Surgical Treatment of Endometriosis

Dr shahla danaei

- Presence of endometrial tissue (glands & stroma) outside the uterus

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- It is a progressive debilitating disease affecting general physical, mental & social well being of women

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- Affects nearly 7 to10% of the women in reproductive age, 30% of those who are infertile or present with pain.

- The most frequent sites of implantation are pelvic viscera and the peritoneum

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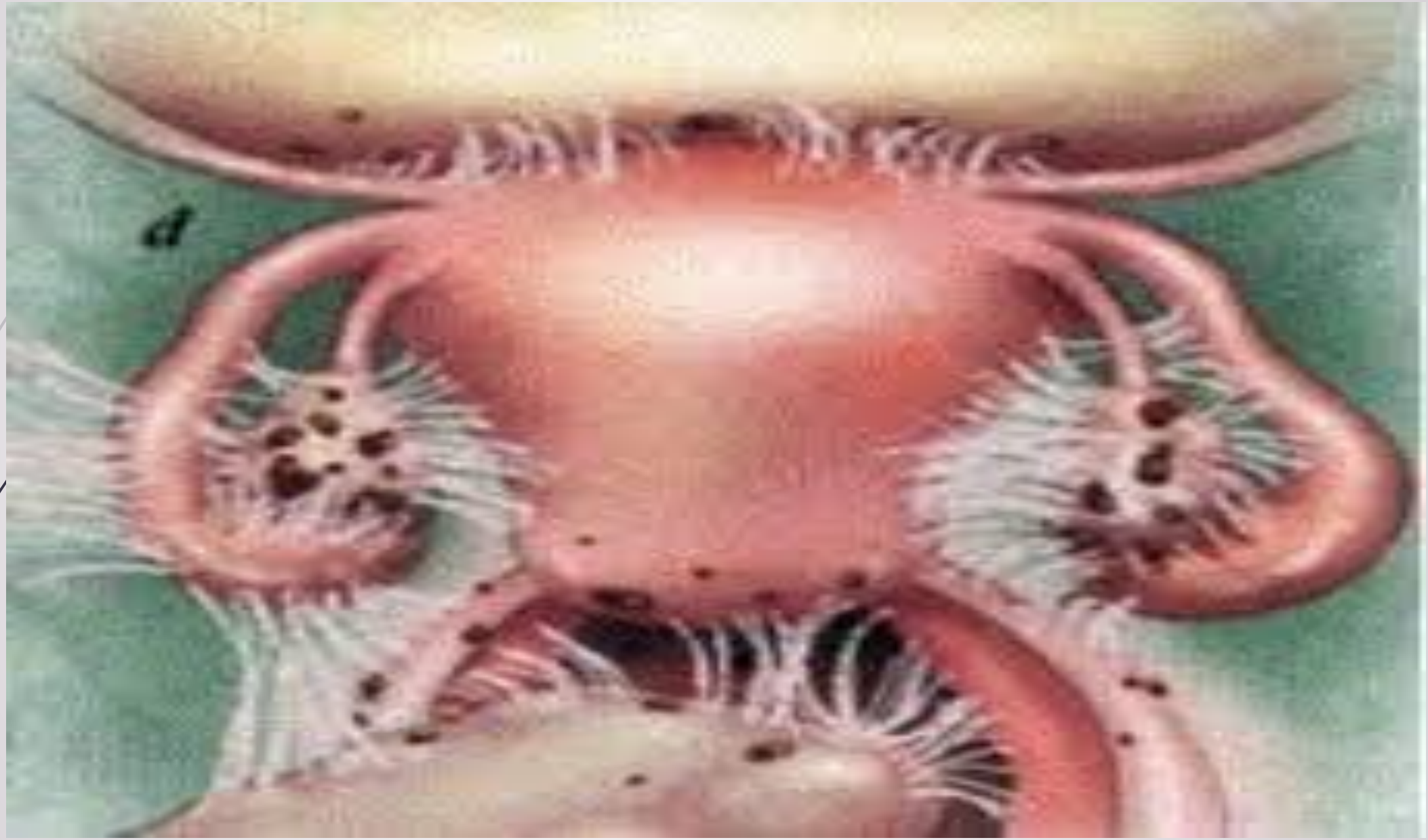
- Less commonly cervix, hernial sacs, the umbilicus, laparotomy or episiotomy scars may be involved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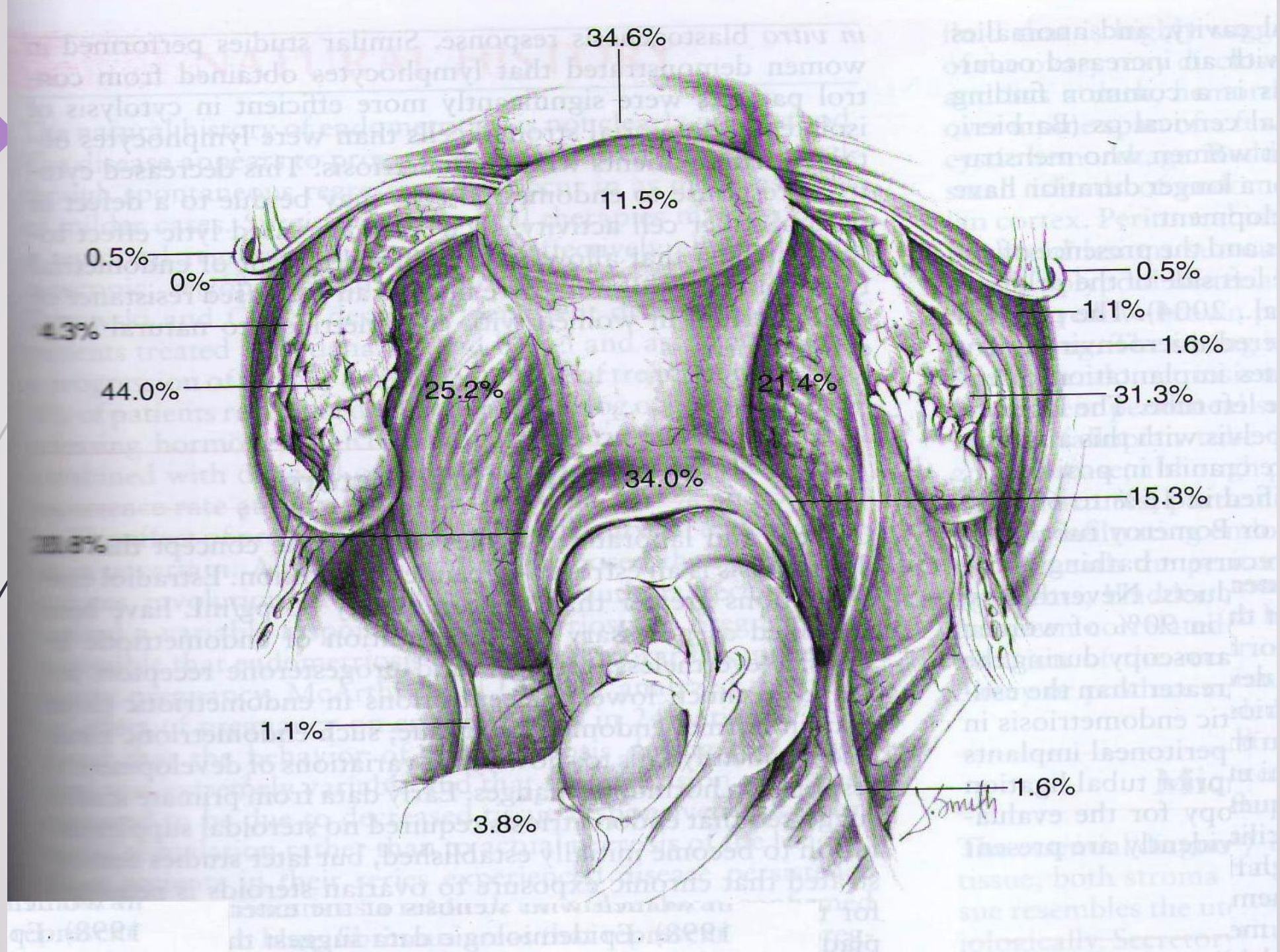
Sites of endometriosis

