Title
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Citation

Issue Date
2016

URL
http://hdl.handle.net/2433/215863

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Type
Journal Article

Textversion
publisher

Kyoto University
Right hemicolecotomy for mesenteric phlebosclerosis potentially caused by long-term use of herbal medicine: A case report and literature review

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1. Introduction

Mesenteric phlebosclerosis (MP) is a rare ischemic disease affecting the colon. Less than 100 cases have been reported thus far [1,2], and most of these have been reported from Asian countries. This disease shows non-specific symptoms, such as nausea, vomiting, and abdominal pain and distension; therefore, it is often diagnosed in an advanced stage [1]. The pathogenesis of MP remains unclear, but conditions that cause portal vein hypertension [3,4] or the administration of toxic agents such as certain herbal medicines [5] have been suggested to contribute to the onset of MP. The progress of this disease is chronic but irreversible [6]. Further, among patients with symptoms such as intestinal obstruction that are refractory to conservative therapy, surgical intervention is needed [1,2]. However, the appropriate extent of colonic resection in these patients remains unclear.

We present a case of MP that required surgical intervention after long-term use of herbal medicines. We also review previously reported cases focusing on surgical interventions for MP.

2. Presentation of case

The patient was an 87-year-old woman who had worked at a pharmacy that dispensed herbal medicines. She often used several herbal medicines, such as Oregenedokuto, for 40 years. Her past medical history included appendectomy, bronchiectasis, and mild chronic renal failure. In April 2013, she visited a hospital for abdominal pain and distension, where she was diagnosed with ileus and was admitted. She received conservative therapy using a nasogastric decompression tube or ileus tube, but the symptoms did not improve and she was transferred to our hospital. Physical examination revealed a distended abdomen and diffuse abdominal tenderness. Laboratory data showed mild inflammation (C-reactive protein 4.0 mg/dL), anemia (hemoglobin 9.7 g/dL), malnutrition (albumin 2.6 g/dL), and mild renal dysfunction (creatinine 1.53 g/dL). Other findings were normal. Abdominal radiography revealed threadlike calcifications in the right abdomen (Fig. 1a). Computed tomography (CT) revealed a dilated small intestine,
thickened colonic wall, luminal stenosis of the ascending colon, and serpentine calcifications alongside the colonic and mesenteric veins, extending from the ileocolic to the middle colic vein (Fig. 1b). These findings suggested that she had MP, and her drug history suggested long-term use of herbal medicine as a possible cause. Given the patient’s advanced age and poor general condition, performing wide colonic resection was not feasible. Therefore, emergency ileostomy was performed to decompress the dilated small intestine after identifying the existence of arterial blood flow in the affected mesenteric region. The postoperative course was uneventful, and she was temporarily discharged from our hospital. In June 2013, she was re-admitted for a planned second surgery. Intraoperatively, we observed that the intestinal wall between the ascending and mid-transverse colon was dark purple. In particular, the cecum and proximal ascending colon were strongly affected and they were hard (Fig. 2). We performed a right hemicolectomy with ileo-colonic anastomosis (Fig. 3). Pathological examination of the resected portion revealed shedding mucosa, increased submucosal collagen fibers, intimal thickening, calcifications of the mesenteric veins, normal arteries, and no malignancy, which was consistent with the typical pathological findings of MP (Fig. 4). The postoperative course was uneventful except for temporary arrhythmia, and the patient was discharged 20 days after the second operation. She stopped using the herbal medicine and had no sign of recurrence at 2 years after the second operation.

3. Discussion

MP was first reported by Koyama et al [7] in 1991. Yao et al. [4] termed it phlebosclerotic colitis, while Iwashita et al [8] called it idiopathic MP because of the unknown pathogenesis and the lack of pathological inflammation. Of the approximately 100 reported cases, most reports have described patients from Asian countries, especially Japan [2].

The symptoms of MP are non-specific, so it is difficult to diagnose it in its early stages [1]. There are no distinct diagnostic criteria for MP, but a few specific imaging findings have been reported, including dark-purple mucosa seen in colonoscopy, thread-like calcifications in abdominal radiographs, serpentine calcifications on abdominal CT, narrowing of the colon in barium enema, and decreased venous flow on angiography [2,4,6]. The pathogenesis of this disease remains unclear; however, circulatory disturbances caused by mesenteric venous occlusion (e.g., due to liver cirrhosis) have been suspected as a possible cause [4]. Recently, Hiramatsu et al [5] summarized 25 cases with MP associated with the long-term usage of herbal medicines. They suspected that geniposide contained in herbal medicines might be a causative agent of MP. Oyegedokoto, the herbal agent used in this case, contains geniposide.

