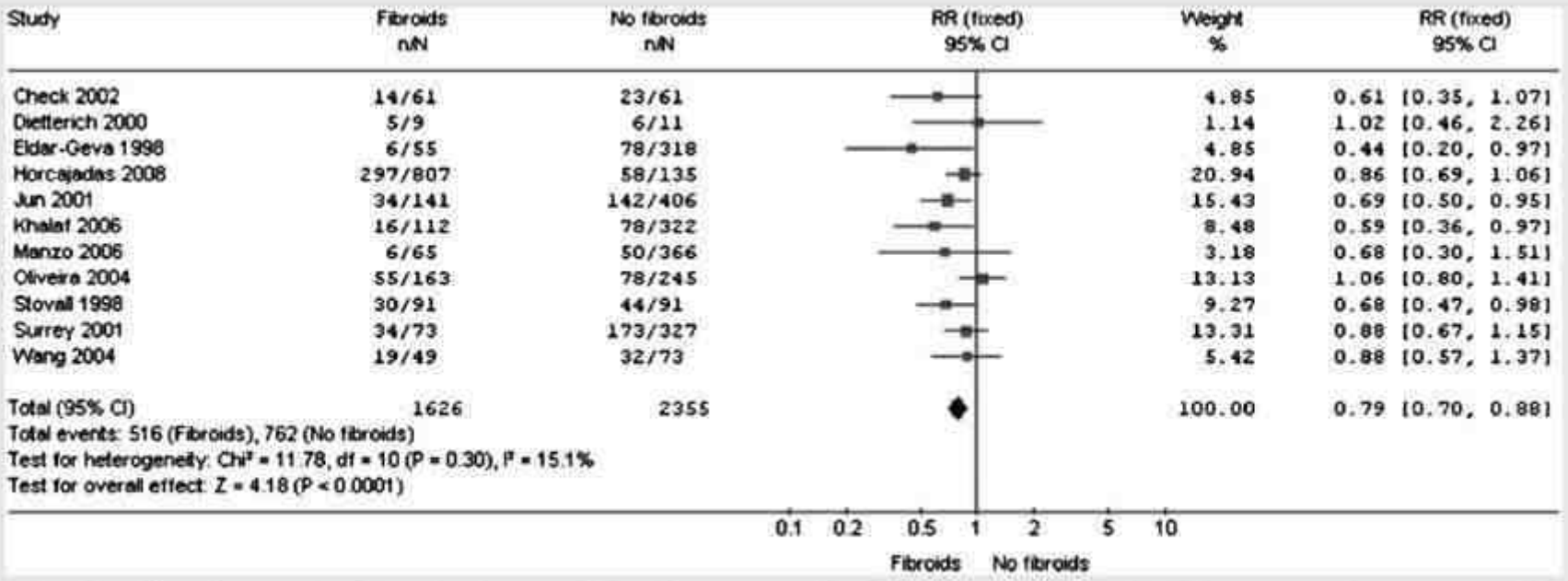
Outcome	Number of studies/ substudies	Relative risk	95% confidence interval	Significance
A. All studies				
Clinical pregnancy rate	12	0.810	0.696–0.941	$P=.006$
Implantation rate	7	0.684	0.587–0.796	$P<.001$
Ongoing pregnancy/live birth rate	8	0.703	0.583–0.848	$P<.001$
Spontaneous abortion rate	8	1.747	1.226–2.489	$P=.002$
Preterm delivery rate	1	6.000	0.309–116.606	Not significant
B. Prospective studies				
Clinical pregnancy rate	3	0.708	0.437–1.146	Not significant
Implantation rate	2	0.552	0.391–0.781	$P=.001$
Ongoing pregnancy/live birth rate	2	0.465	0.291–0.744	$P=.019$
Spontaneous abortion rate	2	2.384	1.110–5.122	$P=.002$
Preterm delivery rate	0	—	—	—
C. Studies using hysteroscopy in all subjects				
Clinical pregnancy rate	2	0.845	0.666–1.071	Not significant
Implantation rate	1	0.714	0.547–0.931	$P=0.013$
Ongoing pregnancy/live birth rate	2	0.733	0.383–1.405	Not significant
Spontaneous abortion rate	2	1.215	0.391–3.774	Not significant
Preterm delivery rate	1	6.000	0.309–116.606	Not significant

Pritts. Fibroids and infertility. Fertil Steril 2009.

Pritts EA et al, Fertil Steril,91:1215-23,2009.

Myomların Fertilite Sonuçlarına Negatif Etkisi Var mıdır?

FIGURE 3



Forest plot of studies of non-cavity-distorting intramural fibroids versus no fibroids in women undergoing IVF treatment for outcome of live birth rates.

Penzias. Recurrent IVF failure. Fertil Steril 2012.

Yardımcı Üreme Teknikleri Uygulanan Fertilite Hastalarında Myomların Etkisi

Meta analiz sonuçları:

- Intramural myomları olanlarda implantasyon oranlarında kontrol grubuna göre negativ bir etki söz konusudur :
  16,4 vs 27,7% - OR 0,62 (0,48-0,8)

- Transfer siklusu başına doğum oranları anlamlı olarak daha düşük bulunmuştur:
  31,2 vs 40,9 % - OR 0,69 (0,50-0,95)

Benecke et all Gyn/Obs. İnvest March - 2005

Myomektomi ART Başarısını Arttırır mı?

- İntramural myomu olan ART öncesinde histeroskopik olarak kavite distorsiyonu saptanmayan 110 olgu değerlendirildi.
- Group A : (n= 39) Myomektomi (Laparotomi/Laparoskopi)
- Group B : (n= 71) Operativ girişimi yok
- I. ART uygulaması; r FSH + flexibl antagonist protokol

TABLE1. Results of COH

Means *	Group A	Group B
Duration of stimulation (days)	7,5±1,5	7,6±1,8
Total rFSH dose (IU)	2812±873	2695±790
Daily dose (IU)	369±66	355±60
No of retrived oocytes	6,9±7,5	6,5±6,3
No of mII oocytes	5,2±4,6	5,4±5,3
No of fertilized oocytes	3,3±2,9	3,2±2,8
No of transferred embryos	2,2±0,9	2,3±0,8

all p values >0,05.

TABLE 2. Implantation and Pregnancy Rates

Means	Group A	group B
Implantation rates (%)*	22,0±35,4	8,8±19,4
Pregnacy (per transfer) (%)	31,4	23,4
Pregnacy (per patients) (%)	28,2	21,1
Live birth rates(per patients) (%)	25,6	12,7

* p value: 0,029.

Is myomectomy essential before ART?
Akdoğan A et al, Fertil Steril , 90 Suppl 1:458, 2008.

Myomektomi Endikasyonları
ACOG and ASRM 665-73,2004

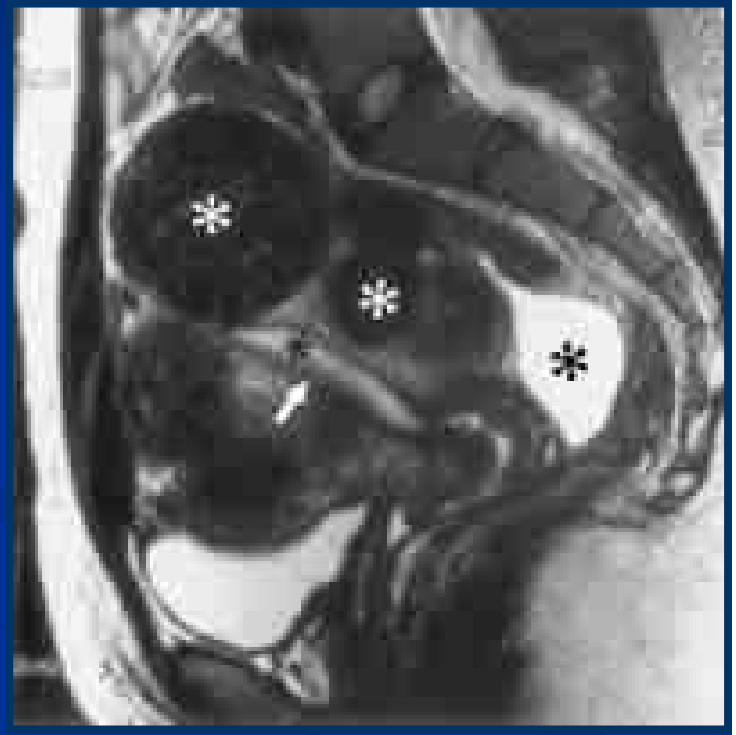
1. Konservatif tedaviye cevap vermeyen anormal uterin kanama
2. Yüksek derecede malignite kuşkusu
3. Postmenopozal dönemde büyüme
4. İnfertil olguda uterin kavite distorsiyonu veya tubal oklüzyona neden olması
5. Yaşam kalitesini olumsuz etkileyen ağrı veya bası semptomları
6. Üriner şikayetler, anormal uterin kanamaya bağlı anemi

Laparoskopik Myomektomi Endikasyonları

- Cerrahi endikasyon var ise
- Pelvik ağrı, bası ve anormal uterin kanama
- Komşu organ ve dokulara bası, üriner şikayetler, konstipasyon, disparoni
- Fertilite problemleri

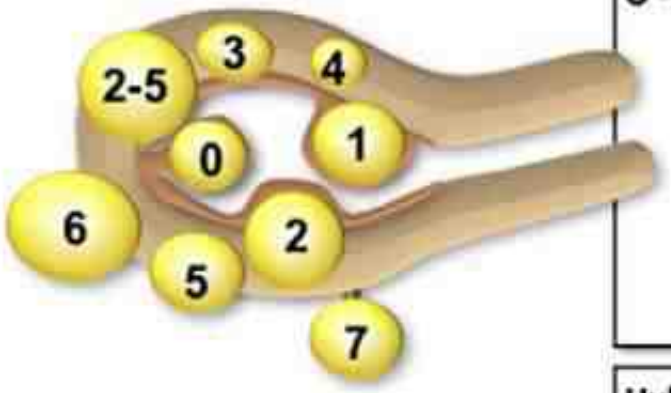
Myomektomi öncesi incelemeler

- Jinekolojik anamnez ve muayene
- TVUSG
- Hemogram ve rutinler
- Pelvik MRI (myomların yeri, sayısı, gadolinium'lu çekim-sarkom ayırıcı tanısı artmış vaskülarite nedeni ile tutulum artışı)
- Gerekir ise HSS, Histeroskopi



