OFFICIAL

OBSTETRICS AND GYNAECOLOGY
CLINICAL PRACTICE GUIDELINE

Myomectomy

Scope (Staff):	WNHS Obstetrics and Gynaecology Directorate staff
Scope (Area):	Obstetrics and Gynaecology Directorate clinical areas at WNHS

This document should be read in conjunction with this Disclaimer

Contents

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 heavy menstrual bleeding and can interfere with fertility. For women who wish to preserve fertility myomectomy is the procedure of choice (vs hysterectomy). Myomectomy can be associated with a large degree of blood loss.

Women with heavy menstrual bleeding 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.[4] 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.[5] 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 [1]. 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 heavy menstrual bleeding

Medical treatments used for the management of heavy menstrual bleeding include, tranexamic acid, gonadotrophin releasing hormone antagonists, non-steroidal anti-inflammatories, 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.

3 – Preoperative misoprostol

A recent systematic review demonstrated a decrease in average blood loss of 149mL, and a smaller reduction in post-operative Hb, in women given PV misoprostol.[2,6]

Dose recommended: Misoprostol 400 microg intra-vaginally, one hour prior to surgery.

Intra operative

Vasoconstrictor therapy

Argipressin (vasopressin)

A Cochrane review[2] of two RCTs demonstrated a median decrease in blood loss of 299 mL.

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 argipressin (vasopressin) dilution

Add 1 mL (20 units) of argipressin (vasopressin) into 200 mL sodium chloride 0.9% to make a concentration of 0.1 unit/mL

Max dose for infiltration in 50 mL (5 units) 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.
- Argipressin (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 (norepinephrine)

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.

(please note KEMH Pharmacy only stock 4 mg/4 mL amps)

Suggested noradrenaline dilution

Add 2 mg noradrenaline into glucose 5% 1000 mL to make a concentration of 2 microg/mL

Max dose for infiltration is 100 mL of this solution, although more than 60 mL is rarely needed.

Repeat dose in 45-60 minutes (probably safe due to short half-life).

Surgical techniques

Peri-cervical tourniquet

Two RCT's demonstrate a median decrease in blood loss of 289mL[2]

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.[3]

Uterine artery clamps

This technique, as part of the triple tourniquet method, has been demonstrated to be of benefit, with a significant reduction in blood loss of 1870ml.[7]

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 or OxiPlex).

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 gynaeoncologic 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), 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 huggers (top and bottom) and the inditherm heating mattress. Wrapping the patient's head and warming all irrigation and intravenous fluids also helps.

Intravenous fluid and 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 243 mL. [7]

This treatment is contraindicated in women with a history of, or risk factors for, thromboembolic disease.

Suggested tranexamic acid dilution

Tranexamic acid 10 mg/kg (maximum 1 g) loading dose over 10 min
followed by infusion of 1 mg/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 suction 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.

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Related WNHS policies, guidelines and procedures

WNHS Anaesthesia and Pain Medicine guideline: Intraoperative cell salvage

WNHS Pharmacy Medication Guidelines (Adult)

Useful resources and related forms

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Version history

Version number	Date	Summary
1	Aug 2025	First version. **History**: In Aug 2025 this guideline was split back into an individual document. Previously: In Sept 2017 amalgamated five individual guidelines (from section Gynaecology), dated from 2001, into one document 'Gynaecology (non-oncological)'. The content in this guideline formed one chapter of that document. Prior to Sept 2017, these chapters were individual guidelines. Contact OGD Guideline Coordinator for previous versions. Original titled as C2.4 'Myomectomy- Strategies to Minimise Blood Loss and Anaemia'. **Changes in this version**: • Routine content review. Minor amendment to background.

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