

Case report

Management of acute haemorrhage following chemotherapy for invasive molar pregnancy by embolization and conservative fertility-sparing surgery

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ABSTRACT

Management of perforated invasive molar pregnancy, especially, in those women desirous of future fertility can be difficult. We report one of the very few instances, to our knowledge, where a combination of preoperative uterine artery embolization and conservative surgical techniques was used. This was successful in terms of minimising intraoperative blood loss and long term in attaining control of disease when combined with multi-agent chemotherapy. Subsequent term pregnancy was achieved with no maternal or fetal complications.

1. Introduction

Gestational trophoblastic disease (GTD) includes a range of pre-malignant and malignant disorders of trophoblastic tissue. Invasive mole can present as a surgical emergency with rapidly progressive and highly vascular trophoblasts causing uterine perforation. Often hysterectomy is resorted to as a life-saving measure but in women desirous of future fertility, other options should be considered. We present the case of a nulliparous woman who, after receiving a dose of chemotherapy for invasive mole, presented with uterine perforation and hemoperitoneum and was managed by uterine artery embolization and a wedge resection of the uterus and repair, thus avoiding hysterectomy (see Figs. 1–3 and Table 1).

2. Case report

A 19-year-old woman presented at 9 weeks gestation with intermittent bleeding in her first pregnancy. Serum β hCG measurement was $> 100,000$ mIU/ml. An ultrasound scan showed numerous tiny cysts, an associated distorted empty sac, and slight fluid within the uterine cavity. The findings were suspicious for molar pregnancy. She underwent suction evacuation of the uterus. The uterus was 16 weeks size and a large amount of vesicular tissue was evacuated. Histopathology reported immature, large, hydropic villi with areas with cistern formation and intermingled small villi. The large villi contained

fetal blood vessels; in areas there was a protuberant growth pattern and non-polar lacey trophoblast proliferation. The features were consistent with partial molar pregnancy.

Serum β hCG monitoring showed a fall to 5204 mIU/ml. There was then an increasing trend as noted in the table. Ultrasound scans showed a heterogeneous vascular uterine mass with possible myometrial invasion. An MRI scan was arranged and reported a uterine fundal complex hemorrhagic mass likely representing malignant trophoblastic disease with myometrial invasion. A CT scan showed a mass lesion in the uterine cavity showing invasion into the uterine fundus. A pulmonary nodule was seen in the left upper lung lobe and a tiny nodule in the right lower lobe. No evidence of hepatic metastasis was seen and a Brain CT scan was unremarkable.

A plan was made for treatment with systemic chemotherapy. Her risk score was calculated at 4 (BHCG > 10000 , Number of metastasis 2 nodules, Size of the uterine mass 4.4 cm). Treatment was commenced with Methotrexate and Folinic acid. She was discharged home in a stable condition but returned three hours later with dizziness, lower abdominal pain and vaginal bleeding. She was hypotensive with a BP of 66/40 mmHg and pulse 112 bpm. Her abdomen was soft with no distension or tenderness. Vaginal examination revealed a brownish discharge. Her haemoglobin was 6.7 g/dl.

She was resuscitated with intravenous fluids and admitted to the high dependency unit for blood transfusion of 2 units and close monitoring. An ultrasound scan of the abdomen showed a moderate

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Fig. 1. Radiological images showing uterine arteries prior to (Fig. 1) and post (Fig. 2) embolization with particles until total occlusion.



Fig. 2. Radiological images showing uterine arteries prior to (Fig. 1) and post (Fig. 2) embolization with particles until total occlusion.

haemoperitoneum. The anterior wall of the uterus was completely involved by a cystic lesion showing marked vascularity.

It was considered that the bleeding could be from either the vascular uterine mass lesion itself or from rupture of one the dilated vessels. The patient was transfused 2 more units of blood and re-assessed. It was decided to proceed with a CT Angiogram to determine if any bleeding vessels could be isolated and embolised to control hemorrhage.

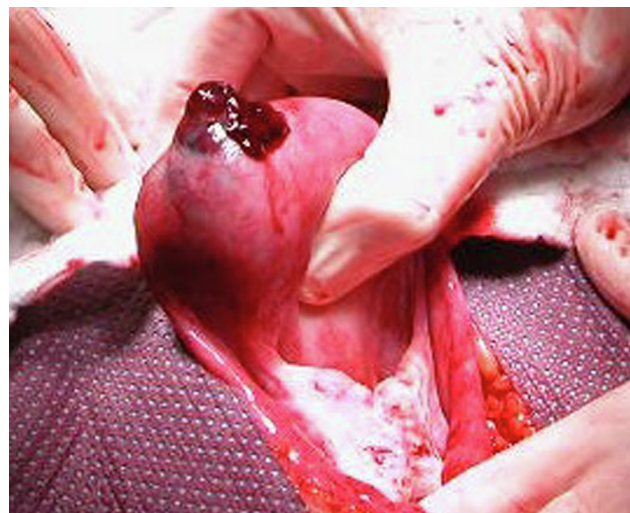


Fig. 3. Intra operative photo demonstrating the perforating invasive molar pregnancy at the uterine fundus.

Table 1

Dates	Beta HCG values
6 January	> 225,000
UNDERWENT SUCTION EVACUATION OF MOLAR PREGNANCY	
21 January	5204
4 February	35,137
25 February	52,244
1 March	44,286
10 March	44,042
14 March	32,139
<ul style="list-style-type: none"> • Reviewed in Gyne-Oncology Unit and plan of care discussed in MDT meeting • Started on Chemotherapy 14 March • 14 March(3 h post treatment) presented to emergency • 15 March Underwent Embolization + Fertility preserving Surgery 	
16 March	10,985
20 March	1,803
26 March	407
3 April	211
10 April	108
17 April	55
9 May	21
24 May	9
5 June and thereafter	Negative

The CT scan showed:

- (1) Focal discontinuity of the uterine outline at the superior aspect of the hypervascular myometrial mass with marked hemorrhagic ascites, suggestive of tumor/uterine rupture.
- (2) Massive haemoperitoneum with different densities but no definite active vascular contrast extravasation.

