

Uterine myomectomy by Coblation

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Accepted 9 November 2005.

Please cite this paper as: Langton J, Timms M. Uterine myomectomy by Coblation. BJOG 2006; 113:347–349.

Case report

A 33-year-old nulliparous woman presented to the gynaecology clinic with a 2-year history of heavy and painful periods. On pelvic examination, the uterus was thought to be 12-week-size and irregular, suggesting fibroids. On ultrasound scan, the uterus was 12 × 7.7 × 7.8 cm. There was an area of mixed echogenicity on the anterior uterine wall measuring 8.4 × 7.4 × 7.8 cm, consistent with a fibroid. She was initially managed with tranexamic acid and mefenamic acid, but her periods continued to be heavy, and she developed symptoms of urinary urgency and frequency.

Five months later, laparoscopy and hysteroscopy revealed a 16-week-size uterus with a large anterior wall fibroid and two small, right-sided subserosal fibroids. There was no evidence of endometriosis, and both tubes and ovaries were normal. The uterine cavity measured 14 cm and was distorted due to the presence of the large fibroid. She was offered myomectomy and made aware of the possible risk of hysterectomy.

At laparotomy, she had a 10-cm left anterolateral myometrial fibroid, 3-cm right-sided subserosal fibroid and a 1-cm posterior subserosal fibroid. These were excised by Coblation (Figure 1). After adequate exposure of the uterus, the coblator was used to incise over the greater curvature of the myoma through the myometrium to the pseudocapsule of the lesion. The edges were grasped and retracted to enable tissue lysis between lesion and uterine muscle until sufficient tumour was exposed to allow insertion of a myoma screw. This allowed maximum distraction and exposure of the surgical plane. Most small vessels were coagulated without bleeding. Any larger, actively bleeding vessels were coagulated using the coagulation-only pedal, with simultaneous irrigation and suction delivered by the plasma wand, making identification of vessels easy and their coagulation accurate. This process was carried out in all directions, progressively freeing the tumour

until total removal was achieved. The uterine wall was then reconstituted with interrupted sutures and the abdomen closed in layers with suction drainage. No haemostatic clamps were used and the endometrial cavity was not opened. Blood loss was recorded as 300 ml.

Postoperatively, the suction drained 50 ml, but her haemoglobin dropped from 11.8 preoperatively to 9.1, and she was commenced on iron. She was discharged home on day 7. At follow up, an ultrasound scan measured the uterus at 8.9 × 6.9 × 4.8 cm, and her periods remained painful but not heavy, and she reported a good response to mefenamic acid. Haemoglobin was now 11.0.

Discussion

Coblation[®] (cold coblation; Arthrocare Corporation, Sunnyvale, CA, USA) is a process by which a radiofrequency current is used to excite sodium ions in a salt-rich medium, normal saline in this application, creating a plasma field around the tip of the plasma wand. Normal saline is delivered through an integrated channel to the wand tip whenever the activating pedal is depressed. The integral suction channel aspirates any fresh bleeding, allowing identification of vessels and their coagulation. The blood loss was calculated by subtracting the volume of saline used from the total content of the suction bottle. The coblation field contains sufficient energy to destroy intercellular bonds and break down soft tissue into inert molecules, enabling the resulting solution to be aspirated. This will contain some blood and may partly account for the drop in haemoglobin postoperatively. Simultaneous delivery of a low-power radiofrequency bipolar coagulation current at the wand tip creates simultaneous destruction and haemostasis. These processes occur at a temperature of only 60–70°C, thus limiting damage to surrounding tissues. Conventional diathermy operates at 400°C. At 200°C or more,

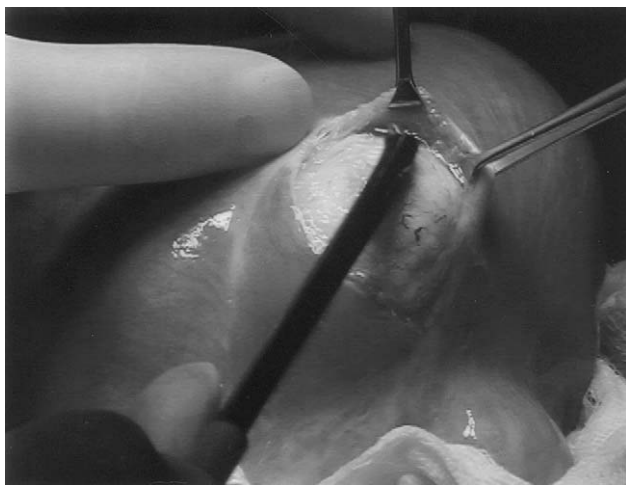


Figure 1. Myomectomy in progress.