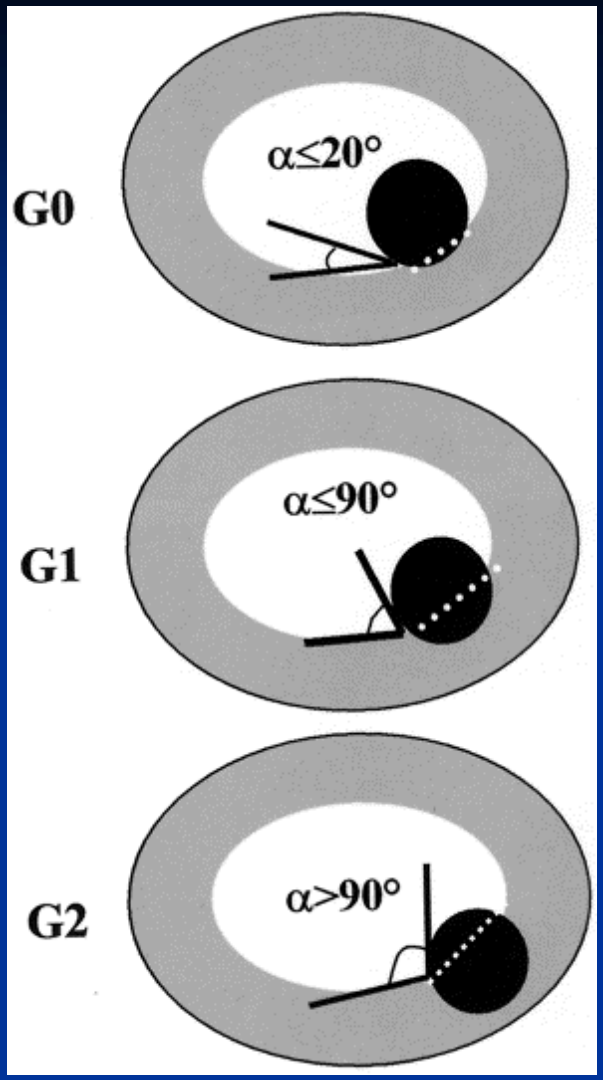
FİGO SINIFLAMA

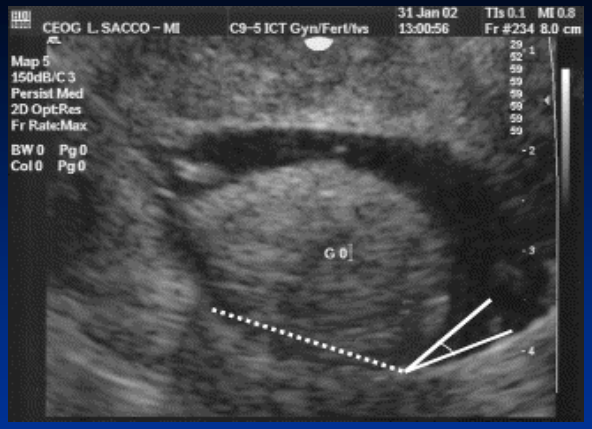
Leiomyoma subclassification system

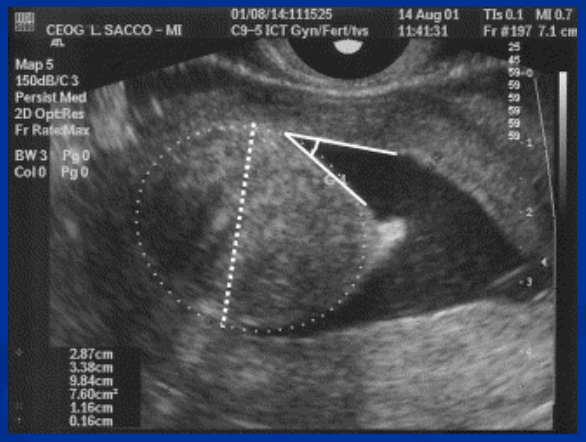


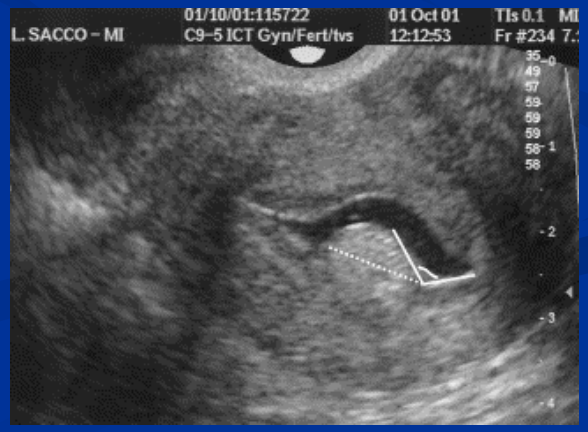
SM - Submucosal	0	Pedunculated intracavitary
	1	<50% intramural
	2	≥50% intramural
O - Other	3	Contacts endometrium; 100% intramural
	4	Intramural
	5	Subserosal ≥50% intramural
	6	Subserosal <50% intramural
	7	Subserosal pedunculated
	8	Other (specify e.g. cervical, parasitic)

Hybrid leiomyomas (impact both endometrium and serosa)	Two numbers are listed separated by a hyphen. By convention, the first refers to the relationship with the endometrium while the second refers to the relationship to the serosa. One example is below	
	2-5	Submucosal and subserosal, each with less than half the diameter in the endometrial and peritoneal cavities, respectively.









İleri intramural komponentli myomlar: " iki-basamak prosedür " ile rezeke edilirler.

Gimpelson RJ, Obstet Gynecol Cl North Am,June 2000

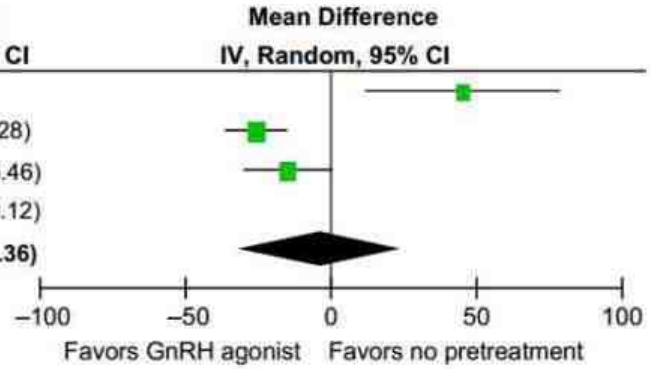
Preop GnRHa Kullanımı

Operative time, min

Study or Subgroup	GnRH Agonist Mean	SD	Total	No Pretreatment Mean	SD	Total	Weight, %	Mean Difference IV, Random, 95% CI
Campo and Garcea [6], 1999	157.5	74.61	30	112.33	54.71	30	25.7	45.17 (12.06 to 78.28)
Palomba et al [10], 2001	91.5	17.6	20	117.3	16.1	21	38.2	–25.80 (–36.14 to –15.46)
Zullo et al [12], 1997	98.5	26.1	35	113.3	35.1	32	36.1	–14.80 (–29.72 to 0.12)
Total (95% CI)			**85**			**83**	**100.0**	**–3.57 (–31.51 to 24.36)**

Heterogeneity: $Tau^2 = 504.39$; $\chi^2 = 16.35$; $df = 2$ ($p = .003$); $I^2 = 88\%$

Test for overall effect: $Z = 0.25$ ($p = .80$)

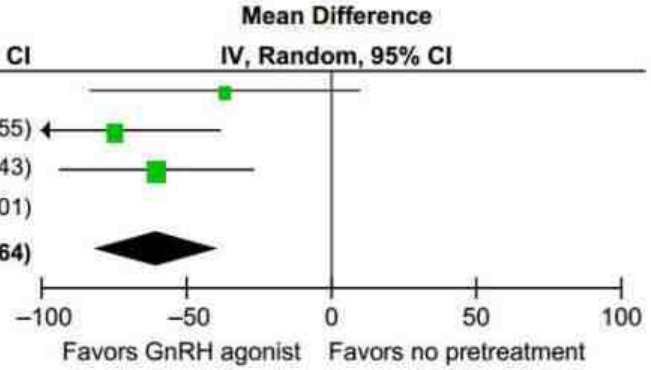


Intraoperative blood loss, mL

Study or Subgroup	GnRH Agonist Mean	SD	Total	No Pretreatment Mean	SD	Total	Weight, %	Mean Difference IV, Random, 95% CI
Campo and Garcea [6], 1999	198.5	98.1	30	235.3	84.6	30	21.8	–36.80 (–83.15 to 9.55)
Palomba et al [10], 2001	171.2	64.3	20	245.8	53	21	35.9	–74.60 (–110.77 to –38.43)
Zullo et al [12], 1997	171.8	70.9	35	232.1	68.1	32	42.3	–60.30 (–93.59 to –27.01)
Total (95% CI)			**85**			**83**	**100.0**	**–60.30 (–81.96 to –38.64)**

Heterogeneity: $Tau^2 = 0.00$; $\chi^2 = 1.59$; $df = 2$ ($p = .45$); $I^2 = 0\%$

Test for overall effect: $Z = 5.46$ ($p < .001$)



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Pathologic changes in gonadotropin releasing hormone agonist analogue treated uterine leiomyomata

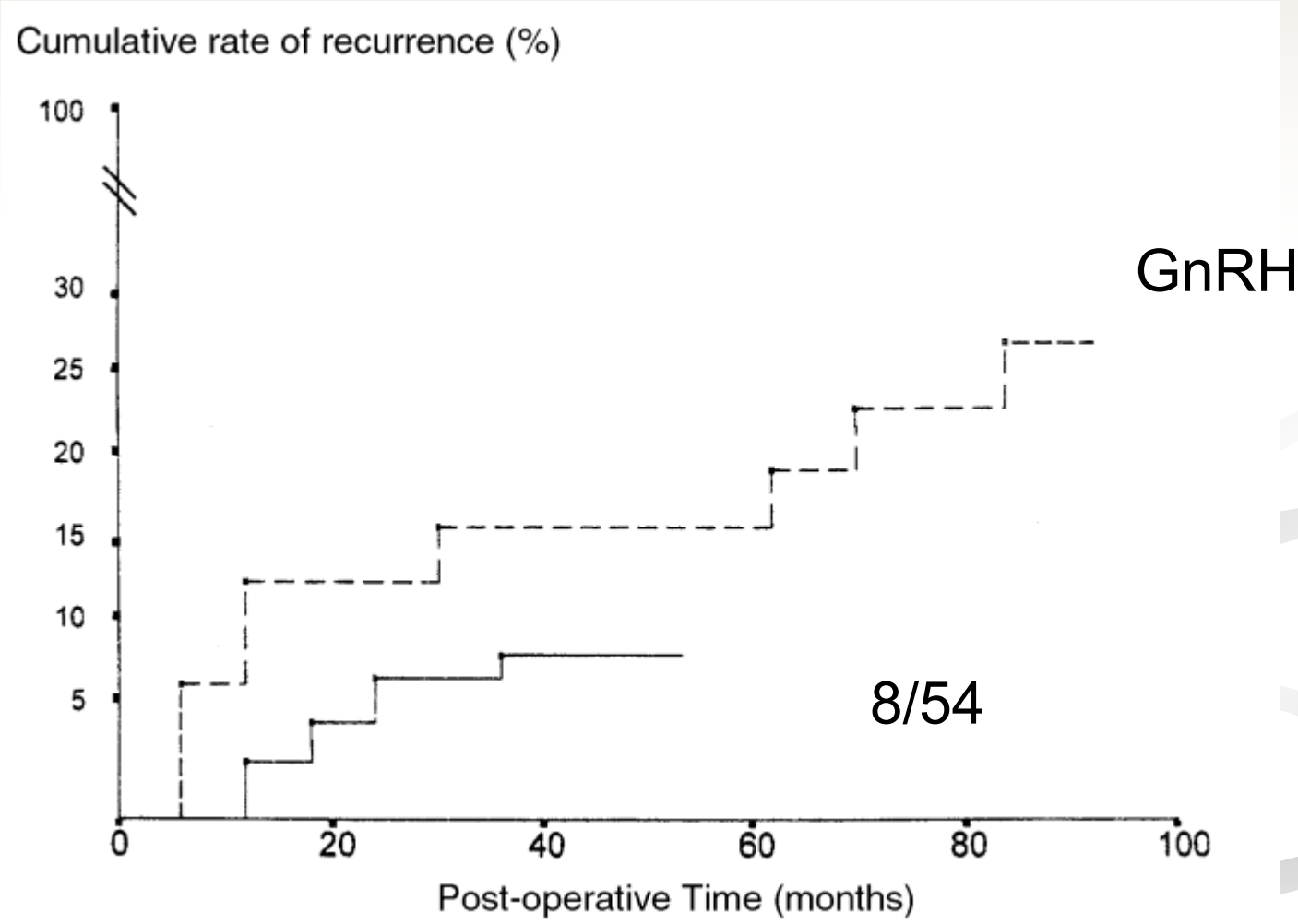
Liane Deligdisch, M.D.*
Scott Hirschmann, M.D.†
Albert Altchek, M.D.‡

Table 1 Pathologic Findings in LA-Treated and Untreated Leiomyomata

Pathologic finding	Proportion of treated patients with finding	Proportion of untreated patients with finding	*P*
Nodular hyalinization	19/30	1/30	0.05
Geographic hydropic degeneration	15/30	5/30	0.05
Necrosis	11/30	5/30	0.05
Obliteration of cleavage plane	21/23	4/8	0.05
Edema	14/30	10/30	NS
Lymphocytic infiltrate*	5/30	0/30	NS
Abnormal color and/or consistency*	8/30	7/30	NS
Nuclear atypia-moderate*†	2/30	1/30	NS
Hypercellularity	2/30	1/30	NS

* Significance evaluated with Fisher's exact test; all other findings evaluated with Pearson χ^2 test with Yates' correction.
† Severe nuclear atypia was not observed in entire sample space.