- ***Pelvic***
  - Ovary
  - Cul de sac
  - Uterosacrals
  - Posterior surface of uterus
  - Posterior broad ligament
  - Rectovaginal septum
  - Tubes and round ligaments
- ***Extrapelvic sites***
  - Intestines (rectosigmoid, cecum, terminal ileum, proximal colon, appendix)
  - Lungs & thorax
  - Urinary tract
- ***Less common sites***
  - Cervix
  - Hernial sacs
  - Umblicus
  - Laparotomy/episiotomy sites
  - Tubal stumps after sterilization
- ***Rarest***
  - Extremities


34.6%
11.5%
0.5%
0%
4.3%
44.0%
25.2%
21.4%
0.5%
1.1%
1.6%
31.3%
34.0%
15.3%
1.1%
1.6%
3.8%

Endometriotic lesions

Variable appearance

Peritoneum

Typical

Superficial

- Early red lesions
- Powder burn or gunshot
- Black, dark brown or bluish puckered lesions
- White plaques
- Adhesions –flimsy,vascular,dense

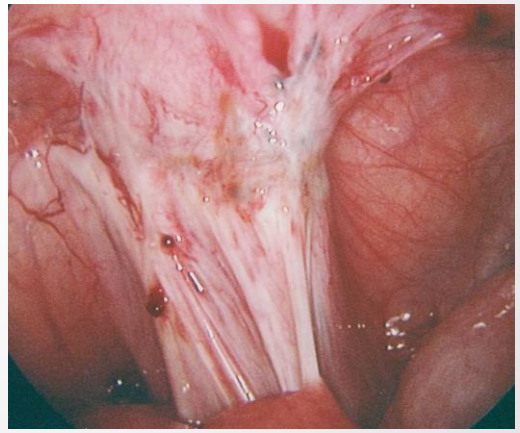
(DIE) Deeply Infiltrating Endometriosis , >5mm depth

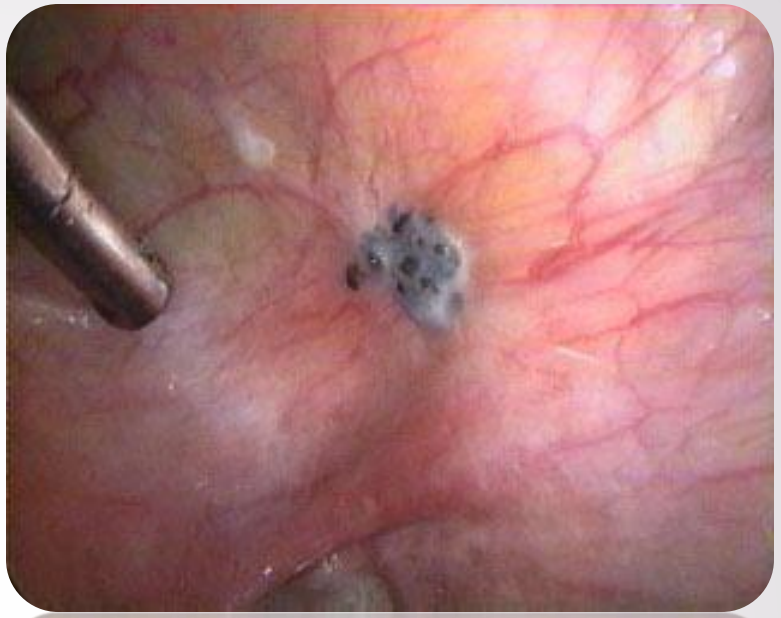
Atypical or subtle lesions

- Serous / clear vesicle
- Yellowish discoloration

Ovaries

- Superficial
- Subovarian adhesions
- Endometriomas






Clear endometriosis

Endometriosis and Infertility,Pathophysiology

- Pelvic anatomy distorsion
- Inflammatory and oxidative damage
- Impaired endometrial receptivity, implantation
- Ovulatory dysfunction
- Endocrine disorders
- Decreased oocyte and embryo quality
- Tubal motility dysfunction

