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Acute pelvic inflammatory disease

Aim
The diagnosis and appropriate management of women who present with Pelvic Inflammatory Disease.

Background
Pelvic Inflammatory Disease (PID) constitutes a general term for a spectrum of genital tract infection. The disease lacks a precise definition and not all patients complain of symptoms.

It is usually the result of infection ascending from the endocervix causing endometritis, salpingitis, parametritis, oophritis, tubo-ovarian abscess and / or pelvic peritonitis. While sexually transmitted infections such as *Chlamydia trachomatis* and *Neisseria gonorrhoea* have been identified as causative agents, additional STIs including *Mycoplasma genitalium*, anaerobes and other organisms may also be implicated\(^1,2\). Bacterial vaginosis is a recognised association. Other organisms may be implicated in acute PID infection including (*Haemophilus influenzae*, *Streptococcus pneumoniae*, group A streptococcus and *S. aureus*) Sexually active young women are particularly at risk of PID. A high index of suspicion and a low threshold for empiric treatment of PID is recommended since the potential consequences of not treating PID are significant resulting in infertility, ectopic pregnancy and chronic pelvic pain.\(^3,4\) The risk of complications increases with delayed diagnosis or repeated episodes.

Chronic PID (> 1 month duration) may result from infection with *Mycobacterium tuberculosis* or *Actinomyces* spp. These infections are not discussed in detail in this guideline.

Diagnosis
There is no single pathognomonic sign, symptom or investigation in the diagnosis of PID. The approach to the diagnosis should be multifaceted.

Clinical
The following clinical features are suggestive of a diagnosis of PID:

- Bilateral lower abdominal tenderness (sometimes radiating to the legs)
- Abnormal vaginal or cervical discharge
- Fever > 38°C (not always present)
- Abnormal vaginal bleeding- including intermenstrual, postcoital or ‘breakthrough’ bleeding
- Deep dyspareunia
- Cervical motion tenderness on bimanual examination (with or without palpable mass)
- Dysuria
- Right upper quadrant pain (Fitz Hugh Curtis syndrome)
Recommended investigations

- Full blood picture
- C reactive protein
- Mid-stream urine (MC&S)
- Urine HCG to exclude complications of pregnancy e.g. ectopic pregnancy, miscarriage
- Endocervical and low vaginal (either self-obtained by patient or during a physical examination) swabs for *Chlamydia trachomatis* and *Neisseria gonorrhoea* PCR. First void urine can also be used for *C. trachomatis* and *N. gonorrhoeae* PCR.
- High vaginal swab (Culture and Sensitivity. For complex or recalcitrant disease, consider adding *M. genitalium* PCR).
- Serology for potentially sexually transmitted diseases where an extended STD workup appropriate (HIV infection is associated with increased risk of tubo-ovarian abscess)
- Imaging – if uncertain clinical diagnosis, severe illness or if unresponsive to the initial therapy.
  - Transvaginal ultrasound scanning may be helpful when there is diagnostic difficulty but is frequently normal in early or uncomplicated disease. When supported by power Doppler, it can identify inflamed and dilated tubes and tubo-ovarian masses / abscesses. It may differentiate in some cases from appendicitis, ectopic pregnancy or ovarian cyst complications, but there is insufficient evidence to support its routine use.\(^5,6,8\)
  - CT may be indicated in patients with diffuse pelvic pain, peritonitis or equivocal ultrasound.\(^15\)
  - MRI has shown to be superior to TVUS in the diagnosis of PID but cost and availability are prohibitive\(^16\). There is potential for use in selected cases where further investigation is required or theatre is contraindicated

When there is diagnostic doubt, laparoscopy may be useful to exclude other pathologies. It also enables specimens to be taken from the fallopian tubes and the Pouch of Douglas, and can provide information on the severity of the condition.\(^7,8\) However it is invasive, pelvic organs may appear normal in mild disease(lower sensitivity) and it plays a limited role in the treatment of acute PID.\(^17\)

Differential diagnosis

The differential diagnosis of lower abdominal pain in a young woman includes:

- Ectopic pregnancy
- Acute appendicitis
- Endometriosis
- Irritable bowel syndrome (and less commonly, other gastrointestinal disorders)
- Complications of an ovarian cyst such as rupture or torsion
- Urinary tract infection
- Functional pain (pain of unknown physical origin)
Treatment of acute PID in sexually active women with no predisposing factors

Mild – Moderate PID: suitable for outpatient management

- PID suspected clinically or confirmed microbiologically
- Clinically well - no evidence of sepsis, haemodynamically stable, pain controlled with simple analgesia
- No evidence of TOA on TVUS
- Compliant with oral treatment and follow-up

In mild or moderate PID (in the absence of a tubo-ovarian abscess), there is no difference in outcome when women are treated as outpatients or admitted to hospital. It is likely that delaying treatment, especially in Chlamydia infections, increases the severity of the condition and the risk of long-term sequelae such as ectopic pregnancy, subfertility and pelvic pain.\(^1\)

Outpatient treatment of mild – moderate STI related PID

The response to treatment is often a good indicator of whether PID is likely.

