The evidence on what to do by laparoscopy

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Early laparoscopy (EL) versus active observation(AO) for non specific abdominal pain

- Systematic review of the evidence – randomised trials
- Significant methodological heterogeneity means results from studies could not be pooled
- EL was better in establishing final diagnosis (79.2-96.9%) vs. AO (28.1-78.1%)
- final therapeutic utility of laparoscopy was lower than the
- diagnostic rate (10.9-86.5%)
- Mortality and morbidity rate of EL was similar to AO
- Hospital stay was shorter in EL
- L C. Domınguez A Sanabria, V Vega, C Osorio. Early laparoscopy for the evaluation of nonspecific abdominal pain: a critical appraisal of the evidence; Surg Endosc 2009

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Laparoscopy in the trauma setting

- inaccurate in diagnosing hollow viscus injuries
- As good as sonography in determining the need for open exploration
- Elliott DC, Rodriguez A, Moncure M, Myers RA, Shillinglaw W, Davis F, Goldberg A, Mitchell K, McRitchie D (1998) The accuracy of diagnostic laparoscopy in trauma patients: a prospective, controlled study. Int Surg 83: 294–298
- Rossi P, Mullins D, Thal E (1993) Role of laparoscopy in the evaluation of abdominal trauma. Am J Surg 166: 707–710

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The use of laparoscopy in abdominal emergencies

- 277 consequtive cases
- 129 cases (46%), peritonitis in 64 cases
- (23%), small bowel obstruction in 52 cases (19%),
- complications after previous surgery or invasive procedures
- in 24 cases (9%), and sepsis of unknown origin in 8
- cases (3%).
- obtained a correct diagnosis in 98.6% of the cases
- 75% the procedure was completed laparoscopically, 12.5% required a target incision, 12.5% underwent formal laparotomy
- morbidity rate was 5.8%
- B. Kirshtein, A. Roy-Shapira, L. Lantsberg, S. Mandel, E. Avinoach, S. Mizrahi The use of laparoscopy in abdominal emergencies Surg Endosc (2003) 17: 1118–1124

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Laparoscopy in pregnancy

- Every year, about 50,000 (1.5%-2.2%) pregnant women undergo non-obstetric surgery in the United States

  F Nezhat, S Tazuke, C Nezhat Laparoscopy During Pregnancy:A Literature Review JSLS (1997)1:17-27

- This has been reported as 0.2% of the obstetric population in the UK A. Rauf & P. Suraweera & S. De Silva Operative laparoscopy; is it a safe option in pregnancy? Gynecol Surg (2009) 6:381–384

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Laparoscopy in pregnancy Questionnaire

- 189 surgeons responded to the questionnaire, 410 laparoscopic
- cases in pregnancy were reported
- 197 (48%) cholecystectomies, 66 (16.1%) appendectomies, and
- 115 (28%) adnexal surgeries
- 410 surgeries, 133 (32.5%) were in the first trimester, 222 (54.1%) were in the second trimester, and 54 (13.1%) in the third
- total of 14 (3.4%) complications occurred, consisting of 5 intraoperative complications (including one intrauterine Veress needle insertion) and 9 postoperative complications (including 5
- first trimester spontaneous abortions and one preterm
- labor)

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Laparoscopic surgery for presumed benign ovarian tumor during pregnancy *Cochrane Database of Systematic Reviews* 2006, Issue 4.

- no randomized controlled trials identified
- The available case series studies of laparoscopic surgery for benign ovarian tumour during pregnancy provide limited insight into the potential benefits and harms associated with this new surgical technique in pregnancy. Randomized controlled trials are required to provide the most reliable evidence regarding the benefits and harms of laparoscopic surgery for benign ovarian tumour during pregnancy

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Is laparoscopic appendectomy safe in pregnant women?

