

## Case report

# Malignant stromal tumour of the rectum: findings at endorectal ultrasound and MRI

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**Abstract.** This case report describes the findings on endorectal ultrasound and MRI in a patient with a giant malignant stromal tumour of the rectum. A review of imaging characteristics and histopathological findings as described in the literature is presented.

## Case report

A 52-year-old male was referred to our hospital because of slowly progressive lower urinary tract obstruction. A large mass in the region of the prostate was palpated on digital rectal examination. Laboratory findings, including prostate specific antigen, were all within normal limits.

Endorectal ultrasound using a 7.5 MHz probe demonstrated a solid, heterogeneous mass within the pouch of Douglas (Figure 1) with a diameter of 10 cm × 8 cm × 12 cm and approximate total volume of 500 ml. Neither the prostate nor the rectal wall could be clearly identified. MRI was performed to evaluate tumour extension.  $T_1$  weighted images demonstrated a homogeneous mass with intermediate signal intensity, a maximum diameter of 15 cm and irregular enhancement after intravenous gadolinium (Figures 2a–c). On  $T_2$  weighted images the mass showed heterogeneous signal intensity (Figure 2d). The prostate was identified caudally within the mass (Figure 2b). The bladder was displaced to the left and upwards, with stretching of the urethra (Figure 2c). Invasion of rectal wall, bladder wall and prostate could not be ruled out on MRI. While the left seminal vesicle could not be identified, the right seminal vesicle was displaced ventrolaterally. There was no evidence of metastatic disease. At surgery the tumour was totally removed by radical cystoprostatectomy and extirpation of the rectum. Urinary diversion using an ileal conduit (Bricker) and colostomy were performed.

Histopathological examination demonstrated a leiomyosarcoma with a maximum diameter of 12 cm, of intermediate malignancy grade (mitotic count 5–10 per 10 high power fields), originating

from the muscularis propria of the rectum. Additional immunohistochemical examination was demonstrated diffusely positive for desmin and  $\alpha$ -smooth muscle actin (SMA), consistent with a tumour with leiomyodifferentiation.

1 year later, the patient was well, with no clinical evidence of local recurrence or distant spread.

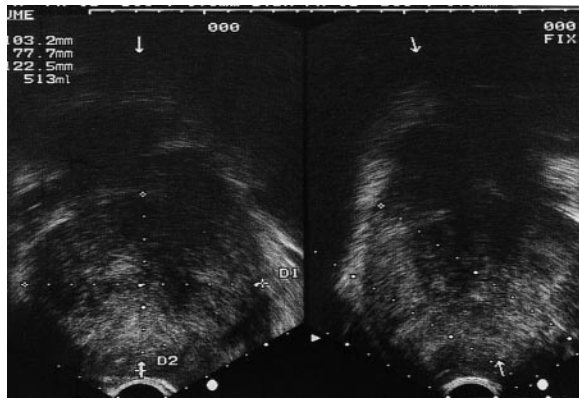
## Discussion

Most rectal tumours are of epithelial origin. Only a small number of rectal tumours originate from the smooth muscle cells in the rectal wall. Such stromal tumours are either benign (leiomyoma) or show malignant characteristics (formerly known as leiomyosarcoma), and may have a submucosal, subserosal or intraluminal location [1, 2]. Malignant stromal tumour of the rectum represents 0.5% of all rectal tumours and 7% of gastrointestinal stromal tumours (GIST) [3, 4]. In the male pelvis, leiomyo(sarco)mas can also originate from the prostate, seminal vesicles or bladder.

Macroscopically the tumour originates from the muscularis propria of the rectum, and the mucosa generally remains intact. Microscopic findings consist of a proliferation of spindle cells arranged in fascicles [1]. Immunohistochemically, GIST typically are positive for CD34, desmin and  $\alpha$ -SMA, although the latter may be also positive in fibroblastic tumours [5, 6].

On endorectal ultrasound, a GIST is seen as a hypoechoic, heterogeneous polycyclical mass, which at high resolution ultrasound imaging is shown to originate from the muscularis propria [1, 7]. Endorectal ultrasound is very helpful in defining the extent of disease [8]. CT appearances of GIST located in the rectum do not differ from those in other parts of the digestive tract. On non-enhanced CT, a GIST presents as a well

Received 26 October 1999 and in revised form 6 March 2000, accepted 20 April 2000.



**Figure 1.** Endorectal ultrasound demonstrates a large pelvic mass with mixed echogeneity.



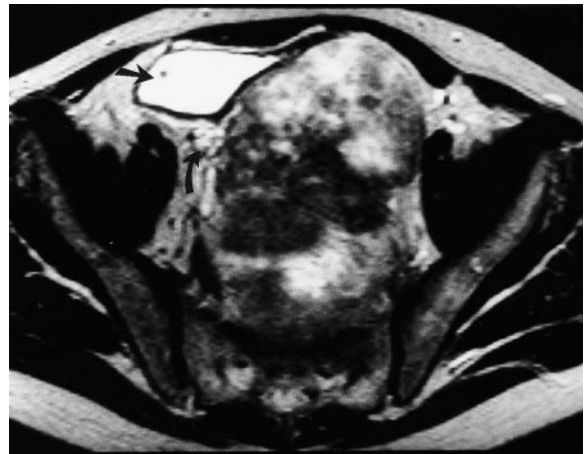
(a)



(b)



(c)



(d)

**Figure 2.** (a) Sagittal  $T_1$  weighted image shows a large mass in the pouch of Douglas with homogeneous intermediate signal intensity. (b) Sagittal  $T_1$  weighted image after gadolinium shows clear delineation of the prostate (arrow), which is not involved by the tumour. (c) Sagittal  $T_1$  weighted image after intravenous administration of gadolinium demonstrates irregular enhancement of the tumour. The stretched course of the urethra is readily discerned (arrow). (d) Transverse  $T_2$  weighted image depicts displacement of the bladder (straight arrow) and the right seminal vesicle (curved arrow). The mass has a heterogeneous high signal intensity.

delineated, lobulated, homogeneous soft tissue mass with low attenuation and sometimes with calcification [2, 9]. There is heterogeneous enhancement following intravenous contrast medium. The mass arises from the rectal wall, with exorectal extension [1, 10]. Rectal adenocarcinomas tend to show a more irregular contour, with invasion of the perirectal fat.

MRI findings of malignant stromal tumour of the rectum have not been described previously. Our patient presented with a mass of uniform, intermediate signal intensity on  $T_1$  weighted images, and heterogeneous high signal intensity on  $T_2$  weighted images. Irregular enhancement occurred after intravenous gadolinium. These imaging characteristics are in accordance with leiomyosarcomas in other neighbouring organs, or stomach [7, 11, 12].

Although GIST confined to the rectal wall can be treated by local excision [13], the prognosis of GIST of the rectum is poor and the 5-year survival rate ranges from 22% to 66% for high grade malignant and low grade malignant types, respectively [14, 15]. Tumours with mitotic counts higher than 5 per 10 high power fields, and a size larger than 10 cm have an especially significant risk of recurrence [5]. These figures do not differ from GIST in other part of the digestive tract [7].

Although malignant stromal tumour of the rectum is rare, it should be included in the differential diagnosis of a pelvic soft tissue mass.

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