- Ceftriaxone 500mg in 2mL 1% lignocaine IM, or 500mg IV as a single dose.
- Metronidazole 400mg orally, 12 hourly for 14 days
- Azithromycin 1g orally as a single dose for women who are pregnant or suspected to be non-adherent to doxycycline, then Azithromycin 1g orally as a single dose 1 week later
- Doxycycline 100mg orally, 12 hourly for 14 days
  - or
  - for women who are pregnant or suspected to be non-adherent to doxycycline:
    - Azithromycin 1g orally as a single dose 1 week later

Women should be reviewed in 72 hours from initial presentation by their General Practitioner or in the Emergency Centre. Failure to clinically improve may indicate the need for further investigation or to consider other diagnoses or alternative management such as inpatient treatment. Further review in 4-6 weeks after treatment by a GP should be performed.

Admission to hospital is appropriate in the following:

- PID in pregnancy
- Non adherence or intolerance to oral therapy
- Tubo-ovarian abscess
- Lack of response to oral therapy
- Clinically severe disease (haemodynamically unstable, pain, nausea and vomiting, pyrexia, acute abdomen)
- Unable to exclude surgical emergency
Most admissions can be managed at secondary gynaecological services. Transfer to the tertiary centre may be required if there are no gynaecological services available, if specialist ultrasonography services are required or if considering surgical intervention and the gynae-oncology / endoscopy team needs to be consulted.

**Inpatient treatment of severe STI related PID**

-ceftriaxone 2g IV daily
  
  plus

-metronidazole 500mg IV 12 hourly
  
  plus

-azithromycin 500mg IV daily

Until the patient is afebrile and improved, then

-doxycline 100mg 12 hourly orally for a minimum of two weeks and up to four weeks in complicated cases (slow clinical resolution; pelvic collections) or Azithromycin if pregnant : see above
  
  plus

-amoxicillin plus clavulanate 875mg/125mg, orally, 12 hourly for a minimum of 2 weeks and up to 4 weeks

**Alternative IV regimen, especially for patients with immediate hypersensitivity to penicillin**

- gentamicin IV (usual dose 5 mg/kg ideal body weight see gentamicin guidelines)
  
  Plus

- Azithromycin 500mg IV daily
  
  Plus

-clindamycin 600mg IV, 8 hourly. (Microbiology approval required for IV clindamycin within 24 hours of starting therapy).

Until the patient is afebrile and improved then,

-metronidazole 400mg orally, 12 hourly for a minimum of 2 weeks
  
  plus

-doxycycline 100mg 12 hourly orally for a minimum of 2 weeks or Azithromycin if pregnant : see above).

**Outpatient treatment of mild – moderate procedure related PID (non pregnant)**

For patients who develop PID after a recent pregnancy, termination or gynaecological procedure (including IUCD insertion or removal) and those with a prior history of PID, Chlamydia trachomatis, Neisseria gonorrhoea and Mycoplasma
hominis may be implicated, together with mixed anaerobic and aerobic bacteria such as Bacteroides spp, anaerobic cocci, Streptococcus spp and enteric bacteria.

- Doxycycline 100mg orally 12 hourly for 2 to 4 weeks
  plus
- Amoxicillin plus Clavulanate 875mg/125mg orally, 12 hourly for 2 to 4 weeks

For patients with an immediate hypersensitivity to penicillin
- Doxycycline 100mg orally, 12 hourly for 2 to 4 weeks
  plus
- Metronidazole 400mg orally, 12 hourly for 2 to 4 weeks

Inpatient treatment of severe procedure related PID
For severe infection related to pregnancy or surgery that is unlikely to be sexually acquired:

- Amoxicillin 2g IV 6 hourly
  plus
- Gentamicin IV (usual dose 5mg/ kg ideal body weight. See gentamicin guideline)
  plus
- Metronidazole 500mg IV 12 hourly

Alternative Regimen

- Clindamycin 600 mg IV TDS (microbiology approval required within 24 hours of starting therapy).
  plus
- Ceftriaxone* 2g IV daily
  plus
- Azithromycin 500 mg IV daily
  *If the patient is allergic to cephalosporin agents or has a type 1 hypersensitivity reaction to penicillin, replace ceftriaxone with gentamicin