- A very small prospective study of 11 patients on each arm laparoscopic (LA) vs open appendectomy (OA)
- no significant difference in the length of procedure (60 vs. 46 min) and the complications rates
- The length of postoperative stay was shorter in the LA group (3.6 vs 5.2 days; $p = 0.05$)

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Laparoscopic versus conventional appendectomy in children

- 48 children who underwent conventional appendectomy (CA) were compared to 34 children who had laparoscopic appendectomy (LA) for acute and recurrent subacute appendicitis
- LA took significantly longer
- LA is a safe operation that has the advantage of being exploratory, with shorter hospitalization time, early ambulation, and superior cosmetic results

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Ectopic pregnancy

- free fluid on her ultrasound scan and symptomatic of pain, makes medical management of ectopic pregnancy with methotrexate a probably unsuitable treatment option (RCOG guideline, 2004)
- controllateral tubal damage known or verified on laparoscopy should pre-empt the surgeon to consider a salpigotomy rather than a salpingectomy, since there is some evidence that this method is associated with a higher subsequent intrauterine pregnancy rate (RCOG guideline, 2004)

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Ectopic pregnancy

- The laparoscopic approach to the surgical management of tubal pregnancy has been proven to be cost effective, but again when a salpingotomy was performed, there was a higher rate of persistent trophoblast, compared to an open approach (Hajenius PJ, 2009)
- rate of persistent trophoblast with salpingotomy is quoted as 8% in the Green Top Guidelines of the Royal College of Obstetricians and Gynaecologists from pooled data of studies

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Ovarian cysts

- Risk of malignancy is increased after the menopause and in women complaining of symptoms such as lower abdominal and back discomfort (Knudsen et al., 2004)
- The laparoscopic approach is associated with lower morbidity in premenopausal ovarian cyst surgeries (Yuen et al., 1997)

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Ovarian cysts

- Laparoscopic approach is associated with significantly higher cyst rupture rate in cysts larger than 7cm (Panici et al., 2007b, Panici et al., 2007a).
- if the cyst is proven to be malignant and necessitate adjuvant treatment (Knudsen et al., 2004)
- It may be therefore reasonable to consider a laparotomy in these circumstances where a postmenopausal patient with a very large ovarian cyst is being treated surgically

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Mature teratomas, dermoids

- relatively commonly occurring benign pathology
- risks of rupture, spillage and peritonitis associated with a dermoid ovarian tumour and the risk of malignant transformation which appear to be in the region of one in one-hundred mainly from retrospective case series (Allam-Nandyala et al., 2010, Hurwitz et al., 2007)

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Mature teratomas, dermoids

- At randomised controlled trials (Morgante et al., 1998, Lin et al., 1995, Campo and Garcea, 1998), laparoscopy had the benefit of fewer intraoperative complications and postoperative morbidity, at the expense of possibly longer operating time and increased risk of spillage (Lin et al., 1995, Nitke et al., 1996), which with thorough irrigation of the peritoneal cavity has not shown to increase the rate of clinical peritonitis and postoperative complications (Lin et al., 1995, Campo and Garcea, 1998).

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Mature teratomas, dermoids
Adhesions

- This is in contrast to a randomised study of **adhesion** formation after dermoid content spillage in an animal model, that demonstrated the considerable presence of inflammatory response despite saline irrigation(Fielder et al., 1996)
- Perhaps the use of an **endoscopic retrieval bag** may have helped the procedure to be faster and with less risk of spillage (Campo and Garcea, 1998), but nor this, nor the retrieval through a **culdotomy** have shown to have clinical benefit to the patients (Campo and Garcea, 1998, Wang et al., 1999)

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Endometriosis

- The presence of Endometriomas could be associated with and indeed raise the suspicion of more extensive disease severity (Chapron et al., 2009, Ghezzi et al., 2005, Banerjee et al., 2008)
- there is increasing evidence that symptomatology may indicate severity of disease, and probably even stronger the presence of endometriosis(Ballard et al., 2010).

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Endometriomas

- cystectomy for an endometrioma, reduce srecurrence rates(Hart et al., 2008)of symptoms and reoperation
- risk with of premature ovarian failure is reaching 2-3% in bilaterally operated endometriomas(Busacca et al., 2006, Busacca and Vignali, 2009)
- If this was to happen, we would need to face the possibility of hormonal supplementation to the patientwhich could result in recurrence of the disease and the patients symptoms(Al Kadri et al., 2009).

