PREGNANCY WITH MYOMA

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OUTLINE

Introduction

Intrapartum complication

Cesarean section

Myomectomy

INTRODUCTION

- Uterine fibroids ; leiomyomas, myoma
- Benign smooth muscle tumors of the uterus
- Most common benign gynecologic tumor
- Reproductive age

INTRODUCTION

- Incidence
  - 40–60% by age 35 years
  - 70–80% by age 50 years
- Incidence in pregnancy ranges from 3.2% to 10.7%

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

INTRODUCTION

- Complications during pregnancy
  - Most common >>> pain
  - Obstetric complications

INTRODUCTION

Associated obstetric complications	Risks
Second trimester abotion	8X increased risk
Cesarean delivery	6x increased risk
Fetal malpresentation	4X increased risk (most common: breech presentation)
Placental abruption	4X increased risk
Preterm birth	2.5x increased risk associated with large fibroids (> 5 cm)
Dysfunctional labor	2x increased risk
First trimester bleeding	2x increased risk
Postpartum hemorrhage	risk increase with size of fibroid; 4-7cm, 7-10cm,>10cm (11%, 13%, 36%)

William obstetric 26th ed by F.Gary Cunningham

Coutinho LM, Assis WA, Spagnuolo-Souza A, Reis FM. Uterine Fibroids and Pregnancy: How Do They Affect Each Other? Reprod Sci. 2022 Aug;29(8):2145-2151.

INTRAPARTUM COMPLICATIONS

- Placental abruption
- Placenta previa
- Malpresentation
- Cesarean birth
- Dysfunctional labor
- Preterm labor
- PPROM
- Postpartum hemorrhage
- Obstetric hysterectomy

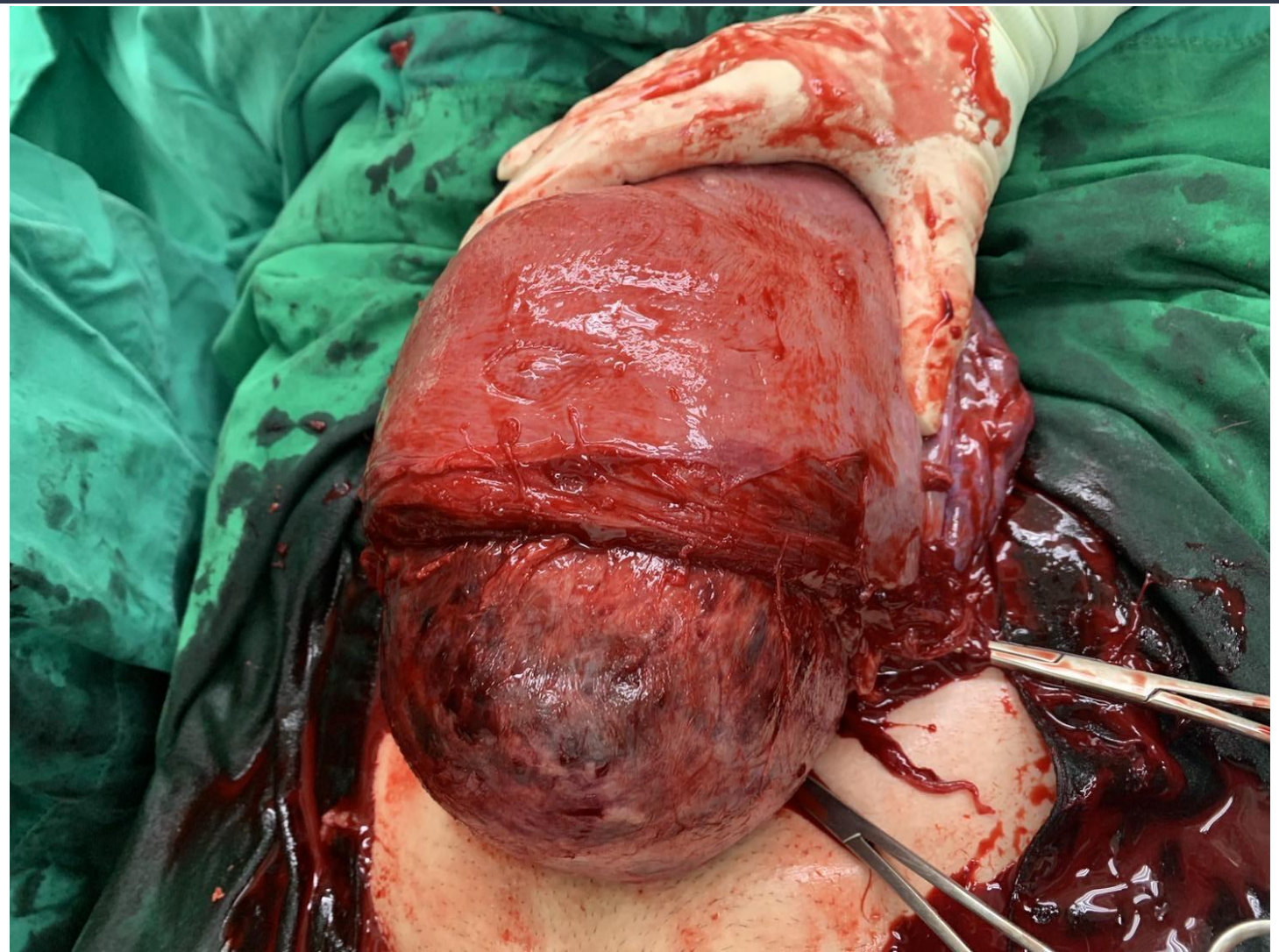
Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

