Eosinophilic Gastroenteritis

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SUMMARY: Eosinophilic gastroenteritis is an uncommon cause of abdominal pain which may mimic other causes of acute abdominal pain and result in unnecessary laparotomy. In many cases clues to the diagnosis are available prior to surgery; however a high index of suspicion must be maintained if the condition is to be identified at presentation. Two cases are described followed by a review of the disease entity.

Case Report One

A fit 23 year old infantry subaltern presented with a two week history of severe intermittent epigastric pain associated with vomiting. He had been investigated in another hospital as an inpatient where a diagnosis of gastritis had been made after upper gastrointestinal endoscopy and ranitidine 150mgs bd was prescribed; he had been discharged, clinically well, after ten days. He presented two days later with a recurrence of his pain associated with vomiting. His past medical history was unremarkable apart from a hypersensitivity reaction to penicillin; in particular there was neither a personal, nor a family history of atopy. He had visited Hong Kong several times in the past; his last visit had been over one year previously. The physical examination on admission revealed only epigastric tenderness.

The initial screening investigations consisting of full blood count, urea and electrolytes, liver function tests, ESR, urinalysis, chest and abdominal X-rays were normal apart from an absolute eosinophilia of $4.11 \times 10^9/L$.

He was investigated over the next three weeks culminating in laparotomy twenty-five days after admission. During this time his symptoms of intestinal obstruction waxed and waned dramatically such that he could be asymptomatic in the morning, writhing in agony with associated vomiting in the afternoon, only to settle completely within forty-eight hours. During this time his eosinophil count rose to a peak of $8.48 \times 10^9/L$ nine days after admission.

He developed ascites shortly after admission; analysis of the fluid revealed $11.64 \times 10^9/L$ (75%) eosinophils. No microfilariae were seen. The complement fixation tests for *Strongyloides stercoralis* and the stool analysis for ova, cysts and parasites were both negative.

Furthermore he had not responded to a five day course of thiabendazole in a dose of 25mg/kg bd. Upper gastrointestinal endoscopy with biopsies was performed on two occasions but revealed only non-specific gastritis. A CT scan of the abdomen revealed thickened loops of small bowel and ascites but these changes were non-specific. A barium meal and follow through examination revealed a very poorly motile segment of duodenum but no specific diagnostic features of either Crohn's disease or lymphoma. A superior mesenteric arteriogram was performed to exclude polyarteritis nodosa and this was normal as was his spiogram.

At laparotomy the serosal surface of the stomach was congested; the muscular coat of the antrum and pylorus was very thickened resembling infantile hypertrophic pyloric stenosis. The serosal surface of the small bowel was also congested, the wall was oedematous and rapidly went into spasm when handled. Full thickness biopsies of both pyloric antrum and omentum were taken. The postoperative course was uneventful apart from an allergic skin reaction to steristrip skin closures.

Histology of the pyloric antrum revealed normal muscle fibres surrounded by an eosinophilic exudate which extended into the subserosal zone in which the papillary blood vessels were markedly dilated; the mucosa was normal. The omentum was congested with swelling and proliferation of the serosal cells together with an eosinophilic infiltrate in both the fatty and fibrous tissues.

Treatment with prednisolone 45mgs daily was started on the fourth postoperative day, the patient made a rapid and uneventful recovery without a recurrence of his obstructive symptoms, and returned to his normal

weight. His eosinophil count fell dramatically to $0.11 \times 10^9/L$ the day after prednisolone was started. During follow up his steroid dose has been titrated against the eosinophil count and he has remained well over 6 months.

Case Report Two

A sergeant presented to the Field Surgical team in Belize with an acute abdomen following which an appendicectomy was performed. The appendix was normal, however, and his symptoms settled. He was evacuated to the Queen Elizabeth Military Hospital where over the following two days he developed symptoms and signs of small bowel obstruction which was confirmed by plain radiography. He had an absolute eosinophilia. A presumptive diagnosis of Crohn's disease was made and a laparotomy performed. This revealed a segment of narrowed and congested small bowel which was resected. He made an uneventful recovery.

Histological examination of the resected bowel revealed normal muscle fibres surrounded by a marked eosinophilic infiltrate. A retrospective history revealed that he had attended many beach barbecues in Belize where fish had been cooked, perhaps incompletely.

