Successful spontaneous pregnancy following surgical removal of a post uterine artery embolized necrotic fibroid capsule: a case report

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Uterine artery embolization has been shown to be an effective treatment in controlling symptomatic uterine fibroids. Reports suggest that significant complications associated with the procedure are rare. However, data pertaining to preservation of fertility after embolization are scarce, and some authors do not advocate this procedure for women considering future pregnancy. We present a case of a post-embolization uterine cavity abnormality which was repaired surgically, followed by successful pregnancy outcome.

Key words: female infertility/fibroid/pregnancy/surgery/uterine artery embolization

Introduction

Uterine artery embolization for the treatment of symptomatic uterine fibroids was first reported by Ravina and colleagues in 1995 (Ravina et al., 1995). Since that report, uterine artery embolization has been shown to be an effective treatment in controlling symptoms such as menorrhagia, dysmenorrhoea and pressure symptoms on bladder and bowel in up to 80–94% of women, leading to its acceptance as a treatment for uterine fibroids in many centres around the world (Worthington-Kirsch et al., 1998; Goodwin et al., 1999; Hutchins et al., 1999; Spies et al., 1999, 2001, 2004; Pelage et al., 2000; Siskin et al., 2000; Andersen et al., 2001). Complications associated with the procedure include pain, infec­tion, sloughing and vaginal expulsion of tissue, and rarely hysterec­tomy and death. Reports suggest that significant complications are rare and are usually seen early after embolization (Walker and Pelage, 2002). Immediate hysterec­tomy following uterine artery embolization has been most commonly quoted as between 1 and 3.5% (Lupattelli et al., 2005). However, data pertaining to preservation of fertility after embolization are scarce, and some authors do not advocate this procedure for women considering future pregnancy (Abulafia and Sherer, 1999; Tulandi et al., 2002; ACOG Committee on Gynecologic Practice, 2004; Carpenter and Walker, 2005). We present a case of post-embolization uterine cavity abnormality which was repaired surgically and followed by successful pregnancy outcome.

Case report

A 35-year-old female first presented to this unit in 2003 with a 2.5 year history of primary infertility. She had a regular menstrual cycle every 28 days with 3 days of menses. Her past gynaeco­logical history dating from 1997 included severe menorrhagia, flooding and passage of large menstrual clots of 18 months dura­tion. At that time, a large intramural fibroid measuring 10 cm × 9 cm was diagnosed using ultrasound. Uterine artery embolization was performed to the point of near total occlusion via percutane­ous transcatheterization of the femoral artery. Following the uter­ine artery embolization, the patient suffered no apparent immediate complications and had been free from menorrhagia.

Her initial transvaginal ultrasound scan at the current consultant in 2003 revealed an echo-dense structure (29 × 25 × 19 mm) in the right fundal area of her uterus. This finding was consistent with the history of a previously embolized uterine fibroid. As part of the standard infertility investigation, a hysterosalpingogram was performed. A calcified opacity was noted in the right pelvic cavity, presumably the previously embolized fibroid (Figure 1). Contrast medium entered the region of the fibroid in a disorganized fashion and identified a separate distinct left sided uterine cavity with a patent left Fallopian tube. At the point at which the left-sided uterine cavity and the fibroid met, there was a tight area of constriction involving the base of the left uterine cavity (Figure 2). The appearance was suggestive of a previously embolized fibroid in the right horn of either a deeply septate or bicornuate uterus with resulting scarring at the junction between the two horns. In view of these findings, magnetic resonance imaging (MRI) was performed which showed the appearance of a bicornuate uterus with a 3 cm fibroid related to the right uterine horn; a low signal intensity band across the junction of both horns was consistent with the diagnosis of an adhesion.
Pregnancy following surgery for post-UAE fibroid

Diagnostic hysteroscopy and laparoscopy was then performed. The hysteroscopy revealed a uterine cavity that had the appearance of a unicorneate uterus with a narrowing at its lower end. On the right side of the visualized uterine cavity, a necrotic-like area was evident with a defect at the isthmus leading into a false cavity, consistent with the history of a previously embolized fibroid. The laparoscopy revealed an enlarged anteverted mobile uterus with a 6 cm fibroid on the right side. The discrepancy between intra-operative and pre-operative measurements of the fibroid may be related to the fibrous tissue and muscularis stretched around the fibroid. The peritoneum showed diffuse signs of previous inflammation. Instillation of methylene blue dye into the uterine cavity revealed a ‘paper thin’ muscularis and serosa overlying the fibroid. Following discussion with the patient and her partner, the decision was made to perform a laparotomy and myomectomy.

During the laparotomy, the narrowing of the uterine cavity was initially dilated via the transvaginal route. For the myomectomy, the uterus was incised anteriorly, which revealed a calcified fibroid with a necrotic core. The fibroid was carefully shelled out. Re-exploration of the cervix transvaginally confirmed the presence of a fistula between the fibroid and the region of the cervix and uterine isthmus. The fistula was subsequently repaired (Figure 3).

Six months following the myomectomy, a spontaneous pregnancy was diagnosed with an initial serum βHCG level of 4475 IU/l. A single viable intra-uterine gestation sac was seen using a transvaginal ultrasound scan at 6 weeks gestation. The antenatal period was uncomplicated. The patient was admitted as an in-patient from 30 weeks gestation as a precautionary measure against uterine rupture. This reflected concerns about myometrial integrity. An elective lower segment Caesarean section was performed at 33.5 weeks gestation as there were minor uterine contractions. Intramuscular betamethasone was administered on two occasions 24 h prior to the delivery to facilitate the production of lung surfactant in the fetus. A healthy live infant was delivered without complication.