CESAREAN BIRTH

- Increased risk of cesarean birth
- Located in the lower uterine segment
- Increased risk of malpresentation
- Obstruction of the birth canal
- Placental abruption

CESAREAN SECTION

Operation



“ Protruding of submucous myoma at uterine incision stie “

Myomectomy
Bleeding at placental bed and myoma incision site

→ Repaired but can’t stop bleeding at fundus

CESAREAN MYOMECTOMY

- Myomectomy during cesarean section
- Routinely avoided
  - increased vascularity of the gravid uterus
  - massive hemorrhage
  - unnecessary hysterectomy
  - increased perioperative morbidity and mortality

Garg, P. and R. Bansal (2021). "Cesarean myomectomy: a case report and review of the literature." J Med Case Rep **15**(1): 193.

A CASE REPORT

- A 27-year-old G2 P1 L1 GA 35 weeks
- Previous caesarean section with labor pain and scar tenderness
- Intramural fibroid of 8.6 × 6.5 cm , located in the left anterolateral wall of the lower uterine segment
- Emergency cesarean section
- Bulging myoma into the incision line >>> causing difficulty in closure of the uterine wound

Garg, P. and R. Bansal (2021). "Cesarean myomectomy: a case report and review of the literature." J Med Case Rep **15**(1): 193.

A CASE REPORT

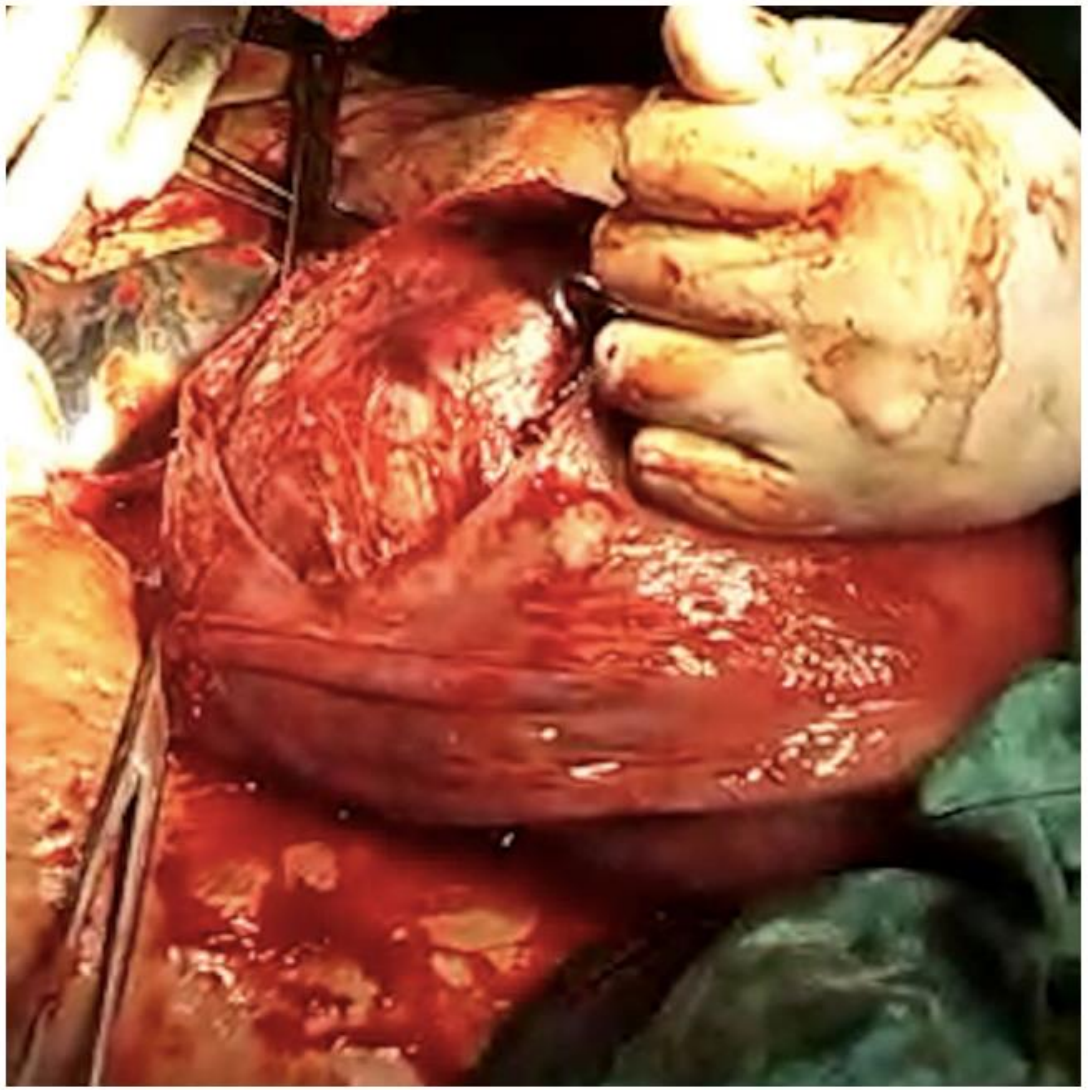


Fig. 1 Intraoperative image depicting the fibroid bulging into the incision line

Garg, P. and R. Bansal (2021). "Cesarean myomectomy: a case report and review of the literature." J Med Case Rep **15**(1): 193.

