The First Year of Life

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VOMITING

Vomiting in the newborn: types of vomit

Vomiting is the forceful expulsion of gastric contents through the mouth. Mothers often confuse vomiting with regurgitation, which is the effortless bringing up of small amounts of milk during and between feeds, usually accompanied by air. If the milk dribbles down the chest it is likely to be regurgitation. Babies often bring up small amounts of milk with air, and this is of no importance. Recurrent vomiting may be a sign of lethal disease, but a careful history and examination enable a diagnosis to be made with the minimum of special investigations.

Frothy mucoid vomit

Oesophageal atresia with tracheo-oesophageal fistula may present with vomiting, coughing, and cyanosis when the infant begins the first feed. Vomiting of *frothy* mucoid material may be the only definite observation, but the condition should be suspected in any baby who has *any* symptoms during the first feed. As the fluid expelled is not gastric contents, vomiting is not an accurate description but this is the term often used.

Bile-stained vomit

The vomit in infants with intestinal obstruction is usually yellowish-green due to bile staining. But occasionally it consists only of milk. The cause may be atresia, stenosis, or volvulus of the small gut, necrotising enterocolitis, or congenital intestinal aganglionosis (Hirschsprung's disease) of the large gut. Abdominal distension is usually present and there may be visible peristalsis. Plain radiographs of the abdomen in the erect, supine, and lateral positions should be taken immediately. They often show fluid levels, dilated loops of gut proximal to the obstruction, and the absence of gas shadows distally. Ideally, every infant who vomits bile should be seen by a surgeon within an hour.

Blood-stained vomit

Blood-stained vomit may be caused by trauma from a feeding tube, swallowed maternal blood, or, most seriously, haemorrhagic disease of the newborn. Trauma caused by a feeding tube may produce a few specks of blood in the vomit. Maternal blood may be swallowed before delivery after premature separation of the placenta or after delivery as the result of bleeding from a cracked nipple. Maternal haemoglobin in the vomit can be recognised in the laboratory.

Haemorrhagic disease of the newborn begins between the 2nd and 4th days of life. The first symptom may be haematemesis or melaena and the bleeding can be profuse. An immediate dose of 1 mg vitamin K₁ should be given intramuscularly and a transfusion of fresh blood given urgently if bleeding has been severe or persists after vitamin K treatment.

Milk

Vomiting of milk may be caused by infections, feeding problems, necrotising enterocolitis, intracranial haemorrhage, or drugs.

Gastroenteritis, urinary tract infection, septicaemia, and meningitis may all be associated with vomiting. A ravenous infant may swallow excessive air at the beginning of the feed, and if he is not properly "winded" he may later regurgitate milk with air. Larger feeds, more frequent feeds, or a larger hole in the teat is needed.

Necrotising enterocolitis has occurred in epidemics in special care baby units during the last 10 years. Lethargy and refusal of feeds are followed by vomiting and abdominal distension. In the majority of the infants there is melaena. Predisposing factors are prematurity, perinatal hypoxia, hypotension, umbilical vessel catheterisation, and prolonged rupture of the membranes. Embolism or thrombosis of mesenteric vessels is followed by ischaemic changes, which vary from mucosal ulceration to complete necrosis of the gut wall. Bacteria invade the necrotic tissue and healing is followed by scarring and sometimes a stricture. Despite optimal treatment there is a 25% mortality rate and early advice from a paediatric surgeon is advisable.

Raised intracranial pressure due to intracranial haemorrhage may cause vomiting of milk, as may several drugs, especially digoxin.

Vomiting from the 1st week to 1st year: causes

Feeding problems

Infections

- Urinary tract infection
- Septicaemia
- Meningitis

As in the newborn, vomiting in infants older than 1 week may be a symptom of a feeding problem or an infection such as urinary tract infection, gastroenteritis, septicaemia, or meningitis.

If no cause of the vomiting is found and the symptoms are mild, urine should be collected for microscopy and culture and should be examined for protein, bile, and reducing substances.

Pyloric stenosis

Pyloric stenosis must be considered in every infant less than 3 months of age who vomits. Rarely the vomiting may occur in the first week of life, but it usually begins in the 2nd or 3rd week, though there may be a delay before the infant is seen by a doctor. Usually the vomit is produced forcefully and reaches some distance from the infant. The infant often accepts another feed immediately after vomiting. Stools are infrequent. If the symptoms have been present for more than a few days there will be loss of weight due to dehydration and loss of subcutaneous fat. Scanty urine is associated with dehydration.

