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CASE REPORT

Successful microwave ablation of endometrial carcinoma

Nick Sharp, Michael Ellard, Lynn Hirschowitz, Simon Malthouse, Nick Johnson*

Case report

An 89 year old woman had a two-month history of vaginal bleeding. Vaginal ultrasound examination showed an expanded endometrium. An outpatient endometrial biopsy was performed, which showed a moderately differentiated grade 2 endometrioid endometrial adenocarcinoma. Magnetic resonance imaging suggested that the tumour was minimally invasive and confined to the uterus (Fig. 1). The woman had limited exercise tolerance due to long-standing heart disease. Echocardiology confirmed moderate aortic stenosis. A cardiologist estimated that the chances of her surviving a general anaesthetic would be slightly greater than 50%. Several treatment options were discussed with the woman and her family. No treatment was rejected because the vaginal bleeding was increasing and was distressing for the woman and her family. Palliative treatment with radiotherapy and progesterone were also considered but rejected by the woman and her family. Therapeutic microwave ablation of the tumour was proposed.

The Royal United Hospital Research Ethics Committee considered an emergency proposal to treat the woman's minimally invasive endometrial carcinoma with microwave endometrial ablation. The Committee was satisfied that the woman and her family understood that this technique was entirely experimental in the current context and that other treatment options had been considered but rejected. Approval was granted. Microwave ablation of the endometrium was performed using a local anaesthetic block to the cervix. The cervix was easily dilated and as much tumour as possible was aspirated with a 7-mm diameter suction curette from the uterine cavity, which measured 11 cm in length. Uneventful microwave endometrial ablation was then performed. The treatment lasted for $6^{1}/_{2}$ minutes and the entire cavity lining was ablated under transabdominal ultrasound surveillance. The woman did not experience any discomfort, significant bleeding or untoward side effects and was discharged from hospital on the following day.

She was seen three months later and remained well without any symptoms. An ultrasound examination showed the typical post-ablation echogenicity. The ablated zone around the cavity measured 12 mm anteroposteriorly. There was no loculation to suggest haematometra. However, a scan five weeks later suggested that the area of necrosis and scarring was not resolving. It measured 12 × 30 mm in the sagittal plane and the risk of residual disease was considered to be high. As significant uterine prolapse had been observed at the time of microwave ablation of the endometrium, a vaginal hysterectomy was performed under



Fig. 1. Magnetic resonance image of the uterus demonstrating the bulky endometrial interface and minimal myometrial invasion.

Departments of Gynaecology, Pathology and Radiology, Royal United Hospital, Combe Park, Bath, UK

* **Correspondence**: Dr N. Johnson, Departments of Gynaecology, Pathology and Radiology, Royal United Hospital, Combe Park, Bath BA1 3NG, UK.

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spinal anaesthesia. Although the procedure was technically straightforward the woman had a protracted recovery with episodes of cardiac failure, confusion as a result of cerebral hypoxia and vault sepsis, but eventually made a full recovery.

Macroscopic examination of the resected uterus revealed a sharply demarcated zone of yellowish brown necrotic tissue occupying the innermost 5–7 mm of the uterine wall (Fig. 2). Histological examination showed the endometrium to be completely necrotic (Fig. 3). A narrow zone of fibrous tissue separated the necrotic tissue from the underlying myometrium. Despite examination of sections from multiple blocks, no residual endometrial adenocarcinoma was identified, indicating that microwave ablation of the endometrium had successfully ablated the entire endometrial tumour. No lymphovascular invasion was identified and the endocervix and parametrial shavings were free of tumour. The woman remains free of disease 36 months later.