Hamdan et al, 2015

Dysmenorrhea & pelvic pain-

- Often starts after years of pain free menses.
- Starts before the onset of periods and continues throughout menses
- Most studies failed to show correlation between degree of pain and severity of endometriosis.
- Causation of pain –
  - local peritoneal inflammation,
  - deep infiltration- proximity to nerve fibers,
  - adhesion formation and fibrotic thickening,
  - collection of shed menstrual blood in implants, resulting in painful traction with physiological movements.

Clinical Presentation

Severe dysmenorrhoea

Deep dyspareunia

Chronic pelvic pain

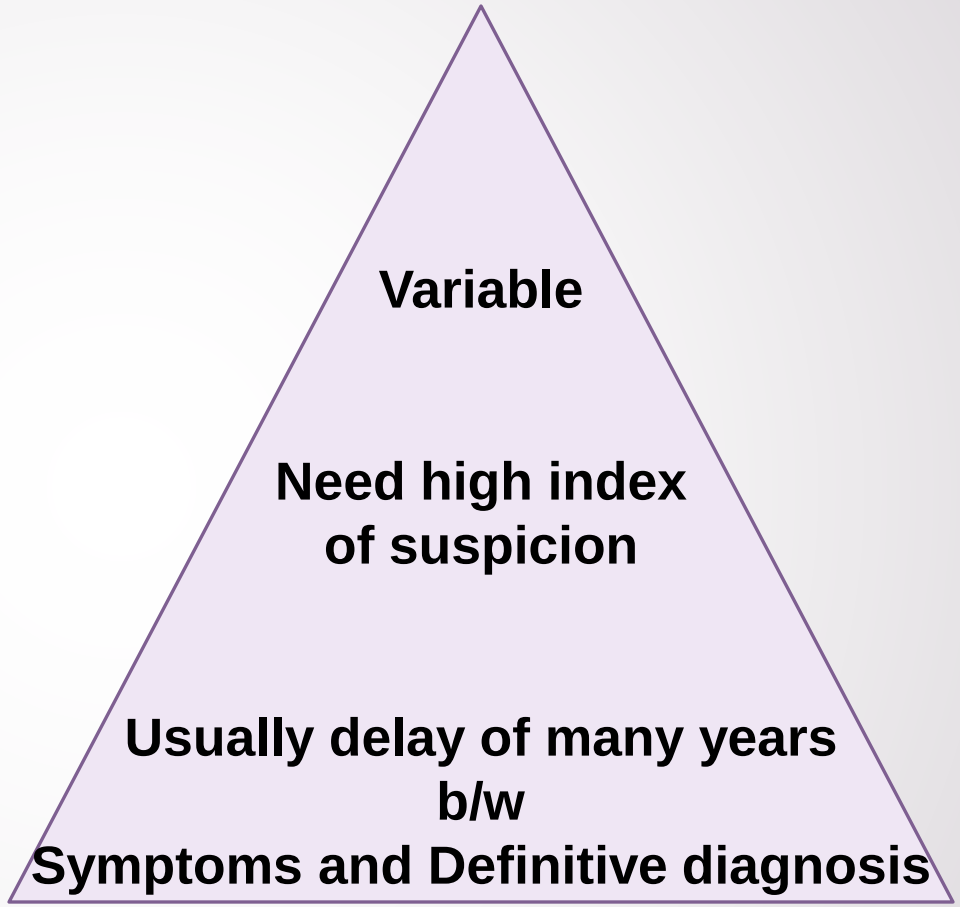
Ovulation pain

Perimenstural pain/bleed

Infertility

Chronic fatigue

Pain during defecation



Infertility

Possible mechanisms

- **Mechanical causes**
  - Altered tubo ovarian relationships
  - Altered tubal motility
  - Impaired oocyte pickup
- **Alterations in peritoneal fluid**
  - ↑Macrophages, PGs, Cytokines - affect sperm motility, sperm oocyte interaction, sperm phagocytosis, implantation failure
- **Alteration of systemic immune response**
  - ↑ antiendometrial antibodies –*(Gajbhiye et al 2008,Mathur et al 2000)*
  - ↑ cell mediated gametocyte injury

Hormonal factors

- Defective folliculogenesis
- Luteinized unruptured follicle (4-35%)
- Luteal phase deficiency
- Hyperprolactinemia and galactorrhea
- Fertilization and implantation failure

- Monthly fecundity rate is lower in women with mild disease (5-11% vs 25%)
- No evidence that spontaneous abortion rates are higher in endometriosis.

Diagnosis

- Pelvic tenderness, a fixed retroverted uterus, tender utero-sacral ligaments or enlarged ovaries suggest endometriosis.
- Deeply infiltrating nodules on utero-sacral ligaments/POD or visible lesions on vagina or cervix give more certainty.
- The detection is improved if examined during menstruation. Acceptance may be an issue
- Rectovaginal examination is required if suspecting DIE.

Diagnosis

- For a definitive diagnosis of endometriosis visual inspection of the pelvis at laparoscopy is the gold standard investigation, unless disease is visible in the vagina or elsewhere.(RCOG recommendation level B)

- There is insufficient evidence to justify timing the laparoscopy at a specific time in the menstrual cycle but it should not be performed during or within 3 months of hormonal treatment so as to avoid under diagnosis .