Preop GnRHa Kullanımı



Rossetti, Human Reprod, 2001

Preoperatif GnRHa Tedavisi

- N: 20 myomlu olgu 1993-1995 yıllarında
- Yaş: 32.8
- Min. 2 ay süre ile Triptorelin asetat 3.75mg/ay veya Goserelin 3.6mg/ay
- Olgular son dozdan ort 31 gün sonra opere edildiler
- Myom çapları ort.%47, uterus volümü %21 küçüldü.
- Op: 12 pelv, 5 hyst, 3 lap.

Tavmergen E.N. Tavmergen E Türker S: Gynecol Endocrinol, 1996

Laparoskopik myomektomi
Preop GnRHa kullanımı

Yapılan birçok çalışmanın sonucunda:

- **Myom rekkürenslerinin artması**
- **Enükleasyon zorluğu**
- **Laparokonversiyon 5 misli**
- **Cerrahi sırasında kan kaybına sınırlı yarar sağlaması nedeni ile pre-op rutin kullanımının yararı önerilmemelidir.**

Ancak pre-op anemik olgularda zaman kazanmak üzere kullanılabilir.

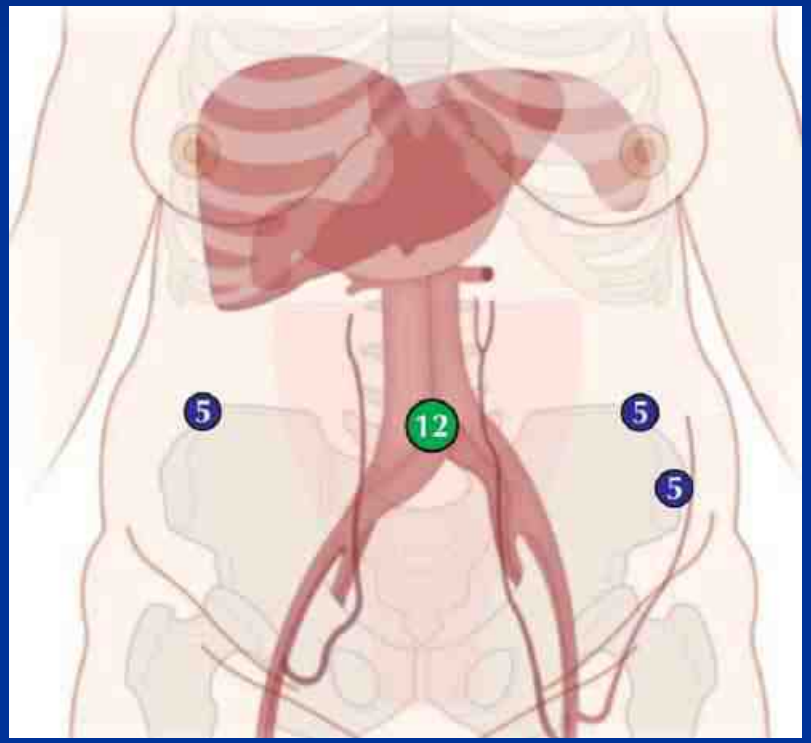
Zullo et al. Am J Obstet Gynecol 108-12,1998
Campo et al Hum Reprod 44-8,1999
Palomba et al. J.Am Assoc Gynecol Laparosc 170-4,2002
Lethaby et al.Cochrane Database Systematic Rev 1,2004

Laparoskopik Myomektomi

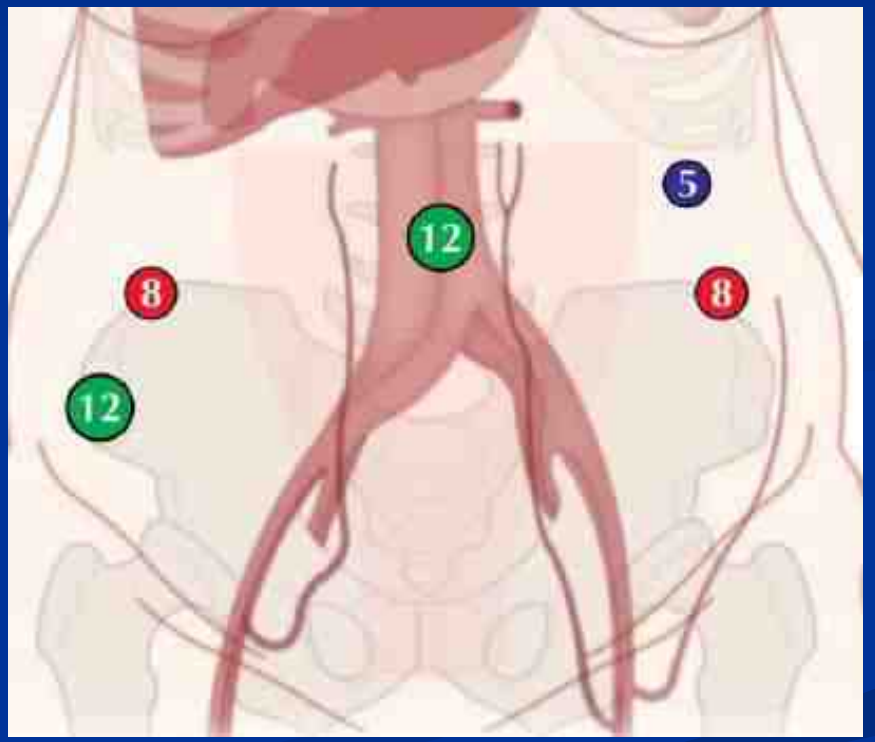
Laparoskopik (pelviskopik) myomektomi 1970'li yıllarda K. Semm tarafından tanımlanmış idi.

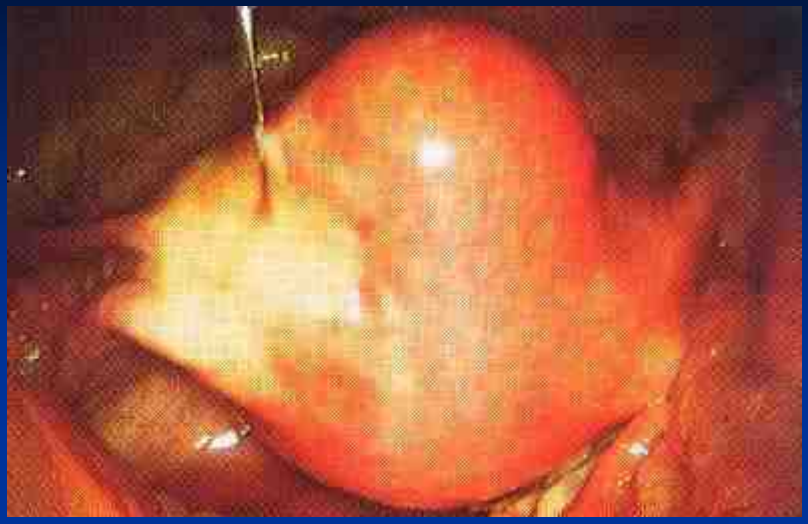
Semm Geburtshilfe u. Frauenheilk. 1977, Semm Endoscopy 1978, Semm Endoscopy 1979, Semm, Mettler Am J Obstet Gynecol 1980