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Endometriosis and pain

- Pain associated with endometriosis can be improved when this is treated at the time of the laparoscopy(Jacobson et al., 2009) something which could important especially in those women with dysmenorrhoea, who may have been using painkillers for a considerable period of time with no alleviation of her pain(Allen et al., 2009)
- there is insufficient evidence to support the use of medical therapy in the form of progestagens, danazol and GnRH for the alleviation of her pain(Yap et al., 2004).
- the levonorgestrel releasing intrauterine systempostoperatively may reduce the recurrence of the dysmenorrhoea(Abou-Setta et al., 2006)

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Laparoscopy
Endometriosis and pain

- Laparoscopic surgery results in improved pain outcomes when compared to diagnostic laparoscopy alone

Laparoscopic surgery for pelvic pain associated with endometriosis Cochrane Database of Systematic Reviews

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Endometriosis and fertility

- There is evidence that treatment of minimal and mild endometriosis may improve fertility(Jacobson et al., 2010) and this could be achieved laparoscopically
- there is insufficient evidence to support the use of a medication to cause ovulation suppression to improve fertility outcomes(Hughes et al., 2007

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Laparoscopy
Endometriosis and fertility

- The use of laparoscopic surgery in the treatment of subfertility related to minimal and mild endometriosis may improve future fertility.

Laparoscopic surgery for subfertility associated with endometriosis Cochrane Database of Systematic Reviews

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Sterilisation

- Major morbidity seems to be a rare outcome for both, laparoscopy and minilaparotomy. Personal preference of the woman and/or of the surgeon can guide the choice of technique. Practical aspects must be taken into account before implementing endoscopic techniques in settings with limited resources. Culdoscopy is not recommended as it carries a higher complication rate
- *Cochrane Database of Systematic Reviews* 2004, Issue 3.

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Adhesions and pain

- There is only limited evidence that adhesions may be associated with chronic pelvic pain, since only when adhesiolysis was performed where adhesions were severe there was an observed alleviation of the pain(Stones and Mountfield, 2000)
- laparoscopy as a therapeutic modality has been shown to generate fewer adhesions than laparotomy (Gutt et al., 2004)

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Fibroids

- Only one randomized controlled study was included (131 women) and this was probably underpowered. There was **no evidence** of a difference in outcome in terms of clinical pregnancy rate and live birth rate when fibroids were removed via laparotomy or laparoscopy for infertility.
- **some non fertility benefits** of removal via laparoscopy including shorter hospital stay, less febrile illness and a smaller drop in pre-operative haemoglobin concentration when compared to laparotomy.
- There were **no randomised controlled studies** comparing hysteroscopic removal or no intervention with other surgical modalities

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Hysterectomy

- **Surgical approach to hysterectomy for benign gynaecological disease** Cochrane Database of Systematic Reviews
- VH should be performed in preference to AH where possible. Where VH is not possible, LH may avoid the need for AH however the length of the surgery increases as the extent of the surgery performed laparoscopically increases

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TLH vs VH

- Laparoscopic hysterectomy results in a shorter hospital stay, less blood loss, and less postoperative pain compared with vaginal hysterectomy.

- Candiani M, Izzo S, Bulfoni A, Riparini J, Ronzoni S, Marconi A **Laparoscopic vs vaginal hysterectomy for benign pathology.** Am J Obstet Gynecol. 2009 Apr;200(4):368.e1-7. Epub 2009 Jan 10.

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Ovarian FIGO I cancer

Cochrane review has found no evidence from randomised trials to help quantify the value of laparoscopy for the management of early stage ovarian cancer as routine clinical practice

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Endometrial cancer

- Laparoscopic surgical staging for uterine cancer is feasible and safe in terms of short-term outcomes and results in fewer complications and shorter hospital stay

- Walker JL, Piedmonte MR, Spirtos NM
Laparoscopy compared with laparotomy for comprehensive surgical staging of uterine cancer: Gynecologic Oncology Group Study LAP2. J Clin Oncol. 2009 Nov 10;27(32):5331-6. Epub 2009 Oct 5.

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Gynecol Oncol. 2009 Jan;112(1):126-33. Epub 2008 Oct 22.

Total laparoscopic hysterectomy versus abdominal hysterectomy with lymphadenectomy for early-stage endometrial cancer: a prospective randomized study.

- 159 patients with clinical stage I endometrial cancer were enrolled in a prospective randomized trial and treated with LPS or LPT approach. The para-aortic lymphadenectomy was performed in all cases with positive pelvic lymph nodes discovered at frozen section evaluation, in patients with poorly differentiated tumors with myometrial invasion greater than 50% (ICG3), and non-endometrioid carcinomas
- benefits of decreased discomfort with decreased convalescence time without compromising the degree of oncological radicality required
- Same overall survical

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Options for laparoscopic surgery in cervical carcinomas. Possover M European Journal Of Gynaecological Oncology [Eur J Gynaecol Oncol] 2003; Vol. 24 (6), pp. 471-2.