For mild to moderate infection, or “step down” oral therapy

- amoxicillin+clavulanate 875+125 mg orally, 12-hourly for 14 days
  plus
- doxycycline 100 mg orally, 12-hourly for 14 days or Azithromycin : see above
For non-pregnant patients with hypersensitivity to penicillins (see Antimicrobial hypersensitivity), use:

- Doxycycline 100mg orally, 12 hourly for 2 weeks or Ciprofloxacin 500mg BD
  Plus
- Metronidazole 400mg orally, 12 hourly for 2 weeks

Other Regimens
There are many potential antimicrobial options to treat PID. Discuss with microbiology if above regimens are unsuitable due to allergy, other medical conditions, severe disease, unusual organism, lack of clinical response or potential need for hospital in the Home (HITH) treatment.

Follow up
- Follow up is important to ensure symptoms have resolved, that the patient was compliant with medication and that partners have been treated if Chlamydia trachomatis and / or Neisseria gonorrhoea have been detected. If any of these factors remain unresolved, a test of cure may be required.
- The patient should be reviewed within 24-48 hours to ensure symptoms and signs respond to treatment.
- Ensure the woman understands the importance of compliance with medication
- Advise the woman to avoid sexual intercourse until both she and her partner are fully treated (i.e. have completed their respective antibiotic courses).
- If there is no improvement, therapy should be re-evaluated and alternative diagnoses considered.

Intrauterine contraceptive device
In the presence of an intrauterine contraceptive device (IUCD), consideration should be given to the removal of the device, particularly if there has been no resolution of symptoms within 72 hours or if inserted within the last 2-3 weeks. Current Australian Therapeutic Guidelines do not recommend routine removal of an IUD in the presence of PID especially if occurring 3 weeks after insertion. IDSA guidelines recommend close follow up however, if an IUD is left in place in a patient diagnosed with PID.

Tubo-ovarian abscess
- In the presence of Tubo-Ovarian abscess ultrasound or CT guided drainage should be considered following discussion involving the Gynaecology Consultant and the Consultant Sonologist.
- Surgical treatment is another alternative management strategy that needs to be considered in severe cases or when there is evidence of pelvic abscess.
- Antibiotic courses of longer length than those recommended above (ie > 4 weeks)
may be required in patients with extensive disease. Specialist consultation with Clinical Microbiologists/Infectious Diseases is recommended.

Management of sexual partner(s) of women with PID
When a sexually transmitted infection is either proven or likely to be the cause of PID, the current sexual partner(s) should be offered health advice and screening for chlamydial and gonococcal infection through their GP.

REFERENCES / STANDARDS

RESPONSIBILITY
Policy Sponsor AMS Committee
Initial Endorsement May 2008
Last Reviewed January 2016
Last Amended
Review date January 2019
Ovarian cyst accidents

Background
Ovarian cyst accidents refer to any of the three complications of ovarian cysts\(^1\).

1. Ovarian torsion
2. Ovarian cyst haemorrhage
3. Ovarian cyst rupture

Key points
- Other gynaecological complications can present similarly to an ovarian cyst event. Consider on examination conditions such as: ectopic pregnancy, pelvic inflammatory disease, tubo-ovarian abscess, or non-gynaecological issues e.g. appendicitis\(^1\).
- Ovarian cyst accidents will most commonly involve benign ovarian cysts.
- Immediate treatment should occur if ovarian torsion is suspected as this is a gynaecologic emergency\(^2\).

Torsion
Ovarian torsion, or adnexal torsion; is partial or complete rotation of the ovarian vascular pedicle causing obstruction to venous outflow and later arterial inflow\(^1\). The incidence of ovarian torsion occurs mainly in women of childbearing age, it is rare and accounts for 3% of gynaecologic emergencies\(^1, 3\). Thought to be primarily caused by a “heavy ovary” in conditions such as ovarian hyper stimulation or teratoma; right sided ovarian torsion is more common\(^1\). 10-20% of ovarian torsion can occur during pregnancy; with infertility treatment being a possible risk factor\(^3\). Reoccurrence can occur in polycystic ovaries\(^3\). 15% of ovarian torsion can occur in children and adolescents\(^4\).

Diagnosis: Is based on a high index of clinical suspicion\(^3\):

Signs of ovarian torsion include:
- Characterised by colicky pain in lower abdomen or pelvic tenderness which becomes constant and can disappear if tissue is severely necrosed\(^3\).
- 50% of cases present with nausea and vomiting\(^3\).
- The presence of an adnexal mass on USS raises the suspicion of a torted ovarian cyst. Doppler sonography can be useful in diagnosis but normal blood flow does not excludetorsion\(^5\).