there is carbonisation. The tissue carbonises similarly to a fourth-degree burn; this can lead to a delay in the post-operative course of healing. At 65–70°C, there is coagulation. Collagen is converted into glucose, collagenous tissue shrinks and there is haemostasis and minimal delay to healing. The Coblation and coagulation current can be delivered together or the coagulation current delivered alone. Saline provides a cooling effect whichever modality is activated (Table 1).

The cost of the Coblator II is £7637 including value added tax (a diathermy unit is approximately £8500). The plasma wands are £95 each and are provided with an integrated saline line. Depending on the number of wands used by a department, the unit may be supplied free of charge in some circumstances. The wand has an integrated suction port and variable coagulation for optimal haemostasis. Running costs will be for wands (usually one to two per case), normal saline and maintenance of the Coblator II unit. Normally, no regular maintenance and so, no service contract is necessary. In our opinion, it could be possible to adapt a wand for laparoscopic use by increasing the length of the shaft, but we are uncertain how the suction would affect the gas pneumoperitoneum. Presumably, higher gas flows would be required.

Coblation has been used for many years by one of the authors (MJT) for tonsillectomies, adenoidectomies, treatment of nasal obstruction and snoring.

Although the operating time was 2 hours, this was likely to be due to the combination of an otolaryngologist doing a myomectomy and a gynaecologist familiarising herself with Coblation. It is anticipated that surgical training time would be minimal provided the instrument and procedure are demonstrated by an operator experienced in the use of Coblation. The National Institute for Clinical Excellence (NICE) has produced guidance 'Coblation Tonsillectomy' September 2003.

Table 1. Coblation versus conventional electrosurgery

	Coblation	Conventional electrosurgery
Temperatures (°C)	40–70	More than 400
Thermal penetration	Minimal	Deep
Effects on target tissues	Gentle removal dissolution	Rapid heating, charring, burning, cutting
Effects on surrounding tissues	Minimal dissolution	Inadvertent burning or charring

This guidance was part of NICE's work on 'Interventional Procedures'. NICE identified a need for proper training for doctors who want to carry out Coblation tonsillectomy. The British Association of Otorhinolaryngologists, Head and Neck Surgeons has agreed to produce advice on training standards for the procedure.

The wand is effective at cutting into uterine serosa. This is not slow but should be carried out in a steady manner as vessels need to be coagulated simultaneously with cutting. Large vessels, up to 3 mm, can be coagulated but may require more than one application of the wand in coagulation mode. The temptation is to open the pseudocapsule as though with a knife, but this is likely to result in heavy bleeding, which would be difficult to control with this instrument. The advantage of the coblator over conventional diathermy is the reduction in adjacent tissue damage and therefore a quicker healing time. The advantage over the scalpel is the pinpoint coagulation resulting in a much lesser blood loss at the time of the procedure and thereafter. Coblation should provide a useful alternative to conventional (open) myomectomy. No vascular clamps are required during the procedure, the bleeding is minimal, the view is clear and the uterine incision is dry at the end of the procedure.

It is not suggested that Coblation will replace other treatments such as gonadotrophin-releasing hormone analogues,¹ magnetic resonance imaging-directed cryotherapy,² directed laparoscopic cryomyolysis,³ intranodal surgery with electro-mechanical tissue borer⁴ and uterine artery embolisation.⁵ A further two cases of myomectomy have been carried out using this equipment in this department, with similar results, which is encouraging.

Open myomectomy should be the operation of choice when there are large subserosal or intramural fibroids or entry into the uterine cavity expected. Patients should be counselled carefully about the risk of haemorrhage and the possible need to carry out a hysterectomy. Coblation offers an alternative to the scalpel and diathermy. We have not been able to find any published evidence for the use of the coblator in gynaecology to date. ■

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