A CASE REPORT

- Myomectomy
- Prophylactically;
  - Oxytocin infusion
  - Bilateral ligation of uterine arteries
  - Vasopressin injection

Garg, P. and R. Bansal (2021). "Cesarean myomectomy: a case report and review of the literature." J Med Case Rep **15**(1): 193.

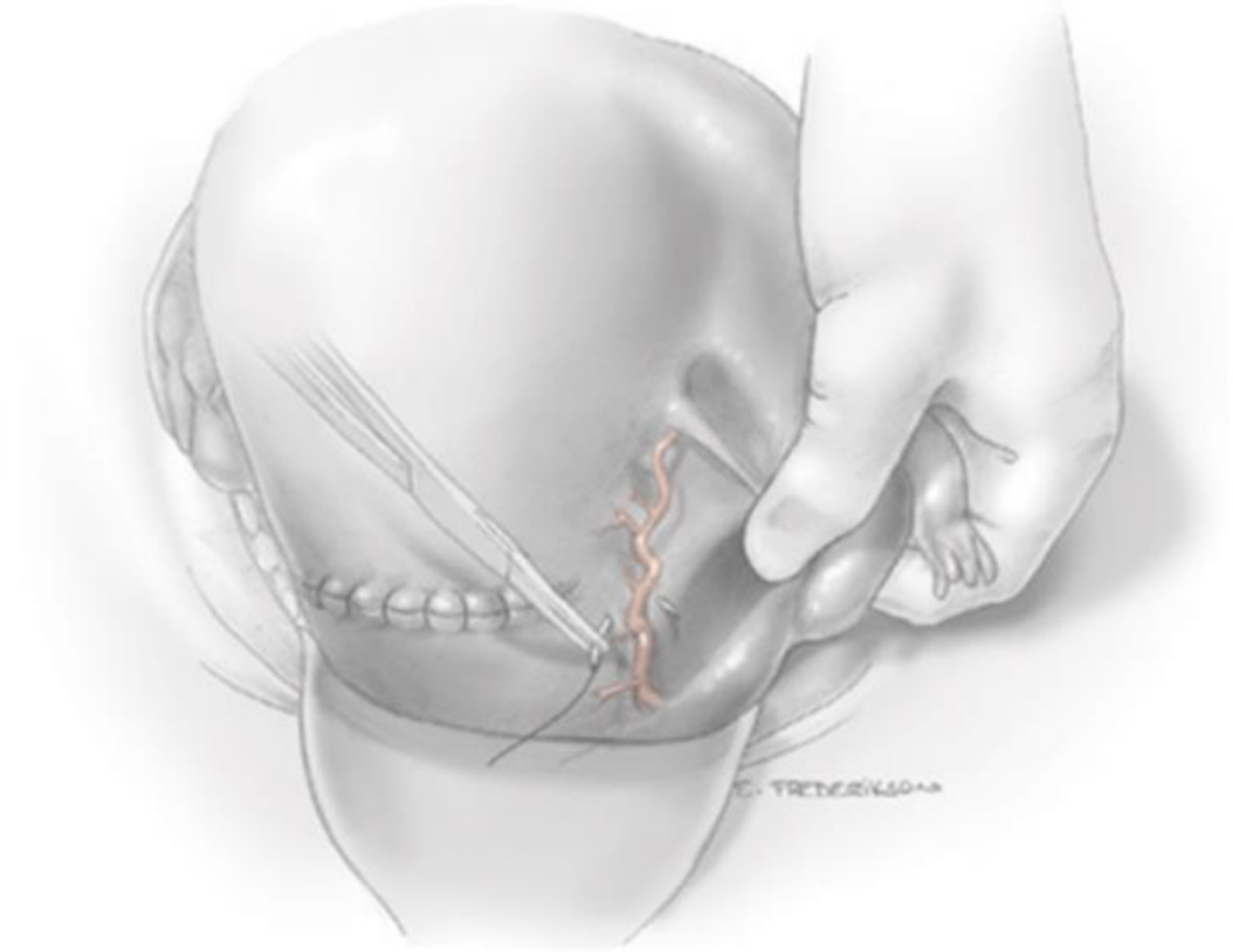


FIGURE 28-4 Uterine artery ligation. The suture goes through the lateral uterine wall anteriorly, curves around posteriorly, then reenters anteriorly. When tied, it encompasses the uterine artery. (Reproduced, with permission, from Cunningham FG, Leveno KJ, Bloom SL, et al (eds). *Williams Obstetrics*. 23rd ed. New York, NY: McGraw-Hill; 2010.)

