INTESTINAL BLOCKAGE BY CARCINOMA AND BLASTOCYSTIS HOMINIS INFECTION

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Abstract. We detected heavy infections of Blastocystis hominis in four individuals with intestinal obstruction due to cancerous growths. After surgery, the infections spontaneously resolved, without specific chemotherapy. It appears that the B. hominis infection was coincidental and not related to the neoplastic growth. We suggest that intestinal obstruction and concomitant stool retention, plus hemorrhage from cancerous lesions, may have permitted the more abundant growth of B. hominis. This is the first report of a possible relationship between intestinal obstruction and a concomitant B. hominis infection.

Brumpt 1 gave Blastocystis hominis its present name and considered it to be a harmless intestinal parasite. Since then, the organism has been found on numerous occasions in the human intestinal tract. However, various questions concerning growth conditions, sites of colonization in the intestinal tract, and pathogenic potential remain to be answered. 2,3 We recently surveyed B. hominis infection among healthy individuals in Japan. 4 The B. hominis-positive individuals were symptom-free despite passing numerous organisms. Furthermore, colonoscopic observations on some of these positive individuals did not reveal any lesions in the intestinal mucosa. On the other hand, case reports have supported a role for B. hominis as a potential pathogen in humans. 5-8 To clarify the pathogenicity of this organism, we examined hospitalized patients with gastrointestinal problems at St. Luke’s International Hospital (Tokyo, Japan) and Tokai University Hospital (Isehara, Japan). Our present survey detected a heavy infection with B. hominis in four individuals with intestinal obstruction due to cancerous growths.

CASES

Pertinent information for the four cases is summarized in Table 1.

Case 1. A Vietnamese student was admitted to Tokai University Hospital complaining of nausea, vomiting, and abdominal pain. Radiograph and computed tomography (CT) scan features showed dilated segments of the small bowel, into which a long intestinal tube was inserted. Microscopic examination of aspirated intestinal contents revealed approximately 30 B. hominis per high-power (400×) field. Emergency surgery revealed a complete obstruction in the ileum due to carcinoma. After resection of the carcinoma, B. hominis were no longer found in her stool. Further follow-up studies were not possible because the patient returned to Vietnam after recovery from the resection.

Case 2. An Indian housewife was admitted to St. Luke’s Hospital with a complaint of abdominal pain and fever (38.2°C). Severe anemia was present (hemoglobin level = 6.8 g/dL). An abdominal radiograph showed dilatation of the intestinal tract due to an accumulation of gas and fluid, and a large cancerous mass (Figure 1). Complete obstruction of the transverse colon due to the carcinoma was ascertained by colonoscopy. Because numerous (36 per high-power field) B. hominis were detected in her stool, the patient was treated with metronidazole for six days before surgical intervention. However, the B. hominis infection was not eliminated. After a partial colectomy, the patient’s stools became free of the parasites for the remaining nine months of her life.

Case 3. A Japanese business man was admitted to St. Luke’s Hospital complaining of nausea, vomiting, and abdominal pain. A lower abdominal mass was revealed by a CT scan. Colonoscopic examination showed an obstruction at the rectosigmoid junction and a lower anterior resection was performed. Prior to surgery, 32 B. hominis per high-power field were found in his stool. However, a stool examination 20 days post-resection did not detect the organism.

Case 4. A Japanese man was admitted to St. Luke’s Hospital complaining of abdominal pain. An abdominal radiograph showed dilated segments of both the small and large intestines. Colonoscopic examination revealed obstruction of the sigmoid colon due to carcinoma and sigmoidectomy was performed. A presurgical stool examination showed many (32 per high-power field) B. hominis. A stool examination 12 days post-resection did not detect the organism. His daughter, who resided with him, also had sigmoid colon carcinoma but without intestinal blockage. Blastocystis hominis was never found in her stool.

In all cases, stools cultured for Campylobacter species, pathogenic Escherichia coli, Salmonella species, Yersinia, Vibrio, and Clostridium difficile were negative. All stool examinations for B. hominis were by direct wet film microscopic examination and by egg-medium culture, as described in our previous report; 4 two smears from each stool sample were examined and the number of organisms was estimated by counting 40 fields (20 fields/smear) under high-power magnification (400×). On the first follow-up examination performed 10–21 days post-surgery, the four patients were found to be negative for B. hominis. On the second follow-up stool examination performed three months after surgery, three of the four patients remained negative for B. hominis (one patient left the study and returned to Vietnam). The neoplastic growths were diagnosed by pathologic examination. Parasites other than B. hominis were not detected at any time. Before surgery, three of the four patients did not receive any treatment for B. hominis.

