

Cervical cancer - the role of ultrasound from diagnosis to treatment.

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Background:

Despite a well established screening programme which aims to prevent cervical cancer by treating pre cancerous disease [1], data from 2014-2016 reveals around 3200 new cases of cervical cancer are detected each year in the UK, with peak incidence in females aged 25-29 [2]. With presenting symptoms including unusual vaginal bleeding and pain, symptoms that can be attributed to many different gynaecological conditions, ultrasound will likely be one of the initial diagnostic tests performed.

Case report:

A 42 year old female presents via GP referral for an abdominal and pelvic scan with abdominal pains and nausea. Lower vaginal discharge and dysmenorrhoea. Clinical question: Is there bowel/pelvic pathology.

Gynae specific history taken at time of initial scan: patient has 3 children, a history of 4 pregnancies, one of which resulted in a preterm delivery by C-section. Patient reports not up to date with smear tests. LMP 16 days prior to initial scan.

Key findings from initial ultrasound and follow up scan with a Consultant Radiologist:

- Normal appearances of the upper abdomen.
 - Endometrium of 6mm- normal thickness for LMP however fluid seen distending the endometrial canal.
 - Abnormality of the anterior cervical wall which is difficult to delineate however hyper vascular.
 - Posterior deviation of the endocervical canal
- Conclusion : Highly likely obstructive lesion of 40 x 34 x 27mm
?adenoma malignum ? adeno carcinoma.

(See figures 1-4)

Key Findings from MRI report and biopsy:

MRI conclusion :

The examination confirms the presence of significant pathology within the cervix in keeping with a cervical malignancy with suspected parametrial involvement. Radiology suggested FIGO stage 2B.

Gynaecology assessment and Cone biopsy result:

No smear for 13 years, Irregular mass seen on speculum examination with touch bleeding.

Cone biopsy confirms adenosquamous cancer of the cervix.

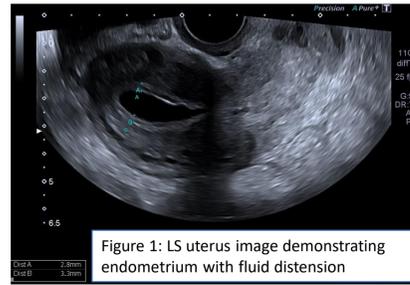


Figure 1: LS uterus image demonstrating endometrium with fluid distension

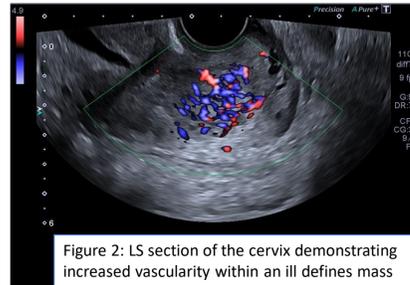


Figure 2: LS section of the cervix demonstrating increased vascularity within an ill defined mass



Figure 3: Transverse section of cervix demonstrating mass

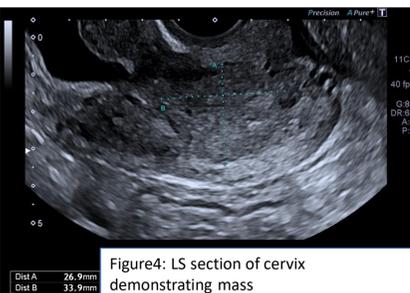


Figure 4: LS section of cervix demonstrating mass

Common symptoms of cervical cancer:

Symptoms can be non-specific and varied however can include post coital, post-menopausal or intermenstrual bleeding. An increased amount of or unpleasant discharge. Pain in the back and pelvis, and dyspareunia.

In more advanced cancer, pain can be in the region of the kidneys or there can be haematuria. Patients can also experience altered bowel habits.

It should be noted that in the early stages, cervical cancer can often be asymptomatic. [3]

The patient in this case presented with a number of these symptoms.

Cervical screening programme: and HPV immunisation programme:

Cervical screening is offered to all women aged between 25 and 64. The aim of this test is to detect early pre cancerous changes and treat these, preventing cancer developing [1]. If low grade or borderline changes are detected within a sample at cytology and HPV virus is detected at HPV triage, women should be offered colposcopy to remove the cells [4].