A CASE REPORT

- Total operative time 50 minutes
- Blood loss 1100 mL
- Hb 12.1 >11.4 g/dl
- No blood transfusion

Garg, P. and R. Bansal (2021). "Cesarean myomectomy: a case report and review of the literature." J Med Case Rep **15**(1): 193.

CESAREAN MYOMECTOMY

"Enucleation was much easier in pregnancy due to increased softness of the tissue."

Kwawukume E. Myomectomy during cesarean section. Int J Gynecol Obstet. 2002;76(2):183–4.

Taylor & Francis
Taylor & Francis Group

The Journal of Maternal-Fetal & Neonatal Medicine

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Feasibility and safety of performing cesarean myomectomy: a systematic review and meta-analysis

Yue Huang, Xiu Ming & Zhengyu Li

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A SYSTEMATIC REVIEW AND META-ANALYSIS

Table 2. Pooled results of the meta-analysis of each outcome.

Outcome	Studies	CM vs. CS	Total effect (95%CI)	*p*	I^2
Mean hemoglobin decline (g/dL)	18	1406 vs. 3500	0.20 (0.06, 0.35)	.007	89%
Duration of operation (min)	18	1370 vs. 3445	10.40 (8.54, 12.25)	<.001	81%
Duration of Postoperative hospitalization (days)	15	1140 vs. 3331	0.18 (0.12, 0.24)	<.001	62%
Blood loss (mL)	5	2422 vs. 299	45.54 (2.68, 88.41)	.04	67%
Blood transfusion rate	17	3465 vs. 1612	1.47 (1.09, 1.99)	.01	0%
Hemorrhage incidence	11	667 vs. 866	1.46 (1.06, 2.01)	.02	0%
Postoperative fever rate	10	637 vs. 852	1.12 (0.77, 1.62)	.55	0%

Huang, Y., et al. (2022). "Feasibility and safety of performing cesarean myomectomy: a systematic review and meta-analysis." J Matern Fetal Neonatal Med **35**(13): 2619-2627.

A SYSTEMATIC REVIEW AND META-ANALYSIS

- Lack of data in terms of the size, location, type, and number of myomas
- A myomas > 7 cm increased the rate of massive intraoperative bleeding regardless of myomectomy.
- Multiple myomas; transfusion and postoperative complications
- Small, anterior wall, pedunculated subserous myomas, CM is safe and feasible to perform.

Huang, Y., et al. (2022). "Feasibility and safety of performing cesarean myomectomy: a systematic review and meta-analysis." J Matern Fetal Neonatal Med **35**(13): 2619-2627.

A SYSTEMATIC REVIEW AND META-ANALYSIS

- Homeostatic techniques
  - Vascular tourniquets
  - High-dose oxytocin
  - Uterine artery ligation
  - Trans-endometrial approach

Huang, Y., et al. (2022). "Feasibility and safety of performing cesarean myomectomy: a systematic review and meta-analysis." J Matern Fetal Neonatal Med **35**(13): 2619-2627.

Review

Perioperative Complications of Cesarean Delivery Myomectomy

A Meta-analysis

Vasilios Pergialiotis, MD, PhD, Ilias Sinanidis, MD, Ioannis-Evangelos Louloudis, MD, Theodoros Vichos, MD, Despina N. Perrea, PhD, and Stergios K. Doumouchtsis, PhD, MRCOG

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

- 19 studies, a total number of 3,900 women
- 2,301 women had myomectomy during cesarean delivery
- 1,599 had cesarean delivery only

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Concomitant myomectomy	**Mean difference**	**95% CI**
Decline in hemoglobin	0.25 mg/dL	0.06-0.45
Longer surgical time	13.87 minutes	4.78-22.95
Postoperative hospitalization	0.35 days	0.25-0.46
	Odd ratio	**95% CI**
Blood transfusion	1.41	0.96-2.07
Postoperative fever	1.12	0.80-1.56

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Table 3. Results of the Fixed-Effects Model Meta-analysis for Each of the Assessed Variables

Variable	Total Effect (95% CI)	*P*
Mean hemoglobin drop	0.09 (0.04–0.14)	<.001
Incidence of hemorrhage	1.15 (0.78–1.69)	.49
Rates of blood transfusion	1.41 (0.96–2.07)	.08
Intraoperative duration	18.78 (17.92–19.64)	<.001
Rates of postoperative fever	1.12 (0.81–1.56)	.50
Postoperative hospitalization	0.35 (0.26–0.44)	<.001