Surgical Treatment

- Gold standard of treatment of endometriosis is laparoscopic surgery
- Sclerotherapy of ovarian endometrioma isn't recommended
- Only 40% of endometriosis patients have endometriomas
- 80 % of endometriosis patients have DIE in pevic floor

Advantages of surgery

- Pain relief
- Removing of endometriosis points in pelvic
- Treatment of infertility
- Suppression progression of disease
- Less recurrence of disease
- Improve of reproductive function
- Increasing of pregnancy rate

Advantages of surgery in infertile patients

- Better ovulation
- Better access of ovary for ART treatment
- Removing of simultaneous hydrosalpinx
- Reduce risk of ruppter of cyst

Disadvantages of surgery

- Anesthesia complications
- Organ injury
- Infections
- hemorrhage
- Adhesion
- Cost

Disadvantages of surgery in infertile patients

- There is 50 % of recurrence of disease in suboptimal surgeries and 20% recurrence in advance surgery of endomteriosis
- medical treatment is needed after surgery
- Decrease of ovarian reserve and AFC
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Decrease of ovarian reserve

- Technique of removing of endometrioma is important
- skill of surgen
- Saving of normal ovarian tissue
- There is 30 – 40 % of reduction of AMH between 6 – 12 month after surgery and then it increases 20 – 25 %
- Endometriosis without surgery itself reduces ovarian reserve

Disadvantages of conservative management

- Infection
- abscess formation
- Spontaneous infection
- ART treatment dose not increase recurrence of disease
- Pregnancy complications

absolute indications of surgery

- Inaccessibility of follicles
- Doubt of malignancy
- Unilateral endometrioma in young patients
- Advance age DOR (diminished ovarian reserve) , RIF (recurrent implantation failure)
- Organ damage (colon , urinary)

Stage 1 - 2 Endometriosis Surgical Treatment

Laparoscopic treatment of stage 1-2 endometriosis increases live birth and ongoing pregnancies

Canadian(ENDOCAN)Multicenter

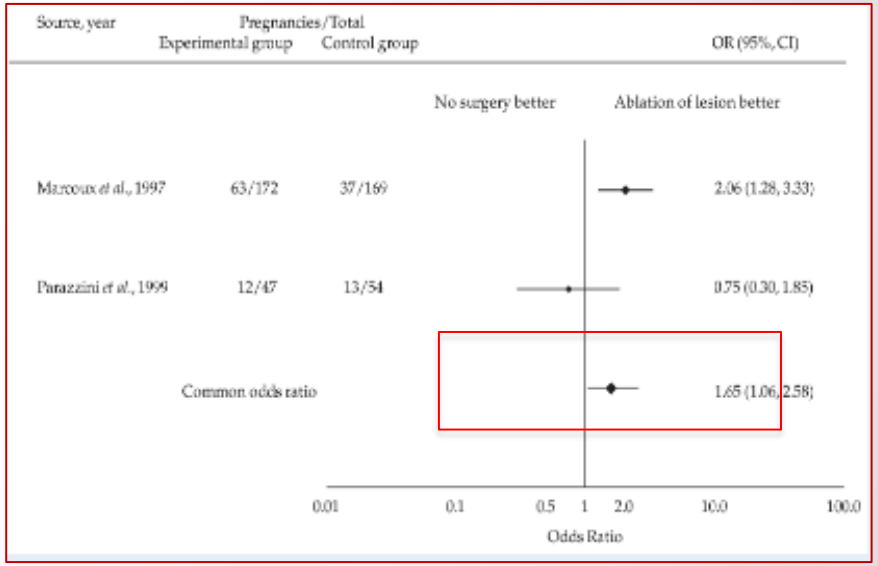
- N=172 laparoscopic surgery
- N=169 diagnostic laparoscopic
- PR: %29 in LS GR & %17 CONTROL
- Significant

(Marcoux et al., 1997)

Study from Italy

- Multicenter
- N=54 laparoscopic surgery
- N=47 diagnostic laparoscopic
- LBR: %20 & %22
- Not significant

(Parazzini et al., 1999)



Duffy JM,et al. Cochrane Database Syst Rev 2014

ESHRE guideline: management of women with endometriosis

In infertile women with AFS/ASRM Stage I/II endometriosis, clinicians should perform operative laparoscopy (excision or ablation of the endometriosis lesions) including adhesiolysis, rather than performing diagnostic laparoscopy only, to increase ongoing pregnancy rates (Nowroozi *et al.*, 1987; Jacobson *et al.*, 2010).	A
In infertile women with AFS/ASRM Stage I/II endometriosis, clinicians may consider CO_2 laser vaporization of endometriosis, instead of monopolar electrocoagulation, since laser vaporization is associated with higher cumulative spontaneous pregnancy rates (Chang *et al.*, 1997).	C

Human Reproduction,Vol.29, No.3 pp.400-412,2014

2005

- 4cm endometrioma ➔ SURGERY

  Increased spontaneous pregnancy

  Increased response to COH

  Easier OPU

  Decreased pelvic infection risk

2013

- > 3 cm endometrioma
- With concomittant pelvic pain surgery

  Increased spontaneous pregnancy

  Increased response to COH

  Easier OPU

  Decreased pelvic infection risk

➔

2021

- Surgical treatment
- It is recommended to offer surgery as one of the options to reduce endometriosisassociated pain
- When surgery is performed, clinicians may consider excision instead of ablation of endometriosis to reduce endometriosis-associated pain.
- It can be concluded that LUNA is not beneficial as an additional procedure to conventional laparoscopic surgery for endometriosis, as it offers no additional benefit over surgery alone. PSN is beneficial for treatment of endometriosis-associated midline pain as an adjunct to conventional laparoscopic surgery, but it should be stressed that PSN requires a high degree of skill and is associated with an increased risk of adverse effects such as intraoperative bleeding, and postoperative constipation, urinary urgency and painless first stage of labour.

