Letters to the Editor

Doxycycline-Induced Esophageal Ulceration: Do Old Capsules Play a Role?

To the Editor:

Doxycycline has been implicated in approximately 45% of all reported cases of drug-induced esophageal mucosal injury (1). We have carried out in vitro studies that suggest that the capsule age may be a contributory factor in the pathogenesis of doxycycline-induced mucosal injury.

Doxycycline capsules obtained fresh from the manufacturer (new capsules) and those that had been stored for between 1 and 5 years at room temperature and that belonged to different batches (old capsules) were used in this study.

The capsules were opened, the doxycycline powder removed, and the capsules filled with methylene blue dye. Care was taken to ensure that no dye spilled on to the capsule surface. The capsules were then kept in beakers containing either tap water (pH 6.5) or water that had been acidified with hydrochloric acid to a pH of 3.5 to simulate the acid environment in the esophagus in the presence of gastric acid reflux. The time taken for the dye to appear on the capsule surface was recorded using a stopwatch and was taken as the end point of the study.

The Student’s t test for unpaired samples was used for statistical analysis and a p value < 0.05 was considered significant.

Old doxycycline capsules began to dissolve significantly faster than new capsules (p < 0.001), as indicated by the dye leaking through the capsule (Table 1). Decreasing the pH, as would happen if there was reflux of gastric contents into the esophagus, hastened the process considerably, but the old capsules continued to dissolve faster than the new capsules.

Our findings suggest that capsule age may be yet another predisposing factor in doxycycline-induced mucosal damage by facilitating contact between the esophageal mucosa and the doxycycline powder.

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REFERENCE


Gastrogastric Intussusception

To the Editor:

Intussusceptions of the stomach are rare and are usually the result of a leiomyoma or lipoma intussuscepting into the duodenum. It is extremely rare to encounter a gastrogastric intussusception, which we here report.

An 81-year-old white woman was admitted for the evaluation of a severe anemia, with a hemoglobin of 6.6 g% and a hematocrit of 20.3%. Microcytic, hypochromic indices were present.

A single contrast upper gastrointestinal series revealed a traction deformity of the fundus (Fig. 1). Arising from the deformed fundus were a series of parallel folds representing a pseudopedicle. These terminated in a smooth ovoid mass in the antrum (Fig. 2). The entire lesser curvature showed marked shortening. A "coiled spring" appearance was noted in the antrum. The intussusception could not be reduced manually.

### TABLE 1. Time taken for old and new capsules to become leaky when immersed in water and in dilute hydrochloric acid

<table>
<thead>
<tr>
<th>Condition</th>
<th>Old capsules (n = 6)</th>
<th>New capsules (n = 6)</th>
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<tbody>
<tr>
<td>Water alone (pH 6.5)</td>
<td>5 ± 0.26*</td>
<td>15 ± 0.37</td>
</tr>
<tr>
<td>Dilute HCl (pH 3.5)</td>
<td>3.95 ± 0.12*</td>
<td>9.87 ± 0.08</td>
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All values are the mean ± SEM. The number of capsules studied are indicated in parentheses.

* p < 0.001 compared to new capsules.