

Case report

MR findings of malignant melanoma of the vagina

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Abstract. We report a case in which malignant melanoma of the vagina showed some MR signal changes after radiotherapy. Before radiotherapy, the tumour had slightly high signal intensity on T_1 weighted images and was enhanced after gadolinium-DTPA administration. After radiotherapy, the signal intensity of the tumour increased conspicuously on both T_1 weighted images and fat suppression T_1 weighted images.

Primary malignant melanoma of the vagina is extremely rare. The only previous report describing the MRI features of malignant melanoma of the vagina was by Moon et al [1]. There are no previous descriptions in the literature regarding the signal characteristics after radiotherapy.

Case report

A married 64-year-old woman presented with occasional slight vaginal bleeding for 6 months. On vaginal examination, a huge tumour, greyish brown in colour, with superficial ulceration, extended from the vaginal orifice up to its anterior fornix (Figure 1).

MRI of the pelvis was performed with a 1.0 T superconducting unit (Siemens Magnetom Impact; Erlangen, Germany). An irregular mass in the vagina, 4 cm × 5 cm × 8 cm in size, was demonstrated on T_1 weighted images. This mass involved the cervix and there were multiple daughter lesions around the main tumour (Figures 2a,b). On T_1 weighted images, the signal intensity of the tumour was 18% higher than that of the adjacent pelvic muscles (608.9 vs 516.1), while on T_2 weighted images the tumour showed intermediate signal intensity (Figure 2c). The mass enhanced moderately after administration of gadolinium-DTPA, and its daughter lesions were shown more clearly (Figure 2d).

Histologically, the tumour was composed of epithelioid cells containing clear cytoplasm, arranged in a patchy or striped manner. All the cells had hyperchromatic nuclei and prominent nucleoli, although some cells were admixed with round or spindle cell components. The mitotic rate of the tumour was high. Brown melanin granules

were found in some parts and were also demonstrated with HMB45 immunohistochemical staining. The tumour cells also showed positive reaction to S-100 protein and vimentin. These features supported the diagnosis of malignant melanoma.

The patient was treated with external irradiation by accelerator and intracavitary irradiation with a strong source of cobalt-60 by a remote-control after-loading system. The total dose was 6000 cGy. Follow-up MR examination was performed 3 months after the irradiation. The tumour had shrunk to 2.5 cm × 3 cm × 5 cm, and the signal intensity of the tumour had

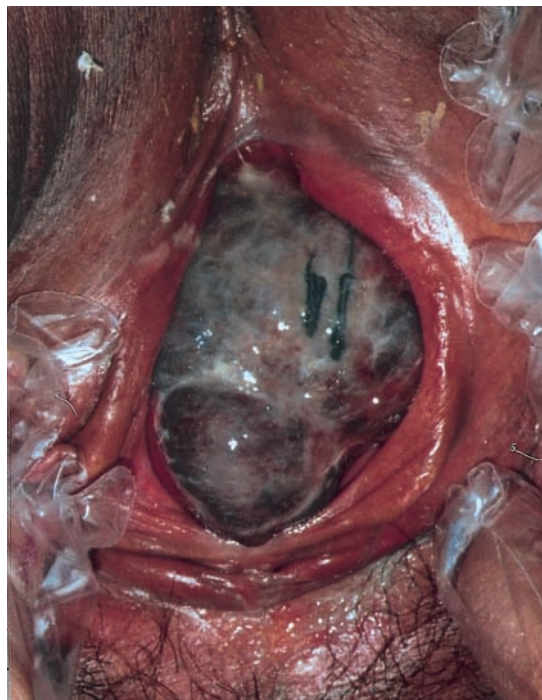


Figure 1. On initial vaginal examination, the tumour with superficial ulceration was seen within the vaginal orifice.

