MYOMECTOMY:
Adjunctive diagnostic and surgical interventions: ultrasound versus MRI, vasoconstrictive agents, traditional versus barbed suture, adhesion barriers

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NIMES
Ultrasound versus MRI for the diagnosis.
Ultrasound versus MRI for the diagnosis

- Examination: the first indication that a patient may have uterine fibroids.

- Pelvic and transvaginal ultrasonography: initial study to confirm the diagnosis of uterine fibroid tumors.

- MRI is the most expensive modality for evaluating fibroid tumors.
ULTRASONOGRAPHY

- Transvaginal ultrasonography, advantages:
  - The lowest sensitivity and specificity,
  - Non invasive nature
  - Cost-efficiency
  - Detect the number of uterine myomas? (often equal as the number documented by the surgery). Fambrini found a sensitivity of 59.4% in its study
    Fambrini M and al, 2009
  - evaluate the therapeutic efficacy of administration of a GnRH analog before laparoscopic myomectomy (in reducing blood loss and decreasing operating time)
    Zullo F and al, 1998; Chia CC and al, 2006
  - may allow planning time of laparoscopic myomectomy (operation time significantly related to the myoma weight)
    Hsu WC and al, 2007
  - Contact ultrasonography and transvaginal ultrasonography may be useful to detect myomas during surgery, particularly to remove all myomas and to place incision on the uterine wall
    Shimanuki H and al, 2006; Lin PC and al, 2004
  - Doppler ultrasonography evaluate uterine artery blood flow prior to extensive myomectomy, particularly in case of artery ligation
    Narin MA and al, 2007
MRI

- We found fewer studies about pre-operative MRI. We especially found articles on post-operative time.

- **MRI:**
  - precise myoma mapping (for surgical purposes)
    *Mitchell DG, 1992*

- Comparison ultrasound vs MRI: Sensitivity (85%) and accuracy (94%) of MRI for abnormal segments was significantly better than that of ultrasound (Se = 69%; accuracy = 87%): MRI is superior to ultrasound for preoperatively locating uterine myomas.
  *Dudiak CM and al, 1988*
Pre-operative or intra-operative vasoconstrictive agents, how reduce intra-operative bleeding?
**PRE-OPERATIVE TECHNICS**

- **Pre-operative embolization reduce:**
  - intra-operative abnormal bleeding.
  - reduce operative time
  - intra-operative blood loss
  - hospital staying  
  
  *Bahri Üstünsöz and al, 2007; Takeda A and al, 2009; Thumuluru Kavitha Madhuri and al, 2010*

- Patient conceived pregnancy after surgery, and successful pregnancies after myomectomy with pre-operative artery embolization.

- **Preoperative administration of an agonist and antagonist decrease:**
  - myoma’s size,
  - intra-operative blood loss,
  - operative time
  
  *Zullo F and al, 1998; Chia CC and al, 2006 ; Matsuno Y and al, 1999; Andreyko JL and al, 1988; Di Lieto A and al, 2003*

- **Misoprostol**
  - The preoperative use of misoprostol  may reduce intraoperative blood loss
  
  *Kalogiannidis I, 2011*
INTRA OPERATIVE AGENTS

- Local administration of Ocytocin and Vasopressin to the uterus:

- Vasopressin seems to be a safe and effective hemostatic technique for controlling regional blood flow
  
  *Shimanuki H and al, 2006*

- Oxytocin infusion may decrease operative blood loss and blood transfusion during laparoscopic myomectomy

  *Wang CJ and al, 2007; Lin XN and al, 2008*
INTRA OPERATIVE AGENTS

- However several side effects are described with intramyometrial vasopressin injections:
  - Severe vasospasm mimics hypotension after high-dose intrauterine vasopressin
    
    Riess ML and al, 2011
  
  - Bradycardia and cardiac arrest
    
  
  - Severe hypotension
    
    Kitamura T and al, 2008
  
  - Pulmonary edema
    
    Tulandi T and al, 1996
INTRA OPERATIVE AGENTS

- **Artery ligation** (uterine artery or internal iliac artery)
  - facilitates laparoscopic myomectomy with minimal blood loss

- seems to be safe with a good efficacy (uterine artery), with a return to normal myometrial perfusion after surgery
  
  *Rosen DM and al, 2009*

- A randomized, double-blind study was performed in Turkey; they didn’t find any differences between two groups differentiated by the level of ligation on internal iliac artery

  *Narin MA and al, 2007*
**INTRA OPERATIVE AGENTS**

- **Tranexanic acid**
  - No effect on intra-operative blood loss and blood transfusion
    - Caglar GS and al, 2008

- **Bupivacain**
  - Injection of bupivacaine plus epinephrine seems to be effective in reducing blood loss, total operative and enucleation time.
    - Zullo F and al, 2004

- **Gelatin-thrombin matrix (FloSeal)**
  - may reduce intra and post-operative blood loss when applied immediately and directly to bleeding uterine tissue (but myomectomies performed by laparotomy)
    - Raga F and al, 2009
Conclusion

“There is limited evidence that misoprostol, vasopressin, bupivacaine plus epinephrine, tranexamic acid, gelatin thrombin matrix, peri-cervical tourniquet, and mesna may reduce bleeding during myomectomy. Bupivacaine plus epinephrine has limited clinical importance compared with other interventions as the clinical impact was small. There is no evidence that oxytocin and morcellation reduce blood loss. Further well designed studies are required to establish effectiveness, safety and the costs of different interventions for reducing blood loss during myomectomy.”

