On-line Case Report

The acute surgical abdomen following Kyphoscoliosis corrective surgery

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Superior mesenteric artery syndrome or cast syndrome is a recognised and reported complication of Kyphoscoliosis correction in orthopaedic surgery but much less published in the general surgical literature. The purpose of this case report is to review and highlight the occurrence, presentation and management of this unusual cause of the acute abdomen presenting as a general surgical emergency.

Key words: Kyphoscoliosis correction – Acute abdomen – Superior mesenteric artery syndrome – Cast syndrome

In December 2003, a 14-year-old girl was referred via her GP with suspected appendicitis giving a 2-day history of colicky right sided abdominal pain and profuse vomiting. Her relevant past history included corrective scoliosis surgery for adolescent idiopathic scoliosis. An anterior spinal fusion T11–L3 and posterior spinal fusion T3–L3 had been performed 21 and 15 days previously, respectively. She had been discharged in a Scotchcast body cast. This surgery had been performed at a neurosurgical unit in another hospital.

On examination, she was flushed, tachycardic at 115 beats/min and pyrexial at 38.2°C. Her abdomen was soft with moderate generalised tenderness throughout and percussion tenderness in the epigastric and RIF region. Diagnosis was uncertain at this point. Ultrasonography demonstrated a large, left upper quadrant, fluid-filled viscus extending from high in the left upper quadrant to the pelvis on the left side and then across the midline to the right. In addition, there was a loop of dilated small bowel in the right upper quadrant. As a result of the ultrasound scan, an abdominal and chest X-ray were performed (Fig. 1) showing a large stomach with a fluid level. Fluoroscopy after oral

Figure 1 Abdominal and chest X-ray.

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Figure 2 Results following barium meal showing a relative delay in the passage of contrast between the second and third part of the duodenum.

Gastromiro (Bracco UK Ltd, Bucks, UK), confirming marked dilatation of the stomach. The clinical and radiological impression was that of high, small bowel obstruction. A nasogastric tube was inserted and trial of conservative management instituted. A barium meal was performed on day 3 which demonstrated a relative delay in the passage of contrast between the second and third part of the duodenum (Fig. 2); superior mesenteric artery syndrome was diagnosed. Large gastric aspirates continued and on day 5 a laparotomy was performed. The pre-operative findings were confirmed, the duodenum was mobilised from the retroperitoneum, transected and re-anastomosed anterior to the superior mesenteric artery. A combined nasogastric/jejunal tube was inserted and jejunal feeding commenced. She recovered uneventfully and was discharged home at 2 weeks, the delay being due to relative gastric atony.

Discussion

Superior mesenteric artery (SMA) syndrome or cast syndrome has been documented in the medical literature

since its first description by Rokitsansky 1842.¹ The condition is due to reduction of the normal angle between the SMA and aorta scissoring the third part of duodenum as it crosses the L3 vertebra. This is sometimes exacerbated by a congenitally short ligament of Treitz attached to the fourth part of the duodenum pulling the third part of duodenum more acutely into the SMA-aorta angle. Normally, retroperitoneal fat and lymphatic tissue hold the SMA off the spine and help prevent scissoring after spinal distraction.² Individuals who lack the protective fatty cushion are more vulnerable to SMA-aorta angle reduction. The reported classical profile is, therefore, that of the adolescent growth spurt, under weight and of tall stature²⁻⁵ as with our case. The condition can range from mild insidious symptoms of upper GI obstruction, nausea, vomiting and abdominal distension^{6,7} to acute and severe fulminant symptoms of perforation.⁸ Presentation is usually within the first 10 days following corrective spine surgery.^{3,4,9,10} However, presentation can be delayed up to 4 weeks from surgery⁸ as in our case. If, as usually happens, obstructive features

present before discharge then this rare cause of upper gastrointestinal obstruction is more frequently suspected early by spine surgeons. If the condition occurs a number of weeks after discharge and the patient presents at a different hospital in a toxic manor, the correct diagnosis may be delayed and result in gastric perforation. Investigations are limited to plain abdominal X-ray which usually shows grossly dilated stomach and fluid level; however, a contrast film series will invariably clinch it,^{2,4,5,9} as typified by our case. The management of these patients relies on early recognition of clinical signs and instigation of swift conservative measures, NG tube, I.V.I. hydration, electrolyte correction and enteral (NJ)/parenteral feeding is usually effective.^{3-5,9} Reports of the left lateral position or prone position has been reported as being beneficial.^{3,4,10-12} As seen in our case, failure of conservative management to resolve or further deterioration leads to surgical intervention^{3,9,10} The recognised surgical options include laparotomy and bypassing the obstruction by anastomosing duodenum to a proximal loop of jejunum (duodeno-jejunostomy),^{3,4,9,10} with division of ligament of Treitz^{4,9} or stomach to jejunum (gastrojejunostomy).^{3,4} More recently, the use of an endoscopic gastrointestinal stapler to perform a laparoscopic duodeno-jejunostomy has been described as a viable alternative.¹³

References

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