Computed Tomography in the Differential Diagnosis of the Enlarged Retrorectal Space

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Abstract. The value of computed tomography (CT) in the differentiation of an enlarged retrorectal space was analyzed in 132 cases. Classification of barium enema findings into those with simultaneous mucosal alterations and those without any visible lesions of the rectal mucosa seems to be useful. Computed tomography helps in those cases without mucosal changes to differentiate between retrorectal fibrosis, tumorous masses, and inflammatory diseases of the colon. It also demonstrates the lack of pathologic lesions in equivocal cases of pelvic lipomatosis and so-called "normal variants."

If simultaneous mucosal involvement on barium enema – especially in rectal carcinoma or recurrent carcinoma of the rectum – is found, CT may show the perirectal extension of tumorous masses and thus help to clarify local operability.

Key words: Retrorectal space, enlargement – CT – Barium enema.

Enlargement of the retrorectal space (RRS) is frequently due to a pathologic process of the neighboring organs. The distance between the posterior wall of the rectum and the ventral contour of the sacrum at the level of S5 should not exceed 1–1.5 cm in single- or double-contrast barium enema with maximum filling of the rectum [1].

In addition to changes with no pathologic significance, the most common causes of an enlarged RRS are tumors of the rectum and inflammatory processes of the colon. Less common diseases such as retroperitoneal soft tissue tumors or radiation fibrosis may also result in this condition [1–6].

Conventional radiographic techniques usually do not allow an accurate differentiation, although differential diagnosis can be narrowed down based on a number of criteria such as mucosal lesions in the rectum. With computed tomography (CT), extraluminal perirectal alterations can be easily visualized. Additional density measurements of this region permit one to make further conclusions [3, 7–9].

The present study demonstrates the uses for CT in the differential diagnosis of an enlarged retrorectal space and shows how this procedure can be usefully employed.

Subjects and Methods

Included in this study were 132 patients presenting with an enlarged RRS. The width of this space was measured on a strictly lateral projection in double-contrast filling of the rectum in hypotonia. In a diffuse enlargement, the retrorectal space was measured at the level of S5, since the possibility of error (due to the plica transversalis recti projecting into the lumen of the rectum, or to a low rectosigmoidal transition) can most easily be avoided here. In the case of a circumscribed enlargement, measurement was made at the point of maximum width. Widening of the RRS by more than 2 cm was considered to be pathologic [1].

In 69 patients, CT scans were performed. Eight-millimeter parallel scans were obtained from the anal verge to the lower paraaortal region, after rectal filling with a water-soluble contrast medium (1% diatrizoate meglumine: Gastrografin®). Since enlargement of the RRS was demonstrated primarily on barium enema in all cases, no maximum filling of the rectal ampulla was attempted on CT; instead, attention was focused on the visualization and assessment of perirectal changes.

Final diagnosis of pathologic changes was confirmed at surgery or by biopsy, as shown in Table 1.

Results

To allow for systematic evaluation, the 132 cases were classified into the two groups described below.
Table 1. Diagnosis of patients with and without mucosal lesions of the rectum in retrorectal space enlargement

| With mucosal lesions | | | With mucosal alterations | | | Without mucosal lesions | | |
|----------------------|-----------------| | Diagnosis               | N  | CT | | Diagnosis               | N  | CT |
| Rectal carcinoma      | 25              | 15 | | “Normal variants”       | 25 | 4   | | Pelvic lipomatosis      | 6  | 4   | |
| Recurrent carcinoma   | 10              | 10 | | Ulcerative colitis      | 6  | 3   | | Crohn’s disease         | 7  | 3   | |
| Ulcerative colitis    | 10              | 2  | | Proctitis               | 5  | 2   | | Proctitis               | 5  | 2   | |
| Crohn’s disease       | 5               | 2  | | Retrorectal abscess     | 3  | 2   | | Retrorectal abscess     | 3  | 2   | |
| Proctitis             | 3               | 2  | | Retrorectal tumor       | 2  | 2   | | Retrorectal tumor       | 8  | 6   | |
| Retrrectal abscess    | 4               | 2  | | Retropertonebral fibrosis| 3 | 2   | | Retropertonebral fibrosis| 3 | 2   | |
| Retrorectal tumor     | 2               | 2  | | Radiation fibrosis      | 10 | 8   | | Radiation fibrosis      | 10 | 8   | |
| Total                 | 59              | 35 | | 73                        | 34 |

* Number of cases in which CT was used.

Enlargement of the RRS with Simultaneous Alteration of the Rectal Mucosa

An accurate diagnosis of the underlying lesion was possible in over 85% of these 59 patients (51 patients) based on findings from the double-contrast barium enema alone.

Twenty-five patients presented with rectal carcinoma; all of them could be correctly diagnosed on barium enema. In all 15 cases, CT showed a thickening of the perirectal fascia. In 3 cases no extramural tumorous mass was evident (Fig. 1); in 8 patients an advanced stage was visible with infiltration of pelvic fat layer or muscles and distant metastases.

Ten patients had previously undergone low continence-conserving resection of the rectum (Fig. 2). Recurrence was suspected on barium enema in 5 cases. In the other 5 cases the mucosal alterations were considered to be due to scar formation and the enlargement of the RRS to the shortening of the rectosigmoid. Computed tomography could demonstrate perirectal soft tissue masses in 8 cases; these were considered to be caused by recurrent carcinoma in 6 patients and by scar formation in 1 case. A biopsy specimen revealed tumor recurrence in 7 cases. There were therefore 2 false-negative cases on barium enema and one false-negative on CT.

In the presence of inflammatory colon disease in 18 cases, characteristic mucosal lesions were visible; diagnosis was possible on barium enema. In 4 cases of retrorectal abscess, perforation of the rectal wall was marked by the escape of contrast medium into the RRS. Therefore in all these cases CT did not contribute to diagnosis, but provided additional information about extension of the lesions in the perirectal spaces.

In 2 cases of retrorectal tumors, mucosal changes due to infiltration of the rectal wall were present. The diagnosis of an extended tumor required the use of CT.