Editorial note
by W. E. Berdon on the following paper by R. M. Schisgall

This paper was the subject of considerable debate between editors and reviewers. It represents an admittedly controversial, even heretical point of view.

It is a radiologic paper written by a surgeon - he has chosen the topic of chronic abdominal pain in children and found a group he interprets as having appendiceal colic. He admits he really has not controls; his observations are based on operations with relief of previously unrelieved signs and symptoms.

Dr. Schisgall is a pediatric surgeon who is controversial in his own areas of specialization; he is trying to define a condition of colic without inflammation. This is not a paper on appendicitis due to retained barium; it is on appendiceal colic as the cause of the pain - colic due to inspissated material within the appendiceal lumen with partial obstruction.

We chose to publish it so that the reader may be aware of this point of view, and perhaps to try to see if the approach works. We anticipated a furor by accepting it.

Radiographic features of appendiceal colic in children

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Abstract. The concept of appendiceal colic was introduced in 1980 to explain the common problem of recurrent crampy abdominal pain (RAP) in children. Children with appendiceal colic often have inspissated casts of stool as foreign bodies of the appendix. The radiographic findings of 115 children operated upon for appendiceal colic have been reviewed. The radiographic features of this syndrome have included: filling defects of the appendix (83% incidence of inspissated casts of stool within the appendix); partial filling of the appendix (44% incidence of fecal casts); retained barium behind 72 h (92% incidence of fecal casts blocking egress of barium); non-visualization of the appendix (42% incidence of fecal casts); and distention of the appendix (100% incidence of fecal casts). The correlation of radiographic and operative findings will be presented. A rational approach to the radiographic workup of a child with RAP will be presented.

The concept of “appendiceal colic” was introduced in 1980 to help explain the continuing problem of recurrent crampy abdominal pain (RAP), often accompanied by right lower quadrant tenderness, frequently seen in children [1]. This syndrome represents the most common reason for otherwise unexplained recurrent crampy abdominal pain in children in this author’s experience. A review of the radiographic features of 115 children with appen-
Appendiceal colic was undertaken to familiarize radiologists with the radiographic features of this syndrome.

Since the radiologist often participates in planning the workup of children with recurrent abdominal pain, this article will also attempt to suggest a rational radiographic approach to children with unexplained abdominal pain and right lower quadrant abdominal tenderness so as to best visualize the appendix.

Appendiceal colic is characterized by recurrent episodes of crampy abdominal pain referred either to the peri-umbilical or right lower quadrant region, tenderness to deep palpation over the appendix in the right lower quadrant of the abdomen, radiographic features to be outlined, and most commonly, inspissated, non-calcified casts of fecal material found within the lumen of the appendix. Less commonly, appendiceal distention due to trapped air or secretions within a partially obstructed appendiceal lumen is seen. The diagnosis can be made by appropriate radiographic studies. Appendectomy has relieved abdominal pain in 95% of the children.

It is postulated that inspissated casts of stool are true foreign bodies of the appendix [1, 2]. Pain results from distention of the appendix by the foreign material, or from vigorous appendiceal contractions which attempt to extrude the foreign material. The common denominator of otherwise unexplained recurrent abdominal pain may be intermittent distention of the appendix as the organ contracts in an effort to empty itself of inspissated fecal material or trapped secretions.

Materials

One hundred and fifteen children with histories of recurrent abdominal pain or unremitting right lower quadrant pain were subjected to operation after appropriate radiographic and laboratory workup, and after an appropriate trial of medical and dietary management had failed to relieve their pain. All of these children had appendiceal tenderness on physical examination. Children with obvious inflammatory bowel disease or other intestinal, urologic, or gynecologic anomalies have been excluded from this study. Only the 115 children with negative workups and undefined abdominal pain will be considered. Gastroenterologists would refer to these children as having "irritable bowel syndrome."

The clinical population varied from 4 to 18 years of age. Two thirds were female, one third male. Duration of pain varied from 2 weeks to several years. Two thirds of the children complained of intermittent crampy abdominal pain, and one third of unremitting right lower quadrant pain. Medical management has consisted of high fibre diets, stool bulking agents, antispasmodics, and elimination of milk products from the diet. A 6-month trial of medical management in the child with chronic pain was attempted. Children with disabling pain were often operated upon after several weeks of illness. Indications for surgery have included: increasing severity of pain, increasing frequency of pain, increasing loss of time from school, continuous disability due to pain, and lack of response to pharmacologic and dietary management.

Laboratory studies

Several of these children have had elevated white blood cell counts at various times in their illness, but over 90% had normal leukocyte counts. Elevated sedimentation rates were not seen. Urine and stool studies had also been normal.

Histology

Sixty-eight appendices were histologically normal; 41 showed diffuse lymphoid hyperplasia; 5 showed focal areas of inflammatory infiltrate; and one showed a focal area of chronic inflammatory reaction. Appendices were thus essentially normal in 99 of the 115 children.

Radiographic findings

Since all of these children had right lower quadrant abdominal tenderness, our attention was focused on the appendix as a possible source of pathology. The radiographic appearance of the appendix thus became crucial to the diagnosis of appendiceal colic. The radiographic findings and operative correlates are presented in Table 1.

Normal appendices were described in 14 children. Filling defects of the appendix were seen in 53, non-visualization in 26, partial filling in 9, "normal" appendix in 14, and no comment in 3. Retained barium beyond 72 hours was seen in 13 children.

| Table 1. Radiographic features in appendiceal colic in 115 children |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| Finding         | No. of children | No. of children with fecal casts | No. of children with other foreign bodies | No. of children with trapped secretions |
| Filling defects | 53              | 44 (83%)          | 3               | 2               |
| Retained barium | 14              | 13 (92%)          | 1               | 1               |
| Non-visualization | 26              | 11 (42%)          | 1               | 6               |
| Partial filling | 9               | 4 (44%)           | 0               | 3               |
| Distention      | 2               | 2                 |                 |                 |
| "Normal" appendix | 14              | 9 (63%)           | 2               |                 |
| No comment      | 3               |                   |                 |                 |
| **Total**       | **121**         |                   |                 |                 |

Six children had more than one finding, e.g., filling defects and retained barium.