Management of ovarian torsion
- Perform laparoscopy if suspicion of ovarian torsion as soon as possible to aid in preservationof ovarian tissue. Diagnosis can only be made at laparoscopy or laparotomy.
• During surgery de-torsion only is recommended as blood resupply in 91-100% of cases will be restored. Further surgery at a later stage should be considered for cysts deemed to be complex\(^1\).\(^3\).

**Rupture & haemorrhage**

Usually this is a physiological event during the ovarian cycle involving the follicle or corpus luteum. An extremely rare cause of rupture is pseudomyxoma, (mucinous cyst)\(^1\). Complications can occur with women with a history of coagulopathy\(^1\). If a benign teratoma/ endometriotic cyst is involved be aware that the ruptured cyst content can be extremely irritant for the peritoneum\(^1\). Historically treatment for functional ovarian cysts has included the oral contraceptive pill; this has not been proven to be beneficial in most cases as functional ovarian cysts are likely to resolve within several months\(^6\). Other treatment such as repeated laparoscopic ovarian cystectomies for functional cysts has been shown to reduce fertility without any added benefit to the woman.

**Signs of rupture / haemorrhage\(^3\):**

• Characterised by a sudden onset of sharp then constant ache. Pain is at its worst at the time of onset.
• Most women are systemically well; mild signs of peritonism may be present on examination, not associated with fevers, tachycardia or inflammatory markers.
• Free fluid may be seen on USS.
• If significant blood loss occurs the women could present with hypovolemic shock. This is a very late sign.

**Management**

• Ultrasound is the first line of investigation.
• Management is usually conservative, with analgesia and observation.
• Address any predisposing cause such as Factor VIII deficiency causing haemorrhage\(^1\).
• If pain does not improve within 48 hours consider an alternative diagnosis\(^1\)
• If the pain persists beyond a few days then laparoscopy should be considered.
• Follow up after 6 weeks with an ultrasound to confirm resolution is recommended when an ovarian haemorrhagic cyst has been identified\(^1\).
REFERENCES / STANDARDS

RESPONSIBILITY
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Vulvar dynia

Aim
- To describe the diagnosis and management of vulvar vestibulitis.

Background
Vulvar dynia is uncommon, however is the most common cause of vulvodynia seen in the sexual health clinic and an important cause of dyspareunia. The characteristic features are of introital dyspareunia, vestibular erythema, focal inflammation, and localised tenderness confined to the vulvar vestibule. To diagnose the condition, other causes of vulvodynia such as vulval dermatoses, herpes vulvitis, atrophic vaginitis, cyclic vulvovaginitis and dysthetic vulvodynia need to be excluded. Candida has been reported in up to 43% of women with this condition.

Diagnosis
Medical history
Enquire about the following points in addition to a standard medical history:
- Presenting symptoms - specifically pain, times the pain is experienced, location, duration, precipitating and alleviating factors
- Duration of symptoms
- Sexual activity - record the frequency and severity of pain with sexual intercourse
- Severity of symptoms:
  - Grade 0 - no pain with sexual intercourse.
  - Grade 1 - some pain with sexual intercourse.
  - Grade 2 - has to stop sexual intercourse because of pain.
  - Grade 4 - avoiding sexual intercourse.
- Is the woman able to insert a tampon?
- Attend a personal / family history (e.g. autoimmune or atopic conditions, incontinence, smoking) and drug history.

The following conditions should also be enquired about:
- Has the woman ever had pain free sexual intercourse?
- Candidiasis
- Skin disorders i.e. psoriasis, eczema, lichen sclerosus, lichen planus, dermatitis
- Other gynaecological conditions
- Medication which is associated with genital oestrogen deficiency – Depo-Provera, implanon, conditions associated with a high prolactin level-prolonged breast feeding, phenothiazines.
- Current medications and known drug allergies
- Allergies, hay-fever, asthma
- Sexual assault
- Consider whether the pain might be referred- any history of back injury through sport or a motor vehicle injury or arthritis.

