High oesophageal web formation in association with heterotopic gastric mucosa (the gastric inlet patch): a small case series

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Background Upper oesophageal webs or rings have rarely been reported in association with heterotopic gastric mucosa (HGM).

Objective To describe the finding of oesophageal webs in association with HGM.

Design Small case series.

Setting Patients presenting with dysphagia to an open access hospital dysphagia clinic.

Patients Six cases were found.

Interventions Symptomatic improvement is demonstrated with oesophageal dilatation in symptomatic patients.

Main outcome measurements Symptomatic improvement.

Results The six cases which are described here demonstrate that a web or ring exactly matches the distribution of the heterotopic mucosa, can occur at both proximal and distal squamo-columnar junctions and the inlet patches may be multiple with multiple rings. A radiological double web sign is described.

Limitations A rare condition with a small number of patients.

Conclusions Effective treatment can be by oesophageal dilatation and acid suppression. The cause of web formation is thought to be due to heterotopic acid production and is analogous to the Schatzki ring.

Introduction

Heterotopic gastric mucosa (HGM) in the upper oesophagus or the gastric inlet patch is a well recognised finding in the upper oesophagus during endoscopy. It rarely causes symptoms but there have been isolated reports of web formation associated with them. Here we present six cases of web or ring formation associated with the squamo-columnar junction of a gastric inlet patch and postulate that they are caused by acid secretion and are in effect Schatzki rings.

Case reports

Case No 1

A patient had a 4 year history of increasing dysphagia to solids felt high in the chest. A barium swallow demonstrated a web-type of stricture high in the oesophagus and an endoscopic dilatation was performed figure 1. The patient represented 3 years later and a repeat endoscopy revealed a circumferential thin ring stricture 3 cm distal to the cricopharyngeus at the lower margin of a circumferential gastric inlet patch, the lumen through this was no more than 7 mm (figures 2–4). There was also a less severe ring formation at the upper margin of the inlet patch. A sequential through the scope balloon dilatation to 16 mm was performed which caused ring fracturing with an improvement in symptoms

Case No 2

A single episode of bolus obstruction at the level of the neck was experienced by this patient while eating beef. This lasted for some hours until intravenous buscopan was given at the local hospital emergency department. There were no further episodes. The patient subsequently admitted to lifelong problems with eating, being unable to swallow large tablets of pieces of food and always having to eat slowly. A barium swallow showed a circumferential web in the cervical oesophagus, the lumen of which measured 7 mm in diameter compared with 17 mm above and below (figure 5). At endoscopy, a circumferential area of gastric mucosal heterotopia 3 cm long was found with the web forming at the distal squamo-columnar margin of the gastric mucosa (figure 6). A 15 mm sequential balloon dilatation was performed without complication. At follow-up over 6 months later there had been no further dysphagia.

Figure 1 Case No 1: Radiographic swallow demonstrates both rings.

Figure 2 Case No 1: Circumferential heterotopic gastric mucosa with proximal and distal rings.

Case No 3

A patient presented with a several year history of intermittent but frequent episodes of high oesophageal

Figure 3 Case No 1: Narrow distal ring.

Figure 4 Case No 1: Narrow band imaging.

dysphagia to solids only with regurgitation of retained food. Symptoms of gastro-oesophageal reflux with an unpleasant taste in the mouth were present. Endoscopy revealed an unusual arrangement of high oesophageal webs. There were four of these arranged in two pairs, 1 cm apart, on opposite sides of the oesophagus, occupying a quarter of the oesophageal circumference. Between each pair was a gastric inlet patch exactly matching the webs circumferential extent (figures 7–9). A subsequent barium swallow was performed to assess the swallow and showed indentations into the cervical oesophagus corresponding to the webs seen at endoscopy (figure 10). After a trial of proton pump inhibitor (PPI) treatment produced no improvement, the patient had a 20 mm balloon

Figure 5 Case No 2: Ring on radiographic swallow.

Figure 6 Case No 2: Endoscopic view of gastric heterotopia abutting ring.

dilatation of the web area and was asymptomatic when reviewed 2 months later.