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Study or Subgroup	With myomectomy Mean	SD	Total	Without myomectomy Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Akbas; 2016	1.67	0.96	63	1.27	0.77	63	8.0%	0.40 [0.10, 0.70]
Akkurt; 2016	1.8	0.6	90	1.6	0.3	61	9.3%	0.20 [0.05, 0.35]
Brown; 1999	1.64	1.7	16	1.4	1.3	16	2.6%	0.24 [-0.81, 1.29]
Hassiakos; 2006	1	0.3	47	0.8	0.4	94	9.5%	0.20 [0.08, 0.32]
Kaymak; 2005	1.6	0.7	40	1.5	0.7	80	8.3%	0.10 [-0.17, 0.37]
Kumar; 2014	1.33	1.155	21	1.05	0.854	42	5.5%	0.28 [-0.28, 0.84]
Kwon; 2014	1.3	1.3	65	1.4	1.2	96	7.0%	-0.10 [-0.50, 0.30]
Lin; 2010	1.3	0.4	36	1.2	0.5	36	8.8%	0.10 [-0.11, 0.31]
Ozcan; 2016	1.48	0.7	82	1.31	0.68	224	9.1%	0.17 [-0.01, 0.35]
Park; 2009	1.2	1.2	97	1.1	1.3	60	6.9%	0.10 [-0.31, 0.51]
Simsek; 2012	3.09	1.24	70	1.25	0.77	70	7.6%	1.84 [1.50, 2.18]
Tinelli; 2014	1.5	0.3	68	1.6	0.1	72	9.7%	-0.10 [-0.17, -0.03]
Topcu; 2015	1.4	0.9	76	1.4	1.1	60	7.6%	0.00 [-0.34, 0.34]
Total (95% CI)			**771**			**974**	**100.0%**	**0.25 [0.06, 0.45]**

Heterogeneity: $Tau^2 = 0.10$; $Chi^2 = 137.34$, $df = 12$ ($P < 0.00001$); $I^2 = 91\%$

Test for overall effect: $Z = 2.50$ ($P = 0.01$)

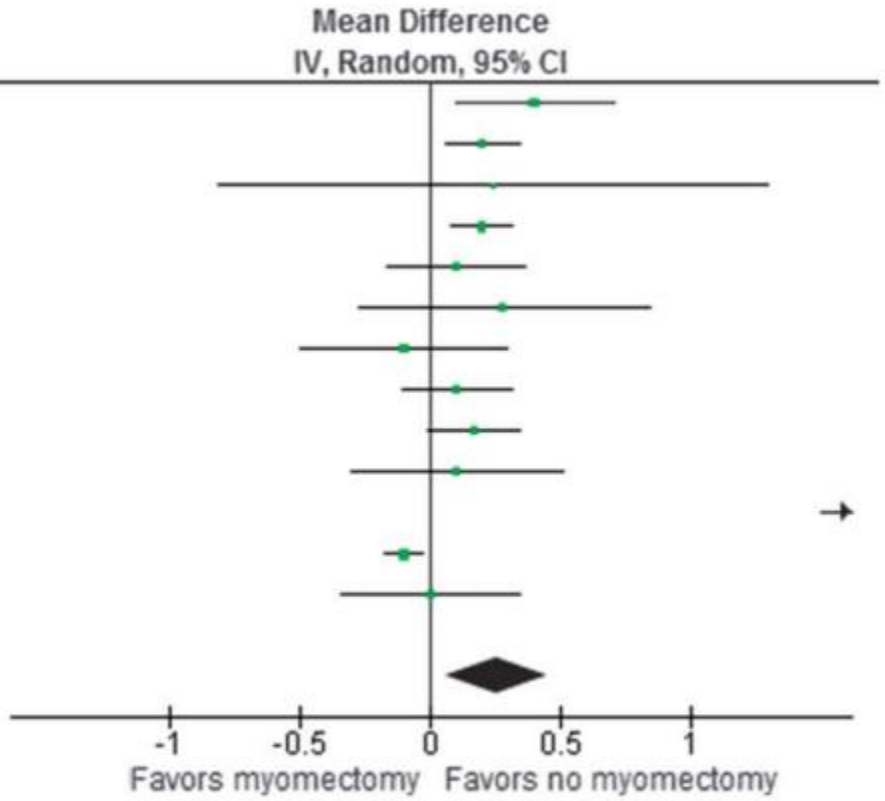


Fig. 2. Mean hemoglobin decline was significantly decreased among patients who had myomectomy (P=.02). IV, independent variable, df, degrees of freedom.

Pergialiotis. Myomectomy at Cesarean Delivery. Obstet Gynecol 2017.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Study or Subgroup	With Myomectomy Mean	SD	Total	Without Myomectomy Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Akbas; 2016	45.87	5.25	63	37.3	4.73	63	7.8%	8.57 [6.83, 10.31]
Akkurt; 2016	57.1	10.2	90	48.3	7.2	61	7.8%	8.80 [6.02, 11.58]
Hassiakos; 2006	63.2	16.4	47	48.5	5.6	94	7.7%	14.70 [9.88, 19.52]
Kaymak; 2005	53.3	18.6	40	44.4	6.7	80	7.6%	8.90 [2.95, 14.85]
Kumar; 2014	68.57	15.012	21	51.55	9.595	42	7.5%	17.02 [9.97, 24.07]
Kwon; 2014	91.9	21.5	65	60	18.8	96	7.5%	31.90 [25.46, 38.34]
Li; 2009	83.6	10.8	1242	41.9	9.1	145	7.8%	41.70 [40.10, 43.30]
Lin; 2010	64	10	36	53	10	36	7.7%	11.00 [6.38, 15.62]
Owolabi; 2007	66.8	5.4	14	56.4	4.6	14	7.7%	10.40 [6.68, 14.12]
Ozcan; 2016	39.94	12.5	82	35.27	9.1	224	7.8%	4.67 [1.71, 7.63]
Park; 2009	60.1	19.2	97	55.8	15	60	7.6%	4.30 [-1.09, 9.69]
Tinelli; 2014	50.5	19.2	68	41.6	8.2	72	7.7%	8.90 [3.96, 13.84]
Topcu; 2015	51.6	13.5	76	42.1	8.7	60	7.7%	9.50 [5.75, 13.25]
Total (95% CI)			**1941**			**1047**	**100.0%**	**13.87 [4.78, 22.95]**