MP progresses chronically, and the symptoms of this disease often improve by stopping the herbal intake. However, intractable cases require surgical intervention. In the English literature, we identified 22 cases that required surgical treatment [1–5,8–15], including 9 cases [1,2,5,12] with a history of using herbal medicines (Table 1). Of these, 10 cases were preoperatively diagnosed as MP, and 3 cases were misdiagnosed as Crohn’s disease and appendicitis. CT (11 cases) and/or colonoscopy (10 cases) were frequently used as the diagnostic modalities. Especially, CT was used in the last 7 cases. Also, angiography and/or barium enema were used in some former cases [2,4,6,8,10,11]. The reasons for performing surgery in these cases were persistent abdominal pain (7 cases), intestinal stenosis (5 cases), intestinal perforation (2 cases), intestinal gangrene (1 case), intra-abdominal abscess and intestinal stenosis (1 case), and unknown (6 cases). Total colectomy was performed in 3 cases; subtotal colectomy, in 12 cases; and right hemicolectomy in 7 cases. With regard to the relationship between the extent of colonic resection and the pathogenesis of MP, limited colonic resection appeared to be performed in the cases of MP caused by herbal
Fang, Shibata, Guo, Chang, Hiramatsu, Kato, and Kimura. Consequently, perhaps the most important principle for determining whether MP is caused by intestinal disease is to compare the lesion with the colon shape, peritoneal distribution of disease, and CT findings, as well as referring to the specific outcomes of the colonoscopy and preoperative diagnosis. In addition, certain drugs, like herbal medicines, could be a causative agent for the occurrence of MP, which is consistent with the findings of previous studies. The presence of MP can be confirmed by comparing the findings of CT and colonoscopy with the corresponding symptoms of intestinal disease.

### Table 1: Review of previously reported surgical cases and our case.

<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Age</th>
<th>Sex</th>
<th>Herbal medicine</th>
<th>Affected region</th>
<th>Preoperative diagnosis</th>
<th>Operative indication</th>
<th>Surgical method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999</td>
<td>Kitamura</td>
<td>56</td>
<td>F</td>
<td>ND</td>
<td>I-D</td>
<td>I-D</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2000</td>
<td>Yao</td>
<td>36</td>
<td>M</td>
<td>A-T</td>
<td>I-D</td>
<td>Abdominal pain</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2003</td>
<td>Iwashita</td>
<td>57</td>
<td>M</td>
<td>A-T</td>
<td>C-D</td>
<td>Crohn’s disease</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2005</td>
<td>Markos</td>
<td>53</td>
<td>M</td>
<td>A-T</td>
<td>C-T</td>
<td>Stenosis</td>
<td>Right hemicolectomy</td>
<td>Total colectomy</td>
</tr>
<tr>
<td>2014</td>
<td>Chang</td>
<td>56</td>
<td>F</td>
<td>I-D</td>
<td>C-S</td>
<td>Appendicitis</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2015</td>
<td>Kato</td>
<td>68</td>
<td>M</td>
<td>MP</td>
<td>C-T</td>
<td>Perforation</td>
<td>Subtotal colectomy</td>
<td>Total colectomy</td>
</tr>
<tr>
<td>2017</td>
<td>Hiramatsu</td>
<td>55</td>
<td>F</td>
<td>MP</td>
<td>C-T</td>
<td>Appendicitis</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2018</td>
<td>Guo</td>
<td>63</td>
<td>M</td>
<td>MP</td>
<td>C-D</td>
<td>Perforation</td>
<td>Right hemicolectomy</td>
<td>Total colectomy</td>
</tr>
<tr>
<td>2019</td>
<td>Fang</td>
<td>56</td>
<td>M</td>
<td>MP</td>
<td>C-D</td>
<td>Appendicitis</td>
<td>Subtotal colectomy</td>
<td>Subtotal colectomy</td>
</tr>
<tr>
<td>2020</td>
<td>Our case</td>
<td>87</td>
<td>F</td>
<td>MP</td>
<td>C-T</td>
<td>Stenosis</td>
<td>Right hemicolectomy</td>
<td>Total colectomy</td>
</tr>
</tbody>
</table>

**A**: ascending colon; **C**: cecum; **CT**: computed tomography; **D**: descending colon; **I**: terminal ileum; **MP**: mesenteric phlebosclerosis; **ND**: not documented; **S**: sigmoid colon; **T**: transverse colon.

The transverse colon is one of the most common sites for MP occurrence, as described previously. Most patients report a low-grade fever, pain, and leukocytosis, which is consistent with an inflammatory response. Therefore, the colonoscopy is helpful in identifying the affected region intraoperatively, as our case. Furthermore, surgical intervention is needed for patients with MP, as the long-term use of herbal medicine was suspected to be a causative agent for the occurrence of MP. The presence of MP can be confirmed by comparing the findings of CT and colonoscopy with the corresponding symptoms of intestinal disease. Therefore, the accurate diagnosis of MP is essential for determining whether MP is caused by intestinal disease. In conclusion, the occurrence of MP can be confirmed by comparing the findings of CT and colonoscopy with the corresponding symptoms of intestinal disease.
the cause of the disease, and we performed right hemicolectomy because the calcifications on CT were localized in the right colon.

4. Conclusion

We have reported a case of MP potentially caused by long-term use of herbal medicine. Limited colonic resection is usually indicated for MP caused by herbal medicine. Characteristic findings in CT and intraoperative findings can help to determine the optimal extent of intestinal resection in patients with MP that does not respond to conservative management.

Conflicts of interest

None.

Funding

None.

Ethical approval

This is not a research study, and ethical approval is not required.

Consent

Written informed consent was obtained from the patients for publication of this Case Report and any accompanying images.

Author contributions

Koya Hida performed the surgery. Nobuaki Hoshino wrote the draft. Suguru Hasegawa and Kenji Kawada revised it critically. Yosiharu Sakai approved it to be published.

Guarantor

Nobuaki Hoshino.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.ijscr.2016.05.051.

References


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