ANTI-SPASMODIC EFFECT OF PRIFINIUM BROMIDE ON THE PROXIMAL AND DISTAL COLON IN PATIENTS WITH DIVERTICULAR DISEASE

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Summary

In 5 patients with diverticular disease, colonic motilities of the proximal and distal colon were recorded using the ERBI method. The motilities were studied during resting, after prostigmin 0.5 mg i.m. injection and after prifinium bromide 7.5 mg i.m. injection, with the following results: After prostigmin colonic motility of the proximal colon became significantly greater than that of the distal colon. Prifinium bromide inhibited the prostigmin-induced hypermotility markedly. It was demonstrated that this drug has an anti-spasmodic action not only on the distal colon but also on the proximal colon. Prifinium bromide was an anti-spasmodic drug which brought about a rapid effect which appears within 3 minutes after injection. The effect persisted for about 1 hour.

Key Words: proximal colon motility, diverticular disease of the colon, ERBI method, prifinium bromide.

Parasympatholytic drugs such as quaternary ammonium compounds have an inhibitory effect on the hypermotility of the gastrointestinal tract and urinary tract1,2). However, there have not yet been reports on the effect of the drugs on the proximal colon motility. This is because motility studies using pressure recording techniques have caused difficulties in placing devices in the proximal colon. We have recently devised a new method in which a tube is inserted into the proximal and distal colon by colonofibroscope. This technique has been named endoscopic retrograde bowel insertion (ERBI) method. This method facilitates the simultaneous recording of both proximal and distal colon motilities. In this paper, therefore, an investigation was carried out on the effect of a parasympatholytic drug on the proximal and distal colon motilities in patients with diverticular disease.

Patients

Patients subjected to the study were 4 males and 1 female with an average age of 55, of whom 4 had diverticular disease in the proximal colon and 1 in the distal colon. Three patients had diarrhea and 2 had normal stools (Table I).

Method

Preparation for colonofiberscopic examination was necessary for this study. On the day
before the study, low residue diet was given and laxatives such as 15% magnesium sulfate were orally given. On the morning of the study, the patient was instructed not to eat breakfast, and was given an i.m. injection of prifinium bromide 7.5 mg as pretreatment. After the colono-\(^{1}\) fiberscope (Olympus Co. Ltd., CF-LB\(_3\)) was fluoroscopically introduced into the proximal colon, a double-lumen tube made of Teflon was passed through the proximal and distal colon by the ERBI method. Before the trial of the ERBI method, the following equipment was necessary.

* A guide-wire of 300 cm in length
* Double-lumen tube made of Teflon (maximum diameter about 8 mm)
  One long tube of 120 cm
  One short tube of 60 cm
  (the two tubes are tied together in a parallel position.)
* Pressure transducer
  Mikrotip\(^{1}\) (Millar Co. Ltd.)

The ERBI method consists of 4 steps (Fig. 1). In the 1st step, the colono-\(^{1}\) fiberscope covered partially with a stiffening cuff is inserted into the proximal colon. In the 2nd step, a guide-wire of 300 cm in length is passed through the channel of the scope, and then the colono-\(^{1}\) fiberscope is withdrawn while the guide-wire remains in position. At that time, the stiffening cuff is still in the distal colon. In the 3rd step, the longer Teflon tube is inserted as far as the end of the guide-wire in the proximal colon. Together with this, the shorter tube is then located in the distal colon. Finally, the guide-wire and the stiffening cuff are pulled out and the double-lumen tube remains in position. In the 4th step, pressure transducers, Mikrotips, are inserted into both the proximal and distal colon through the double-lumen tubes. The tips of both pressure transducers are guided manually under fluoroscopic observation to protrude from the end of the tube. The tip of each transducer is adjusted to be located in the ascending colon, and in the middle part of the sigmoid colon. Respiration is also recorded during each examination. Fig. 2 shows the devices in position. Mikrotips are connected via Millar Transducer Control Unit TCB-100, and amplifiers EB-102 (San-ei Co., Ltd.) to an ink writer. The paper speed is 1 cm per minute and the amplification is generally adjusted to give a

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Table 1. Age, sex, bowel movement and diagnosis of subjects

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (yr)</th>
<th>Sex</th>
<th>Bowel Movement</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>54</td>
<td>M</td>
<td>Diarrhea</td>
<td>right-sided Diverticular Disease</td>
</tr>
<tr>
<td>2</td>
<td>47</td>
<td>M</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>38</td>
<td>F</td>
<td>Diarrhea</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>M</td>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>67</td>
<td>M</td>
<td>Diarrhea</td>
<td>left-sided Diverticular Disease</td>
</tr>
</tbody>
</table>

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1. Ref to the original content for the figure (Fig. 1) and Table 1.