2021

- When performing surgery in women with ovarian endometrioma, clinicians should perform cystectomy instead of drainage and coagulation, as cystectomy reduces recurrence of endometrioma and endometriosis-associated pain
- When performing surgery in women with ovarian endometrioma, clinicians can consider both cystectomy and laser vaporization, as both techniques appear to have similar recurrence rates beyond the first year after surgery. Early post-surgical recurrence rates may be lower after cystectomy
- When performing surgery for ovarian endometrioma, specific caution should be used to minimize ovarian damage.

2021

- Clinicians can consider performing surgical removal of deep endometriosis, as it may reduce endometriosis-associated pain and improves quality of life
- The GDG recommends that women with deep endometriosis are referred to a centre of expertise
- The GDG recommends that patients undergoing surgery particularly for deep endometriosis are informed on potential risks, benefits, and long-term effect on quality of life.
- There are currently no prognostic markers that can be used to select patients that would benefit from surgery. Such markers would need to be assessed prior to surgery and predict a clinically meaningful improvement of pain symptoms.

Medical therapies as an adjunct to surgery 2021

- It is not recommended to prescribe preoperative hormonal treatment to improve the immediate outcome of surgery for pain in women with endometriosis.
- Women may be offered postoperative hormonal treatment to improve the immediate outcome of surgery for pain in women with endometriosis.

Medical versus surgical treatment for endometriosis 2021

The GDG recommends that clinicians take a shared decision-making approach and take individual preferences, side effects, individual efficacy, costs, and availability into consideration when choosing between hormonal and surgical treatments for endometriosis-associated pain

Disadvantages to perform surgery

- Decreased ovarain reserve

  Serum AMH descreases

  Decreased AFC

  Raffi et al., 2012; Somigliana et al., 2012 Goodman 2016

- Decreased spontanous ovulation following surgery

  Loh et al., 1999; Candiani et al., 2005; Horikawa et al., 2008

- Decreased response to COH

  Gupta et al.,2006; Somigliana et al., 2011

The post-operative decline in serum anti-Müllerian hormone correlates with the bilaterality and severity of endometriosis

The decrease in ovarian reserve should be taken into account in patients indicated for cystectomy for bilateral endometriomas or unilateral endometrioma with high rASRM scores

Characteristics and variables	Overall ($n = 38$)	Unilateral ($n = 20$)	Bilateral ($n = 18$)	*P*-value
Age (years)	33.8 ± 4.7	34.0 ± 3.9	33.6 ± 5.4	0.830[a]
BMI (kg/m^2)	20.1 ± 2.3	20.4 ± 2.7	19.7 ± 1.7	0.781[b]
Preoperative				
Monocystic/Multicystic (%)	6 (16)/32 (84)	5 (25)/15 (75)	1 (6)/17 (94)	0.184[c]
Cyst size 1 (cm)	6.4 ± 2.2	6.1 ± 2.5	6.7 ± 1.8	0.125[b]
Cyst size 2 (cm)	3.9 ± 1.3	NA	3.9 ± 1.3	NA
Cyst size 1 + 2 (cm)	8.2 ± 3.4	6.1 ± 2.5	10.6 ± 2.5	<0.001[b]
Serum CA125 (IU/ml)	85.4 ± 84.8	99.7 ± 105.1	68.7 ± 46.3	0.915[b]
Surgery				
Laparoscopy/Laparotomy	33 (87)/5 (13)	18 (90)/2 (10)	15 (83)/3 (17)	0.653[c]
Blood loss (ml)	249 ± 305	152 ± 216	357 ± 350	0.005[b]
rASRM score	49.5 ± 28.3	36.7 ± 23.5	63.7 ± 26.3	<0.001[b]
Number of follicles in specimens	18.1 ± 19.8	16.9 ± 14.8	19.4 ± 24.2	0.763[b]
Serum AMH (ng/ml)				
Preoperative	3.9 ± 2.5	4.1 ± 2.3	3.6 ± 2.7	0.299[b]
Post-operative	2.1 ± 1.6	2.9 ± 1.6	1.2 ± 1.0	0.001[b]

Hirokawa, Hum Reprod, 2011

Ovarian damage after laparoscopic endometrioma excision might be related to the size of cyst

TABLE 2

Comparison of antral follicle count (AFC), number of dominant follicles, and number of oocytes retrieved between operated ovaries and intact ovaries in two groups.

	Cyst diameter <4 cm (n = 51)			Cyst diameter ≥4 cm (n = 63)		
	Operated ovary	Intact ovary	*P* value	Operated ovary	Intact ovary	*P* value
AFC	4.9 ± 2.7	5.6 ± 3.0	.078	4.9 ± 3.2	7.3 ± 3.8	<.001
No. of dominant follicles	2.6 ± 2.2	3.4 ± 2.3	.053	2.1 ± 2.2	4.0 ± 2.7	<.001
No. of oocytes retrieved	4.6 ± 3.6	5.5 ± 4.1	.196	2.8 ± 2.5	6.2 ± 3.7	<.001

Note: Values are mean ± standard deviation (SD). Paired-Samples *t* test was used for the analysis. *P*< .05 was considered statistically significant.

Tang. Ovarian damage and endometrioma size. Fertil Steril 2013.

TABLE 3

Differences of antral follicle count (AFC), number of dominant follicles, and number of oocytes retrieved from two ovaries between the groups with an excised cyst of <4 cm or ≥4 cm diameter.

