CASE REPORT

Uterine artery embolisation for acute dysfunctional uterine bleeding with failed medical therapy: a novel approach to management

Chye Lee Kho, Manisha Mathur

¹Department of Obstetrics & Gynaecology, KK Women's & Children's Hospital, Singapore

Correspondence to
Dr Manisha Mathur,
drmanishamathur@aol.com

Accepted 30 December 2014

SUMMARY

A 35-year-old woman with a history of three previous caesarean sections was admitted with acute dysfunctional uterine bleeding (DUB) complicated by anaemia; she had a haemoglobin level of 5.3 g/dL, requiring multiple blood transfusions. Investigations performed excluded pelvic pathology and haematological causes for her acute DUB. Despite the use of various pharmacological agents, her bleeding persisted and she eventually underwent uterine artery embolisation (UAE) to arrest bleeding. She was well postprocedure and was discharged on combined oral contraceptives. However, she presented a year later with another episode of acute DUB that required a repeat UAE. This case report summarises the use of UAE in the management of acute DUB following failed medical therapy.

BACKGROUND

Menorrhagia is commonly associated with pelvic pathology including uterine fibroids, adenomyosis or endometriosis, malignancy or infection as well as systemic diseases such as hypothyroidism or bleeding diathesis. However, in a proportion of cases, investigations may not reveal any obvious cause, resulting in patients being diagnosed with dysfunctional uterine bleeding (DUB). The standard treatment of DUB is divided into medical and surgical methods, with the former comprising of hormonal treatment, non-steroidal anti-inflammatory drugs (NSAIDs) and tranexamic acid, and the latter consisting of endometrial ablation and, ultimately, hysterectomy.¹ We present an interesting case of a patient with acute DUB whose menorrhagia was managed by uterine artery embolisation (UAE) following failed medical therapy.

CASE PRESENTATION

In August 2012, a 35-year-old woman, para 3, presented to KK Women's and Children's Hospital, Singapore, with acute menorrhagia. She had a history of three prior caesarean sections, with the most recent having been performed a year earlier. Prior to this episode, she had experienced regular menstrual cycles. Examination was unremarkable with a bulky uterus. Investigations revealed a negative urine pregnancy test, haemoglobin level of 5.3 g/dL with normal platelet counts and a normal pelvic ultrasound, the latter demonstrating a follicle. The patient reported a similar episode of menorrhagia 2 weeks prior requiring admission to her local hospital, where she underwent curettage

and was transfused with 5 units of packed cells. Histology showed benign endometrial cells. The episode of menorrhagia recurred a week later and she was readmitted; she was transfused 4 units of packed cells and required an intrauterine balloon tamponade to arrest bleeding. She was subsequently transferred to our hospital.

On admission, the patient received intramuscular progesterone 100 mg, maintenance oral progesterone and intravenous antibiotics. She was also transfused with packed cells and platelets. The menorrhagia, however, persisted. A CT of the pelvis did not show any arteriovenous malformation. Investigations for haematological causes were negative. The patient was started on intravenous tranexamic acid and subsequently on oral oestrogen when the bleeding persisted. Despite that, the bleeding continued and she eventually underwent a pelvic angiogram and embolisation of bilateral uterine arteries. The bleeding settled and she was started on combined oral contraceptives (COC) prior to her discharge.

However, the patient presented again to the hospital a year later with prolonged heavy vaginal bleeding of 5 days duration. Prior to this, her menses were regular and menstrual flow was reported to be normal. There were no clinical findings suggestive of adenomyosis. An ultrasound scan of the pelvis was performed but was unremarkable and did not suggest adenomyosis. The patient was started on oral progesterone and discharged well the following day. Her haemoglobin on discharge was 12 g/dL.

The patient then re-presented the following day with severe menorrhagia complicated by symptomatic anaemia. A repeat haemoglobin level revealed a drop of 3 g/dL. She was given blood transfusions and started on oral oestrogen and intravenous tranexamic acid. Despite these conservative measures, the vaginal bleeding persisted. A pelvic angiogram and embolisation of bilateral uterine arteries were performed. Intraoperatively, a tortuous right uterine artery (figure 1) was noted but there was no arteriovenous malformation. The bleeding settled and the patient was discharged on the COC.

Following discharge, the patient underwent an elective hysteroscopy with dilation and curettage, which revealed a normal endocervical (figure 2) and endometrial cavity (figures 3–5). The histology of the endometrial curetting showed late secretory endometrium without any evidence of hyperplasia or malignancy. Management options were discussed and the patient is now considering a hysterectomy.

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To cite: Kho CL, Mathur M. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-204446

Figure 1 Tortuous right uterine artery seen on pelvic angiogram.