**Medical assessment**

- Perform a standard symptomatic STI screen\(^5\) (See Clinical Guideline, O&G, STI: Screening Tests for Symptomatic Females), including PAP smear and HSV2 serology.
- Exclude other conditions i.e. atrophic vaginitis, nonspecific vaginitis, cervicitis. Consider testing for other conditions e.g. thyroid disease, diabetes, iron deficiency\(^5\)
- Look for dermatitis, and examine skin at other sites\(^5\)
- Document clinical signs of vestibulitis:
  - Peri-vestibular erythema
  - Tenderness on touching the vestibular glands with a dry cotton bud.
- Document any tenderness in a clockwise manner at 7 points of the vestibule via a patient self-rating scale out of 10 for pain (0= no pain, 10 = severe pain). Both sides of urethra and at 0200, 0400, 0600, 0800, 1000 of vaginal orifice.

**Management**

- Prescribe Fluconazole 150mg per week for 6 weeks unless contraindicated, even if Candida is not isolated.
- Prescribe Ovestin cream topically (a tiny smear) to introitus bd for 6-9 months (If there is a history of breast cancer, consult with their oncologist, if there is a history of a thromboembolic condition, consult with their haematologist).
- Provide medical counselling as appropriate.\(^5\) In particular provide information about the disease, and information on sexual activity.\(^5\)
- Discuss soothing products, wearing loose fitting clothing and perineal hygiene, keeping the area clean, dry and ventilated.\(^1,5\)
- Referral to physiotherapy.
- Transcutaneous electrical nerve stimulation (TENS) may be effective for reducing pain associated with vestibulodynia.\(^6\)
- Review in 6 weeks.

**6 week review**

- Provide the results from the first appointment.
- Assess clinical response.
- Discuss the condition and treatment and compliance to date.
- Assess sexual intercourse and pain levels.\(^5\)
• If Candida is present, consider fluconazole prophylaxis 150mg/week for 6 months.
• If the patient is not prescribed fluconazole
  ➢ Explain the importance of diagnosis and treatment of candidiasis if recurrences occur.
  ➢ Inform the woman that she should present to the clinic for diagnostic testing if she develops symptoms of Candida or her vulval pain worsens.
• If HSV 2 serology is positive prescribe antiviral therapy for at least 12 months and then review.
• Ensure the patient has attended physiotherapy.

12 week review

• Do a medical assessment.
• Exclude candidiasis.
• Encourage the physiotherapy programme and enquire about progress.
• If the woman is in a sexual relationship, enquire about her partner’s response to the condition and treatment.
• Consider antihistamines for the atopic group.
• Consider vagifem for localised oestrogen deficiency in addition to topical ovestin (3-6 months supplemental course of 10mcg two times a week).

4 month review

• If there is no significant improvement, commence on analgesics i.e. Low dose amitriptyline. Commence at 10mg / day and increase by 10mg per fortnight until the pain is controlled or side effects up to a dose of 200mg/ day. Topical anaesthetics and antidepressants (amitriptyline hydrochloride) may be prescribed to reduce itch and discomfort. NB: ideally the woman should have had approximately 3 months of physiotherapy before being commenced on analgesia. Women who gain weight on amitriptyline can be given roboxetine.
• For women unable to tolerate either of the above medications, gabapentin or pregabalin can be given.
• Advise the woman that the treatment is usually given for over 12 months and is continued for 6 months after the pain levels have reduced or gone before the drug is discontinued. Surgical intervention can be considered if symptoms remain unrelieved after medical treatment.
• Frequent follow-up is suggested to monitor progress. Continue to review the woman at 6-8 week intervals to monitor progress, therapy compliance and provide support / encouragement.
• Consider assessing urine for evidence of oxalate crystalluria.
• Consider psychosexual counselling\(^3\),\(^5\) with referral to a clinical psychologist. A clinical psychologist can assist with a number of concerns common to women with Vulvar Vestibulitis including current sexual functioning, self-esteem and the development of a graduated sexual reintroduction programme.

REFERENCES (STANDARDS)


[endnote]

RESPONSIBILITY

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**Myomectomy: Strategies to reduce blood loss & anaemia**

**Aim**
To minimise the need for blood transfusion and to decrease the impact of postoperative anaemia in women undergoing a Myomectomy.

**Background/Rationale**
Leiomyomas (fibroids) are benign lesions of the uterus which commonly cause menstrual disorders such as menorrhagia and can interfere with fertility. For women who wish to preserve fertility Myomectomy is the procedure of choice (vs hysterectomy). Myomectomy, especially open abdominal procedures, can be associated with a large degree of blood loss. Women with menorrhagia may also be suffering from anaemia +/- iron deficiency prior to surgery, further increasing the likelihood that they may need a blood transfusion. A recent audit at King Edward Memorial Hospital for Women, Western Australia, identified a 15% transfusion rate of women undergoing open abdominal myomectomy. Although serious reactions are rare, transfusion is not without risks e.g. labelling errors, Transfusion Related Acute Lung Injury (TRALI) and Transfusion Associated Circulatory Overload (TACO). Perioperative transfusions and anaemia have both been associated with increased complications and length of stay in surgical patients. Since Myomectomy is an elective procedure, with careful planning and considered use of some of the interventions listed below, it should be possible in most cases to avoid the need for transfusion and minimise the impact of postoperative anaemia. Some of these techniques may be applicable for other types of surgery.