In addition to these four cases, we surveyed 15 individuals.
Cases of intestinal blockage by carcinoma and concomitant Blastocystis hominis infection

<table>
<thead>
<tr>
<th>Case</th>
<th>Age (years)</th>
<th>Gender</th>
<th>Site of obstruction</th>
<th>B. hominis number*</th>
<th>1st follow-up²</th>
<th>2nd follow-up²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>F</td>
<td>Ileum</td>
<td>30§</td>
<td>0§</td>
<td>ND</td>
</tr>
<tr>
<td>2</td>
<td>40</td>
<td>F</td>
<td>Transverse colon</td>
<td>36</td>
<td>0</td>
<td>0§</td>
</tr>
<tr>
<td>3</td>
<td>62</td>
<td>M</td>
<td>Rectosigmoid colon</td>
<td>32</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>71</td>
<td>M</td>
<td>Sigmoid colon</td>
<td>32</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

* Determined by direct wet film method.
² Stool examination three months post-surgery. ND = not done.
3 Average number of B. hominis estimated by counting 40 fields under high-power magnification (×400).

Discussion

Although the pathogenicity of B. hominis is still controversial, it seems likely that the protozoan was not related to the colonic ulcerations in the four individuals reported here. However, our present case report does indicate that intestinal obstruction due to cancerous growths may create a suitable environment for the growth of the parasite.

The occlusions were observed in various sites of the intestinal tract in the four patients, as shown in Table 1, indicating that the parasite can grow anywhere in the intestine. The numbers of parasites seen were much greater than in our previous estimation. After resection of the occluding masses, the patients received antibiotics to prevent microbial infections, and all reported improved bowel movements. Stool examinations 2–3 weeks and three months post-resection failed to detect B. hominis. The prophylactic administration of antibiotics to these patients is not believed to be responsible for the elimination of the parasite because antibiotics other than metronidazole are not effective against B. hominis. However, as shown in case no. 2, treatment with metronidazole can also be unsuccessful in eradicating the organism. We also identified 15 other individuals with similar complete intestinal obstructions, but did not detect B. hominis. Therefore, occlusion of the intestine was not dependent on the presence of the parasite. Thirty-nine other individuals with non-occluding intestinal masses, were also negative for B. hominis. One of these 39 individuals is the daughter of patient no. 4, with whom she resides. Thus, living with a B. hominis-infected individual may not necessarily result in transmission of the parasite, as previously reported.

Contaminated water has been implicated as a major source of infection since several B. hominis cases have been traced to oral infection.

Two of the four patients are Japanese. As described in the previous survey, the prevalence rate of B. hominis infection in Japan is lower than in other countries. Therefore, if individuals with complete intestinal obstructions become infected with the parasite, the present observations may explain the great increase in the parasite population.

Endoscopic and biopsy observations have indicated that (mean age = 71.8 years) with complete intestinal obstructions and 39 individuals (mean age = 66.4 years) who exhibited a non-occluding intestinal mass. All were negative for B. hominis.

B. hominis does not invade the intestinal mucosa. In our histologic examination of the resected cancerous lesions, tissue invasion by the organism was not detected, even when large numbers of B. hominis were found in fecal samples. Our observations also indicated that B. hominis remains non-invasive even in the presence of cancerous lesions in the mucosa.

Based on these observations, it appears that the B. hominis infection in the four cases was coincidental and not related to the neoplastic growths. However, we suggest that the intestinal obstruction and concomitant stool retention, plus hemorrhage from the cancerous lesions, may have permitted more abundant growth of B. hominis because the parasite was eliminated from the patients’ intestinal tracts following the improvement in bowel function. It therefore seems likely that B. hominis is an opportunistic organism that can take advantage of changes in the normal physiology of the intestinal tract. Our experience with patients with both intestinal blockage and B. hominis infection does not indicate that patients should be treated before surgery. Indeed, after surgery, the B. hominis infection frequently resolves spontaneously.

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