- laparoscopic staging of cervical cancer can also be recommended when preoperative chemotherapy is planned. Using the laparoscopic staging method the treatment of the patient may be more individualized.

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patients with early cervical cancer: our instruments and technique. Surgical Oncology [Surg Oncol] 2009 Dec; Vol. 18 (4), pp. 289-97. *Date of Electronic Publication:* 2008 Sep 19.

- 60 patients underwent a class III procedure and 17 patients a class II procedure according to the Piver classification
- Para-aortic lymphadenectomy was performed up to the level of the inferior mesenteric artery in eight cases with positive pelvic lymph nodes at frozen section evaluation
- Total laparoscopic radical hysterectomy can be considered a safe and effective therapeutic procedure for the management of early stage cervical cancer with a low morbidity; moreover, the laparoscopic route may offer an alternative option for patients undergoing radical hysterectomy, although multicenter studies and long-term follow-up are required to evaluate the oncologic outcomes of this procedure

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Sacrocolpopexy RCT

- Results from the LAS Trial, an RCT comparing open abdominal to laparoscopic sacrocolpopexy for the treatment of post hysterectomy vault prolapse (Abstract number 120)
- International Urogynecology Journal 2008

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Sacrocolpopexy retrospective study

- Laparoscopic sacrocolpopexy in the treatment of vaginal vault prolapse: 8 years experience. Granese R; Candiani M; Perino A; Romano F; Cucinella G European Journal Of Obstetrics, Gynecology, And Reproductive Biology [Eur J Obstet Gynecol Reprod Biol] 2009 Oct; Vol. 146 (2), pp. 227-31
- 165 laparoscopic sacrocolpopexy procedures, using a polypropylene mesh
- This study shows that laparoscopic sacrocolpopexy, in the hands of an expert surgeon, can be considered a safe, effective procedure for the treatment of vaginal vault prolapse, allowing long-term anatomical restoration (94.9% success rate).

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Sacrocolpopexy prospective study

- A prospective study of laparoscopic sacrocolpopexy for the management of pelvic organ prolapse. North CE; Ali-Ross NS; Smith AR; Reid FM BJOG: An International Journal Of Obstetrics And Gynaecology [BJOG] 2009 Aug; Vol. 116 (9), pp. 1251-7.
- Laparoscopic sacrocolpopexy is a safe and effective treatment for vault prolapse, providing excellent vault support in the medium term. The outcome for anterior and posterior support is less predictable, and anatomical outcome correlated poorly with functional outcome.

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Learning Laparoscopic sacrocolpopexy

- Laparoscopic sacrocolpopexy for female genital organ prolapse: establishment of a learning curve. Akladios CY; Dautun D; Saussine C; Baldauf JJ; Mathelin C; Wattiez A European Journal Of Obstetrics, Gynecology, And Reproductive Biology [Eur J Obstet Gynecol Reprod Biol] 2010 Apr; Vol. 149 (2), pp. 218-21
- The learning curve of laparoscopic sacrocolpopexy shows a steady decrease in the duration of surgery. A turning point is observed after 18-24 procedures. During the learning curve there is no increased morbidity

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Sacrocolpopexy with hysterectomy

- **Sacrocolpopexy with hysterectomy using mesh for uterine prolapse repair *National Institute for Health and Clinical Excellence*** January 2009
- Higher rate of mesh erosion in hysterectomy groups and less in subtotal hysterectomy and sacrohysteropexies

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Sacrocolpopexy or sacrospinous fixation?

- One RCT of 95 women reported an objective failure rate of 4% (2/46) for sacrocolpopexy (mesh) and 19% (8/43) for sacrospinous colpopexy (no mesh), respectively (mean follow-up 24 months
- de novo stress urinary incontinence was reported in 9% (2/22) of women treated by sacrocolpopexy (mesh) compared with 33% (8/24) of women treated by sacrospinous colpopexy

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Sacrocolpopexy or sacrospinous fixation?

- De novo prolapse (cystocele) occurred in 31% (10/32) of women in the sacrocolpopexy group and 14% (4/28) of women in the sacrospinous colpopexy group
- mesh erosion after sacrocolpopexy in 2% (1/47) of women
- A non-randomised comparative study of 117 women that compared laparoscopic with open sacrocolpopexy reported bowel obstruction in 2% (1/56) of women in the laparoscopic group and 3% (2/61) of women in the open group.

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