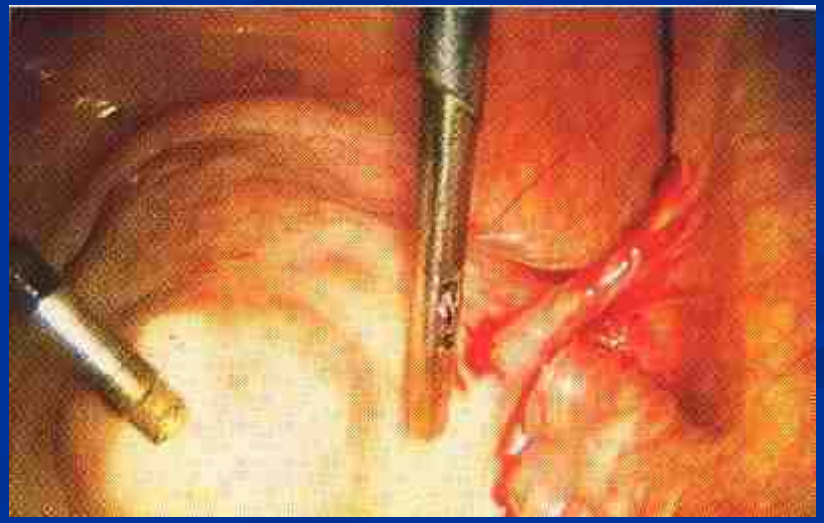
Laparoskopik myomektomi



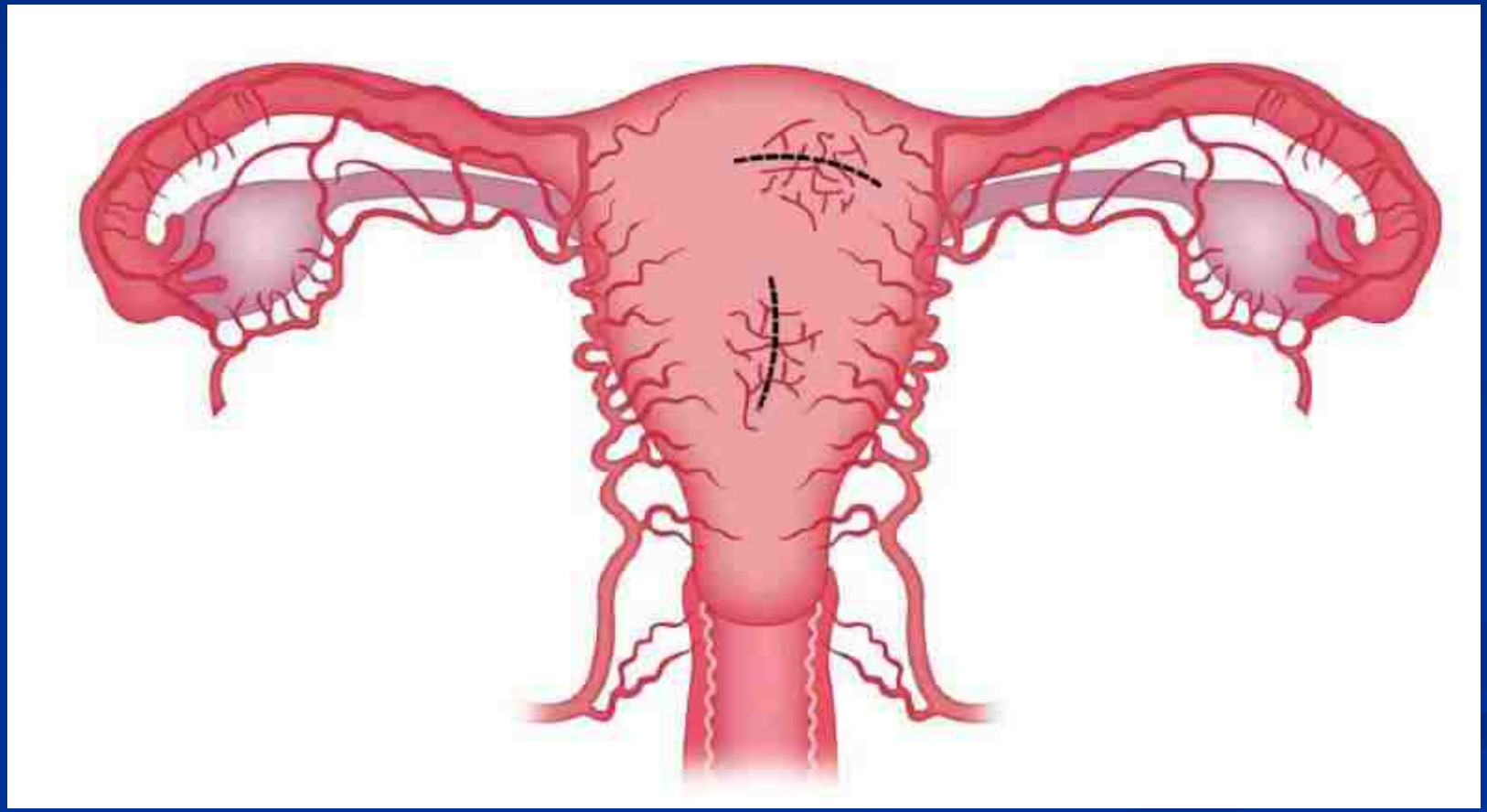
Robotik myomektomi

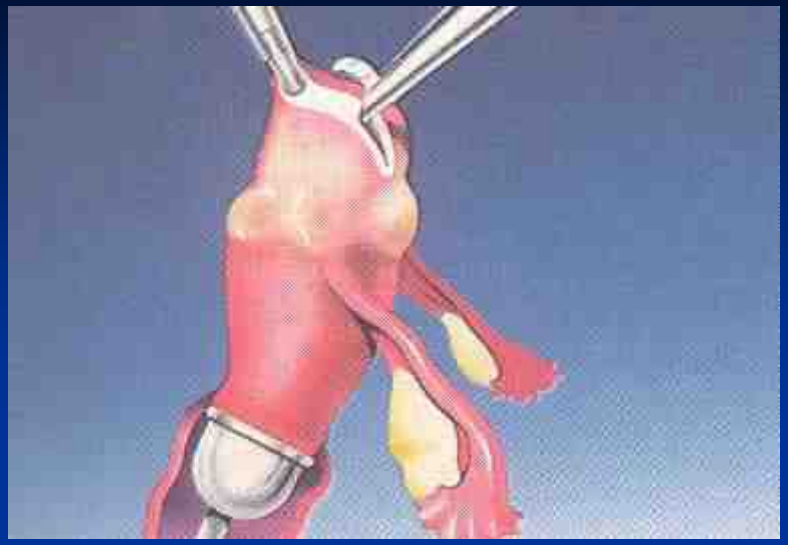


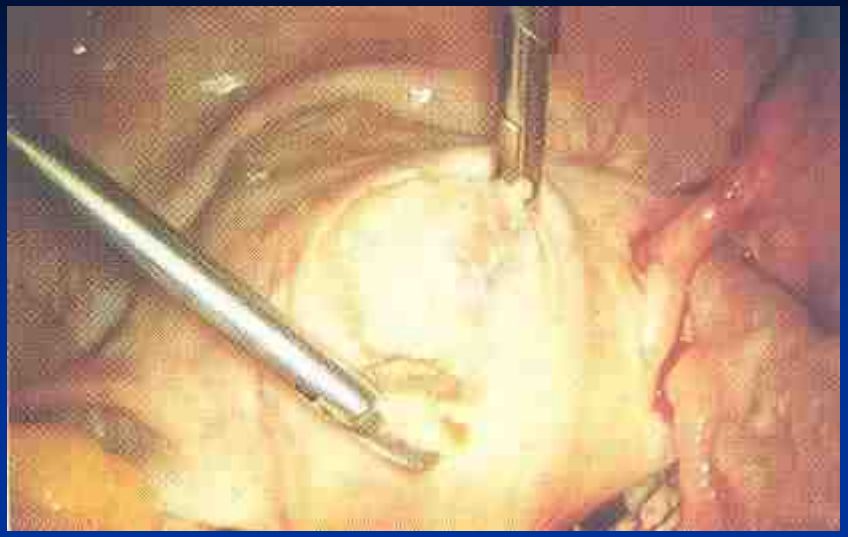


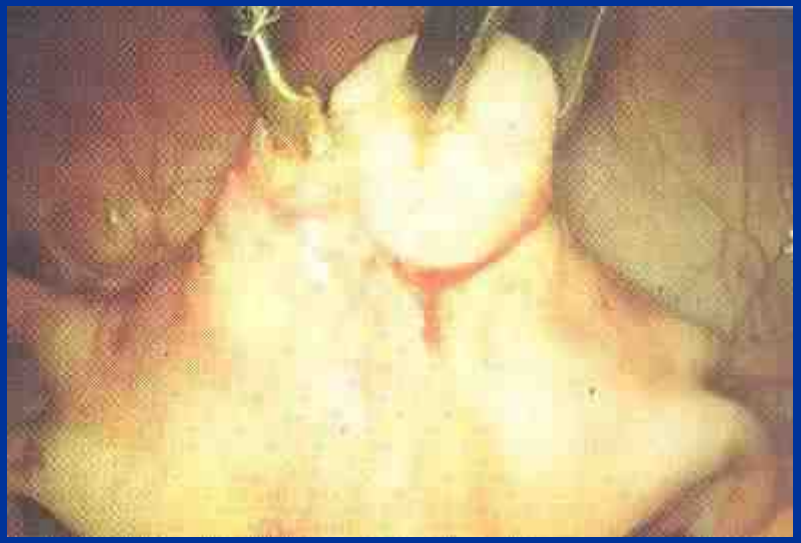


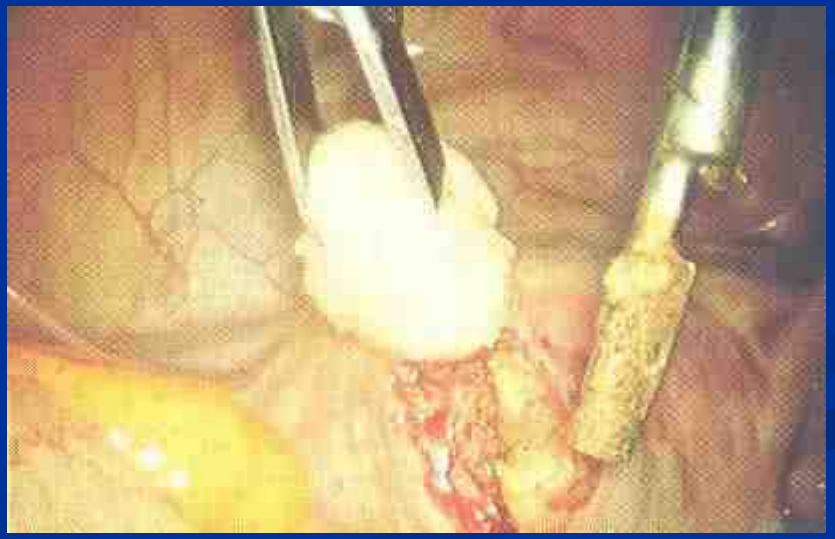
Myomektomi için uterin insizyon

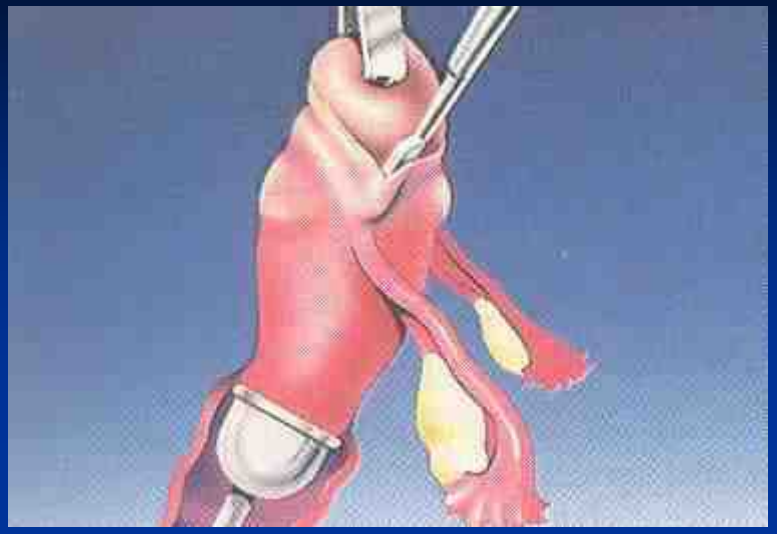


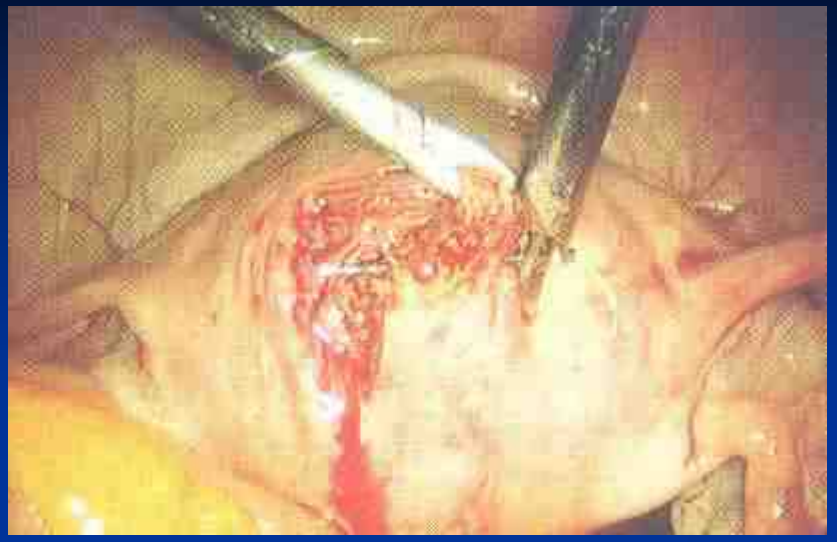


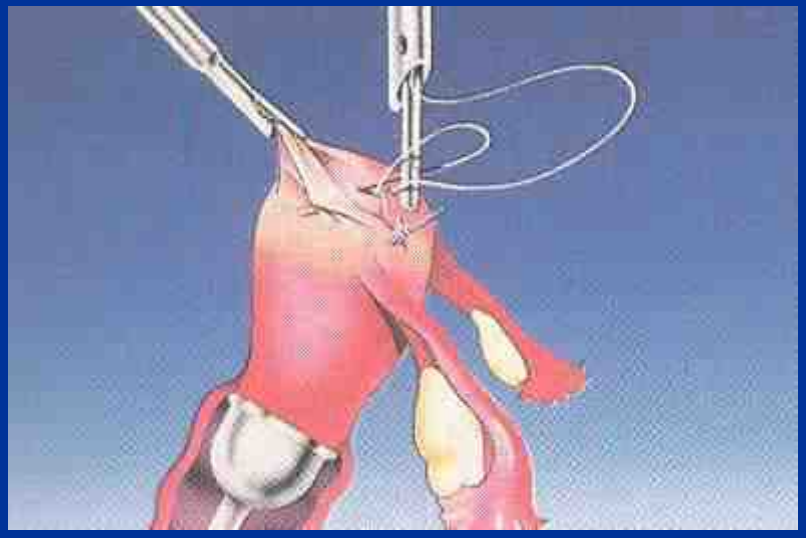


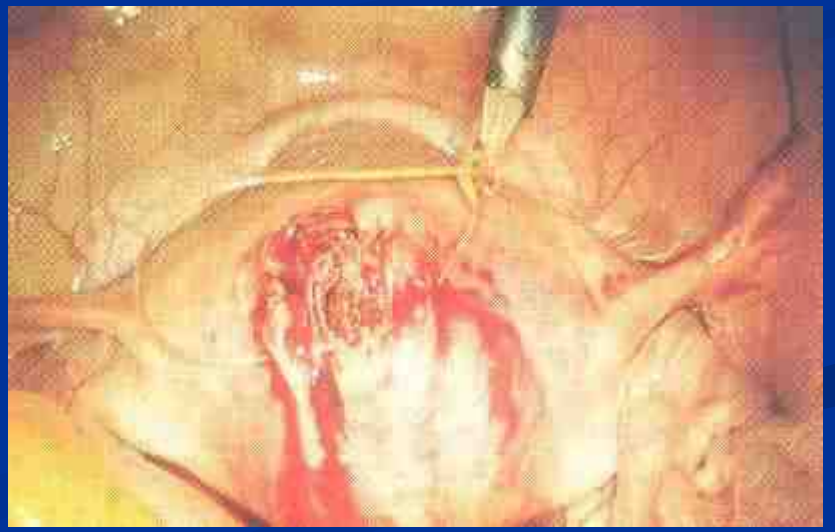




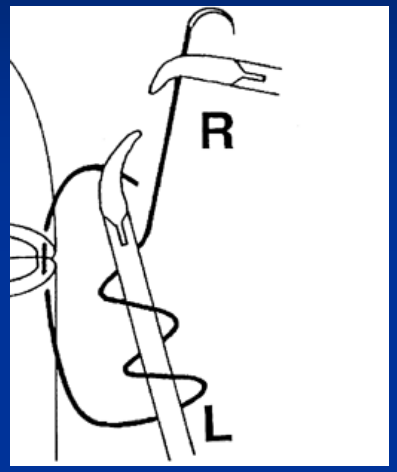


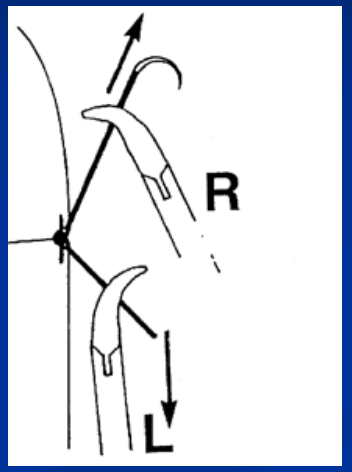


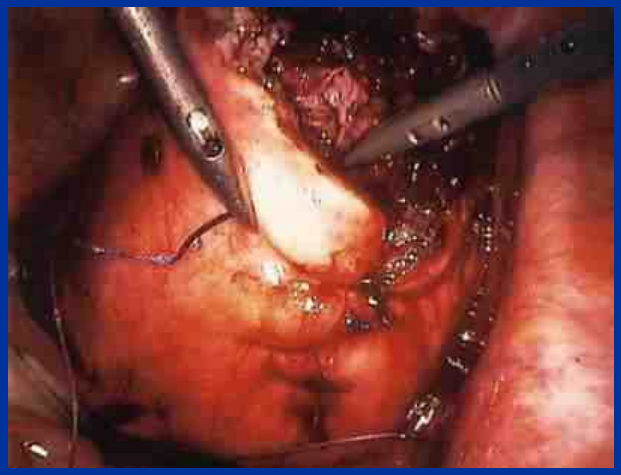


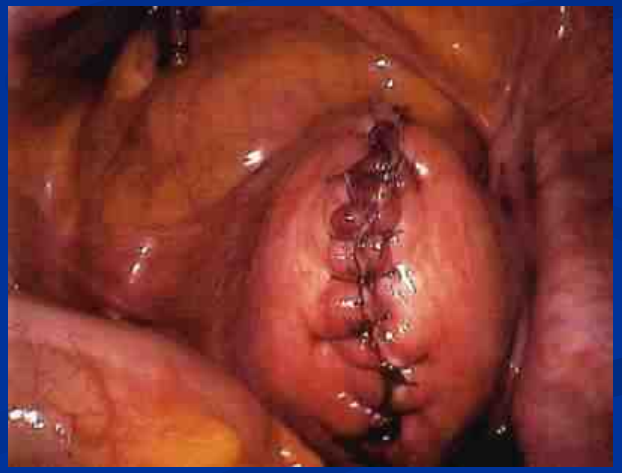


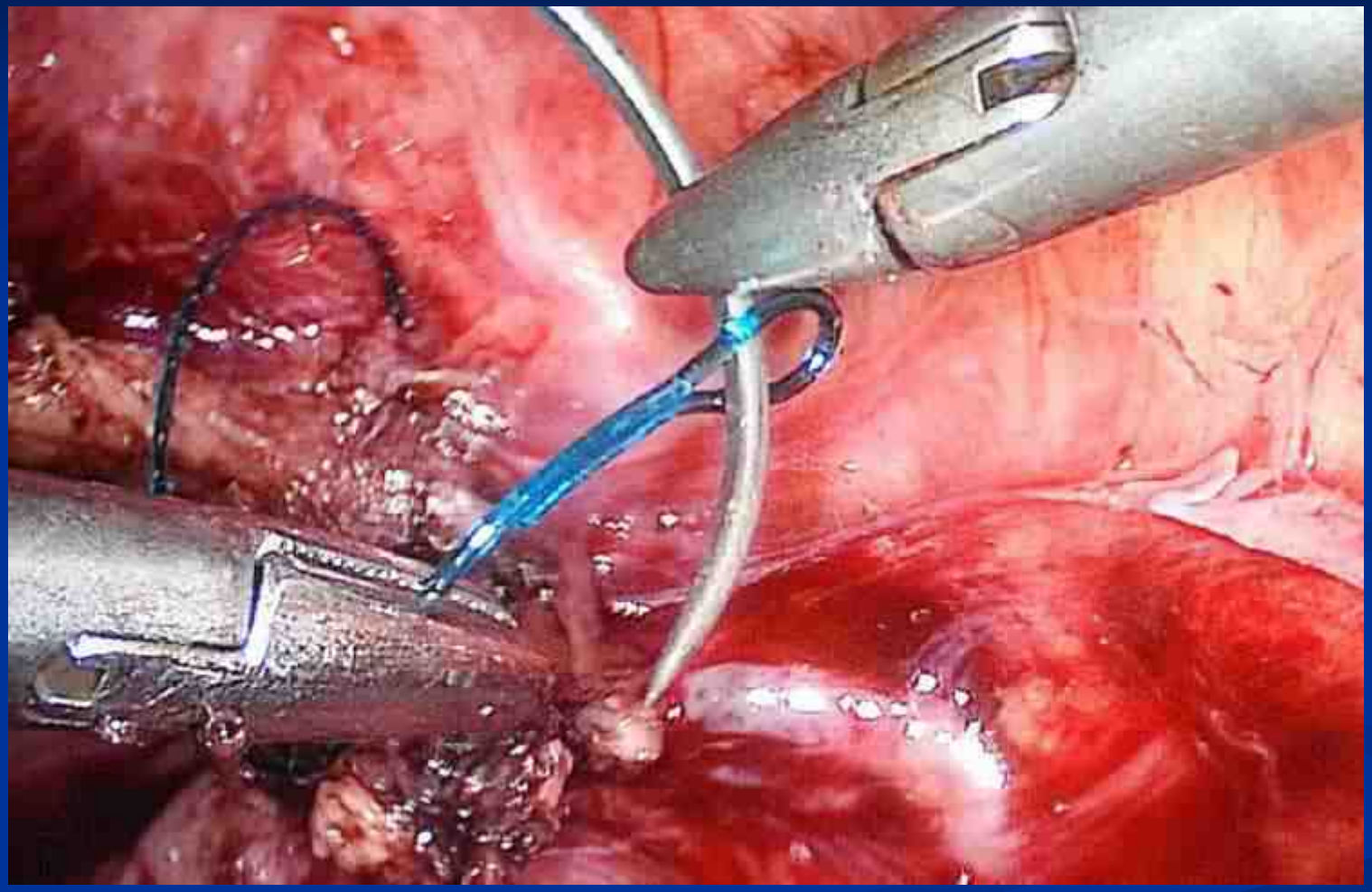
İntra-korporeal Sütür







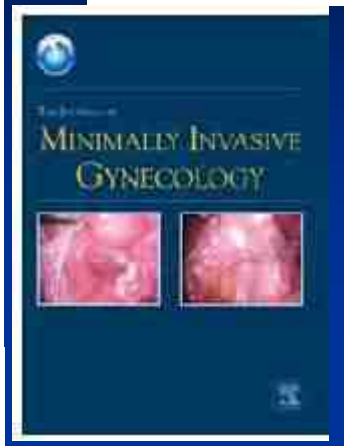




The use of Barbed Suture for Laparoscopic Hysterectomy and Myomectomy: A Systematic Review and Meta-analysis

Received Date: 2 September 2013
Revised Date: 22 September 2013
Accepted Date: 24 September 2013

Togas Tulandi, MD, MHCM Jon I. Einarsson, MD PhD MPH



Meta Analysis of Suture Time

Studies	N	Barbed mean	Sd	N	Control mean	Sd	SMD [95% CI]
Alessandri et al, 2010	22	11.5	4.1	22	17.4	3.8	-1.47 [-2.13 , -0.80]
Angioli et al, 2012	19	9.9	4.3	20	15.8	4.7	-1.28 [-1.97 , -0.59]
RE Model							-1.38 [-1.86 , -0.90]

-2 -1 0 1

Standardized Mean Difference

Meta Analysis of Operative Time

Studies	N	Barbed mean	Sd	N	Control mean	Sd	SMD [95% CI]
Einarsson et al, 2013	32	146.4	76.5	31	133.9	61.3	0.18 [-0.32 , 0.67]
Ardovino et al, 2013	18	131.5	14.8	43	137.2	14.7	-0.38 [-0.94 , 0.17]
Bassi & Tulandi, 2013	63	115.9	4.18	139	118.6	2.42	-0.87 [-1.18 , -0.57]