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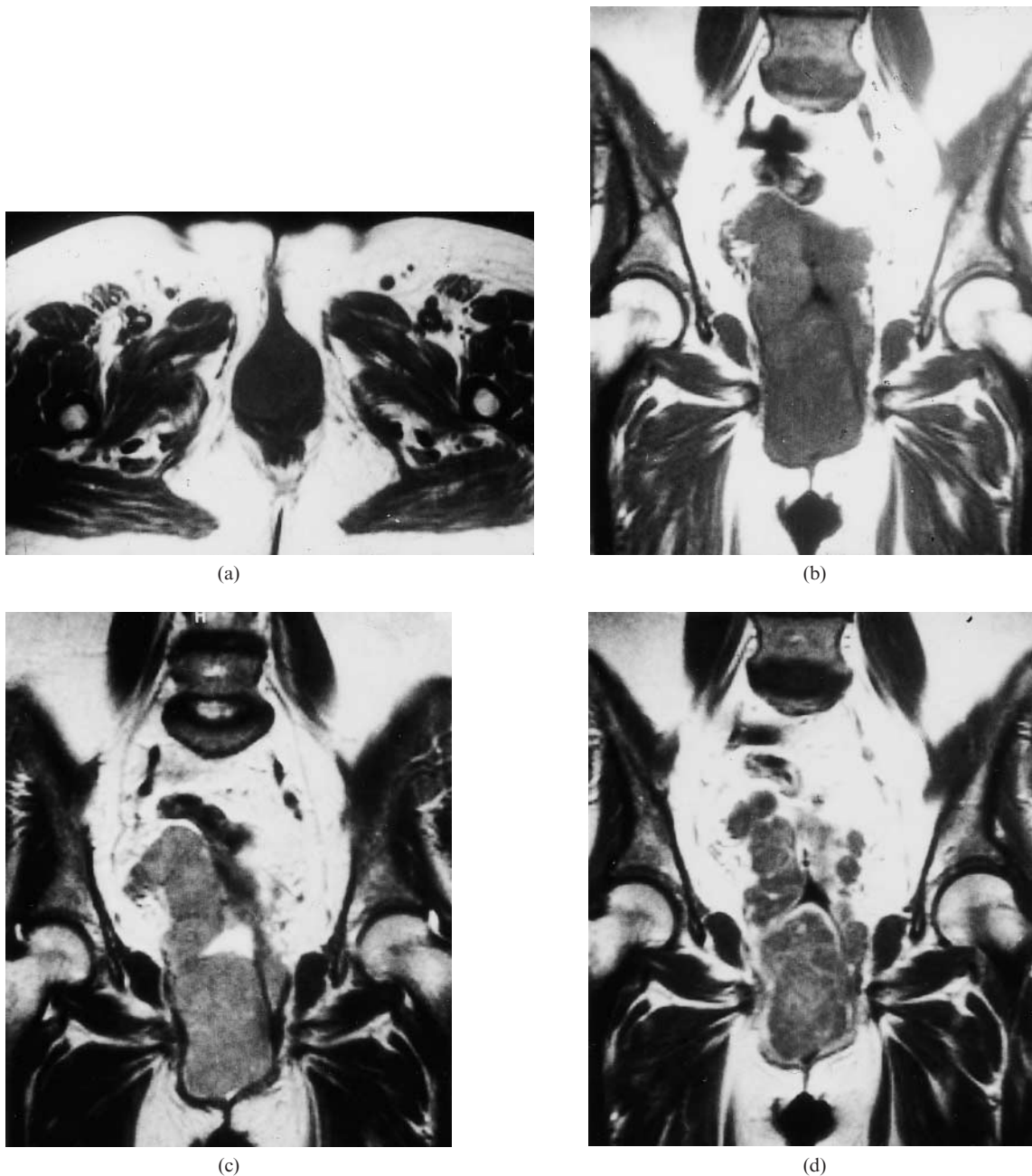


Figure 2. (a,b) Unenhanced axial and coronal spin echo (SE) T_1 weighted images (TR/TE 510/14) before radiotherapy showing a large irregular mass in the vagina, involving the cervix, with multiple daughter lesions. The signal intensity of the tumour was slightly higher than that of the adjacent pelvic muscles. (c) Coronal turbo SE T_2 weighted image (TR/TE 3500/90) showing an intermediate signal intensity mass. (d) Coronal SE T_1 weighted image (TR/TE 510/14) showing the mass enhanced moderately after administration of gadolinium-DTPA, with the multiple small melanomas around the main tumour demonstrated more clearly.

significantly increased on T_1 weighted images (Figure 3a), which was most evident on fat suppression T_1 weighted images (Figure 3b). The tumour showed no characteristic signal changes on T_2 weighted images.

The patient died from extensive metastasis 1½ years after radiotherapy.