	Cyst diameter		
Difference	<4 cm (n = 51)	≥4 cm (n = 63)	*P* value
AFC	0.7 ± 2.7	2.5 ± 3.9	.011
No. of dominant follicles	0.8 ± 2.7	1.9 ± 2.9	.039
No. of oocytes retrieved	0.9 ± 4.9	3.3 ± 3.6	.006

Note: Values are mean ± standard deviation (SD). Mann-Whitney *U*-test was used for the analysis. *P*< .05 was considered statistically significant.

Tang. Ovarian damage and endometrioma size. Fertil Steril 2013.

Yan Tang Fertil Steril 2013

Second surgery for recurrent endometriomas is more harmful to healthy ovarian tissue and ovarian reserve than first surgery

Surgery for recurrent endometriomas is associated with evidence of a higher loss of ovarian tissue and is more harmful to the ovarian reserve evaluated by AFC and ovarian volume, if compared with endometriomas operated for the first time. Indications to surgery for recurrent endometriomas should be reconsidered with caution.

histology grade	(n = 17)	(n = 11)	value
Total cyst wall (mm)	1.1 ± 0.3	1.7 ± 0.3	.00003
Endometriotic tissue (mm)	0.2 ± 0.1	0.3 ± 0.1	.007
Ovarian tissue (mm)	0.3 ± 0.2	0.6 ± 0.3	.0009
Histology grade	0.4 ± 0.6	0.7 ± 0.3	.35

Note: Data are expressed as mean ± SD. PS = primary surgery; RS = recurrent surgery.

Muzii. Surgery for recurrent endometriomas. Fertil Steril 2015.

Antral follicle count	(n = 17)	(n = 11)	RS group)
Operated ovary	5.1 ± 2.8	3.5 ± 1.4	.07
Contralateral ovary	5.7 ± 2.2	4.6 ± 1.5	.17
P value (operated vs. contralateral ovary)	.2	.002	

Note: Data are expressed as mean ± SD. PS = primary surgery; RS = recurrent surgery.

Muzii. Surgery for recurrent endometriomas. Fertil Steril 2015.

Ovarian reserve evaluation by ovarian volume after surgical excision of ovarian endometriomas.

Ovarian volume	PS group (n = 17)	RS group (n = 11)	*P* value (PS vs. RS group)
Operated ovary (mL)	7.0 ± 2.0	5.3 ± 1.7	.03
Contralateral ovary (mL)	7.5 ± 1.9	6.6 ± 1.7	.23
P value (operated vs. contralateral ovary)	.08	.001	

Note: Data are expressed as mean ± SD. PS = primary surgery; RS = recurrent surgery.

Muzii. Surgery for recurrent endometriomas. Fertil Steril 2015.

Muzzii L, Fertil steril 2015

Laparoscopy – gold standard

- Diagnose the **extent** and **severity** of disease.
- Should not be performed within 3 months of hormonal therapy to avoid under diagnosis.
- **Methodical approach required**. Thoroughly inspect the lateral sidewalls, all ovarian surfaces, both sides of broad ligament, bladder, bowel serosa and inferior aspects of the cul de sac.
- **Uterine manipulation** helps in visualizing POD and recto vaginal septum
- **Photography** and video recording of the findings should be done ideally.

Treatment Options

- **Medical Therapy**
  - NSAIDs and Cox2 inhibitors
  - COCs
  - Progestogens
  - Anti progestins
  - GnRH agonists and antagonists
  - Aromatase inhibitors
  - Selective Estrogen Receptor Modulators
  - Selective Progesteron Receptor Modulators

- **Surgical Treatment**
  - Conservative Surgery
  - Definitive Surgery

Grading of Endometriosis

Endometriosis	Deposits	< 1cm	1-3 cm	> 3cm
Peritoneal	Superficial	1	2	4
	Deep	2	4	8
Ovary	Right superficial	2	4	8
	Right deep	4	16	20
	Left superficial	2	4	8
	Left deep	4	16	20
Cul-de-sac obliteration	Partial	4	Complete	40
Adhesions	**Enclosure**	**<1/3**	**1/3-2/3**	**>2/3**
Ovary	Right filmsy	1	2	4
	Right dense	4	8	16
	Left filmsy	1	2	4

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE
REVISED CLASSIFICATION OF ENDOMETRIOSIS

Patient's Name _____ Date _____

Stage I (Minimal) - 1-5
Stage II (Mild) - 6-15
Stage III (Moderate) - 16-40
Stage IV (Severe) - >40
Total _____

Laparoscopy _____ Laparotomy _____ Photography _____
Recommended Treatment _____
_____
Prognosis _____

PERITONEUM	ENDOMETRIOSIS	<1cm	1-3cm	>3cm
	Superficial	1	2	4
	Deep	2	4	6
OVARY	R Superficial	1	2	4
	Deep	4	16	20
	L Superficial	1	2	4
	Deep	4	16	20

POSTERIOR CULDESAC OBLITERATION	Partial	Complete
	4	40

OVARY	ADHESIONS	<1/3 Enclosure	1/3-2/3 Enclosure	>2/3 Enclosure
	R Filmy	1	2	4
	Dense	4	8	16
	L Filmy	1	2	4
	Dense	4	8	16
TUBE	R Filmy	1	2	4
	Dense	4*	8*	16
	L Filmy	1	2	4
	Dense	4*	8*	16

*If the fimbriated end of the fallopian tube is completely enclosed, change the point assignment to 16.

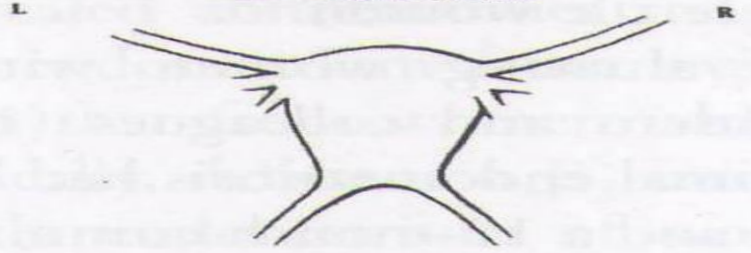
Denote appearance of superficial implant types as red [(R), red, red-pink, flamelike, vesicular blobs, clear vesicles], white [(W), opacifications, peritoneal defects, yellow-brown], or black [(B) black, hemosiderin deposits, blue]. Denote percent of total described as R____%, W____% and B____%. Total should equal 100%.