RE Model							-0.38 [-1.00 , 0.23]

-1 0 1

Morselatör

Gynecol Oncol. 2014 Nov 20. pii: S0090-8258(14)01474-7. doi: 10.1016/j.ygyno.2014.11.011. [Epub ahead of print]

Impact of Morcellation on Survival Outcomes of Patients with Unexpected Uterine Leiomyosarcoma: A systematic review and meta-analysis.

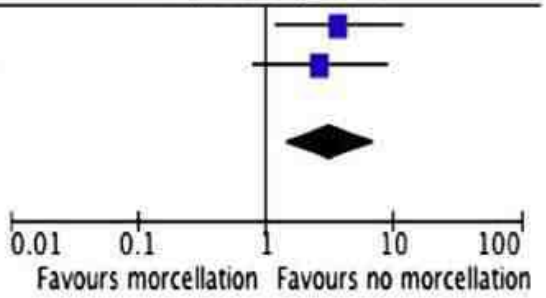
Bogani G[1], Cliby WA[2], Aletti GD[3].

Overall recurrence rate

Study or Subgroup	Morcellation Events	Total	No morcellation Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Park 2011	13	25	7	31	52.0%	3.71 [1.18, 11.74]	2011
George 2014	14	19	20	39	48.0%	2.66 [0.80, 8.82]	2014
Total (95% CI)		**44**		**70**	**100.0%**	**3.16 [1.38, 7.26]**	
Total events	27		27				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.16$, df = 1 (P = 0.69); $I^2 = 0\%$

Test for overall effect: Z = 2.72 (P = 0.007)

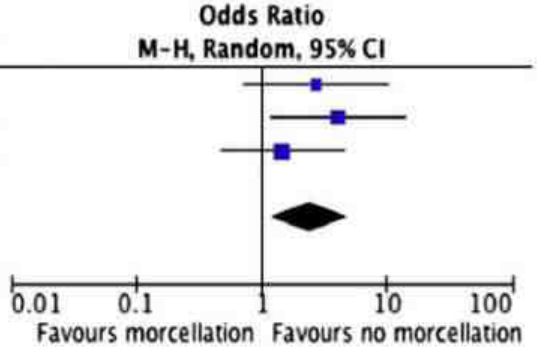


Overall survival

Study or Subgroup	Morcellation Events	Total	No morcellation Events	Total	Weight	Odds Ratio M-H, Random, 95% CI	Year
Perri 2009	10	16	8	21	27.9%	2.71 [0.71, 10.36]	2009
Park 2011	11	25	5	31	32.6%	4.09 [1.18, 14.13]	2011
George 2014	8	19	13	39	39.5%	1.45 [0.47, 4.49]	2014
Total (95% CI)		**60**		**91**	**100.0%**	**2.42 [1.19, 4.92]**	
Total events	29		26				

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.49$, df = 2 (P = 0.47); $I^2 = 0\%$

Test for overall effect: Z = 2.45 (P = 0.01)



İnsidans:0.36/100000, Hister/Myom:1/350

AAGL MEMBER UPDATE: Disseminated Leiomyosarcoma With Power Morcellation

Located in Association News (click link to see other articles).