Rolled out in 2008, a HPV vaccine has been available and from September 2019 is to be offered to children in the UK aged 12-13 [5]. 10 million doses have been given and a reduction in the incidence of HPV type 18 and 16, the most high risk strains related to cervical cancer has already been reported in some regions [6].

Despite the advances in immunisation and cervical screening, as demonstrated in this case, it cannot be assumed that all women will have had either the vaccine or attended cervical screening. In England only 71% of women aged 25-49 and 76% of women aged 50-64 had an adequate screening test result recorded within the last 3.5 year period [7].

Adenosquamous carcinoma of the cervix:

Whilst the most common cervical cancers are either adenocarcinomas and squamous cell carcinomas, this patient has a rarer form of cervical cancer, an adenosquamous carcinoma. These cancers contain both squamous cell and glandular type cells and account for only 5-6% of cervical cancers however treatment is similar to that of squamous cell cervical cancer [8].

Treatment:

This patient has had a combined chemotherapy, external beam radiotherapy and intra-uterine brachytherapy treatment regime. Treatment overall has been well tolerated and was delivered as planned with no immediate post treatment complications.

Intra-uterine Brachytherapy is a procedure where a radioactive source (iridium) is delivered to the tumour site via Flexitron. Prior to treatment, brachytherapy applicators, a tandem which sits in the endo-cervical canal and ring which sits against the cervix within the vagina need to be inserted in theatre [9]. (Figure 5)

Intra-uterine brachytherapy is locally delivered on 3 occasions over a two week window. Patients are admitted onto the ward the afternoon prior to each treatment, and taken to theatre with applicator placement being performed first thing in the morning under general anaesthetic [9]. Recently, liaison with the ultrasound team has allowed for a qualified Sonographer to scan trans-abdominally during applicator insertion and placement to confirm position prior to treatment delivery (figure 6).

Studies undertaken by Watkins et al, 2010 [10] and Rao and Ghosh, 2015 [11] assessing the use of ultrasound guidance in intra-uterine brachytherapy applicator placement, acknowledge multiple studies which highlight the reduced risk of uterine perforation when using ultrasound guidance, particularly given the altered anatomy due to cancer in situ. Both studies advocate the use of ultrasound guidance for accurate tandem placement with no cases of perforation reported in either study. Roa and Ghosh, 2015 also demonstrated a reduced procedure time when ultrasound guidance is utilised.

Avoiding perforation of the uterus is paramount as not only does this avoid damage to the uterus itself, it avoids unnecessary exposure of radiation to incorrect pelvic organs and inadequate dosage to the tumour, potentially affecting treatment outcome [12].

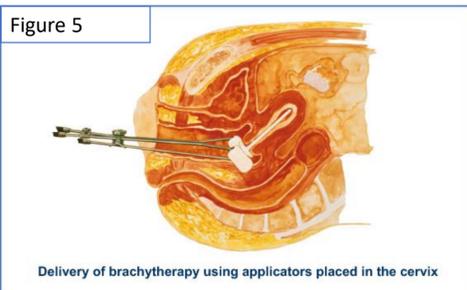


Image credit: <https://aboutbrachytherapy.com/cancer-types/cervical-cancer/brachytherapy-treatment>

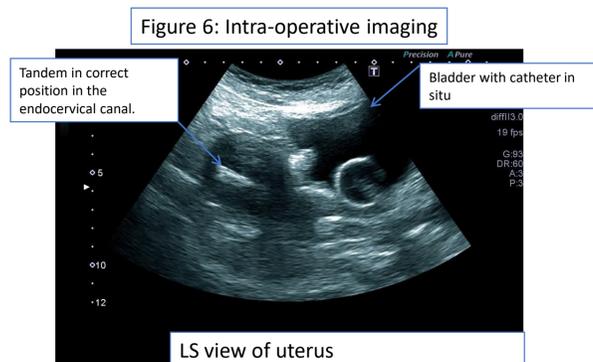


Figure 6: Intra-operative imaging

LS view of uterus

Outcome at MRI scan 2 months post treatment and Conclusion

Initial post treatment MRI reports significant reduction in tumour bulk in keeping with good treatment response.

This case demonstrates that Ultrasound has a valuable role in both the detection and diagnosis of cervical cancer but also has a very valuable role in the successful delivery of intra-uterine brachytherapy treatment.

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