

Case report

MRI in primary non-Hodgkin's lymphoma of the vagina associated with a uterine congenital anomaly

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Abstract. This case report describes the MRI features of untreated primary lymphoma of the vagina associated with a congenital septate uterus. The information provided by MRI was superior to CT in defining the extent of tumour invasion. MRI also detected a previously undiagnosed congenital anomaly.

Introduction

Primary lymphoma of the female genital tract is a rare condition, accounting for approximately 1% of primary extranodal lymphoma. In a review of 12447 cases of lymphoma by Freeman et al, only 10 patients presented with lymphoma arising in the uterus, cervix or ovaries [1].

We report the findings on MRI and CT in a case of primary lymphoma of the vagina with involvement of the cervix uteri. MRI also demonstrated a septate uterus. To our knowledge the MRI features of untreated vaginal lymphoma have not been reported previously. These features, together with those of the septate uterus, represent a rare case in which the pathological extent of disease and the congenital anomaly were much better demonstrated by MRI than CT.

Case report

A 50-year-old female presented with intermenstrual bleeding and worsening menorrhagia over the previous 18 months. Colposcopy showed thickening of the vaginal vault, but biopsies from the vagina and cervix were normal at that time. She was otherwise well. There was no significant past medical history. The patient had previously had four children by normal vaginal delivery. The intermenstrual bleeding subsided on norethisterone treatment, but 6 months later the patient noticed a number of firm 5 mm nodules at the introitus. On examination, nodules were visible in the lower vagina and labia minima. These nodules were biopsied and histological analysis showed intermediate grade non-Hodgkin's lymphoma.

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Staging investigations included a chest radiograph, bone marrow biopsy and a CT examination of the chest, abdomen and pelvis. The chest radiograph was normal; but lymphomatous involvement was present on the bone marrow biopsy, indicating Stage IV disease according to the Cotswold Classification [2].

CT was performed on a Siemens Somatom plus 24 scanner using conventional contiguous 10 mm slices through the chest and abdomen and spiral scanning through the pelvis with a collimation of 1 cm and a pitch of 1. Intravenous contrast medium (100 ml of iopromide with 300 mg of iodine per ml; Schering Health Care, West Sussex, UK) was administered as a bolus immediately before the spiral scan.

CT examination demonstrated a soft tissue mass within the vaginal vault, showing moderate homogenous contrast enhancement and measuring 8 × 10 cm in the transverse and anteroposterior diameter (Figure 1). Concentric thickening of the vaginal wall was also observed, the vaginal wall thickening extended inferiorly to the introitus while superiorly tumour was seen extending into the cervix uteri. The mass was indistinguishable from the bulky uterus.

MRI was performed in order to establish the precise anatomical extent of the tumour, in particular the presence of uterine invasion, and to further delineate tumour involvement of the vagina. The study was performed on a Siemens Magnetom Vision scanner. Turbo spin echo (TSE) axial T_2 weighted images (TR = 2305 ms, TE = 85 ms) with a slice thickness of 9 mm and a slice interval of 1.8 mm were obtained. Sagittal TSE T_2 weighted images (TR = 3215 ms, TE = 120 ms) were also obtained, followed by sagittal T_1 weighted images (TR = 758, TE = 12) before and after injection



Figure 1. CT scan of the pelvis demonstrating a large homogenous soft tissue mass occupying the vaginal vault and inseparable from the uterus (U).

of contrast medium (gadolinium-DTPA; “Magnevist”, Schering Health Care; 0.1 Mmol kg^{-1} body weight). In addition, paracoronal T_1 weighted images (TR = 351, TE = 17) were also obtained following the contrast injection. All images were obtained on a 256×256 matrix except the sagittal T_1 images which were obtained on a 512×512 matrix.