**Disclaimer**
This document is a written practical resource designed to be used specifically by clinical staff here at King Edward Memorial Hospital for Women (KEMH) - Western Australia (WA). The techniques/regimens that have been included are based on the opinion of experienced clinicians familiar with using these techniques. The decision to use any of these techniques is at the discretion of the treating clinician and should take into account their own personal experience, the literature and individual patient characteristics.

**Pre-Operative**

1 – **Correction of preoperative anaemia and iron deficiency**
Screening for anaemia and iron deficiency should be done as early as possible prior to surgery and should be corrected prior to an elective major surgical procedure. Elective surgery should be scheduled to allow anaemia correction to occur first. If anaemia is complex (e.g. Haemoglobinopathy or thalassaemia), consider early referral to haematology.
These patients often have heavy menstrual bleeding and iron deficiency anaemia due to the presence of fibroids. Treatment with intravenous iron is recommended if there is a short time to surgery, moderate to severe anaemia (e.g. Haemoglobin < 100), a history of intolerance to oral iron, or heavy ongoing menstrual bleeding (for which oral iron is mostly not suitable).¹

2 – Medical treatments for menorrhagia

Medical treatments used for the management of menorrhagia include, tranexamic acid, gonadotrophin releasing hormone antagonists, non-steroidal anti-inflammatory drugs, and other hormonal therapies. These may also be beneficial in decreasing preoperative blood loss and thus facilitating the correction of preoperative anaemia and iron deficiency. The decision to use any of these medical therapies is at the discretion of the treating clinician. A Cochrane review, comparing the evidence for a number of these therapies, has not yet been completed. ⁶

3 – Preoperative misoprostol

One small RCT demonstrated a significant decrease in average blood loss of 149mL²

Dose recommended

Misoprostol 400 mcg intra-vaginally, one hour prior to surgery.

Intra operative

Vasoconstrictor therapy

Vasopressin

Two RCT’s demonstrate a median decrease in blood loss of 298mL²

Contraindications:

- History of CVS disease, such as hypertension, ischaemic heart disease or other cardiac disease.
- Caution in smokers or those on nicotine replacement therapy.

Suggested vasopressin dilution

Add 20units of vasopressin (1 ampoule) into 200mL of saline = 0.1u/mL

Max Dose for infiltration is 50mL (5u) of this solution.

Recommendations:

- Surgeons should inform the anaesthetist when injecting.
- Inject into the base of myomas prior to incision.
- Aspirate regularly to avoid intravascular injection.
- Pneumoperitoneum may increase the risk of bradycardia.
- Vasopressin has a short half-life. A repeat injection in 45-60 minutes may be safe.
- Never exceed the maximum dose of 5 units.
Noradrenaline

There is no published literature but this is used in some centres including hospitals in WA, and is probably just as efficacious. The same precautions with regard to potential cardiovascular contraindications / precautions apply.

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<td>= 2mcg/mL</td>
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<td>Max Dose for infiltration is 100mL of this solution, although more than 60mL is rarely needed</td>
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<td>Repeat dose in 45-60minutes (probably safe due to short half-life)</td>
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Surgical Techniques

Peri-cervical tourniquet

Two RCT’s demonstrate a median decrease in blood loss of 289mL

This can be achieved by passing and tying a Foley’s catheter around the cervix and the infundibular pelvic ligaments as low as possible compressing the uterine and ovarian vessels.

The best way to achieve a tight seal is to throw one knot on the catheter and then use a clip to hold this tight. This technique may not be feasible if the location of the fibroids prevents the catheter from encircling the cervix.

Ovarian artery clamps

The addition of ovarian artery clamps to a peri-cervical tourniquet (the triple tourniquet technique) has shown the greatest benefit in decreasing overall blood loss. Specific ovarian artery clamps designed to avoid damage to the fallopian tubes are available for this purpose.

Recommendations

- Myomectomies, laparoscopic or open, carry a high re-bleed risk. Consider insertion of an intra-peritoneal drain and measuring haemoglobin level at 6 hours post-op to allow early detection of intra-abdominal bleeding.
- Myomectomy sites also form adhesions frequently, consider overlaying the Myomectomy site with an adhesion barrier (e.g. Interceed).