Additional Endometriosis: _____

Associated Pathology: _____

To Be Used with Normal Tubes and Ovaries

To Be Used with Abnormal Tubes and/or Ovaries



Infertility and endometriosis

- Ablation of endometriotic lesions plus adhesiolysis to improve fertility in minimal–mild endometriosis is effective **(level A,RCOG)**.
- The role of surgery in improving pregnancy rates for moderate-severe disease is uncertain.
- No randomised controlled trials or meta-analyses are available to answer the question.

Conservative Surgery

- An asymptomatic patient with incidental finding of Endometriosis does not require any treatment
- Excision or ablation reduces pain.
- Excision rather than drainage or fulguration provides better pain relief, reduced recurrence, and histological diagnosis
- Surgical excision with scissors, bipolar coagulation or laser
- Ovarian endometrioma < 4 cms – Aspirated, irrigated and interior wall vaporized to destroy mucosal lining

>4cm cystectomy is recommended (level–A RCOG)

Infertility and endometriosis

- ***Laparoscopic ovarian cystectomy is recommended if an ovarian endometriomas ≥ 4 cm in diameter***
  - to confirm the diagnosis histologically
  - improve access to follicles
  - possibly improve ovarian response
  - prevent endometriosis progression
- The woman should be counseled regarding the risks of reduced ovarian function after surgery.

- IUI improves fertility in patients when combined with ovarian stimulation.
- Pregnancy rate is lower in than with unexplained fertility.
- Poor ovarian response and need for high dose of gonadotropin therapy for ovarian stimulation.
- **IVF** is appropriate treatment, especially if tubal function is compromised, if there is also male factor infertility, and/or other treatments have failed.
- Treatment with a GnRH agonist for 3–6 months before IVF in women with endometriosis increases the rate of clinical pregnancy.(level A)

Recurrent endometriosis

- Spontaneous resolution occurs in about 20% of endometriosis stage I-II.
- **Residual disease-** persistence of symptoms or reappearance of symptoms within 3 months .
- **Recurrence** usually appears after 3 months .
- Incidence-6-30% in various studies.
- Depends on- age, stage of disease, prior treatment, completeness of surgery, extent of peritoneal disease.
- Usually presents as chronic pelvic pain , dysmenorrhea

Recurrent endometriosis

- Diagnosis- rising CA-125,TVS, MRI, laparoscopy.

Treatment-

- Pain killers
- Hormones- progesterones, OCPs, GnRH analogues
- **Conservative surgery-**
  - Indicated if medical therapy fails or contraindicated or intolerable side effects.
  - Cystectomy/ adhesiolysis may be an option after IVF fails..
- Postoperative hormone therapy delays recurrence but does not reduce the recurrence.
- **LNG IUCD-** reduces recurrences post surgery & role is being studied in recurrent disease.
- **Hysterectomy with bilateral salphigo oophorectomy**

Newer Treatments

- Angiogenesis Inhibitors
- Antioxidants-Vitamin C,Vitamin E
- Tumor Necrosis Factors- αhibitors
- Matrix Metalloproteinase Inhibitors
- Immunomodulators
- Chinese methods
- Green Tea
- Stem Cells Therapy
- Gene therapy

Surgery for pain relief

- Drug therapy may relieve inflammation and reduce pain in early superficial disease but corrective surgery +/- drug therapy is preferable (Padwick 1999)
- Rectovaginal, rectal and uterosacral lesions always need surgery
- Endometriomas always need surgery
- Abnormal Anatomy and adhesions always need surgery

Role of surgery in pain

- Ablation of endometriotic lesions reduces endometriosis-associated pain, outcome is poorest in minimal endometriosis. **(level A,RCOG)**
- There is no evidence that laparoscopic uterine nerve ablation(LUNA) is necessary when ablating endometriotic lesions and **LUNA** by itself has no effect on dysmenorrhoea associated with endometriosis. **(level A,RCOG)**
- There is currently no evidence to recommend the use of LUNA to treat endometriosis although there is some evidence for the use of presacral neurectomy (PSN). **(Cochrane data 2005)**

- Postoperative hormonal treatment does not produce a significant reduction in pain recurrence at 12 or 24 months and has no effect on disease recurrence. **(level A,RCOG)**

- LNG-IUS, inserted after laparoscopic surgery for endometriosis associated pain, significantly reduced the risk of recurrent moderate–severe dysmenorrhoea at 1 year follow-up. **(level A,RCOG)**

Deep Infiltrating Endometriosis

Classification	*Operative procedure*
A Anterior DIE	
A1: Bladder	***Laparoscopic partial cystectomy***
P: Posterior DIE	
P1: Uterosacral ligament	***Laparoscopic resection of USL***
P2: Vaginal	***Laparoscopically assisted vaginal resection of DIE infiltrating the posterior fornix***
P3: Intestinal	
P3a: Solely intestinal location	
- without vaginal infiltration (V-)	***Intestinal resection by laparoscopy or by laparotomy***
- with vaginal infiltration (V+)	***Laparoscopically assisted vaginal intestinal resection or exeresis by laparotomy.***
P3b: Multiple intestinal location	***Intestinal resection by laparotomy***

Definitive Surgery ? Ovarian conservation

- In DIE & severe cases hysterectomy and removal of all visible endometriotic tissue can be done. **BSO** may result in improved pain relief & reduced chances of future surgery .(RCOG guidelines)