On T_1 weighted images, the tumour showed a low signal intensity and demonstrated homogenous contrast enhancement following intravenous injection of gadolinium-DTPA (Figure 2). A mass



Figure 2. MRI scan of the pelvis using a T_1 weighted sequence in the sagittal plane after injection of gadolinium-DTPA. A mass of low signal intensity had been shown on the unenhanced scan and involved the vaginal vault, vaginal wall and cervix uteri. Note air in a vaginal tampon. The mass shows contrast enhancement, depicting tumour extent.

of relatively high signal intensity with respect to muscle was seen on the T_2 weighted images. The anatomical relationships and extent of disease was best demonstrated on the sagittal and axial images (Figure 3). These showed a large mass which originated in the vaginal vault and extended downwards circumferentially within the vaginal wall to the right labial margin, leaving the vaginal endothelium intact. This was seen as a relatively high signal line on T_2 weighted images (Figure 3b). Invasion of the cervix superiorly was clearly seen on the T_2 weighted images as well as on the post-contrast enhanced scans. A previously undiagnosed septate uterus was shown on the axial T_2 weighted images and the paracoronal contrast enhanced T_1 weighted images, accounting for the bulky appearance of the uterus on CT (Figure 4).

Clinical examination showed an excellent response following treatment with four courses of chemotherapy (cyclophosphamide, doxorubicin, vincristine and prednisolone—CHOP). A further MRI examination also demonstrated a good response to treatment, with a reduction in size of the mass in the axial plane to 5×4 cm in diameter as well as almost complete resolution of the vaginal wall thickening.

Discussion

Primary lymphoma of the female genital tract is a rare condition [3, 4]. The MRI appearances of this disease have been reported in a patient who had received a curative course of CHOP chemotherapy 6 months prior to the MRI examination [5]. The MRI appearances of untreated primary vaginal lymphoma have not been reported previously. In the present case, MRI provided important information additional to CT with regard to delineation of the precise extent of tumour and to the diagnosis of an associated congenital malformation of the uterus.

Diagnosis of genital tract lymphoma involving the uterus, cervix or vagina is frequently delayed owing to the non-specific nature of the clinical picture. The commonest symptoms are of perineal discomfort, intermenstrual or post-menopausal bleeding and vaginal discharge [6]. The tumour is usually infiltrative [3], presenting with diffuse enlargement of the uterus and cervix and thickening of the vaginal wall. Cervical cytology is usually negative [7, 8] and colposcopic biopsy may give false negative results [9]. Another characteristic feature of cervical and vaginal lymphoma is that the endothelium is often preserved intact [7].

Reported MRI appearances of lymphoma in the uterus and cervix are those of a diffuse tumour which is of relatively high signal intensity on T_2 weighted images and of low signal intensity on T_1 weighted images, but showing a variable degree of

