Interventions to reduce haemorrhage during myomectomy for fibroids

05 May 2015

RHL summary

Key findings

Blood loss and blood transfusion were reduced by:

- Peri-cervical tourniquet
- Intramyometrial vasopressin*
- Gelatin-thrombin matrix
- Vaginal dinoprostone

Blood loss was reduced by:

- Vaginal misoprostol*
- Intramyometrial bupivacaine plus epinephrine
- Intravenous tranexamic acid
- Intravenous ascorbic acid
- Loop ligation of the myoma pseudcapsule
- Fibrin sealant patch

No evidence of blood loss reduction:

- Oxytocin, morcellation, clipping of the uterine artery

In one small randomized trial not included in the review (because there was no placebo/no treatment group), bilateral ligation of the ascending branches of the uterine arteries achieved less blood loss than the cervical tourniquet method.

Evidence included in this review

Eighteen randomized trials involving 1250 participants across low, middle and high income hospital settings.

Quality assessment

Moderate quality evidence for interventions demarcated by an asterisk (*) above. Other interventions had low quality evidence.
**Clinical implications**

Cervical tourniquet is a simple and readily available method to reduce bleeding. A medium sized rubber Foley catheter is passed behind the uterus as low down as possible, crossed over in front of the cervix, pulled tight and the point of crossover clamped with an artery forceps. After myomectomy it is loosened to assess for residual bleeding. A similar method has been used for temporary control of postpartum haemorrhage.

Although not included in this review, limited evidence supports the use of bilateral ascending uterine artery branch ligation.

In addition, any of the pharmacological methods mentioned above may be used if available.

**Further research**

More research is needed to improve the quality of evidence on most of the methods reviewed, as well as to produce robust evidence for the use of uterine artery ligation, and of cervical tourniquets in other life-threatening forms of uterine haemorrhage.

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**Research article**

Citation: Kongnyuy EJ, Wiysonge CS. Interventions to reduce haemorrhage during myomectomy for fibroids. *Cochrane Database of Systematic Reviews* 2014, Issue 8. Art. No.: CD005355. DOI: 10.1002/14651858.CD005355.pub5.

**Abstract**

Benign smooth muscle tumours of the uterus, known as fibroids or myomas, are often symptomless. However, about one-third of women with fibroids will present with symptoms that are severe enough to warrant treatment. The standard treatment of symptomatic fibroids is hysterectomy (that is surgical removal of the uterus) for women who have completed childbearing, and myomectomy for women who desire future childbearing or simply want to preserve their uterus. Myomectomy, the surgical removal of myomas, can be associated with life-threatening bleeding. Excessive bleeding can necessitate emergency blood transfusion. Knowledge of the effectiveness of the interventions to reduce bleeding during myomectomy is essential to enable evidence-based clinical decisions. This is an update of the review published in The Cochrane Library (2011, Issue 11).

To assess the effectiveness, safety, tolerability and costs of interventions to reduce blood loss during myomectomy.

In June 2014, we conducted electronic searches in the Cochrane Menstrual Disorders and Subfertility Group Specialised Register, the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, CINAHL and PsycINFO, and trial registers for ongoing and registered trials.

We selected randomised controlled trials (RCTs) that compared potential interventions to reduce blood loss during myomectomy to placebo or no treatment.

The two authors independently selected RCTs for inclusion, assessed the risk of bias and extracted data from the included RCTs. The primary review outcomes were blood loss and need for blood transfusion. We
expressed study results as mean differences (MD) for continuous data and odds ratios for dichotomous data, with 95% confidence intervals (CI). We assessed the quality of evidence using GRADE methods.

Eighteen RCTs with 1250 participants met our inclusion criteria. The studies were conducted in hospital settings in low, middle and high income countries.

Blood loss
We found significant reductions in blood loss with the following interventions: vaginal misoprostol (2 RCTs, 89 women: MD -97.88 ml, 95% CI -125.52 to -70.24; I2 = 43%; moderate-quality evidence); intramyometrial vasopressin (3 RCTs, 128 women: MD -245.87 ml, 95% CI -434.58 to -57.16; I2 = 98%; moderate-quality evidence); intramyometrial bupivacaine plus epinephrine (1 RCT, 60 women: MD -68.60 ml, 95% CI -93.69 to -43.51; low-quality evidence); intravenous tranexamic acid (1 RCT, 100 women: MD -243 ml, 95% CI -460.02 to -25.98; low-quality evidence); gelatin-thrombin matrix (1 RCT, 50 women: MD -545.00 ml, 95% CI -593.26 to -496.74; low-quality evidence); intravenous ascorbic acid (1 RCT, 102 women: MD -411.46 ml, 95% CI -502.58 to -320.34; low-quality evidence); vaginal dinoprostone (1 RCT, 108 women: MD -131.60 ml, 95% CI -253.42 to -9.78; low-quality evidence); loop ligation of the myoma pseudocapsule (1 RCT, 70 women: MD -30.01 ml, 95% CI -354.83 to -255.19; low-quality evidence); and a fibrin sealant patch (1 RCT, 70 women: MD -26.50 ml, 95% CI -44.47 to -8.53; low-quality evidence).

We found evidence of significant reductions in blood loss with a polyglactin suture (1 RCT, 28 women: MD -1870.0 ml, 95% CI -2547.16 to 1192.84) or a Foley catheter (1 RCT, 93 women: MD -240.70 ml, 95% CI -354.83 to -255.19; low-quality evidence). However, pooling data from these peri-cervical tourniquet RCTs revealed significant heterogeneity of the effects (2 RCTs, 121 women: MD (random) -1019.85 ml, 95% CI -2615.02 to 575.32; I2 = 95%; low-quality evidence). There was no good evidence of an effect on blood loss with oxytocin, morcellation or clipping of the uterine artery.

Need for blood transfusion
We found significant reductions in the need for blood transfusion with vasopressin (2 RCTs, 90 women: OR 0.15, 95% CI 0.03 to 0.74; I2 = 0%; moderate-quality evidence); peri-cervical tourniquet (2 RCTs, 121 women: OR 0.09, 95% CI 0.01 to 0.84; I2 = 69%; low-quality evidence); gelatin-thrombin matrix (1 RCT, 100 women: OR 0.01, 95% CI 0.00 to 0.10; low-quality evidence) and dinoprostone (1 RCT, 108 women: OR 0.17, 95% CI 0.04 to 0.81; low-quality evidence), but no evidence of effect on the need for blood transfusion with misoprostol, oxytocin, tranexamic acid, ascorbic acid, loop ligation of the myoma pseudocapsule and a fibrin sealant patch.

There were insufficient data on the adverse effects and costs of the different interventions.

At present there is moderate-quality evidence that misoprostol may reduce bleeding during myomectomy, and low-quality evidence that bupivacaine plus epinephrine, tranexamic acid, gelatin-thrombin matrix, a pericervical tourniquet, ascorbic acid, dinoprostone, loop ligation and a fibrin sealant patch may reduce bleeding during myomectomy. There is no evidence that oxytocin, morcellation and temporary clipping of the uterine artery reduce blood loss. Further well designed studies are required to establish the effectiveness, safety and costs of different interventions for reducing blood loss during myomectomy.

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