normal healthy children.⁴ The association between the fall in atrial natriuretic peptide concentration and decrease in body weight after volume reduction by haemodialysis suggests that in children volume expansion releases atrial natriuretic peptide. In preterm infants plasma atrial natriuretic peptide concentrations are considerably raised on the second day of life and decrease to normal within 2 or 3 weeks of age.⁵ Concentrations are raised in premature infants with increased sodium intake and are related to sodium excretion.⁶

The localisation of the sensor of atrial natriuretic peptide release has not yet been clearly defined in clinical studies. Interruption of left to right shunting and decreased left atrial distension by surgical closure of the patent ductus arteriosus seems to be a good clinical model in which to study mechanisms of atrial natriuretic peptide release in preterm infants. The immediate drop in plasma atrial natriuretic peptide concentration by 72% when the ductus is closed in preterm infants may indicate that atrial distension due to left to right shunting is responsible for increased atrial natriuretic peptide release in preterm infants with patent ductus arteriosus.

Raised plasma atrial natriuretic peptide concentrations in preterm infants with patent ductus arteriosus may help to preserve renal function and to antagonise the renal vasoconstrictor hormones that are raised in preterm infants with symptomatic patent ductus arteriosus. Although we did not measure renal function in the present study, indirect evidence (unchanged body weight and stable plasma concentrations of sodium, protein, and creatinine)

suggest that an appreciable reduction in urine flow did not occur in our preterm infants after closure of the ductus. This may be due to the fact that renal vasoconstrictor hormone concentrations fall at the same time and renal perfusion improves after abolishing the ductal steal phenomenon.

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Intestinal obstruction due to ingested Vaseline

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SUMMARY A case of intestinal obstruction due to ingested Vaseline (white soft paraffin) is described. While intestinal obstruction due to bezoars and impacted foodstuffs is uncommon, though well recognised, we know of no previous reports of obstruction caused by semisolid mineral matter.

Case report

A 13 month old girl was admitted having swallowed about 50 g of Vaseline. After confirmation from the

Regional Poisons Unit that this substance was non-toxic she was observed overnight and discharged home the next day, well and asymptomatic.

The following day she became irritable and unwell, began vomiting, and developed abdominal distension. She was readmitted to hospital four days later, having had no bowel action for two days. Her condition deteriorated and she was then transferred to this unit.

She was obviously unwell, with a temperature of 39°C; she was dehydrated and tachypnoeic with grunting, shallow respiration, and pronounced subcostal and intercostal recession. The abdomen was grossly distended and tympanitic with general

tenderness. Obstructive bowel sounds were present. The rectum was empty and dilated. An abdominal radiograph (figure) showed grossly dilated loops of small bowel. After vigorous resuscitation laparotomy was performed.

The entire small bowel was grossly dilated. The large bowel was slightly dilated and there were large clumps of tenacious, solid material in the caecum and transverse colon, but none in the small bowel. The mesenteric glands were enlarged and inflamed, but there was no perforation or peritonitis. The bowel was normally rotated and there was no evidence of intussusception, bands, or other causes of obstruction.

The small bowel was decompressed by retrograde stripping. A large amount of gas and bile stained fluid was aspirated through a nasogastric tube. The lumps of Vaseline in the caecum and colon were then milked distally to the rectum. The abdomen was closed and the Vaseline in the rectum washed out with saline through a rectal tube.

Her recovery was uneventful and she was discharged home on the ninth day, by which time she was feeding well and opening her bowels normally.

Figure Abdominal radiograph showing dilated loops of small bowel with opaque masses in caecum and right colon.

Discussion

Swallowing non-digestible foreign material is a common occurrence, especially in childhood. Most foreign bodies which reach the stomach will pass through the gastrointestinal tract without complications, and surgical intervention is required only in a few cases, even in small infants.¹

Complications that can arise from failure to pass a foreign body are ulceration, perforation, and obstruction. Ulceration and perforation occur with long, sharp objects. Intestinal obstruction due to ingested foreign material is less common, and usually occurs with bezoars when the amount of material is large and has accumulated over a period of time.^{2,3}

Vaseline is a British trade name for white soft paraffin that has been bleached. It is a non-toxic, purified, semisolid mixture of hydrocarbons obtained from petroleum, with a melting point of 38°–56°C,⁴ and was initially considered unlikely to cause any complications. The enlarged, inflamed, mesenteric glands found at operation suggest that there was an inflammatory response, perhaps as a result of impurities present in the Vaseline. This would account for the clinical signs of fever and abdominal tenderness.

We do not understand why the material (which was able to pass through the small bowel) should lodge in the caecum and colon where the lumen is greater and cause obstruction there. It is possible that absorption of water in the right colon (which is a physiological function) resulted in a tenacious combination of faecal material and Vaseline which proved too much for the bowel peristalsis.

Although not applicable in this particular case because the overt signs of obstruction with peritonism warranted urgent laparotomy, hyperosmolar contrast enema may be used to relieve intraluminal obstruction and should be considered so that laparotomy might be avoided.

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