A recent case of dissemination of an occult uterine leiomyosarcoma in a patient with uterine fibroids has given rise to a discussion about the use of power morcellators in gynecology. We understand the concerns that have been raised and we sympathize deeply with those individuals who have been seriously impacted.

The AAGL is reviewing the scientific evidence and best practices reported by our members to provide readily accessible, comprehensive information to our members. Look for an announcement about this in the near future. We recognize that in rare cases the use of power morcellators can lead to the dissemination of an occult malignancy of endometrial or myometrial origin, and also of dissemination of benign morcellated tissues. We encourage our members to fully research and understand the risks of power morcellation and to learn more about when alternative methods of tissue extraction may be appropriate.

We trust that our members will appreciate that the AAGL is taking a cautious and measured approach to this serious issue. As the leading medical society for gynecologists who practice minimally invasive procedures, the AAGL supports current efforts to mitigate and/or eliminate the potential risks associated with tissue extraction. We are establishing a task force to examine this issue. We encourage members to submit descriptions of tissue extraction methods to TissueExtraction@aagl.org.

The AAGL's primary role is to provide information and training opportunities for our members. We plan to provide comprehensive education on all methods of tissue extraction in webinars, NewsScope, SurgeryU, *The Journal of Minimally Invasive Gynecology*, and hands-on workshops.

Since our founding in 1971, AAGL has been committed to advancing safe minimally invasive procedures for the benefit of women. We remain committed to this cause and, in particular, to ensuring the safety and efficacy of minimally invasive gynecological surgery.

SGO Position Statement: Morcellation

December 2013

Uterine morcellation is commonly performed intracorporeally by gynecologists to remove the uterus through small incisions. Most commonly, morcellation is performed to reduce the size of an enlarged uterus so that it may be removed through small laparoscopic incisions or through the vagina, thus minimizing the morbidity of a larger "open" incision. However, power morcellation or other techniques that cut up the uterus in the abdomen have the potential to disseminate an otherwise contained malignancy throughout the abdominal cavity. For this reason, the Society of Gynecologic Oncology (SGO) asserts that it is generally contraindicated in the presence of documented or highly suspected malignancy, and may be inadvisable in premalignant conditions or risk-reducing surgery.

Patients being considered for minimally invasive surgery performed by laparoscopic or robotic techniques who might require intracorporeal morcellation should be appropriately evaluated for the possibility of coexisting uterine or cervical malignancy. Other options to intracorporeal morcellation include removing the uterus through a mini-laparotomy or morcellating the uterus inside a laparoscopic bag.

Uterine leiomyomas are a common indication for power morcellation. Fewer than one out of 1000 women who undergo hysterectomy for leiomyomas will have an underlying malignancy. The SGO recognizes that currently there is no reliable method to differentiate benign from malignant leiomyomas (leiomyosarcomas or endometrial stromal sarcomas) before they are removed. Furthermore, these diseases offer an extremely poor prognosis even when specimens are removed intact.

Patients and doctors should communicate about the risks, benefits and alternatives of all procedures so that a patient is able to make an informed and voluntary decision about accepting or declining medical care (ACOG Committee Opinion 439 Informed Consent).

FDA

Laparoscopic Uterine Power Morcellation in Hysterectomy and Myomectomy: FDA Safety Communication

FDA issued an **updated safety communication** on November 24, 2014

Date Issued: April 17, 2014

Audience:

- Health Care Providers
- Medical Professional Associations
- Cancer Advocacy Organizations
- Health Care Facilities/Hospitals
- Women with Symptomatic Uterine Fibroids who are Considering Surgical Options
- Manufacturers of Devices used for Minimally Invasive Surgeries

Medical Specialties: Pathology, Internal Medicine, Nursing, Obstetrics/Gynecology, Oncology

Product:
Laparoscopic power morcellators are medical devices used during different types of laparoscopic (minimally invasive) surgeries. These can include certain procedures to treat uterine fibroids, such as removing the uterus (hysterectomy) or removing the uterine fibroids (myomectomy). Morcellation refers to the division of tissue into smaller pieces or fragments and is often used during laparoscopic surgeries to facilitate the removal of tissue through small incision sites.

Purpose:
When used for hysterectomy or myomectomy in women with uterine fibroids, laparoscopic power morcellation poses a risk of spreading unsuspected cancerous tissue, notably uterine sarcomas, beyond the uterus. Health care providers and patients should carefully consider available alternative treatment options for symptomatic uterine fibroids. Based on currently available information, the FDA discourages the use of laparoscopic power morcellation during hysterectomy or myomectomy for uterine fibroids.

Summary of Problem and Scope:
Uterine fibroids are noncancerous growths that develop from the muscular tissue of the uterus. Most women will develop uterine fibroids (also called leiomyomas) at some point in their lives, although most cause no symptoms[1]. In some cases, however, fibroids can cause symptoms, including heavy or prolonged menstrual bleeding, pelvic pressure or pain, and/or frequent urination, requiring medical or surgical therapy.

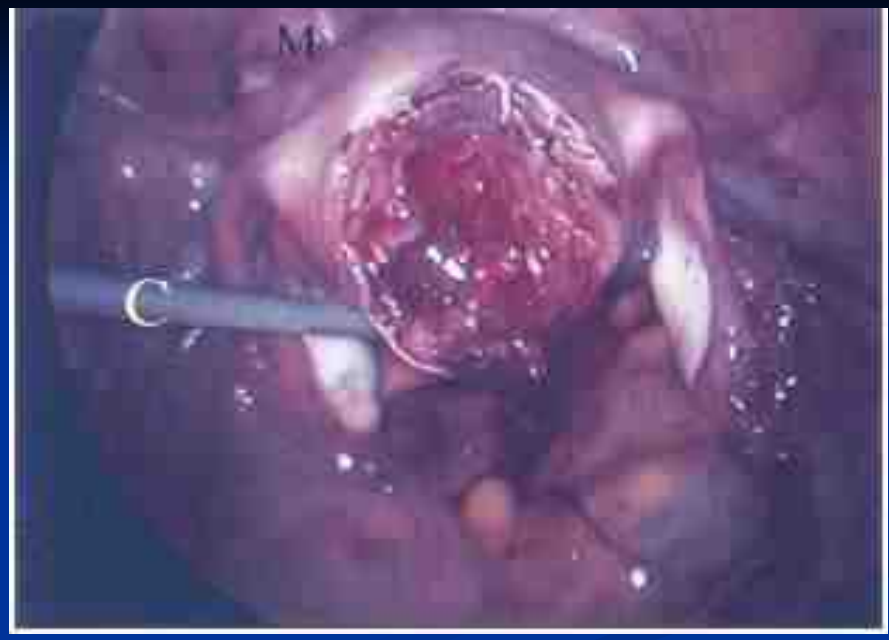
Many women choose to undergo laparoscopic hysterectomy or myomectomy because these procedures are

Morselasyon

- Deneyim olmalı
- Keskin uç batında güvenli bir boşlukda ve sabit tutulmalı
- Rotasyon yapan kısım mutlaka görüntüde olmalı
- ***Kitle rotasyon yapan uca doğru devamlı çekilmeli, morsellatör ilerletilmemeli***
- Histopatolojik inceleme önemli ise kullanılmamalı (kist, ca..)

Adenomyozis

- Adenomyozis rezeksiyonunda myometriumdan fazla rezeke edilmemesine dikkat edilmelidir. Bu olgularda myometriumun adaptasyonu sağlıklı myometrium kadar rahat olmamaktadır.



Morita et al. J Am Assoc Gynecol Laparosc 86-9,2004.

Italian multicenter study on complications of laparoscopic myomectomy

Ornella Sizzi, MD, Alfonso Rossetti, MD, Mario Malzoni, MD, Luca Minelli, MD, Francesco La Grotta, MD, Liberato Soranna, MD, Simona Panunzi, MSc, Rocco Spagnolo, MD, Fabio Imperato, MD, Stefano Landi, MD, Andrea Fiaccamento, MD, and Emilio Stola, MD

Journal of Minimally Invasive Gynecology (2007) 14, 453–462

Table 2 Complications (total procedures: N = 2050)

	No.	%
Major complications		
Hematomas*	10	0.48
Hemorrhages	14	0.68
Sarcomas	2	0.09
Repeat surgeries	2	0.09
Postoperative kidney failure	1	0.04
Bowel injury	1	0.04
Uterine rupture†	1	0.26‡
Procedure failings	7	0.34
Total	38	2.02
Minor complications		
Cystitis	70	3.41
Fever > 38°C	105	5.11
Manipulator injuries	12	0.58
Total	187	9.11
Total complications	225	11.1

*Two cases with double complication.

†Adenomyosis.

‡Data on uterine rupture are reported using the number of pregnancies (386 cases) as the denominator.

Table 4 Probability of developing complications computed on the basis of a logistic regression analysis after applying the Forward Stepwise procedure (underscored): Number of cases: No complications 1827; Complications 225

	Final model		
Variables	Odds ratio	95% CI	p
Myoma size			
1–5 cm	1		—
>5 cm	1.48	0.88–2.46	.13
No. of myomas removed per patient			
1	1		—
2–3	1.73	1.07–2.82	.02
>3	4.46	2.59–7.66	.001
Depth of infiltration			
Pedunculated	1		—
Subserosal	0.72	0.36–1.43	.29
Intramural	1.48	1.05–2.20	.05
Intraligamentous	2.36	1.22–4.59	.01
Vasoconstrictive agents during surgery			
No	1		—
Yes	0.94	0.56–1.59	.82
Age	0.98	0.94–1.01	.29
Hemoglobin before surgery	1.29	0.87–1.92	.38
Hemoglobin after surgery	1.63	1.06–2.51	.02
Operative time	0.99	0.99–1.00	.88

Table 5 Probability of developing major complications computed on the basis of a logistic regression analysis after applying the Forward Stepwise procedure (underscored). Number of cases: Total 2050; Major complications 38

	Final model		
Variables	Odds ratio	95% CI	p
Myoma size			
1–5 cm	1		—
>5 cm	6.88	3.40–13.79	.001
No. of myomas removed per patient			
1	1		—
2–3	1.01	0.70–2.12	.39
>3	1.31	1.09–2.66	.01
Depth of infiltration			
Pedunculated	1		—
Subserosal	0.78	0.56–1.62	.45
Intramural	1.20	0.66–21.09	.14
Intraligamentous	6.44	3.20–0.82	.03
Vasoconstrictive agents during surgery			
No	1		—
Yes	0.20	0.06–0.62	.005
Age	0.98	0.93–1.05	.93
Hemoglobin before surgery	0.50	0.35–0.71	.001
Hemoglobin after surgery	2.71	0.77–9.45	.12
Operative time	1.03	1.01–1.04	.001

Laparoskopik Myomektomi: Rüptür

- Myomektomi sonrası uterin rüptür %1-2

  Nezhat, 2003

- Laparoskopi sonrası artmış uterin rüptür ? (19 vaka)
  - Yetersiz uterin onarım
  - Elektrokoter kullanımı
  - Yetersiz iyileşme (min.3 ay bekleme)

  Parker WH,2010

- LAM (Laparoskopik asiste myomektomi)
  - Kısa operasyon süresi
  - Uterin insizyon yeterli onarımı
  - Gereksiz elektrokoter kullanımının önlenmesi
  - Düşük postoperatif adhezyon

  Nezhat, 2003

Laparoskopik Myomektomi
Post-op Adhezyonlar

- Laparotomide post-op adhezyon riski ~%90 [1,2]
- Laparoskopik myomektomi:

Dubuisson: genelde %26.9
myomektomi yerinde %16.7
adneksial bölgede %11.5

Takeuchi: genelde %29.4
myomektomi yerinde %11.2
adneksial bölgede unil%15.7 ve %3.9bil.