It was decided to proceed to emergency laparotomy to control the haemorrhage. The possible need for hysterectomy was discussed with the patient. A bilateral uterine artery embolization was performed in order to reduce the amount of hemorrhage intraoperatively.

After uterine artery embolization the patient was transferred to theatre. A massive haemoperitoneum of 2000 ml was present. There was a 2 cm perforation at the uterine fundus with protruding vesicular tissue. There was no other uterine abnormality and both adnexae appeared normal. No abnormality was identified elsewhere in the abdomen.

An elliptical incision was made around the mass protruding through the uterine fundus. The tissue was excised as a wedge resection. Vesicles consistent with trophoblastic disease were seen in the

specimen. The uterine cavity was not entered during excision of the abnormal tissue. The perforated area was then repaired in layers using interrupted sutures to deeper layers and a continuous suture to the serosa.

Pathology report: Complete hydatidiform mole. There are a few necrotic fragments of uterine smooth muscle covered by fibrinoid material and infiltrated by abnormal trophoblasts but not villi, making it suspicious for Invasive Mole.

Postoperatively the patient continued on methotrexate chemotherapy. Follow up hCG levels fell from 10985 to 1803 and then 407 mIU/ml. There were no complications post-operatively. She was discharged and managed as an outpatient for continuation of her chemotherapy. There was a good response to the treatment with negative hCG values after Cycle 7.

Two years later the patient conceived spontaneously. She had an uneventful antenatal period. Regular fetal growth scans were normal. She delivered a healthy female infant by elective Cesarean section at 38 weeks. The uterus and adnexa were normal with no pelvic adhesions. The placental histopathology was unremarkable.

3. Discussion + literature review

Fifteen percent of complete moles can develop into an invasive mole, but only 2–4% of partial moles (Miller and Laing). Although initial histology was thought to be a partial mole, pathology review showed the underlying diagnosis was a complete molar pregnancy.

Invasive moles are highly responsive to chemotherapy with an overall cure rate > 90%. This normally ensures that fertility is preserved (Goldstein, 2012). More rarely, invasive moles aggressively grow to invade the uterine tissue and vasculature resulting in uterine perforation with haemoperitoneum. This life-threatening hemorrhagic emergency requires prompt management which frequently involves surgical treatment by hysterectomy. Whilst this is acceptable to some women, the loss of any chance of fertility may be something that others would wish to avoid.

In nulliparous women, the physician needs to consider all options including those that may preserve fertility. Behtash et al. described localized wedge resection of the perforated area of the uterus in two patients (aged 18 and 19 years) presenting with acute pain and shock, while receiving chemotherapy for persistent GTD. These patients had successful term pregnancies 4 and 5yrs later with no recurrent disease (Behtash et al.).

A similar case was reported by Allison et al. (2001) of a woman with persistent uterine GTN. Wedge resection and repair was performed. The patient subsequently had 2 successful pregnancies. Kanazawa et al. (1988) evaluated 22 patients with local myometrial resection of invasive moles. All had lesions localized in the myometrium. Seven patients required chemotherapy after surgery. They observed that the reproductive performance following myometrial resection was similar to that of patients treated with chemotherapy alone.

These tumours are notoriously vascular. Every measure to decrease bleeding should be considered. Selective embolisation of the pelvic blood supply to minimize hemorrhage can serve as a primary option of management (Lim et al., 2002) or as a step prior to surgery. Our patient, despite significant hemorrhage, remained vitally stable thus making embolisation a possible option and one which successfully controlled the acute hemorrhage. Alternative methods to minimize blood loss

intraoperatively include manually occluding the major vessels by placement of Rubber shod vascular clamps across the infundibulopelvic ligaments; using a tourniquet over the lower uterine segment or intra-myometrial injection of a solution of Vasopressin (Allison et al., 2001).

To our knowledge this case is the first report of management of hemorrhage secondary to an invasive mole treated by radiological embolisation prior to surgical excision and uterine reconstruction. This combination achieved a rapid control of hemorrhage followed by excision of disease and reconstruction of the uterus under surgically favourable conditions. Results in terms of control of disease control have been satisfactory and the patient has subsequently had a successful uncomplicated pregnancy.

Fertility rates after uterine artery embolisation are comparable to those seen in untreated patients although there are some concerns that miscarriage rates may be slightly increased (Uterine artery embolization, 2013). There are usually no major obstetric risks, raising the possibility that a pregnancy post embolization can have a successful outcome, without significant increase in morbidity or mortality (Bonduki and Feldner, 2011).

Pregnancies after uterine preservation require close monitoring. When resection and reconstruction has been performed, the mode of delivery will require careful consideration. Uterine scar rupture has been studied in detail in patients with a previous Cesarean scar but not in those with myometrial excision and repair. As Allison et al noted, these cases differ in one main aspect; a Cesarean section involves disruption of myometrial muscle fibres whereas cases such as ours involves actual removal of myometrium. It would be prudent to closely monitor patients with serial ultrasound scans to monitor scar thickness especially in the third trimester.

This case demonstrates, that it is possible to spontaneously conceive and continue a pregnancy with good outcome post Uterine artery Embolization. With respect to fertility preservation using wedge uterine resection, while there are few studies on the procedure being done for invasive molar pregnancy, as in this case, such pregnancies can continue to term with close maternal and fetal monitoring.

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