Case No 4

This patient was referred for a diagnostic upper gastrointestinal endoscopy for symptoms of a hoarse voice and sensation of the need to repeatedly swallow between meals. There was no dysphagia. Endoscopy revealed a 1 cm inlet patch which demonstrated web formation at the proximal and distal squamo-columnar junction (figures 11, 12). The webs were not considered

Figure 7 Case No 3: Double inlet patch and webs.

Figure 8 Case No 3: Four inlet patches in narrow band imaging.

to be related to the symptoms and no further action was taken.

Case No 5

A further patient presented with a few months' history of cervical dysphagia to solids, feeling that food was retained in the neck for some while. There was no previous history of gastrointestinal symptoms. Endoscopy demonstrated two gastric inlet patches lying in the upper oesophagus, opposite each other about 2 cm in length. These were circular in shape and the upper and lower margins both had a web formation figures 13,

Figure 9 Case No 3: Close view of patch with web.

Figure 10 Case No 3: Double web on radiographic swallow.

14. Biopsies of the gastric heterotopia found chronic inflammation in acid secreting gastric mucosa without intestinal metaplasia and she was given a trial of acid suppression. After 3 months on omeprazole the patient was much improved with no problems swallowing.

Case No 6

A globus type of syndrome with very occasional episodes of food sticking in the throat on swallowing was described by this patient. A contrast swallow demonstrated a thick web-type of protrusion into the right cervical oesophagus on the anteroposterior view, and

Figure 11 Case No 4: Small patch with minor ring.

Figure 12 Case No 4: Small patch with minor ring in narrow band imaging.

on right lateral view two small web-type indentations could be seen 3.5 cm apart (figure 15). A subsequent endoscopy found a 3 cm long gastric inlet patch involving a quarter of the circumference on the right lateral wall of the cervical oesophagus. At the distal margin of the patch there was a web causing a degree of narrowing and a lesser web at the proximal margin (figures 16, 17). The patient was relatively asymptomatic after investigation and no active treatment was given.

Case summary

This small series of cases was found over a 1 year period in patients attending a dedicated dysphagia clinic by a single endoscopist. This clinic reviewed between 250 and 300 patients per year over a 10 year period and while gastric inlet patches were seen on occasion, webs

Figure 13 Case No 5: Double patch with proximal and distal web formation.

Figure 14 Case No 5: Double patch with proximal and distal web formation in narrow band imaging.

or rings were not previously recognised. There were four males and two females with an age range of 38–84 years (mean 66.3 years). All had cervical oesophageal webs or rings associated with the HGM. Two patients had circumferential HGM; two single patches; two paired patches, one double (ie, four patches). The vertical length of the patches was between 1 and 3 cm. The cases are summarised in table 1.

Discussion

Oesophageal webs have been long recognised as causing dysphagia but also as asymptomatic lesions. The typical web is thin, horizontal and within the upper oesophagus, usually from the anterior wall. They are common and easily fractured by the passage of a bougie or even the endoscope when they may

Figure 15 Case No 6: Double web on radiographic swallow.

Figure 16 Case No 6: Inlet patch poorly seen on white light imaging.

not be recognised. The Plummer Vinson syndrome recognises a poorly understood association between cervical webs, dysphagia and iron deficiency anaemia. The Schatzki ring is a well recognised entity first described by Schatzki and Gary in 1953.¹ It is a thin mucosal ring which occurs at the squamo-columnar junction in the lower oesophagus and has squamous mucosa on the proximal edge and gastric mucosa distally. Its aetiology is uncertain but because it is usually found in association with a hiatus hernia it is thought that it may be caused by gastro-oesophageal reflux.

HGM or the inlet patch is a well recognised entity where ectopic gastric tissue is found in the upper oesophagus. It is probably underdiagnosed compared with Barrett's oesophagus, as this area of the oesophagus is poorly seen on endoscopic intubation and the colour contrast of the gastric ectopia to squamous mucosa is not large compared with that with Barrett's mucosa. We have found that HGM is more easily seen with narrow band imaging. Until now it has not been possible to recognise HGM by radiological studies. The prevalence of the inlet patch has been variously reported as occurring in 1.1–4.9% of patients.^{2 3 4 5} Akbayir and colleagues⁵ prospectively examined 660 patients attending for diagnostic endoscopy and found 11 patients with the inlet patch; the patch size ranged from 5 to 30 mm and was a twin patch in two patients. The inlet patch has been shown to secrete acid and behaves like gastric mucosa in the stomach, including acquiring *Helicobacter* infection. It is generally considered to be asymptomatic but *Helicobacter* infection has been found in 11% of cases² and adenocarcinoma has been described.⁶ The acid secretion from HGM may be a cause of the globus syndrome. This may have been the unrecognised cause of symptoms in case No 4 in this series. Bajbouj and Meining have shown that ablation

of gastric inlet patches with argon plasma coagulation was effective in alleviating globus sensations.^{7 8}