Discussion

Uterine artery embolization has been gaining popularity as a ‘conservative’ therapy for symptomatic fibroids (Myers, 2002).

Figure 1. Initial image from an hysterosalpingogram series prior to the infusion of radiographic contrast media shows a calcified fibroid in the right side of the pelvic cavity.

Figure 2. Contrast medium can be seen filling a left-sided uterine cavity and tube and a disorganized cavity within the region of the fibroid. There is a marked constriction at the junction of the left cavity with the cervix and the region of the fibroid.

Figure 3. Appearance on the hysterosalpingogram following resection of the fibroid tissue and repair of the uterine wall defect.
The aim of uterine artery embolization is to occlude both uterine arteries with multiple small particulate emboli of polyvinyl alcohol. The therapeutic effect is thought to result from irrecoverable post-embolic ischaemic change within the fibroid, leading to necrosis and volume reduction of the fibroid with subsequent improvement in symptoms such as menorrhagia, pressure symptoms and dysmenorrhoea (Pron et al., 2005). Partial or complete expulsion of leiomyomata has been reported after successful uterine artery embolization (Abbara et al., 1999; Kroencke et al., 2003; Laverge et al., 2003).

Complications following uterine artery embolization include those generally related to arterial catheterization and significant post-procedural pain which may require opiate analgesia. More rarely, endometriosis, pyometra and uterine necrosis requiring hysterectomy may occur (Abulafia and Sherer, 1999). These serious complications appear to be rare (Leonhardt et al., 2005). However, the effects of uterine artery embolization on preservation of fertility are still under scrutiny. Fortunately, cases of endometrial infarction after uterine artery embolization are rare (McCullage et al., 2000; Colgan et al., 2003). Fibroids are thought to be generally more susceptible to ischaemia than normal myometrium, which has an extensive collateral vascular system that is protective (Pron et al., 2005). To date, there are only a limited number of publications reporting the effects of uterine artery embolization on fertility and pregnancy, and they are restricted to case reports (Vashisht et al., 2001; Goldberg et al., 2002; Kovač et al., 2002; D’Angelo et al., 2003) and observational clinical studies (Ravina et al., 2000; Ciraru-Vigneron and Ravina, 2001; McLucas et al., 2001; Walker and Pelage, 2002; Carpenter and Walker, 2005; Pron et al., 2005).

One significant consequence of uterine artery embolization is the retention of substantial necrotic fibroid tissue within the uterine cavity. This may be significant for those seeking fertility, such as in this case. There have been three reported cases of apparent fibroid necrosis associated with uterine wall defect or fistula formation following uterine artery embolization (Iaco et al., 2002; Sultana et al., 2002; Ogliari et al., 2005). In the case being reported, the necrotic fibroid tissue remnant was surgically removed and the patient followed through to a successful pregnancy. There was severe disruption of the architecture of the uterine wall, although it was only on one side of the uterine cavity. This result may not be applicable for someone who underwent myectomy of a necrotic fibroid from a normal endometrial cavity.

A systematic review by Pritts (2001) showed that significantly poorer implantation rates were associated with infertile women who had fibroids when compared with infertile controls with similar primary diagnosis and no fibroids. However, all the studies examined were observational. The histopathological features of leiomyoma necrosis in the early stages are coagulative in type and are associated with cellular debris and acute inflammatory cells. In the later stages, the necrosis is hyaline in type, often with foci of dystrophic calcification (McCullage et al., 2000). A case series by Carpenter and Walker (2005) recognized that necrotic fibroids that may remain after uterine artery embolization represent a complicating factor for successful pregnancy. Women of reproductive age who wish to have uterine artery embolization for symptom control should therefore be counselled regarding retention of necrotic fibroids and the possibility of fertility problems.

In our case, the antenatal period was uncomplicated. A Caesarean section was performed as a precautionary measure against uterine rupture. An analysis of 50 published cases of pregnancy after uterine artery embolization by Goldberg et al. (2002) showed that women are at risk of malpresentation, preterm birth, Caesarean delivery and post-partum haemorrhage. In the Ontario Multicentre Trial, the majority of pregnancies following uterine artery embolization resulted in term deliveries and appropriately grown newborns. However, the authors recommended close monitoring of placental status (Pron et al., 2005). In another case series by Carpenter and Walker (2005), there was an increase in delivery by Caesarean section (88%), half of which were elective.

Conclusion
To the best of our knowledge, this is the first reported case of successful pregnancy outcome in a patient diagnosed with a retained necrotic remnant of a leiomyoma following uterine artery embolization which was subsequently removed surgically. Although successful pregnancies are being reported following uterine artery embolization, patients should be counselled regarding the limited availability of comprehensive data related to fertility. Retention of necrotic fibroid tissue should also be included in the list of potential complications of the procedure, and the subsequent possibility of it causing infertility. Additionally, the possibility that fibroid artery embolization could result in an alteration to the uterine cavity and uterine gestational capacity should alert the clinician to evaluate the uterine cavity integrity in all women of reproductive age who undergo this procedure. Surgical removal of the necrotic tissue should be considered if, subsequently, infertility is a presenting problem.

References


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