The essential diagnostic sign is the presence of a pyloric mass palpated during a test feed. Constant practice is needed to appreciate a pyloric mass. Even if no pyloric mass is felt during the first test feed if the diagnosis of pyloric stenosis is probable the infant should be admitted for rehydration and the examination repeated. Preliminary aspiration and measurement of gastric contents is helpful.

Intestinal obstruction

Any infant who vomits greenish-yellow bile is likely to have intestinal obstruction. He should be admitted immediately and seen by a surgeon within an hour. Abdominal distension is often present and peristalsis may be visible. Duodenal stenosis usually presents during the first few days of life but malrotation of the gut with associated volvulus may produce symptoms at any time during childhood.

An inguinal hernia is more likely to incarcerate in the early months of life than later. Incarceration should be suspected if the hernia is tender or is not reduced easily, and immediate surgery is required. The risk of obstruction is always present and early surgical treatment is advisable in every baby with an inguinal hernia. The baby must remain in the ward until the operation is performed.

Whooping cough

Vomiting may be so severe in infants with whooping cough that the mother is more worried by the vomiting than the cough. During the first five days of the illness (catarrhal phase) there is a short dry nocturnal cough. Later, bouts of 10 to 20 short coughs occur day and night. The cough is dry and each cough is on the same high note or goes up in a musical scale. The long attack of coughing is followed by a sharp indrawing of breath, which causes the whoop. Some children with proved pertussis infection never develop the whoop. Feeding often provokes a spasm of coughing and this may culminate in vomiting. Afterwards there is a short refractory period during which the baby can be fed again without provoking more coughing. In uncomplicated cases there are no abnormal signs in the respiratory system.

Lobar collapse

It may be possible to isolate *Bordetella pertussis* from a pernasal swab, which is cultured immediately after being taken. A lymphocyte count of over $10 \times 10^9/l$ in the presence of a normal erythrocyte sedimentation rate suggests whooping cough. A seven-day course of oral erythromycin or ampicillin reduces the infectivity of the patient but usually does not affect the course of the disease if vomiting has already started. Symptomatic treatment such as promethazine, salbutamol, or phenobarbitone is often used to try to reduce the cough but usually has little effect and the parents can be consoled only by being told that the vomiting will eventually stop. If there are abnormal signs in the respiratory system, the child becomes generally ill, or the cough persists longer than six weeks, a chest radiograph is necessary to exclude the secondary complications of bronchopneumonia or lobar collapse, which need treatment with physiotherapy and antibiotics. If the coughing attacks are severe admission to hospital may be necessary. Ideally, an infant should be admitted with his mother to an isolation room on the children's ward.

Appendicitis

In this age group appendicitis is extremely difficult to diagnose and perforation often occurs before the diagnosis is made. The infant looks extremely ill and has considerable abdominal distension and tenderness.

Rare causes of vomiting

The adrenogenital syndrome (salt-losing type) commonly presents with vomiting as the only symptom in boys. The diagnosis is easier in girls as virilisation of the external genitalia will have been noticed at birth. Symptoms usually begin between the 7th and 10th days and may be fatal within a few days if extra salt and salt retaining adrenocorticosteroids are not given. Intravenous fluids are essential. The diagnosis is confirmed by high plasma potassium, low plasma sodium, and raised urinary 17-oxosteroid concentrations. The 11-oxygenation index is another confirmatory test which can be performed by some laboratories and has the advantage that only a random specimen of the urine is required. Even so, the serum electrolyte concentrations are normal at birth, and pronounced changes may occur suddenly.

In hiatus hernia, which may present at any age, there is often a history of vomiting from birth and the vomit is occasionally blood stained. All the other causes of vomiting should be excluded before considering this diagnosis; it can be confirmed by a barium swallow examination. Vomiting usually diminishes when the infant is nursed prone on a firm surface at an angle of 30° - 45° with the head higher than the trunk.

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The photograph of visible peristalsis was reproduced from *Neonatal Surgery* by kind permission of Professor P P Rickham and Butterworths.