Gastric antral vascular ectasia or GAVE syndrome is an uncommon cause of gastrointestinal bleeding. It was first described by Rider, et al in 1953 (1) but was accurately defined by Jabbari, et al in 1984 (2). GAVE is more common in females than males with a ratio of 5:1, and is seen more commonly in the elderly. The mean age of presentation is 70 years. In large referral population of patients with obscure gastrointestinal hemorrhage, watermelon stomach accounted for 3.9% of cases.

PRESENTATION
Most commonly patients with GAVE present with iron deficiency anemia from chronic, slow bleeding. The lesions are painless, acute presentations like hematemesis and melena are not common. Typical physical exam findings reveal manifestations of anemia. The appearance on endoscopy brings the name “watermelon stomach” as it became known, relating its striped aspect to a watermelon peel.

Two main forms of GAVE have been described: The classic “watermelon stomach” with prominent erythematous streaks traversing the antrum and converging on pylorus. This condition is found in idiopathic cases, which is the most common cause of GAVE. It is also found in association with auto immune and rheumatological diseases such as systemic sclerosis and pernicious anemia and is seen more frequently in women (3).

There is second diffuse variety in which discrete angioma extend proximal to the antrum. This is associated with cirrhosis and portal hypertension and is found in 30% of the cases. There is no gender predominance associated with this form. GAVE syndrome can be distinguished from portal hypertensive gastropathy in that GAVE generally has more antral involvement and the classic features of GAVE syndrome including gastric ectasia, thrombi, increased spindle cell proliferation, and fibrohyalinosis may be seen on biopsy (4).
Portal hypertensive gastropathy (PHG) is associated with diffuse antral angiomas rather than the classic linear pattern. Most commonly the appearance is likened to that of a “snake-skin” mosaic pattern with red spots. However, in the setting of cirrhosis, GAVE syndrome can be difficult to differentiate from PHG. This distinction is paramount in that PHG generally responds to a reduction in portal pressures whereas those with GAVE syndrome and coexisting portal hypertension generally do not respond to such therapy. A study by Spahr, et al of cirrhotic patients with GAVE associated bleeding unresponsive to beta blockers demonstrated the futility of treating such patients with shunt procedures (5). Shortly after spahr’s study, Kamath, et al published their findings which further emphasized the point. They placed transjugular intrahepatic portosystemic shunts (TIPS) in thirty patients with mild PHG, ten with severe PHG and 14 with GAVE. They showed that approximately 75% of the patients with severe PHG responded to TIPS as shown by improvement in endoscopic findings and by a decrease in transfusion requirements; 89% of patients with mild PHG had endoscopic resolution. Patients with GAVE had neither endoscopic resolution nor a decrease in transfusion requirements after TIPS (6).

ETIOPATHOGENESIS
The occurrence of GAVE in patients with cirrhosis may be explained in part by the abnormal antral motility demonstrated in these patients (7). The lesions are often restricted to the antrum, the only gastric region subjected to peristaltic contractions. Affected antral mucosa appears abnormally mobile and loosely attached to the underlying muscularis propria as it would be if mucosa had been pulled from the underlying muscularis propria. Humoral factors have also been proposed such as hypergastrinemia (8), prostaglandin (9), proliferation of neuroendocrine cells containing serotonin and vasoactive intestinal polypeptide, but none have been conclusively proven.

Diagnosis is based on the clinical history and endoscopic appearance and while histologic findings of vascular ectasia with fibrin clots and fibromuscular hyperplasia of the lamina propria (9) are characteristic, they are not necessary to confirm the diagnosis. Sometimes watermelon stomach can be interpreted wrongly as refractory hemorrhagic antral gastritis. However, in contrast to gastritis, lesions of watermelon stomach typically are sharply demarcated with small margined red spots, and the vessels blanch with pressure and bleed freely on endoscopic biopsy (11,12). Despite the vascularity, endoscopic biopsy appears safe in that the lesions ooze some blood but do not result in severe bleeding.

Various disorders seem to be associated with watermelon stomach. In previous studies, autoimmune connective tissue diseases were present in approximately 60% of patients, particularly scleroderma (13) systemic lupus erythematosus (14) and atrophic gastritis with pernicious anemia (15).

TREATMENT
Patients should avoid agents that cause mucosal bleeding and irritation such as aspirin and NSAIDS, clopidogrel and over-the-counter agents such as gingko biloba.

The basic principle of all endoscopic treatments for watermelon stomach is safe and effective hemostasis of mucosal and submucosal ectasia. The goal is to reduce or possibly eliminate the need for blood transfusions. Coagulation of all arrays is necessary to achieve definitive hemostasis and often several treatment sessions are required to obliterate all antral ectasia (16).
Commonly used methods for endoscopic treatment for GAVE include heater probe, multipolar electrocoagulation, APC (Argon plasma coagulation) or laser therapy (17). In an initial phase when APC was used all patients showed a reduction of vascular ectasia pattern as reported by Probst, et al (18).

In a small, retrospective study, patients had an endoscopically observed response to therapy with APC and had a sustained rise in hemoglobin level after treatment. Transfusion dependence ceased in all patients. After a mean follow-up of 20 months, GAVE recurred in two patients. Both patients responded to further APC treatment. No major complications were recorded (19).

The success rates for eradicating watermelon stomach are much higher with the classic type and vary according to the type of therapy used and the center from which data was collected. With the diffuse form success rates are slightly lower, and recurrence rates are higher and depend on comorbid conditions such as cirrhosis and coagulopathies. The most common complications include secondary bleeding with APC and multipolar heater probe. Post-endoscopy treatment bleeding is generally secondary to treatment-related iatrogenic ulcerations, and patients generally are placed on antisecretory agents (Proton pump inhibitors) to promote ulcer healing and prevent iatrogenic rebleeding. Antral narrowing and contractures are reported after Nd: YAG (neodymium yttrium aluminium garnet) and hyperplastic polyps sometimes after both APC and Nd: YAG.

Contrary to portal hypertensive gastropathy, those diagnosed with GAVE syndrome frequently have chronic significant blood loss often resulting in transfusion dependency, unless the lesions are treated. Between 87%–100% of patients have stable hematocrits for up to two years after endoscopic procedures. Iron deficiency should be corrected with oral or parenteral iron. Packed red cell transfusion should be considered based on the individual’s severity of anemia and associated co-morbidities. Antrectomy prevents recurrent bleeding and is usually reserved for patients who fail endoscopic therapies. Combination estrogen and progesterone therapy decreased upper gastrointestinal bleeding in one report, although the ectatic vessels persisted (20).

In conclusion, GAVE has been recognized as a cause of gastrointestinal bleeding, though it is uncommon. It is important to accurately diagnose this condition and differentiate it from portal hypertensive gastropathy since the treatment and outcomes vary significantly.

References