Discussion

Malignant melanomas of the female genital tract, with the vulva being the commonest site,

account for 3% of all malignant melanomas [2, 3]. Only one-tenth of all female genital tract melanomas are primary melanomas of the vagina, which represents 2.5% of all vaginal malignancies [4]. Malignant melanoma of the vagina mainly occurs in post-menopausal women, with 75% of patients being over 50 years [2]. Recurrent vaginal bleeding or discharge of recent onset owing to superficial ulceration of the mass are the most common presenting symptoms. The tumour may arise anywhere in the vagina, with a predilection

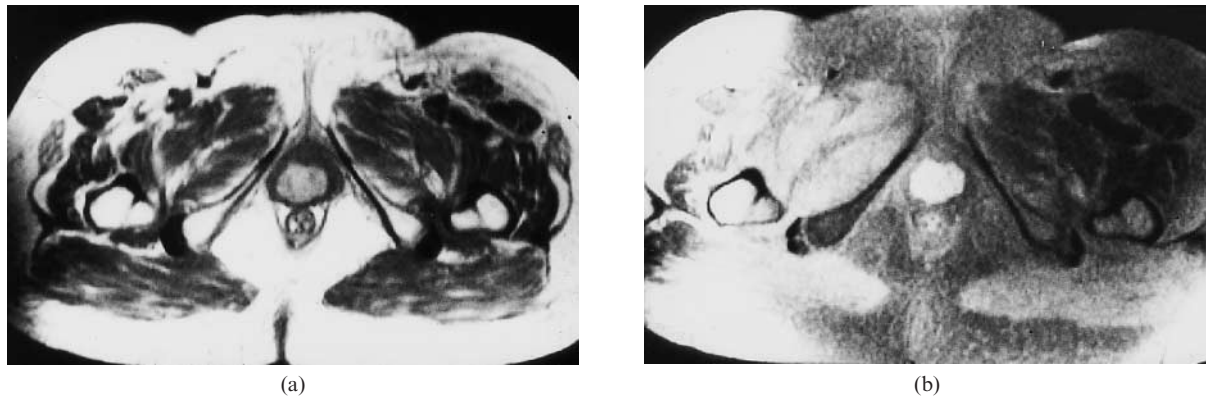


Figure 3. (a) After radiotherapy, axial spin echo T_1 weighted image (TR/TE 600/14) showing shrinkage of the main tumour and a significant increase in signal intensity within the tumour. (b) Fat suppression axial T_1 weighted image (TR/TE 672/14) showing the increased signal intensity of the tumour more clearly.

for the lower third. In our case, the tumour mass was huge, almost filling the whole vagina, whereas the clinical symptoms were relatively mild.

Melanin has a paramagnetic effect, which shortens both T_1 and T_2 relaxation time values [4]. Vaginal melanomas containing melanin are therefore usually unique among the malignant tumours of the vagina in that both T_1 and T_2 are relatively shortened, and their typical MR characteristics are hyperintensity on T_1 weighted images and hypointensity on T_2 weighted images. However, the pattern of signal intensity of the mass is also related to the water, fat and other components contained in the tumour. Water usually plays an important part in determining the signal intensity of melanoma, especially on T_2 weighted images. Moon et al [1] reported two cases of malignant melanoma showing high signal intensity on T_1 weighted images and intermediate signal intensity on T_2 weighted images obtained from a 0.5 T superconducting unit. The signal intensity of melanoma on T_1 weighted images is related to the amount and distribution of the melanin pigments within the tumour [5]. However, the amount of melanin pigment varies in different melanomas on histology, and may change during or after treatment. Masubuchi et al [6] observed an increase in melanin pigment in two cases during radiotherapy. In our case, the signal intensity of the melanoma was significantly

increased on T_1 weighted images and fat suppression T_1 weighted images after high dose irradiation, which might be due to the increase in the concentration of the melanin caused by shrinkage of the tumour, probably together with an actual increase of melanin pigments within the tumour following radiotherapy.

References

1. Moon WK, Kim SH, Han MC. MR findings of malignant melanoma of the vagina. *Clin Radiol* 1993;48:326–8.
2. Levitan Z, Gordon AN, Kaplan AL, Kaufman RH. Primary malignant melanoma of the vagina: report of four cases and review of the literature. *Gynecol Oncol* 1989;33:85–90.
3. Reid GC, Schmidt RW, Roberts JA, Hopkins MP, Barrett RJ, Morley GW. Primary melanoma of the vagina: a clinicopathologic analysis. *Obstet Gynecol* 1989;74:190–9.
4. Gomori JM, Grossman RI, Shelds JA, Augsburg JJ, Joseph PM, DeSimeone D. Choroidal melanomas: correlation of NMR spectroscopy and MR imaging. *Radiology* 1986;158:443–5.
5. Potter PD, Flanders AE, Shieds JA, Shieds CL, Gonzales CF, Rao VM. The role of fat suppression technique and gadopentetate dimeglumine in the MRI evaluation of intraocular tumours and simulating lesions. *Arch Ophthalmol* 1994;112:340–8.
6. Masubuchi S Jr, Nagai I, Hirata M, Kubo H, Masubuchi K. Cytologic studies of malignant melanoma of the vagina. *Acta Cytol* 1975;19:527–32.