Endoscopy and barium enema are accurate in detecting intraluminal lesions of the rectum. Computer tomography (CT) scan enables assessment of perirectal disease but is not always accurate in detecting and staging intramural rectal tumor [1–3]. Conventional ultrasonography is inadequate in detecting rectal and perirectal lesions because of interfering bowel gas and lack of accurate localization of possible abnormalities. Transrectal ultrasonography has been reported as an accurate diagnostic procedure in detecting rectal and perirectal diseases [4–6]. The purpose of this study was to compare blind transrectal ultrasonography (BUS) with endoscopic transrectal ultrasonography (EUS) to determine the accuracy and limitations of these new diagnostic modalities.

**Materials and Methods**

Between October 1984 and October 1985, BUS and EUS were performed in 20 patients with rectal and perirectal disease. Five patients had perirectal disease, four men and one woman with an age ranging from 24 to 79 years. Five patients had villous adenoma, two men and three women with an age ranging from 58 to 75 years. Eight patients had advanced rectal carcinoma and two had intramucosal carcinoma, four men and six women with an age ranging from 26 to 79 years. The results of these investigations were compared with findings at endoscopy, barium meal, or surgical exploration and detailed histological examination of resection specimens. To compare the endoscopic ultrasonographic findings with the corresponding histologic normal and/or pathological wall structures of the rectum, fresh surgical resection specimens of patients who underwent preoperative BUS and EUS for rectal cancer were examined with both ultrasonographic instruments. In two patients the mucosectomy specimen of villous adenomas was also investigated. The results of ultrasonographic investigation in vivo (preoperative US) were compared with corresponding in vitro images (US of resection specimen). In addition, these results were correlated with detailed histology.

The BUS studies were performed with an Aloka ASU-57 transrectal echoprobe, attached to a basic echographic Endoscan SSD-520 equipment. This transrectal instrument has a rigid shaft with a length of 15 cm and a maximal diameter of 15 mm. The echoprobe is attached in the tip of the instrument and can be covered with a balloon, which can be filled with deaerated (boiled) water to improve the ultrasonic images by making optimal contact with the rectal wall. The ultrasound frequency of
this instrument is 5 MHz with a penetration depth of approximately 22 cm and an axial
resolution of 1 mm. The technical characteristics of the EUS instrument have been
described elsewhere. Filling the rectal lumen with deaerated water via a small tube
facilitates the EUS analysis.

The BUS and EUS examinations were performed with the patient in the left lateral
decubitus or the supine position, after preparation with a phosphate enema. The
rectal mucosa had to be cleaned of fecal material to achieve clear visualization of the
rectal wall structures.

A diagnosis was considered correct when the abnormalities detected were of
sufficient magnitude to make the investigator strongly suspect a benign or malign
tumor.

For photographic documentation a Polaroid or single-lens reflex camera can be
used. Videorecording enables the examination to be reviewed.

Results

Table 1 summarizes the results of BUS and EUS in assessing perirectal lesions.

<table>
<thead>
<tr>
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<th>BUS</th>
<th>EUS</th>
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<tbody>
<tr>
<td>Perirectal abscess</td>
<td>3/3</td>
<td>2/3</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>1/1</td>
<td>1/1</td>
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<td>Bladder carcinoma</td>
<td>1/1</td>
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There were three patients with perirectal abscesses, one with prostate cancer and
one with bladder carcinoma. BUS accurately visualized the extent of the lesion and its
anatomical relationship to the surrounding tissues and organs in all five patients on the
basis of the adequate penetration depth of approximately 22 cm and the 360° sector
sonographic image. EUS readily showed the extent of the rectal abscess in two of
three patients (Fig. 1). The bladder carcinoma could not be visualized because of the
limited penetration depth of approximately 10 cm. In contrast, prostate cancer was
clearly demonstrated because of its close anatomic relationship to the rectum.

Table 2 summarizes the results of BUS and EUS, compared with the final histology
of the resection specimens, in evaluating rectal adenomatous polyps.

BUS clearly showed the intraluminal extent of the lesions into the rectal wall in four
of five patients. These findings correlated well with the histology of the resection

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<tr>
<th></th>
<th>BUS/histo.</th>
<th>EUS/histo.</th>
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<tbody>
<tr>
<td>5</td>
<td>4/5</td>
<td>5/5</td>
</tr>
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