An upper oesophageal ring in association with ectopic gastric mucosa was first described in 1979 by Weaver.⁹ Since then there have been several single case reports of this association.^{10 11 12} Ward and Achem¹⁰ described a case in 2003 and reviewed the literature, finding 10 previous single case reports. In a comprehensive review of HGM in 2004, von Rahden and colleagues¹³ proposed acid to be the damaging agent in the pathophysiology of symptomatic oesophageal HGM by inducing chronic inflammation and ulceration with the subsequent healing process leading to the formation of strictures and webs. The Schatzki ring has long been thought to arise by the same processes where acid secreting gastric mucosa is adjacent to oesophageal squamous mucosa. HGM is congenitally acquired but the later age of presentation of symptoms with web formation in this series and previous reports¹¹ suggest that the webs themselves are acquired.

The formation of rings or webs which exactly match the circumferential extent of the inlet patch has not been described before and supports the concept that acid secretion by the HGM may be the cause, and suggests the same applies for the Schatzki ring. The ring can be at both the upper and lower extent of the patch, the latter being an inverse Schatzki ring. The mucosal ring does not appear to extend along the lateral margin. Webs or rings are rarely seen at the squamo-columnar junction in Barrett's oesophagus where the columnar mucosa is of the intestinal-type and does not secrete acid. Therefore, the inlet patch ring suggests the pathogenesis of a squamo-columnar ring is acid induced.

Dysphagia in patients with a HGM web may be due to the web itself but also due to acid secretion giving rise to a globus-type of symptom. A clear history may be able to differentiate between the two. Smaller webs are less likely to cause dysphagia but multiple webs and especially two on opposite sides of the oesophagus may do so. The inlet patch is very high in the oesophagus and there is no capacity to store the food bolus after swallowing and symptoms may occur with lesser degrees of narrowing than more distally in the oesophagus. In this small series, three of our six patients had oesophageal dilatation and

Figure 17 Case No 6: Inlet patch and webs seen with narrow band imaging.

Table 1 Case summary

Case No	No of inlet patches	Radial extent	Type of stricture	Treatment
1	1	Circumferential	Double ring	Dilatation
2	1	Circumferential	Single ring	Dilatation
3	4	Quadrantic in pairs	Multiple webs	Dilatation
4	1	1 cm	Double web	None
5	2	Quadrantic pair	Double web	PPI
6	1	Quadrantic	Double web	None

PPI, proton pump inhibitor.

all had symptomatic improvement. Of the remaining three, two required no treatment and one improved with PPI treatment; this was the only patient who had the HGM biopsied and the gastritis confirmed. The patients who had the most dysphagia and required dilatation were those with the most extensive ring formation; two had circumferential rings and the other multiple inlet patches and webs. A trial of PPI for symptomatic relief before oesophageal dilatation is suggested. It is unknown if web formation will recur after dilatation and consideration should be given to continued PPI treatment to prevent this if acid exposure to the adjacent squamous mucosa is the stimulus to fibrous web formation. Ablation of the inlet patch with argon plasma coagulation may be another treatment modality.

In this small series, five of six patients had a clear web at both the proximal and distal squamo-columnar junction and two of these were clearly seen on barium swallow. This radiological double web sign in the cervical oesophagus could be pathognomonic of the gastric inlet patch. (Since we already have the A and B ring nomenclature applied to rings at the lower oesophagus, this could be termed the AA ring or web.)

We have demonstrated a range of presentations and symptoms from a small series of patients related to inlet patches; the greater the size and number of patches with the associated webs, the greater the symptoms. They may or may not be associated with dysphagia, and can be successfully treated with dilatation.

Patients presenting with cervical dysphagia should have HGM and web or ring formation sought by careful proximal oesophageal endoscopy or contrast radiography.

Competing interests None.

Patient consent Obtained.

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