RESULTS

There was no difference in lymphocyte RNA and DNA synthesis between patients with regional enteritis and normal controls in studies with PHA stimulation. On the other hand, MLC studies provided clear differentiation (Fig 1). Lymphocytes from patients with regional enteritis failed absolutely to respond in MLC; they also stimulated normal cells poorly.

CONCLUSIONS

These studies indicate that lymphocytes from patients with regional enteritis respond normally to the nonspecific stimulus of PHA but they fail to respond to the specific stimulus of histocompatibility antigens in MLC. The reasons for these phenomena could be a defect in maturation of the thymic-dependent lymphocytes or in competitive inhibition by other specific antigens. The results provide strong support for a cellular immunological defect in patients with regional enteritis.

EXTERNAL COMPRESSION OF THE CARDIA RELATED TO GASTROESOPHAGEAL REFLUX

CLINT E. CHAMBERS, MD, LTC, MC USAF,
CHRISTOPHER K. ZARINS, MD, DAVID B. SKINNER, MD, FACS,
AND ELLIS L. JONES, MD

An intraluminal high-pressure zone (HPZ) at the esophagogastric junction (EGJ) is an important factor in the control of reflux. The HPZ has been taken as evidence for a muscular sphincter, but this has not been anatomically identified. The extent to which extrinsic intra-abdominal pressures act on the EGJ to create the HPZ and prevent reflux has not been established.

METHODS

Thirteen rhesus monkeys weighing 3–4 kg were evaluated on four days with a standard esophageal pH reflux and motility test. A pH

From the Department of Surgery, (Blalock 640), Johns Hopkins University School of Medicine and Johns Hopkins Hospital, Baltimore. Supported by National Institutes of Health grant GM 01541.
electrode was placed 3 cm proximal to the HPZ, and reflux was measured both fasting and after an acid load (0.1N HCl, 7 cc/kg), at rest and with applied abdominal pressure. A fall in pH below 4.0 on any maneuver was considered an abnormal reflux test. On this basis six monkeys were classed as refluxers and seven as nonrefluxers. A laparotomy was performed and a catheter (ID 0.034 in) was sutured to the external surface of the EGJ and another sutured 5 cm below on the anterior serosal surface of the stomach. Thereafter, daily simul-

**RESTING PRESSURES (mm.Hg)**

<table>
<thead>
<tr>
<th></th>
<th>NON-REFLUX</th>
<th>REFLUX</th>
<th>P</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>n = 7</td>
<td>n = 6</td>
<td></td>
</tr>
<tr>
<td>D (HPZ)</td>
<td>3.5 ± 2.2</td>
<td>1.4 ± 1.4</td>
<td>&lt; .01</td>
</tr>
<tr>
<td>D - C</td>
<td>1.3 ± 1.7</td>
<td>-2.2 ± 5.1</td>
<td>&lt; .02</td>
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<tr>
<td></td>
<td></td>
<td>*(0 ± 1.1)</td>
<td>&lt; .02</td>
</tr>
<tr>
<td>B - A</td>
<td>7.8 ± 5.9</td>
<td>-1.2 ± 8.6</td>
<td>&lt; .001</td>
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<tr>
<td></td>
<td></td>
<td>*(−4.4 ± 4.6)</td>
<td>&lt; .001</td>
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</tbody>
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*EXCLUDES ONE MONKEY WITH HIGH INTRAGASTRIC PRESSURES

![Diagram](image)

Fig 1. Mean resting pressure differences in normal monkeys and monkeys with abnormal reflux.
taneous intraluminal and extraluminal pressures were measured on five channels (Brush direct writing recorder) using interchangeable Statham pressure transducers balanced daily against a mercury manometer. Intraluminal pressures were recorded from three catheters (ID 0.034 in) bonded together with distal tips 5 cm apart. This assembly was passed through the nose and placed so that the middle tip was in the HPZ. Catheters were continuously perfused with a Harvard pump (0.123 cc/min) during recording. Values were analyzed from readings on three consecutive days on which technically satisfactory recordings from each catheter were obtained. Reflux tests were repeated daily in seven monkeys and after completion of the experiments in six monkeys.

RESULTS

Extraluminal pressure (B) at the EGJ was higher than intraluminal pressure (D) in all monkeys (Fig 1). A pressure gradient existed in the peritoneal cavity with pressure (B) at the EGJ being greater than extragastric pressure (A) in monkeys which did not reflux but less than extragastric pressure in refluxing monkeys. This relationship was true in all monkeys except one. This monkey refluxed freely after an acid load and was unique in that he had remarkably high intragastric pressure (C) on seven of nine days. On the two days that he had normal intragastric pressure his reflux test was negative.

CONCLUSION

The HPZ is greater in nonrefluxers than refluxers and may be a reflection of higher extraluminal pressure. The control of reflux correlates to the gradient between the extragastric and subdiaphragmatic pressures. Placing the distal esophagus below the diaphragm may account for the success of antireflux operations.