Laparotomiye Dönme %2-4

1. 5 cm'den büyük birkaç myom varlığı
2. Pre-op GnRHa kullanımı (x5)
3. İntra mural veya anterior yerleşim.
4. İntraoperatif kanama
5. Adenomyoma varlığı
6. Sütür yerleştirme sorunları

Dubuisson JB etal: Hum Reprod 16:1726-1731, 2001

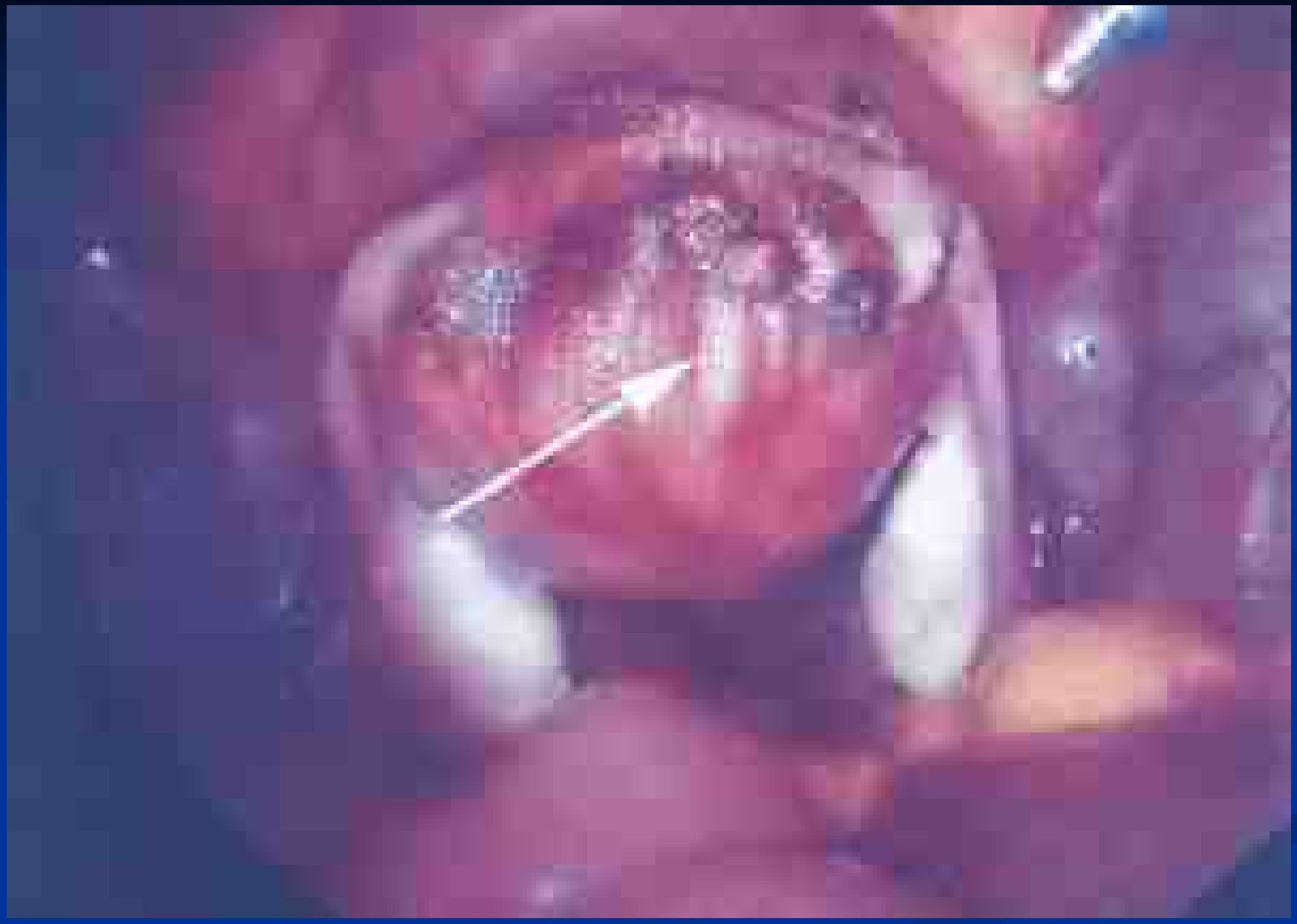


TABLE 2

Adhesions after laparoscopic myomectomy.

Study type (author)	Number	Adhesion rate	Comments
RCT	25 Interceed	40%	Significant ↓ with Interceed
Mais, 1995 (55)	25 controls	88%	
Pellicano, 2003 (57)	18 hyaluronic acid	28%	Significant ↓ with hyaluronic acid
	18 controls	78%	
Assaf, 1999 (98)	21 vasopressin		Significant ↑ adhesions with vasopressin
	17 no injection		
Case control	16 l'scope		Significant ↓ with l'scope
Bulletti, 1996 (48)	16 abdominal		
Case series	45	36%	Adhesions 17% per site
Dubuisson, 1998 (49)			
Takeuchi, 2002 (50)	51	29%	Adhesions 11% per site with fibrin glue
Keckstein, 1994 (51)	22	28%	Significant ↑ adhesions with posterior incisions
Malzoni, 2003 (31)	18	33%	No adnexal adhesions
DiGregorio, 2002 (52)	121	2%	Interceed always used
Hasson, 1992 (53)	24	66%	54% de novo adhesion

Note: l'scope = laparoscope.

Hurst. Laparoscopic myomectomy. Fertil Steril 2005.

Laparoskopik myomektomi Adhezyon Barierleri

- Oksijenize rejenere sellülöz-Interceed: PRCT 50 hastada ikincil bakış L/P de çalışma grubunda %60 vs %12 adhezyonsuzluk, adnekslerde %40 vs %64 adhezyon saptanmış (Mais et al. Hum Reprod 3133-5,1995).
- Hyaluronik asit gel: PRCT 36 hastada ikincil bakış L/P de çalışma grubunda %72 vs %22 adhezyonsuzluk (Pellicano et al.F/S 441-4,2003).
- SprayGel: PRCT çalışma grubunda daha düşük adhezyon skorları saptandı (Mettler et al. J Am Assoc Gynecol Laparosc 339-44,2003- Mettler et al. F/S 398-404,2004).
- GnRHa: Klinik ve deneysel hayvan çalışmalarında adhezyon skorlarının düşük olduğu gösterilmiştir (Marshburn et al.F/S 194-7,2004- Imai et al.J Obstet Gyneacol 660-3,2003

Laparoskopik Myomektomi Rekürens

Laparoskopik 27 aylık takipte % 33 [1]

Laparotomi/Laparoskopi %21[2]

Laparotomi/Laparoskopi %23/%27[3]

Multipl myomektomi- Preop GnRHa kullanımında rekürrens oranı artmakta

Laparoskopik Myomektomi:

- Laparotomiye dönüş risk faktörleri;
  - > 50 mm myomlar
  - İntramural yerleşim
  - Anterior korpus yerleşim
  - Preoperatif GnRH anolog tedavi
  - Adenomyozis
  - Sütür koyma zorlukları

Dubuisson et al, 2001

- Laparoskopik myomektomi

< 6-7 cm ile sınırlandırılmalı

Mals 1996, Parker WH 1994

< 10 cm ile sınırlandırılmalı

Ribetro SC 1999

Laparoskopik Myomektomi
Tartışılan Limitler

- Myom çapının >8-10cm oluşu (Dubuisson et al 1996)
- Birden fazla <5cm. intramural-submüköz myom oluşu (Dubuisson et al 1998)
- Uterin cesametin >16 gebelik hf olması
- Preop GnRHa kullanımı Lap konversiyon riskini ↑
- Intramural myomlar riski ↑(Büyük olanlarda oluşan myometrial defektin onarılamaması nedeni ile)
- Anterior myom lokalizasyonu
- Adenomyoma varlığı

Dubuisson JB et al: Hum Reprod 1726-1731,2001.

Laparoskopik Myomektomi Problemler

- Fertilite: Post-op gebelik %55-80
- Uterin rüptür: ~%1-2

  - Subseröz myomektomi sonrası defektin sütüre edilmemesi

  - İntramural myomektomi sonrası sütür yerleştirilmemesi/yetersiz sütür

  - Çok yaygın ve derin elektrokoter kullanımı

Dubuisson 2000, Nezhat 2000, Silva 2000

TABLE 3

Pregnancy outcomes after laparoscopic myomectomy (patients attempting pregnancy).

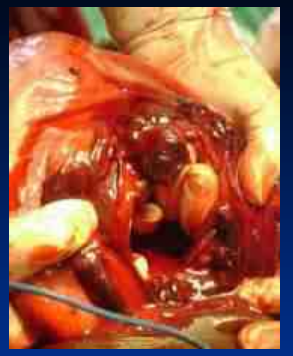
Study	Number pregnant	Pregnancy rate	SAB	Live birth rate	C/S rate	Uterine rupture
RCTs	30 L/S	54%	20%	77%	65%	0
Seracchioli, 2000 (23)	33 abd	56%	12%	88%	78%	0
Case control	44 L/S	42%	7%	93%		0
Bulletti, 1999 (64)	12 No Tx	11%	45%	55%		0
	27 Unexpl	25%	7%	93%		0
Case series						
Ribeiro, 1999 (68)	18	64%	12%	78%	57%	0
Landi, 2003 (69)	72		17%	79%	46%	0
Campo, 1999 (37)	13	54%	15%	85%	45%	0
Malzoni, 2003 (31)	21	55%	15%	81%	57%	0
Seracchioli, 2003 (61)	9	39%	22%	78%		0
DiGregorio, 2002 (52)	65	44%	11%	86%	92%	0
Dubuisson, 2000 (76, 77)	100	53%	31%	69%	42%	1 surgical site
Seinera, 1997, 2000 (33, 63)	64		12%	86%	80%	0
Stringer, 1997, 2001 (26, 60)	7		28%	72%	57%	0
Rossetti, 2001 (73)	21	66%	22%	78%	71%	0
Dessolle, 2001 (74)	44	41%	14%	82%	32%	0
Darai, 1997 (70)	17	39%	23%	58%	33%	0
Nezhat, 1999 (71)	42		20%	75%	78%	0
Dubuisson, 1996 (62)	7	33%	0%	100%	57%	0
Miller, 1996 (72)	30	75%	13%	87%		0
Campo, 2003 (65)	22	61%	14%	86%	40%	0
Total L/S (n)	626					1

Hurst. Laparoscopic myomectomy. Fertil Steril 2005.