DISCUSSION

The medical management of acute DUB comprises of hormonal therapy, NSAIDs and antifibrinolytic agents. Hormonal therapy is considered the first-line medical therapy in acute DUB. Treatment options include intravenous conjugated equine oestrogen, COCs and oral and intramuscular progestins. The efficacy of intravenous conjugated equine oestrogen in the management of DUB was demonstrated in a randomised double-blind study of 34 women. The study showed a 72% decrease in uterine bleeding 8 h after administration of intravenous premarin compared to 38% in the placebo group.² It has been postulated that the induced growth of endometrium from rising levels of oestradiol in the early follicular phase of the normal menstrual cycle has a healing effect on the endometrium. Oestrogen also affects the endometrium by decreasing capillary permeability and by increasing fibrinogen levels, clotting factors and platelet aggregation, which in turn promotes coagulation.³ The other forms of hormonal therapy include COCs and oral progestins. A recent Cochrane review found that there is no difference in efficacy when progestagens alone or progestagens in combination with oestrogen were used in the management of anovulatory DUB.⁴

In cases of ovulatory DUB, NSAIDs and antifibrinolytics can be used on days of heavy uterine bleeding. These agents can be used in combination with other agents to produce a greater reduction of uterine bleeding than when single agent therapy is

Figure 3 Endometrial cavity.

used.⁵ Antifibrinolytics have been found to decrease uterine bleeding from baseline by 40–50% compared to placebo. They have also been found to be superior to NSAIDs with a reported 25–50% of reduction from baseline menstrual blood loss.⁶

The role of surgery in patients with acute DUB is limited to UAE, endometrial ablation and hysterectomy.⁷ Currently, the role of UAE in the management of menorrhagia has only been shown to be evidence based in women with fibroids. The EMMY trial showed that 70% of patients who were randomised to the UAE group did not require a hysterectomy after 5 years of follow-up.⁸ Thus far in the literature, only one case demonstrating the role of UAE in the management of acute DUB has been reported. The case discussed the use of UAE in the treatment of menorrhagia in a 12-year-old girl with first onset life-threatening menorrhagia following failure of response to standard medical or gynaecological measures.⁹ Apart from its role in menorrhagia, UAE has also been shown to play a role in the treatment of postpartum haemorrhage, with a reported success rate of more than 90%.¹⁰ Uterine infection was found to occur in 2% of patients post-UAE in one of the registers. A systematic review of 36 papers found that septic shock and multiple organ failure resulting in death after UAE occurred in 1 patient in a case series of 21 patients. Other complications included arterial

Figure 2 Endocervical cavity.

Figure 4 Right ostia.

Figure 5 Left ostia.

dissection or perforation, groin bleeding or pseudoaneurysm, femoral artery occlusion and bowel perforation.¹¹

The role of endometrial ablation in the treatment of acute DUB was described in a case report where endometrial ablation was used in a 44-year-old woman with end-stage liver disease who did not respond to medical management.¹² However, endometrial ablation was not the appropriate treatment of choice in this case as its use in women with previous caesarean deliveries is yet to be established and studies to date have shown conflicting data.¹³ A retrospective cohort study that investigated the use of endometrial ablation in women with at least one caesarean delivery and no previous caesarean deliveries found that women with previous caesareans had a higher incidence of uterine perforation, although the results were not statistically significant. However, the group of women with three or more previous sections was small, accounting for only 4.8% of the total number of women recruited.¹⁴ The safety of endometrial ablation was questioned when a patient with three previous

transverse caesarean sections developed a vesicouterine fistula following the use of impedance-controlled endometrial ablation.¹⁵ In view of inconclusive data regarding the safety of endometrial ablation in women with three previous caesarean sections and the availability of only microwave endometrial ablation in our hospital, the latter being performed as a blind procedure, endometrial ablation was not considered as the treatment of choice for our patient.

UAE was attempted in this case as the patient did not respond to medical management for DUB and was not keen on undergoing a hysterectomy. Control of her menstrual bleeding was achieved post-UAE on both occasions. The finding of a tortuous right uterine artery on angiogram is suggestive of an increase in the calibre and flow of the right uterine artery. Studies on monkeys have, however, shown that tortuous uterine arteries are only an anatomical variation.¹⁶ In conclusion, we postulate that there may be a possible role for UAE in the management of acute DUB in women where conservation of fertility is desired. However, further studies will need to be performed to ascertain the effectiveness of UAE in the management of acute DUB.

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Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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Learning points

- Medical management is recommended as the initial treatment modality for patients with acute dysfunctional uterine bleeding (DUB). Options include oestrogens, oral progestins, combined oral contraceptives and tranexamic acid. The selection of drugs is dependent on the patient's medical history and contraindications to therapies.⁷
- The decision for surgical therapy is made based on the severity of bleeding, the clinical stability of the patient, failure to respond to medical management or if there were any contraindications to medical therapy. The patient's desire for fertility should be ascertained prior to selecting the mode of surgical treatment.⁷
- This case demonstrates the role of uterine artery embolisation in the management of acute DUB in young patients where conservation of fertility is desired.

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