Heterogeneity: $Tau^2 = 273.92$; $Chi^2 = 1185.25$, $df = 12$ ($P < 0.00001$); $I^2 = 99\%$

Test for overall effect: $Z = 2.99$ ($P = 0.003$)

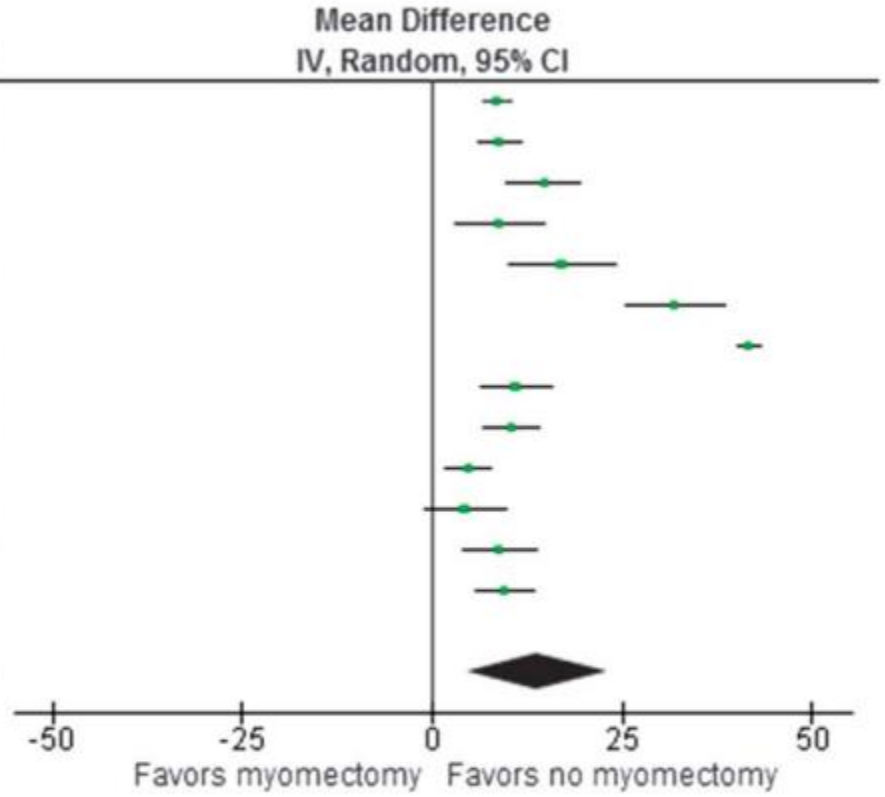


Fig. 3 Mean intraoperative duration was significantly increased among patients who had myomectomy. IV, independent variable; df, degrees of freedom.

Pergialiotis. Myomectomy at Cesarean Delivery. Obstet Gynecol 2017.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Study or Subgroup	With Myomectomy Mean	SD	Total	Withouy Myomectomy Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Akbas; 2016	2.8	1.29	63	2.5	0.94	63	6.2%	0.30 [-0.09, 0.69]
Akkurt; 2016	3.3	1.2	90	3	1.1	61	6.9%	0.30 [-0.07, 0.67]
Hassiakos; 2006	3.7	0.6	47	3.3	0.8	94	13.5%	0.40 [0.16, 0.64]
Kaymak; 2005	3.3	0.8	40	2.7	0.6	80	10.6%	0.60 [0.32, 0.88]
Kumar; 2014	7.26	3.667	21	6.55	2.578	42	0.4%	0.71 [-1.04, 2.46]
Kwon; 2014	5.1	1.4	65	5	1.7	96	4.4%	0.10 [-0.38, 0.58]
Li; 2009	5.3	2.1	1242	5.1	1.2	145	14.2%	0.20 [-0.03, 0.43]
Ozcan; 2016	2.41	0.82	82	2.1	0.87	224	15.6%	0.31 [0.10, 0.52]
Park; 2009	5.5	1.3	97	4.9	1.4	60	5.2%	0.60 [0.16, 1.04]
Simsek; 2012	3.02	1.58	70	2.4	1.09	70	4.9%	0.62 [0.17, 1.07]
Tinelli; 2014	5	1.4	68	4.4	0.7	72	6.9%	0.60 [0.23, 0.97]
Topcu; 2015	2.2	0.9	76	2.1	0.7	60	11.3%	0.10 [-0.17, 0.37]
Total (95% CI)			**1961**			**1067**	**100.0%**	**0.35 [0.25, 0.46]**

Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 14.06$, df = 11 (P = 0.23); $I^2 = 22\%$

Test for overall effect: Z = 6.52 (P < 0.00001)