Kongnyuy EJ and al, 2011
Traditional versus barbed suture.
Traditional versus barbed suture

- Use of barbed suture seems to facilitate closure of the hysterotomy site in laparoscopic myomectomy.
- Angioli:
  - Comparison between an absorbable barbed wire (V-Loc) uterine suture and a classic continuous suture with intracorporeal knots among women undergoing laparoscopic myomectomy.
  - Conclusion: barbed suture may improve operative time, suturing time, and blood loss. *Angioli R and al, 2012*

- Einarsson found with barbed suture:
  - Reduced surgical time
  - Decreased duration of hospital stay.
  - No significant differences about perioperative complications. *Einarsson JI and al, 2011*

- Alessandri found:
  - A reduced time to suture uterine wall defects
  - A reduced intraoperative blood loss
  - But no differences about total surgical time. *Alessandri F and al, 2010*
Traditional versus barbed suture

Currently, complications have been described about barbed sutures. Several surgeons think that it may be the origin of bowel injury and obstruction. However, there is no article published about barbed suture’s complications.

Gynerisq, CNGOF, 2012

« use with caution »
adhesion barriers
adhesion barriers

• Postsurgical adhesions are the most frequent complication of abdominopelvic surgery, occurring in 60%–90% of patients.

• These adhesions cause significant problems
  • Chronic pain,
  • Secondary infertility,
  • Elevated risk of small-bowel obstruction

*Menzies and Ellis, 1990, Monk et al., 1994, Liakakos et al., 2001*
adhesion barriers

Myomectomy is associated with the highest incidence of postsurgical adhesions among all gynecologic surgical procedures

Fauconnier et al., 2000; Miller, 2000

In several large series of laparotomic and laparoscopic myomectomies, the rates of postoperative adhesions were 90% and 45%, respectively

Bulletti et al., 1996; Uğur et al., 1996; Dubuisson et al., 1998; Takeuchi and Kinoshita, 2002
How to reduce Adhesions?

- Tinelli compared myomectomies performed by laparotomy and laparoscopy:
  - Higher rates of adhesions in laparotomy without barrier (28%) in comparison with laparoscopy with barrier (16%).
  - Filmy and organized adhesions with an adhesion barrier, cohesive adhesions without an adhesion barrier

  Tinelli A and al, 2011

LAPAROSCOPY and ADHESION BARRIER seems to reduce adhesion risk
How to reduce Adhesions?

Robertson’s review. Several points to minimize or prevent adhesions during surgical time:

- **Meticulous surgical technique** (less tissue trauma, optimal hemostasis, minimizing the risk of infection, avoiding contaminants and use of foreign materials, limiting packing)
- **Every surgery needs to be carefully considered** (because the risk of adhesions increases with the total number of abdominal and pelvic surgeries)
- Polytetrafluoroethylene (Gore-Tex) barrier is more effective than no barrier or oxidized regenerated cellulose (Interceed) in preventing adhesion formation
- Oxidized regenerated cellulose (Interceed) adhesion barrier is associated with a reduced incidence of pelvic adhesion formation at laparoscopy when complete hemostasis is achieved
- Chemically modified sodium hyaluronate/carboxymethylcellulose (Seprafilm) is effective in preventing adhesion formation.

Robertson D and al, 2010
Cochrane, 2008:
- Absorbable adhesion barrier Interceed reduces the incidence of adhesion formation following laparoscopy, but there are insufficient data to support its use to improve pregnancy rates.

- Gore-Tex may be superior to Interceed in preventing adhesion formation but its usefulness is limited by the need for suturing and later removal.

- There was no evidence of effectiveness of Seprafilm and Fibrin sheet in preventing adhesion formation.

Ahmad G and al, Cochrane Database, 2008
Risks of adhesion barriers?

- **Robertson:**
  - No adverse effects with the use of oxidized regenerated cellulose, polytetrafluoroethylene, or sodium hyaluronate/carboxymethylcellulose
  
  *Robertson D and al, 2010*

- **But:**
  - **Ko:** peritonitis and abscess with adhesion barrier’s use during laparoscopic myomectomy.
    
    *Ko ML and al, 2010*
  - **Santos:** disseminated intravascular coagulation complicating a laparoscopic myomectomy with use of 4% icodextrin
    
    *Santos LM and al, 2006*

In conclusion, adhesions barriers might be use with caution despite of their benefits.
OUR HABITS

- PREVADH™ film (Sofradim Production, Trévoux, France)

- Resorbable dual-sided membrane.

- The anti-adhesive side is a nonporous smooth surface made of porcine collagen, polyethylene glycol, and glycerol.

- The other side is porous and made of lyophilized porcine collagen.

- The dual-sided film is highly hydrophilic and quickly converts into hydrogel once hydrated.
OUR RESULTS

- Multicenter, randomized study

- Laparotomic myomectomy: PREVADH film (n = 33) or 500 mL Ringer’s lactate solution instilled into the pelvic cavity (n = 28). Second-look laparoscopy 10–20 weeks after initial surgery.

- Significantly fewer patients in the PREVADH group developed adhesions (43% vs 92%, P = 0.001). No serious adverse events. At 3-years post myomectomy follow-up, 64% of patients became pregnant in the Prevadhd group (versus 23.5%, P=0.02).
Prêt. Préparer Chariot Patient pour la chirurgie.

AVERTISSEMENT: LE CHARIOT PEUT SE DÉPLACER
THANK YOU FOR YOUR ATTENTION