Anaesthesia techniques

Controlled hypotension / intra-operative blood pressure control

There is good evidence that there is a linear relationship between mean arterial blood pressure and blood loss. Most of the evidence for controlled hypotension/deliberate hypotension comes from spinal surgery, ENT/maxillofacial
surgery, orthopaedic joint replacement surgery and some older papers in gynaecologic surgery showing benefit. The major risk is organ ischaemia or hypo-perfusion and caution should be exercised in patients with cardiovascular disease. It is probable that the risks of a MAP <65mmHg may outweigh any benefit, but it is recommended practice to avoid hypertension. Aiming for a MAP 65-70mmHg (e.g. low normal) seems reasonable in patients without pre-existing cardiovascular disease. Any method can be used e.g. thoracic epidural, Spinal + GA, Remifentanil, or deepening the volatile anaesthesia depth. If infusing vaso-active drugs (e.g. GTN or Phentolamine), the insertion of an arterial line is considered prudent.

It is not advisable to use deliberate hypotension if the patient has poorly controlled hypertension, cardiovascular or cerebrovascular disease. To ensure the surgeons have obtained good haemostasis before closing, the anaesthetist should allow the BP to return to normal levels first. This reveals any bleeding points which may not be obvious at the lower blood pressure but which may lead to concealed postoperative bleeding, if not dealt with prior to closure.

**Regional anaesthesia**

There is evidence that regional techniques decrease intra-operative blood loss, possibly through their ability to lower blood pressure and sympathetic responses. When discussing merits of thoracic epidural analgesia with patients, this additional benefit should be included in the discussion.

Another acceptable alternative for patients not keen on an epidural is a single shot spinal with intrathecal morphine in addition to general anaesthesia.

**Avoidance of hypothermia**

Aggressive intra-operative warming and avoidance of hypothermia will decrease blood loss. Consider the use of two full body bair hugers (top and bottom) and the inditherm heating mattress. Wrapping the patient’s head and warming all irrigation and intravenous fluids also helps.

**Intravenous fluid & coagulation management**

Monitor coagulation with either traditional coagulation tests or Rotational Thrombo-Elastometry (ROTEM) when indicated and treat abnormalities accordingly. Colloid solutions (especially starches such as Voluven) can interfere with fibrinogen polymerisation, and potentially increase blood loss. Consider avoiding or minimising colloid use if possible.

**Acute Normovolaemic Haemodilution (ANH)**

There is limited evidence for the routine use of Acute Normovolaemic Haemodilution outside of cardiac surgery. It probably adds little benefit if intra-operative cell salvage is already planned. This technique could be considered in patients who refuse blood products (e.g. Jehovah’s witnesses).
There are benefits to the clotting factors and platelets in autologous fresh blood, whereas cell salvage will provide only red cells. The equipment and training / experience required is not routinely available here at KEMH at present, hence prior planning would be required, and the involvement of an anaesthetist experienced in this technique would be desirable.

**Tranexamic acid**
One RCT has demonstrated a median decrease in blood loss of 243mL. This treatment is contraindicated in women with a history of, or risk factors for, thromboembolic disease.

**SUGGESTED TRANEXAMIC ACID REGIMEN**
- Tranexamic acid 10mg/kg (maximum 1G) loading dose over 10min
- followed by infusion of 1mg/kg/min
- Cease at the end of surgery.

**Intraoperative cell salvage**
This should be used routinely with open abdominal myomectomy which at present has a very high incidence of >1000mL blood loss. Correct technique is very important, and much of the shed blood may end up in packs and swabs in the operating theatre. It is vital that these are carefully washed in saline then collected via the cell salvage suction apparatus.

**Recommendation:** For optimal success surgeons must be diligent with the use of the sucker and communication between the theatre scrub nurse, the surgical team member and the Anaesthetic Consultant/Registrar with expectations clearly outlined is of the utmost importance. (i.e. to collect all of the blood possible).

**Postoperative Anaemia correction**
Women undergoing Myomectomy are usually relatively young and fit with minimal co-morbidities. They are likely to be able to tolerate lower levels of Haemoglobin (Hb) for short periods of time compared to other elderly patients or those with CVS / respiratory disease. Consider enhancing their own ability to replace the lost Hb with intravenous iron if there is significant post-operative anaemia (or oral iron if mild). This is important if they were iron deficient preoperatively and this hasn’t been corrected, as they will have no iron stores to help them correct their postoperative anaemia. In the stable non-bleeding patient, a reasonable aim should be to transfuse only if Hb < 60-70g/L and give only one unit at a time while assessing the patient’s response.
References

1. Patient Blood Management Guidelines: Module 2 – Perioperative, -


Care following a simple / radical vulvectomy

Aim

- The appropriate management and care of a woman following a simple / radical vulvectomy.