- In cases with normal ovaries, hysterectomy with **ovarian conservation** and removal of endometriotic lesions should be considered.(ACOG guidelines 2010)

- TAH-**BSO is reserved** for women with debilitating symptoms ,who have completed childbearing & other therapies have failed. (ASRM &Canada OBG Society,2010)

Conclusions

Treatment must be individualized

- Multidisciplinary approach involving pain clinic & counseling should be considered

Endometriosis is an inflamatory and Oestrogen dependent condition

- Drugs targeting this are under trial.
- Laproscopy is the gold standard dignostic tool

Drug therapy should be selected considering efficacy, cost and adverse effects

- Treat early and agressively by surgical destruction or excision preferably by laparoscope

Surgical risks

- Major (1,4%)
  - ✓ Vascular
  - ✓ Intestinal
  - ✓ Anesthesia-related
- Minor (7,5%)
  - ✓ Surgical site infection
  - ✓ Ekstraperitoneal insuflation

Chapron et.al,2002

How does it affect OPU technique?

- Distorsion of pelvic anatomy
- Difficulty may be experinced while avoiding entry to endometrioma itself

↓

risk of visceral injury

Human Reproduction Update, Vol.21, No.6 pp. 809–825, 2015
Advanced Access publication on July 12, 2015 doi:10.1093/humupd/dmv035

human reproduction update

The impact of endometrioma on IVF/ICSI outcomes: a systematic review and meta-analysis

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BACKGROUND: Endometriosis is a disease known to be detrimental to fertility. Women with endometriosis, and the presence of endometrioma, may require artificial reproductive techniques (ART) to achieve a pregnancy. The specific impact of endometrioma alone and the impact of surgical intervention for endometrioma on the reproductive outcome of women undergoing IVF/ICSI are areas that require further clarification. The objectives of this review were as follows: (i) to determine the impact of endometrioma on IVF/ICSI outcomes, (ii) to determine the impact of surgery for endometrioma on IVF/ICSI outcome and (iii) to determine the effect of different surgical techniques on IVF/ICSI outcomes.

METHODS: We performed a systematic review and meta-analysis examining subfertile women who have endometrioma and are undergoing IVF/ICSI, and who have or have not had any surgical management for endometrioma before IVF/ICSI. The primary outcome was live birth rate (LBR). Our secondary outcomes were clinical pregnancy rate (CPR), mean number of oocyte retrieved (MNOR), miscarriage rate (MR), fertilization rate, implantation rate, antral follicle count (AFC), total stimulating hormone dose, and any rates of adverse effects such as cancellation and associated complications during the IVF/ICSI treatment.

CONCLUSIONS: Women with endometrioma undergoing IVF/ICSI had similar reproductive outcomes compared with those without the disease, although their cycle cancellation rate was significantly higher. Surgical treatment of endometrioma did not alter the outcome of IVF/ICSI treatment compared with those who did not receive surgical intervention. Considering that the reduced ovarian reserve may be attributed to the presence of endometrioma *per se*, and the potential detrimental impact from surgical intervention, individualization of care for women with endometrioma prior to IVF/ICSI may help optimize their IVF/ICSI results.

Multiparametric score for the indication to surgery in case of endometrioma (MISE score)

Score	**0**	**1**	**2**
Size (cm)	<3	3-5	>5(if>10, score is 3)
Growth rate	**≤1.0 cm/6 mo**	>1.0 cm/6 mo	/
Pain	Absent/mild	/	Moderate/severe *
İnfertility**	Absent	/	Present*
Ultrasound features	Typical	/	Atypical(if blood flow, score is 3)
History positive for cancer ***	Absent	Familiar	Personal
Recurrent endometrioma	No	Yes	/
Age	**≤40**	>40	/

Score <2: Follow up
Score >3: Surgery
İf score of 3 is obtained with
2a :medical treatment
2b:IVF

Muzii L. et al., 2017

Recommendations for the surgical treatment of endometriosis.Part 2: deep endometriosis

- Conclusion Surgery is an important treatment option for women with DE. However, like medical intervention, surgery is not always successful and is also associated with clinically relevant risks (Chapron et al., 1998; Becker et al., 2017). Surgical treatment failure can be partially attributed to the heterogeneity of endometriosis, but it is also correlated with factors such as surgical experience, the complexity of each case, and anatomical locations of the disease.
  Theprinciplesforidentifyingandtreatingdeependometrioticlesions (Table II) and the good practice recommendations in the text aim to supportcliniciansandsurgeonsiscounsellingandtreating(orreferring) women presenting with DE.

In summary,

İndications for surgery in patients with endometriosis-related subfertility

without significant pain:

- Stage 1-2 endometriosis (If surgery is performed for other indications)
- Improving access for oocyte retrieval
- Doubts exist about their exact nature of endometrioma
- Treating hydrosalpinges to improve IVF outcomes
- Patient declines ART due to personal, cultural, or religious reasons
- Patient choice for surgery or unable to access interventions such as ART

Sukhbir S et al.,2017

In summary,

The management of ovarian endometriomas for women **with pain**

- Ovarian reserve may be lower in women with ovarian endometrioma compared with those women without
- Surgical excision of an endometrioma is ideal for pain but may lead to reduced ovarian reserve
- Bilateral, compared to unilateral, ovarian cystectomy for endometriomas may result in a greater negative effect on ovarian reserve
- Recurrent endometrioma excision may further reduce ovarian reserve compared with primary surgery does not improve fertility

Sukhbir S et al.,2017

Take home massage

- Surgery isn't the first step of endometriosis treatment
- Treatment must be individualized
- Drug therapy should be selected considering efficacy, cost and adverse effects
- Fertility preservation should be considered before surgery
- The first surgery should be the best and complete surgery
- consider individualizing the care of women with endometrioma