Myomektomi sonrası uterin rüptür oranları

	Major	Minor	Total Doğum	Oran	Alt Katagori-total sayı			
Normal uterus, previous myomektomi	NA	NA	1,001	1/143 (0.70%)	7	1930-2006	10	Brown, 1956, Garnet 1964, Dubuisson 2000, Seinera 2000, Nezhat 1999, Seracchioli 2000, Seracchioli 2006, Kumakiri 2008, Sizzi 2007, Makino 2008
	Abdominal myomektomi	NA	179	1/60 (%1.7)	3	1930-1960	2	Brown 1956, Garnet 1964
	LS Myomektomi	NA	822	1/206 (%0.49)	4	1989-2006	8	Dubuisson 2000, Seinera 2000, Nezhat, 1999, Seracchioli 2000, Seracchioli 2006, Kumakiri 2008, Sizzi 2007, Makino 2008

Laparoskopik myomektomi sonrası uterin rüptür için risk faktörleri: 19 vaka



Case [reference]	Year of Surgery	Myoma size, cm	Myoma type	Cavity entered	Uterine incision	Hemostasis	Closure	Uterine rupture, wk	Fetal survival	Maternal survival
1 [5]	1992	DM	IM	Yes	Sharp	ENC	1 Layer	28	DM	Yes
2 [6]	1992	3	SS	No	MP	MP	Serosa	34	Yes	Yes
3	1995	3	IM	No	MP	BP, S	1 Layer	34	Yes	Yes
4 [7]	1998	5	IM	Yes	MP	BP, S	1 Layer	28	Yes	Yes
5 [8]	1996	5	IM	Yes	DM	S	DM	28	Yes	Yes
6 [9]	1996	DM	IM	Yes	MP	BP	2 Layers	29	Yes	Yes
7	1997	9	IM	No	MP	BP, S	2 Layers	33	Yes	Yes
8 [10]	1997	5	SS	No	MP	BP	No	33	No	Yes
9 [11]	1997	11	SS-P	No	MP	MP	No	34	Yes	Yes
10 [12]	2000	4	SS	No	MP	MP	No	17	No	Yes
11	DM	2.5	DM	No	UC	S	3 Layers	28	No	Yes
12 [13]	2000	8	SS	No	BP	BP	No	40	Yes	Yes
13 [14]	2001	1.2, 1.2	SS-P	No	MP	MP	No	29	Yes	Yes
14 [15]	2001	3	IM	Yes	DM	BP	1 Layer	26	Yes	Yes
15	2002	2	SS	No	MP	BP	1 Suture	33	Yes	Yes
16	2002	4	SS-P	No	BP	BP	No	35	Yes	Yes
17 [16]	2003	4	SS-P	No	MP	MP	No	36	Yes	Yes
18 [17]	DM	2.5	IM	No	MP	MP	1 Figure-of-8	36	Yes	Yes
19 [18]	2004	4	IM	No	MP	BP	1 Figure-of-8	35	Yes	Yes

Parker W, JMIG, 2010

Laparoskopik Myomektomi:

Dezavantajları:

- Teknik ve deneyimi gereksinimi
- Uzun operasyon zamanı (Morselarasyon)
- Uzamış anestezi süresi
- Postoperatif adhezyon formasyonu
- Artmış maliyet (disposable ürünler)
- Yetersiz skar onarımı

Avantajları:

- L/T'ye benzer gebelik oranları
- Düşük morbidite
- Kısa iyileşme süreci
- Kısa hospitalizasyon
- Artmış hasta uyumu
- Diğer pelvik patolojilerin iyi incelemesi

Nezhat et al, 2003

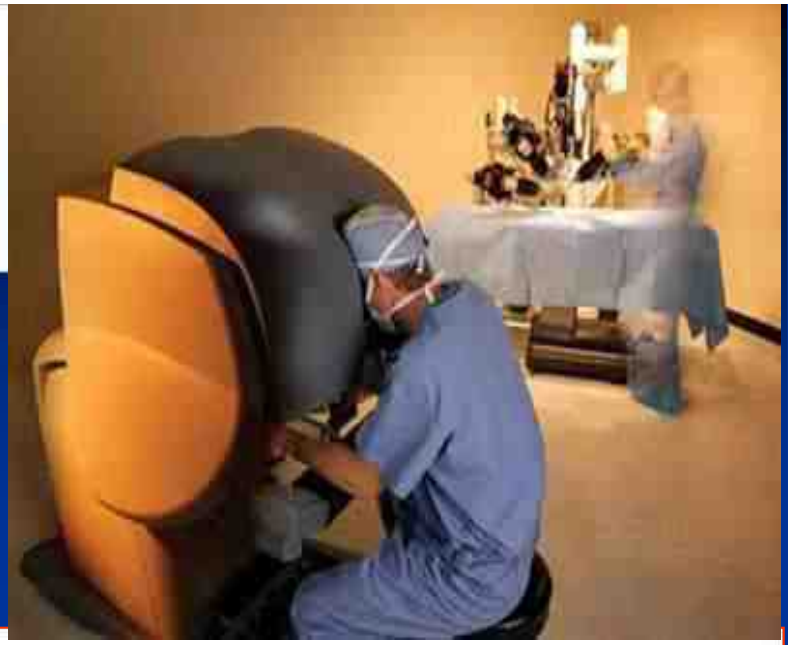
Alternative Laparoscopic Approaches

- Gasless laparoscopic (Laparotenser) myomectomy
- Laparoscopically assisted myomectomy
- Laparoscopically assisted vaginal myomectomy
- Single port access laparoscopic myomectomy
- Robotic-Assisted laparoscopic myomectomy

Robot-assisted laparoscopic myomectomy; a feasible technique for removal of unfavorably localized myomas

CELINE LÖNNERFORS & JAN PERSSON

Acta Obstetricia et Gynecologica. 2009; 88: 994–999



Abstract

Objective. To describe the feasibility of robot-assisted laparoscopic myomectomy for unfavorably localized myomas using the da Vinci surgical system. *Design.* Prospective observational. *Setting.* University hospital. *Method.* Between April 2006 and March 2008, a robot-assisted laparoscopic myomectomy was performed on 13 women selected for having deep intramural myomas with probable impact on fertility and/or later pregnancy. The alternative surgical approach for all 13 was myomectomy via laparotomy. A transvaginal ultrasonography (TVUS) mapping of the myomas was performed to enable an optimal approach during surgery. Using a prospective protocol, relevant times at the operating theater as well as postoperative and follow-up data, were obtained. *Results.* Median time for surgery was 132 minutes (range 94–209 minutes). Median blood loss was 50 ml (range 25–200 ml). No significant complication occurred during or after surgery. Median postoperative hospital stay was one day (range 1–3 days). At follow-up, including TVUS, no unexpected residual myomas larger than 5 mm were identified. Of eight women with an active wish for conception, six have become pregnant a median time of 15 months after surgery. All additional symptoms associated with the myomas were alleviated. *Conclusion.* Robot-assisted laparoscopic myomectomy is a feasible technique for removal of deep intramural myomas unfavorably localized for traditional laparoscopy. The properties of the da Vinci robot facilitate dissection and suturing comprising the major surgical parts of myomectomy.

Robotics in reproductive surgery: Strengths and limitations

Catenacci M, Flyckt RL, Falcone T. Placenta 2011

- Recent clinical research supports robotic surgery as resulting in less post-operative pain, shorter hospital stays, faster return to normal activities and decreased blood loss.
- Reproductive outcomes appear similar to alternative approaches.
- Drawbacks include longer operative times, need for specialized training and increased cost.

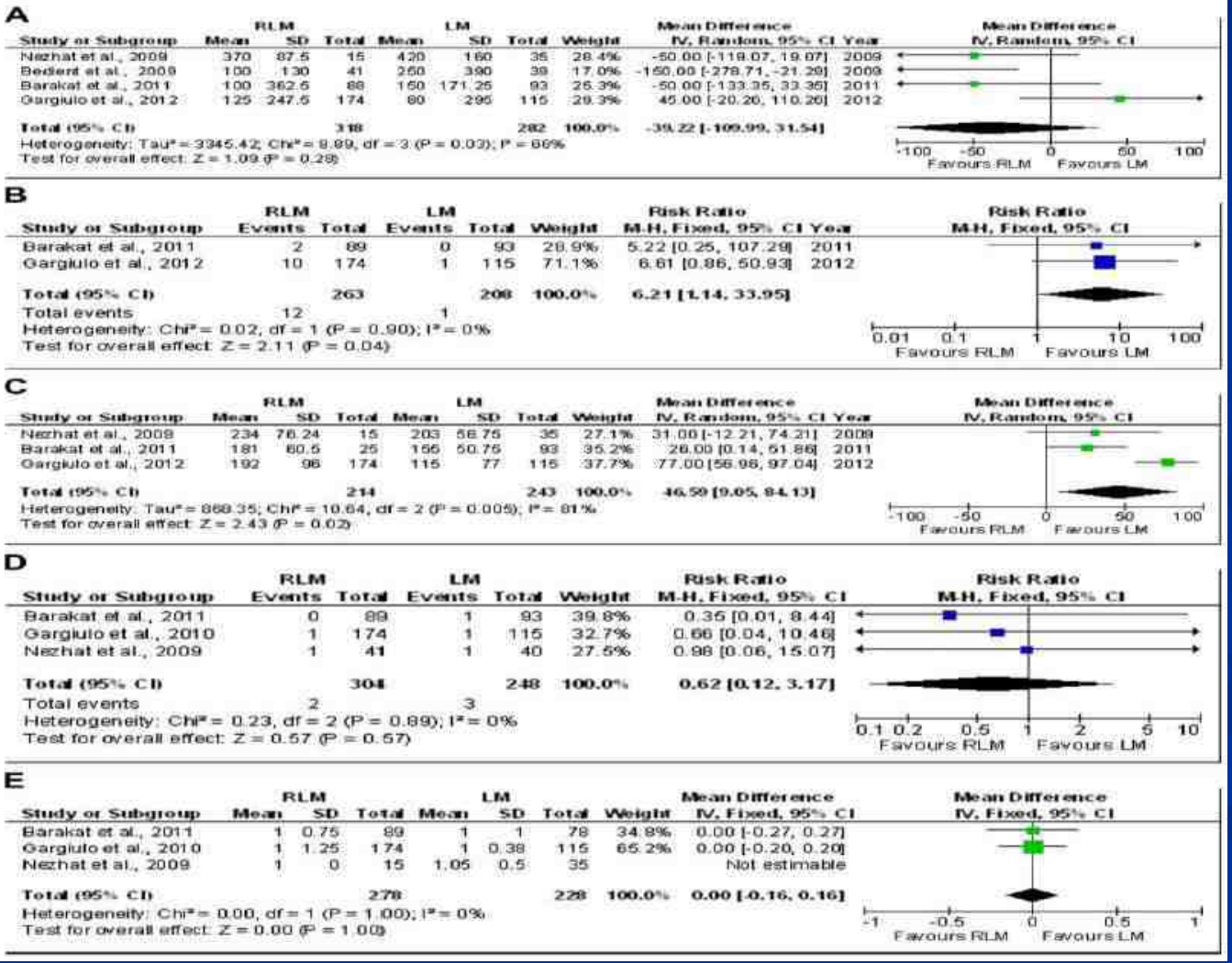
Review Article

Robotic-Assisted Laparoscopic vs Abdominal and Laparoscopic Myomectomy: Systematic Review and Meta-Analysis

Jyotsna Pundir, MRCOG*, Vishal Pundir, MRCS, Rajalaxmi Walavalkar, MRCOG, Kireki Omanwa, MRCOG, Gillian Lancaster, PhD, and Salma Kayani, MRCOG

Journal of Minimally Invasive Gynecology (2013) 20, 335–345 © 2013 AAGL.

Results of meta-analysis of comparison of robotic-assisted laparoscopic myomectomy (RLM) vs laparoscopic myomectomy (LM).



Kan kaybı

Kan transf.

Op süresi

Majör komp.

Maliyet

Laparoskopik Myomektomi
Tartışılan Konular

- Teknik zorlukları olan bir yöntem olarak bilinmektedir.
- Myomun enükleasyon zorluğu
- Kanama riskinin oluşu
- Histerotominin optimal olarak sütüre edilme zorluğu

Sonuç-1

- L/S myomektomi abd. Myomektomi ile karşılaştırıldığında kabul edilebilir ve tercih edilebilir bir alternatiftir.
- L/S myomektomi hospitalizasyon ve rekonvelesan süresi daha kısa, genellikle de daha az kan kaybı ve daha az adhezyon oluşumuna neden olan operatif bir tekniktir.
- Gebelik oranları laparotomi ile karşılaştırılabilir oranlardadır. Gebelik sırasında uterin rüptür riski %1'den azdır.

Sonuç-2

- Fertilite arzusu olan olgularda uterin rüptür riskini azaltmak için myomektomi yerinin dikkatli olarak onarılması gereklidir.
- Mikrocerrahi prensipleri esas olmak üzere, adhezyon barierlerinin de adhezyon formasyonunu azalttığı gözlenmektedir.
- L/S myomektomide limit kendini bilen ve hastasını düşünen cerrahın limitidir.