Post-operative care

1. Nurse in the semi recumbent or Fowlers position, only for the initial 24 hours post operatively, to decrease tension on the suture line and promote comfort. Use a bed cradle if required.\(^1\)

2. Post-operative observations shall be performed and recorded as per Clinical Guideline, O&G: Surgical Patient: Management of: Care Following Major Gynaecology, Oncology or Urogynaecological Surgery

3. Encourage 2 hourly change of position. Ensure standard VTE prophylaxis\(^1,2\) including Flowtron boots\(^3\), graduated compression stockings,\(^4\) early mobilisation and appropriate chest physiotherapy, and pressure ulcer prevention\(^1,5\) particularly of the heels.

4. Ensure groin drains are secured appropriately to prevent dislodgement as extensive lymphatic drainage is usual. There may also be a Yates drain in the perineum (usually sutured) - this drains into a gauze pad.

5. Ensure the in-dwelling catheter (IDC) is secured to promote drainage and comfort.

6. Drains and the IDC shall be removed as ordered.

7. Groin dressings are usually removed at 24 hours or as ordered. A dressing shall be reapplied as required.

8. Report any discolouration or induration of the suture line as it may indicate lymphoedema or lymphocyst formation. This can often present insidiously and be accompanied by low grade pyrexia.

9. Perineal toilet is performed three times per day and following all bowel actions\(^1\). The area is dried using a hairdryer set to ‘cool’.\(^1\) Paraffin gauze may be ordered for the perineal suture line. Use a combine as the perineal pad - underwear is not normally worn at this stage.

10. Consider the need for aperients to prevent straining.\(^1\)

11. Voiding patterns are usually re-established without difficulty however some ‘spraying’ of urinary flow may be noticed post-operatively. Encourage perineal toilets after passing urine or faeces.\(^1\)

12. Assist with mobilisation to prevent over extension of the suture line (particularly when getting into / out of bed). Consider the use of a footstool.

13. Provide the woman with opportunities to express her feelings and concerns about the surgery, including the recommencement of sexual activity and body image concerns.\(^1\) Women may have difficulty discussing personal problems
with family or friends. Spending time counselling and providing advice helps reduce the negative impact from these concerns. 

14. On discharge advise the woman to report any:
   - Unusual odour
   - Breakdown on the incision
   - Fresh bleeding
   - Perineal pain.

15. Educate the woman about:
   - The possibility of developing lower limb lymphoedema, and the signs, symptoms and action to be taken, after surgery to assist development of collateral pathways for lymph drainage.

REFERENCES & STANDARDS

RESPONSIBILITY
Policy Sponsor
Nursing & Midwifery Director OGCCU
Initial Endorsement
June 2009
Last Reviewed
September 2014
Last Amended
Review date
September 2017
References and resources

[guideline under review] See guideline sections above

Related policies


Related WNHS policies, procedures and guidelines

KEMH Clinical Guidelines:

O&G:
- Pressure Injury Prevention
- Reproductive Medicine: Ovarian Hyperstimulation Syndrome
- Sexually Transmitted Infections
- Surgical Patient: Management of: Care Following Major Gynaecology, Oncology or Urogynaecological Surgery
- VTE: Anti-embolic therapy
- VTE: Risk Assessment and Recommended Venous Thromboembolic Prophylaxis in Patients Admitted for Gynaecological Conditions

Anaesthetics: Intraoperative cell salvage

Keywords: PID, pelvic inflammatory disease, genital tract infection, tubo-ovarian abscess, TOA, endometriosis, salpingitis, ovarian rupture, ovarian torsion, ovarian haemorrhage, ovarian cyst, dyspareunia, vaginitis, vulvodynia, vestibulitis, Myomectomy, postoperative anaemia, Leiomyomas, fibroids, peri-cervical tourniquet, Vulvectomy, simple vulvectomy, radical vulvectomy, vulval cancer

Document owner: Obstetrics Gynaecology and Imaging Directorate (OGID)

Author / Reviewer: O&G Evidence Based Clinical Guidelines

Date first issued: 2001 [Sept 2017 amalgamated 5 guidelines]

Last reviewed: Various- see sections above

Next review date: May 2017

Endorsed by: OGCCU

Date: [see sections]

Standards Applicable: NSQHS Standards: 1 Governance, 3 Infection Control, 4 Medication Safety, 7 Blood Products, 8 Pressure Injury

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