

CORRELATION OF DIFFUSION WI TO HISTOPATHOLOGICAL FINDINGS OF LYMPH NODE IN RECTOSIGMOID CANCER

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INTRODUCTION

Rectal cancer is a common disease with a high mortality rate. This neoplasm remains associated with a poor prognosis due to the high risk of metastases and local recurrence. After surgical treatment, local recurrence rates for rectal cancer vary from 3-32% (1). Preoperative assessment of lymph node status in patients with rectal cancer is important because the involved nodes may be responsible for local recurrence. The use of preoperative neoadjuvant therapy (chemotherapy, radiotherapy) may be influenced by the presence of node involvement. The ability to reliably determine node-negative status before surgery could result in less aggressive surgery and preoperative therapy in some patients. We evaluate signal intensity, border characteristics and size of lymph nodes at MRI in rectal cancer patients with histological comparison, and assessment of the potential use of diffusion-weighted MRI in the characterization of pathological lymph nodes.

MATERIAL AND METHODS

This study was performed according to a protocol approved by the relevant ethics committees, and informed consent was obtained from each patient. The study comprised 16 consecutive patients subjected to total mesorectal excision of the sigma-rectum, with a biopsy to determine possible rectal carcinoma. Preoperative MRI imaging was carried out in all cases (Fig. 1A). None of the patients received coadjuvant therapy (chemotherapy, radiotherapy) prior to surgery. Pelvic MRI was performed before and after paramagnetic contrast injection in all patients, using a 1.5T clinical-use system (Magnetom-Sonata, Siemens). The protocol for MRI comprised a three-plane localizer; sagittal, transversal and coronal T2W, transversal diffusion (B=0, 50, 5000, 1000 AND ADC MAP) Axial Chem shift, STIR and T1 Fat Sat and coronal HASTE T2W of the entire pelvis. Following gadolinium injection, sagittal, transversal and coronal planes were acquired with T1W Fat Sat. All patients were imaged in the supine position and no intravenous antiperistaltic agent was administered. Prior to conduction of the study, the patients were administered a 250-ml water enema to cleanse the recto-sigmoid zone. The MRI images of the nodes were characterized according to the following parameters: nodal size (maximum diameter in mm), border contour (irregular and ill defined) and signal intensity (homogeneous or heterogeneous). The final diagnosis for all lymph nodes was established by histopathological examination (Fig. 1B).

RESULTS

The present study comprised 10 patients clinically and colonoscopically diagnosed with neoplastic disease of the sigma and upper third of the rectum. Surgery was the first treatment modality, without preoperative chemo- or radiotherapy. The study period was January-October 2006.

The surgical resection piece was sent *en bloc* to the laboratory for histological study.

The 10 patients yielded 24 adenopathies in the mesorectal fatty tissue, measuring over 3 mm in diameter – pathology from the MRI perspective being defined by diameters in excess of 5 mm. The position of these nodes was established for identification in the histological study. Our interest focused on those nodes that appeared brilliant in the same way as the tumor lesion, in the diffusion study.

Among the 24 adenopathies, 18 measured over 5 mm in diameter. All of these nodes showed an intense signal in the acquisition with b=1000, and proved histologically positive. The nodes corresponded to adenopathies over 5 mm in size in the conventional study. Of the 6 adenopathies under 5 mm in size and which showed brilliance in the diffusion study, two were found to be pathological. Therefore, our study to detect tumor infiltrated lymph nodes before surgery offered a sensitivity of 100%, with a positive predictive value of 83.3%.

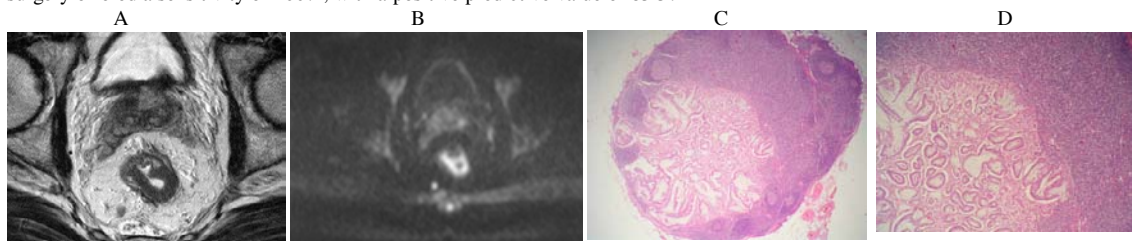


Fig 1: (a) Axial plane T2W with adenopathy adjacent to the sigma-rectum; (b) DWI (b=1000) of the same plane that “a”; (c) Metastasis of sigmoid mucosecretory adenocarcinoma in a 4-mm adenopathy of the mesenteric fatty tissue of the sigmoid colon. Hematoxylin-eosin, x2; (d) Metastasis of sigmoid mucosecretory adenocarcinoma in adenopathy of the mesenteric fatty tissue of the sigmoid colon. Hematoxylin-eosin, x4.

DISCUSSION

Evaluation of nodal involvement in rectal cancer constitutes a challenge for the radiologist. Although morphological imaging with MRI allows the detection of enlarged nodes, it is difficult to accurately differentiate benign from malignant lymph nodes.

Preoperative assessment of lymph node status in patients with rectal cancer is important, because the number of involved nodes influences the patient prognosis (2), and the presence of infiltrated nodes near the mesorectal fascial margin increases the risk of recurrence (2,3).

Existing imaging criteria for nodal positivity vary. Some authors regard any visible node in the perirectal fat as positive, while others employ size criteria with cut-off values for nodal positivity that range from 3-10 mm (2). However, it is accepted that the use of size criteria alone results in false-positive diagnoses. More recently, others authors have proposed that nodal involvement should be assessed on the basis of irregular borders and signal intensity characteristics. The presence of speculate or indistinct nodal borders, and a mottled heterogeneous signal intensity pattern might help predict lymph node involvement (1).

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