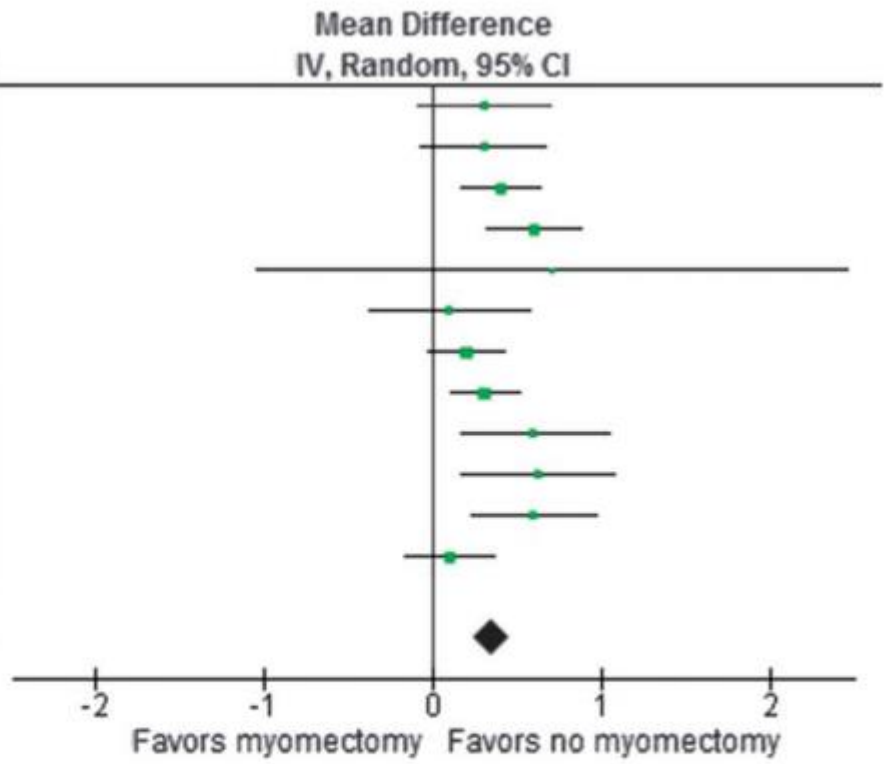


Fig. 4 Mean duration of hospitalization was significantly increased among patients who had myomectomy. IV, independent variable; df, degrees of freedom.

Pergialiotis. Myomectomy at Cesarean Delivery. Obstet Gynecol 2017.

Table 2. Leiomyoma Characteristics (Myomectomy vs Control Group)

	Leiomyoma Location					
Author, Year	Pedunculated	Subserosal	Intramural	Submucosal	Multiple Sites	Not Specified
Dedes, 2017	34/48 vs 40/114		14/48 vs 74/114		N/A	N/A
Akbas, 2016	N/A	N/A	N/A	N/A	N/A	N/A
Akkurt, 2016	8/91*†	36/91*	10/91*†	8/91*	37/91*	N/A
Ozcan, 2016	1/82 vs 3/224	50/82 vs 82/224	29/82 vs 125/224	2/82 vs 14/224	N/A	N/A
Topcu, 2015	N/A	24/76 vs 7/60	44/76 vs 49/60	8/76 vs 4/60	N/A	N/A
Sparic, 2015	9/102 vs 2/83	41/102 vs 16/83	11/102 vs 30/83	N/A	41/102 vs 31/83	N/A
Kumar, 2014	N/A	30/37*	6/37*	1/37*	N/A	N/A
Kwon, 2014	N/A	22/65 vs 37/96	39/65 vs 54/96	2/65 vs 2/96	2/65 vs 3/96	N/A
Tinelli, 2013	6/68*	48/68*	14/68*	N/A	N/A	N/A
Simsek, 2012	N/A	31/73*	33/73*	9/73*	N/A	N/A
Lin, 2010	N/A	N/A	25/36 vs 27/36	11/36 vs 9/36	N/A	N/A
Park, 2009	4/97 vs 0/60	62/97 vs 38/60	21/97 vs 13/60	1/97 vs 0/60	8/97 vs 9/60	N/A
Li, 2009	N/A	407/1,142 vs 4/145	384/1,142 vs 116/145	68/1,142 vs 3/145	383/1,142 vs 22/145	N/A
Owolabi, 2007	0/14 vs 0/14	2/14 vs 0/14	6/14 vs 0/14	1/14 vs 0/14	5/14 vs 0/14	N/A
Hassiakos, 2006	5/47*	18/47*	12/47*	2/47*	10/47*	N/A
Kaymak, 2005	4/40*	13/40*	11/40*	2/40*	10/40*	N/A
Roman, 2004	25/111*	27/111*	27/111*	6/111*	20/111*	6/111*
Kwawukume, 2002	N/A	N/A	N/A	N/A	N/A	N/A
Brown, 1999	N/A	N/A	N/A	N/A	N/A	N/A

N/A, data were not available.
Data are n/N or mean±SD.
* Results were not reported in the control group or leiomyomas not present.
† Submucosal and pedunculated were reported in the same group.

PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

	Pedunculated	Subserosal	Intramural	Submucosal	Multiple Sites	Not specified
Dedes, 2017	34/48 vs 40/114		14/48 vs 74/114		N/A	N/A
Ozcan, 2016	1/82 vs 3/224	50/82 vs 82/224	29/82 vs 125/224	2/82 vs 14/224	N/A	N/A
Topcu, 2015	N/A	24/76 vs 7/60	44/76 vs 49/60	8/76 vs 4/60	N/A	N/A
Sparic, 2015	9/102 vs 2/83	41/102 vs 16/83	11/102 vs 30/83	N/A	41/102 vs 31/83	N/A
Kwon, 2014	N/A	22/65 vs 37/96	39/65 vs 54/96	2/65 vs 2/96	2/65 vs 3/96	N/A
Lin, 2010	N/A	N/A	25/36 vs 27/36	11/36 vs 9/36	N/A	N/A
Park, 2009	4/97 vs 0/60	62/97 vs 38/60	21/97 vs 13/60	1/97 vs 0/60	8/97 vs 9/60	N/A
Li, 2009 N	N/A	407/1,142 vs 4/145	384/1,142 vs 116/145	68/1,142 vs 3/145	383/1,142 vs 22/145	N/A
Owolabi, 2007	0/14 vs 0/14	2/14 vs 0/14	6/14 vs 0/14	1/14 vs 0/14	5/14 vs 0/14	N/A

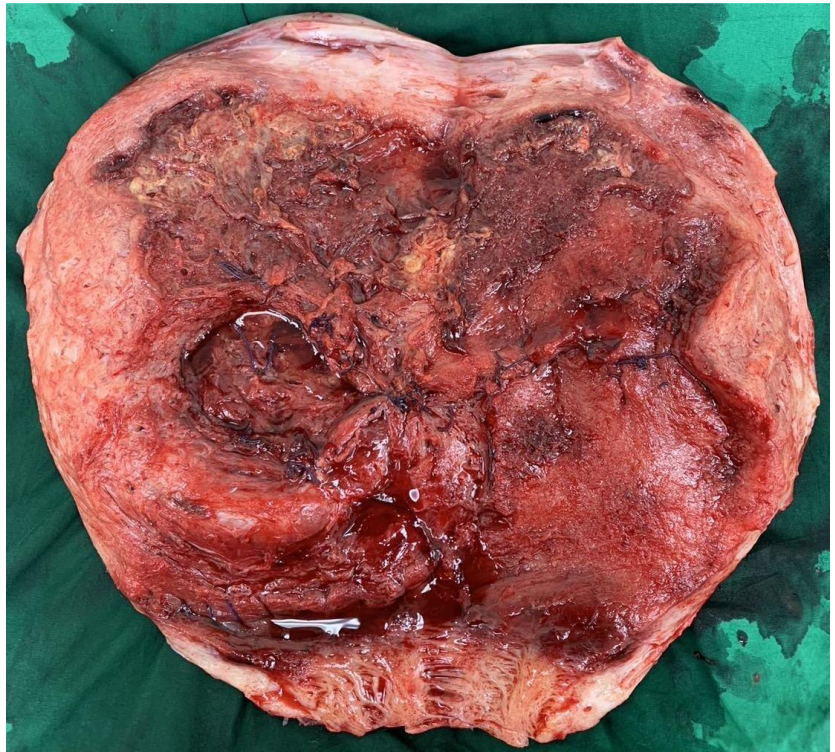
PERIOPERATIVE COMPLICATIONS OF CESAREAN DELIVERY MYOMECTOMY

Leiomyoma Size		
Less Than 3 cm	3 cm to Less Than 6 cm	6 cm or Greater
4/48 vs 44/114	25/48 vs 29/114	19/48 vs 41/114
99.2±85.9 vs 84.12±60 cm^3		
24/91*	42/91*	30/91*
48/82 vs 14/224	17/82 vs 52/224	17/82 vs 30/224
17/76 vs 11/60	39/76 vs 24/60	20/76 vs 25/60
5.56±3.38 vs 5.76±3.57		
14/37*	14/37*	9/37*
30*		35*
N/A	N/A	N/A
N/A	N/A	N/A
9.3±3.3 vs 9.6±3.2		
46/97 vs 29/60	33/97 vs 21/60	18/97 vs 10/60
N/A	N/A	N/A
0/14 vs 0/14	0/14 vs 0/14	14/14 vs 0/14
7.9±4.2 vs 5.9±2.9		
2/40 vs 18/80	14/40 vs 25/80	24/40 vs 37/80
40/111 vs 71/257	46/111 vs 97	22/111 vs 45/257
N/A	N/A	N/A
N/A	N/A	N/A

Pergialiotis, V., et al. (2017). "Perioperative Complications of Cesarean Delivery Myomectomy: A Meta-analysis." Obstet Gynecol **130**(6): 1295-1303.

Operation

Uterine atony: Carbetocin 100mcg, methergin 0.2 mg IV, Nalador 500 mcg+NSS 250ml
Total EBL 3000 ml → Try bakri ballon insertion with NSS 300 ml — Fail
Total EBL 5000 ml → Performed Subtotal hysterectomy




CM
INCHES

SUMMARY

- Preoperative plan
- Postpartum hemorrhage
- Cesarean myomectomy
- Minimize blood loss during myomectomy