Journal of Pediatric Surgery (2013) **48**, 1633–1636

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Journal of Pediatric Surgery

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# Laparoscope-assisted diagnosis and treatment of prepyloric web in children—Report of three cases

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Received 31 January 2013; revised 20 March 2013; accepted 24 March 2013

**Key words:**
Prepyloric web;
Laparoscopy;
Infants

**Abstract** Prepyloric web is a rare diagnosis in pediatrics; only sporadic cases were described in the literature. Treatment is classically performed by open surgery; laparoscope-assisted diagnosis and treatment of prepyloric web in children have not been reported. Three cases with prepyloric web were diagnosed and treated by laparoscope-assisted procedure in our hospital from June 2009 to October 2010. There were no conversions to open surgery and no intraoperative various complications. After following up for 31–42 (mean 36.3) months postoperatively, the 3 infants remained asymptomatic and thriving. The early experiences suggest that the outcomes are excellent.


The clinical manifestation of prepyloric web depends on the degree of the gastric outlet obstruction, the consistency of ingested food, and the ability of the gastric motility to overcome the partial luminal web [1]. Usually, incomplete antral membranes were diagnosed at an older age (3–11 years) and exceptionally in adulthood [2]. Surgical treatment generally consists of excision of prepyloric web and pyloroplasty [3]. Three cases with prepyloric web were managed by laparoscope-assisted procedure in our hospital. In this paper we report our preliminary experiences to emphasize the advantages and feasibility of this procedure in infants.

## 1. Case report

### 1. Case 1

A 17-month-old male infant was admitted to the department of pediatric surgery with intermittent projectile vomiting for sixteen months. He had tolerated only milk and fluids since birth. The patient developed a progressive failure to thrive.

On physical examination, the abdomen was soft and non-tender, but no mass or organomegaly was palpated. A consecutive abdominal ultrasound of the pylorus showed neither external compression nor any other pyloric structural abnormalities. Abdominal X-ray on admission showed a dilated stomach. UGIT series was interpreted as compatible with gastric outlet obstruction, and prepyloric web was suspected. Endoscopy merely revealed narrowing of the gastric outlet. The reports mentioned that passing the endoscope beyond the obstruction was impossible.

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0022-3468/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.jpedsurg.2013.03.065

The laparoscopic approach was discussed with the patient's parents and formal consent was obtained for laparoscopy-assisted surgery under general anesthesia.

The infant was placed supine on the table; a 5-mm port was placed at the umbilicus for a 30° laparoscope. Dilatation of the stomach and weakened gastric peristalsis were seen by direct visualization. The observation caused strong suspicion for the existence of prepyloric web. The anterior wall of the distal gastric antrum was elevated by a transcutaneous stay suture. Longitudinal gastropylorotomy was made and prepyloric web with a central opening of only 3 mm was found. The web was resected and pyloroplasty was performed by transverse anastomosis laparoscopically with 5-0 PDF running suture (Fig. 1). Absence of leakage was confirmed by injection of 50 ml saline with Methylene blue through the nasogastric tube. Microscopic examination of the excised membrane showed hyperplastic mucosa and non-specific active inflammation. Follow-up contrast studies carried out half and one year after operation respectively, showed normal gastric emptying. The patient had been observed for 42 months with no further anemia or vomiting.

## 2. Case 2

A 9-month-old boy weighing 7.5 kg was admitted because of intermittent nonbilious vomiting since the age of 6 months. There was no history of failure to thrive and the infant was born normally at term. The mother had polyhydramnios during pregnancy. Clinical examination showed visible gastric peristalsis. Ultrasound revealed gastric retention but no pyloric hypertrophy or dilation in the duodenum. Contrast studies showed a dilated stomach and slow passage of barium into the duodenum. Endoscopy was performed but failed to reveal the true nature of the gastric outlet obstruction. Laparoscopic exploration was performed and prepyloric web with a central opening of about 5 mm was found by gastropylorotomy. The web was resected and pyloroplasty was performed under laparoscopy.

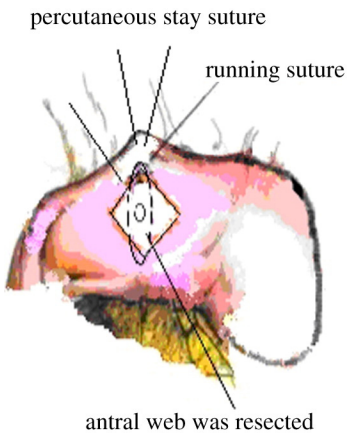


**Fig. 1** Longitudinal gastropylorotomy and pyloroplasty performed by running suture.

The postoperative course was uneventful. Follow-up contrast studies carried out twice half and one year after operation showed normal gastric emptying. And the patient was well after 3 years of follow-up.

## 3. Case 3

A 31-day-old, third-born boy was admitted to our hospital with nonbilious, projectile vomiting. The vomiting was intermittent, but progressive in frequency for the duration of 10 days. All antenatal ultrasound scans were normal with no evidence of polyhydramnios or distended stomach. Through physical examination, no pyloric "olive" was palpated. Chest and abdominal radiograph showed persistence of a distended gas-filled stomach. Ultrasound showed normal pylorus in the case and barium enema showed no abnormalities. An upper gastrointestinal contrast study confirmed the diagnosis of gastric outlet obstruction. Because the boy was only 31 days old, endoscopy was not performed.

The infant underwent laparoscopic exploration on day 34 of life under general anesthesia. The obstruction was visualized at the level of the gastric antrum secondary at surgery. Longitudinal gastropylorotomy proximal to pylorus was made and antral web was found. The web was resected and the pyloroplasty was closed by using 5-0 PDS running sutures. The child made an uneventful recovery and was discharged on the sixth post-operative day. Follow-up contrast studies half and one year after operation showed normal gastric emptying. The child remained asymptomatic and thriving during the following 31 months.

# 2. Discussion

Gastric outlet obstruction in childhood, which is not common, usually presents with non-bilious vomiting. Hypertrophic pyloric stenosis is the main cause of gastric outlet obstruction in infants up to the age of 3 months [4]. Congenital gastric outlet obstruction secondary to antral web represents only about 1% of all gastrointestinal tract obstructions [5]. Antral webs are thin, soft and pliable membranes composed of mucosa and submucosa of sufficient strength to resist manual dilatation, with a 2–3 mm orifice and located 1–3 cm proximal to the pylor-oduodenal junction [6]. There is a slight male predominance reported in the literature, as in our cases.

The suspicion of antral web usually occurs when the diagnosis of pyloric obstruction is made by a plain radiograph which reveals a large distended stomach with no air distal to it. Upper gastrointestinal radiographic studies may be helpful in diagnosis of this disease, and ultrasound has been shown to identify antral web when performed by a skilled operator [7]. Another diagnostic technique described in the literature was endoscopy. In theory, this method should be the conclusive modality in viewing the membrane