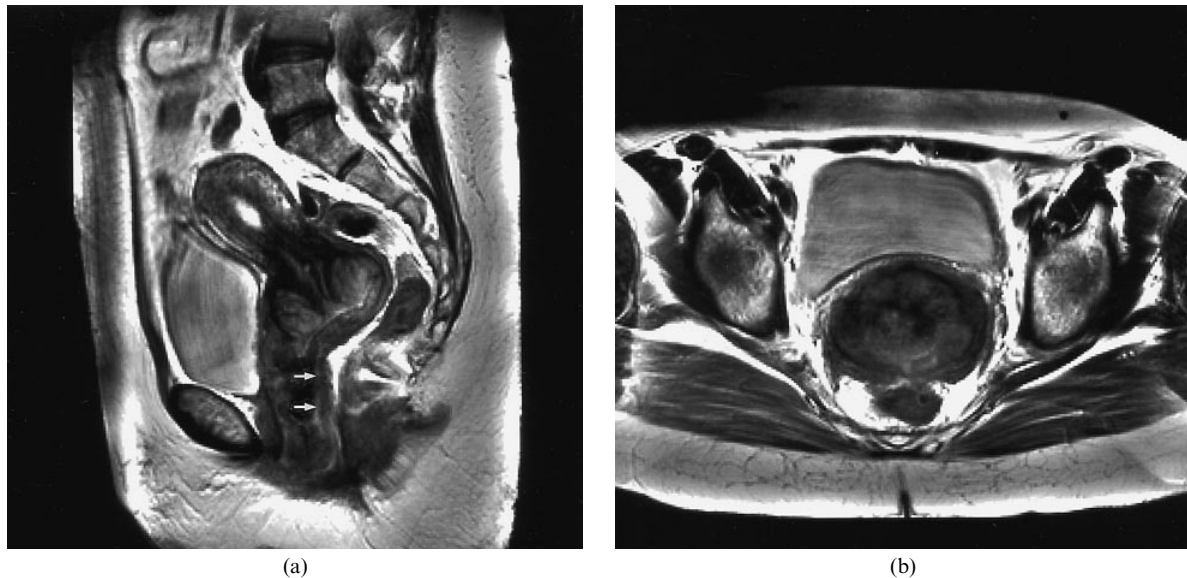


Figure 3. MRI scan of the pelvis using T_2 weighted FSE sequences: (a) sagittal plane and (b) axial plane. The mass of relatively high signal intensity is seen within the thickened vaginal wall and uterine cervix. Note the high signal intensity line indicating an intact posterior vaginal endothelium (arrow).

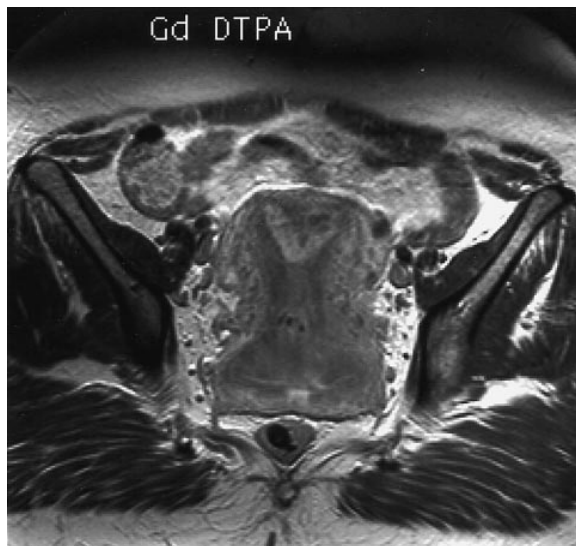


Figure 4. MRI scan of the pelvis using a T_1 weighted post-contrast sequence in the paracoronal plane. A congenital septate uterus is clearly shown in addition to the large tumour mass.

homogenous enhancement following intravenous contrast medium [10, 11]. The previously reported case of vaginal lymphoma showed only moderate signal on T_2 weighting, but the MRI scan was performed following chemotherapy. The authors suggest that the lower than expected signal on T_2 weighted sequences was a consequence of successful treatment. In the diagnosis and staging of lymphoma of the female genital tract, MRI carries important advantages over CT. Firstly, the multiplanar imaging capability of MRI allows more accurate assessment of tumour extent. In the present case this was particularly well demonstrated in the assessment of contiguous spread of tumour

throughout the vaginal wall and into the cervix, best shown on paracoronal and sagittal imaging. Secondly, the tissue contrast of MRI increases the conspicuity of tumours both on T_2 weighted images and on contrast enhanced T_1 weighted images. Thus, tumour can be distinguished from normal tissue whereas distinction between tumour and the normal vagina and cervix is not possible on CT. Thirdly, MRI allows visualization of intact mucosa, preservation of which is a characteristic feature of lymphoma [7]. The observation of an intact cervical and endometrial endothelium may be a useful sign in distinguishing lymphoma of the upper vagina or cervix uteri from cervical and uterine carcinoma [9]. This finding may be important when there are difficulties in establishing a diagnosis of lymphoma from biopsy material [9]. In our patient, biopsy at presentation did not reveal lymphoma, and normal biopsies have also been obtained from areas which were demonstrably involved by lymphoma on MRI scanning in other cases [10].

The role of MRI in the assessment of congenital anomalies of the uterus has been recently reviewed by Mayo-Smith and Lee [12]. MRI elegantly demonstrates such anomalies; enabling images to be obtained in the plane of the uterine cavity, coronal to the long axis of the uterus. Uterine anomalies are due to variations in fusion or agenesis of the müllerian ducts and range from complete agenesis of the uterus to internal septation of the uterine cavity. Our patient demonstrated septation of the uterus with a normal external contour of the uterus, although the uterus itself was bulky. This anomaly was not demonstrated on CT. Although the detection of a septate uterus did not

in itself influence treatment, assessment of response and evaluation of residual disease is more accurate if the anatomy of any congenital malformations as well as tumour extent is precisely defined.

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