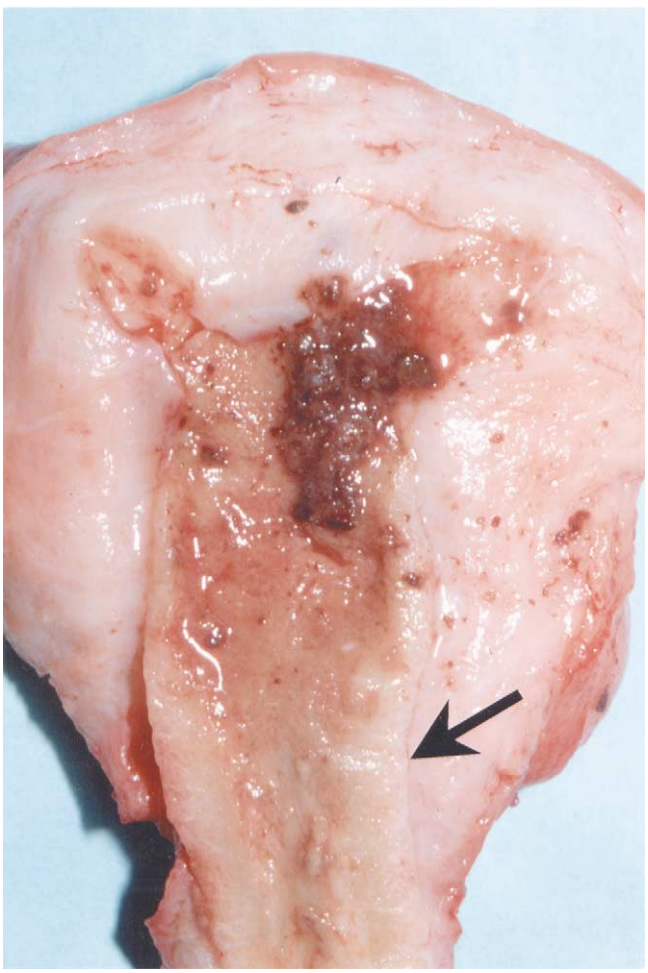


Fig. 2. Resected uterus, coronal slice. A sharply demarcated zone of yellowish brown necrotic tissue, occupies the innermost 5–7 mm of the uterine wall (arrow marks the interface between necrotic tissue and viable myometrium).

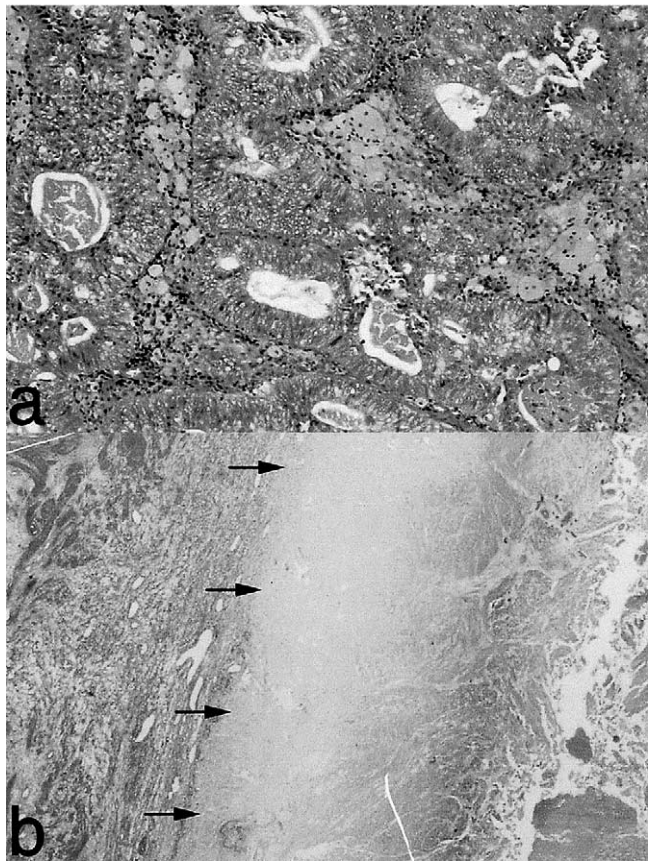


Fig. 3. Histological findings before and after microwave ablation of the endometrium. Sections stained with haematoxylin and eosin. (**a**) Endometrial adenocarcinoma (grade 2, endometrioid type) in endometrial biopsy. (**b**) Uterine lining after microwave ablation of the endometrium. The endometrium is completely necrotic. A sharp demarcation line (arrows) marks the junction between viable myometrium (to the left of the figure) and the necrotic endometrium.

Discussion

Microwave ablation of the endometrium is a novel technique for the treatment of menorrhagia[1,2]. An applicator is passed into the uterine cavity and the endometrial lining is ablated using a microwave frequency of 9.2 GHz. This limits the depth of tissue destruction to 6–7 mm. There is no earth plate, unlike radio frequency ablation, and this avoids the complications associated with dissipated energy. The advantage of this technique over electrosurgical or laser endometrial ablation is its simplicity and the speed with which the ablation is performed (only a few minutes). It is ideal for the outpatient clinic treatment of menstrual dysfunction but has never before been used as primary treatment of endometrial carcinoma.

A vaginal hysterectomy is usually curative for superficially invasive, low grade endometrial carcinoma. However, because of general medical conditions, some women may be unfit for surgery; microwave ablation of the

endometrium may be suitable alternative. In experienced hands, the risk of significant complications is extremely low and the risk of uterine perforation under ultrasound control is negligible. Microwave ablation of the endometrium has considerable advantages over systemic progesterone. Progesterone may have deleterious cardiac consequences in women with underlying heart disease because of its sodium-releasing properties. Although intrauterine depo-progestogen is administered to women with atypical endometrial hyperplasia, it is not used in endometrial carcinoma. The speed, cost and simplicity of microwave ablation of the endometrium has significant advantages over radiotherapy, which is time-consuming, labour-intensive (external beam radiotherapy to the pelvis is administered as 25 daily treatments over five weeks and followed by a single intracavity dose to the uterus) and may have long term side effects in 5–10% of women. Some gynaecologists may already have considered palliative endometrial ablation to treat bleeding from advanced endometrial carcinoma. We suggest that the outcome in this case should encourage others to consider microwave ablation for early carcinoma of the endometrium in elderly women who are unfit for standard treatments.

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