Discussion

Eosinophilic gastroenteritis is an uncommon condition with approximately 150 case reports in the world literature. First described by Kaijser in 1937(1) it predominantly affects young adults(2). The essential features are a peripheral blood eosinophilia, eosinophilic infiltration of some portion of the gastrointestinal tract (usually stomach or small bowel) and abnormalities of gastrointestinal function. The clinical manifestations are largely determined by the layer of gut involvement which led Klein et al to define three clinical pictures(3): if the disease is predominantly mucosal then diarrhoea, faecal blood loss, iron deficiency anaemia and protein losing enteropathy may occur; if the disease involves the muscle layer then obstructive symptoms predominate; and if serosal involvement is present then eosinophilic ascites is present(4). In case one there was clinical evidence of both muscular and serosal involvement (subacute obstruction and ascites respectively) and this was confirmed histologically, whilst in case two the disease was predominantly muscular.

When considering the diagnosis of eosinophilic gastroenteritis the important differential diagnoses to bear in mind are: intestinal parasitoses, lymphoma of the proximal gastrointestinal tract, Crohn's disease, gastric carcinoma and polyarteritis nodosa(5). The hypereosinophilic syndrome is a distinct entity characterised by peripheral eosinophilia and bowel infiltration together with widespread eosinophilic infiltration of heart, brain, lung and kidney with

associated organ damage. It is rapidly fatal if untreated(6) in contrast to the benign course of eosinophilic gastroenteritis.

The aetiology of eosinophilic gastroenteritis is unknown and theories fall into three categories. Firstly it has been suggested that it represents an allergic gastrointestinal response to a variety of allergens – a concept supported by a family and personal history of allergic disorders such as asthma, hayfever and hypersensitivity to drugs in 50-70% of patients(7,8). Several cases have been described where gastrointestinal symptoms have been exacerbated by a specific food challenge and responded to elimination diets(1,9). The concept of food allergy is by no means universally accepted however. Leinbach and Rubin(10) could produce appropriate symptoms in their patients with eosinophilic gastroenteritis when soya or steak challenges were given but they could not detect tissue eosinophilia in jejunal biopsies associated with the food challenges. An allergic reaction to intestinal parasites has also been proposed in two separate outbreaks. A Dutch report of twelve cases from the Rotterdam area in which the herring parasite *Eustoma rotundatum* was isolated(11) was followed by occasional subsequent cases in the UK(12). The symptoms occur after ingestion of raw or lightly salted herring (roll mops) containing larvae of the parasite. Presumably repeated exposure to the worm is required for sensitization to occur(8).

Recently *Ancylostoma caninum* has been implicated in an epidemic of ninety-three cases in Australia(13). In two of these cases the dog hookworm was identified and each of 38 patients specifically questioned described behaviour which could have exposed them to the infective larvae of this widespread dog parasite. Each patient treated with an antihelminthic responded dramatically although several subsequently relapsed, but all of these responded to a further course of mebendazole. This is in contrast to our first case who failed to respond to thiabendazole and in whom hookworms were not identified in the tissue removed at laparotomy.

The two remaining theories postulate that (i) eosinophilic gastroenteritis is caused by a specific infection because the illness is short-lived and non-recurrent and (ii) that it is a collagen disease, perhaps resembling polyarteritis nodosa – one report identified a sub-group of patients with eosinophilic gastroenteritis who also had a connective tissue disease(14). However there is little evidence to support either of these theories.

Corticosteroids remain the mainstay of treatment in eosinophilic gastroenteritis although there has not been a controlled trial to establish their efficacy. The dosages employed range from 20 to 40mg of prednisolone daily. Responses can be dramatic and a short course of 7 to 10 days usually produces clinical remission. The disease runs an intermittent course; most patients can be managed by intermittent short courses of steroids

although a small number may require maintenance steroid treatment(5). Sodium cromoglycate has been tried empirically in several patients; however the results have been mixed(5,7,15). The role of elimination diets has not been defined. A trial would seem justified in those patients where a specific food substance is incriminated. Skin testing for immediate hypersensitivity is an unreliable guide(3,5).

In conclusion, eosinophilic gastroenteritis is a self limiting condition which waxes and wanes so dramatically that infiltrate which blocks the antrum one day may disappear in the space of several days. In the mucosal form the diagnosis may be confirmed by endoscopic biopsy in most, but not all cases(7). The submucosal and serosal forms of the disease are more difficult to diagnose; however, a marked eosinophilia, a normal ESR and proximal intestinal obstruction are so suggestive that a trial of steroids is justified before proceeding to laparotomy in view of the characteristically rapid response. This should be a therapeutic trial during which the conditions forming the differential diagnosis outlined must be considered as the clinical picture evolves. In view of the recent Australian series implicating the dog hookworm, coupled with the considerable risk if *Strongyloides stercoralis* is present, a trial of thiabendazole prior to commencing steroids is recommended. Although eosinophilic gastroenteritis is rare, we feel justified in drawing the attention of Service doctors to this disease entity, of which we had been unaware, as it has presented at least twice in servicemen causing diagnostic difficulty on both occasions.

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