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# Case Study: Persistent Vomiting in an Infant

Kim Bookout

Texas Woman's University

# Case Study: Persistent Vomiting in an Infant

## Subjective Data

### *Patient Profile*

#### *Identifying Factors*

The patient is a one month old term male who presents to the primary care office for assessment of spitting up, diarrhea and diaper rash. He is accompanied by both parents.

### *Background Information*

#### *Chief Complaint*

The infant has had vomiting for 2 days with some diarrhea and diaper rash.

#### *HPI*

The patient presents following spit-up or emesis that progressively worsened over the previous three days. Mother reports the infant began to spit up on Friday and Saturday with more forceful emesis on Saturday and Sunday. (The visit day is Monday). She has been breast feeding and supplementing with milk-based formula since birth. Breastfeeding has been with some difficulty due to inverted nipples. Mom reports never having felt engorged and feedings have lasted from 30-90 minutes every three hours with a continued need for supplementation. She met with the lactation consultant following the two-week well exam due to the infant's failure to thrive. (At 7 lb. 12 oz. he failed to get back to birth weight of 8 lb. 2oz.)

On this visit mom reports that the infant has had some back arching over the weekend but had no fever. He was seen at a pediatric urgent care over the weekend but was diagnosed with a viral illness and sent home.

#### *Past Medical History*

*Illnesses:*

1. Jaundice
2. Failure to thrive
3. Congenital hip dysplasia
4. Erythema toxicum

*Allergies:* NKDA

*Surgeries:* None

*Medications:* None

*Birth:*

Patient was a term infant born via spontaneous vaginal delivery to a 33 year old, G3 P1→2 mother. APGARs of 9/9. The infant had meconium staining with rupture of membranes on delivery and was noted to have transient tachypnea of the newborn (TTN) and was briefly transferred to the neonatal intensive care unit. He was 8 lb. 2 oz. at birth with a discharge weight of 7 lb. 11 oz on day 2 of life. Transcutaneous bilirubin measurement (TCB) at 37 hours was 9.4 and at 48 hours, 8.0. He was given his first Hepatitis B vaccine on day two of life. The infant was discharged home with mom on day two of life.

*Health Maintenance:*

1. Well exam, 3 days old, TdaP for dad, ultrasound hips, stat bilirubin
2. Well exam, 13 days old, total and direct bilirubin, referral to lactation consultant (FTT), supplement after nursing
3. Weight check, 16 days old, weight gain 12 oz in 3 days, bilirubin check

*Social History*

The infant lives with his mother and father in a single family home in Flower Mound, Texas. He has one half-sister who is 13 years old and lives in Florida. His mother is going to stay home with him for two years before she returns to work. He is not exposed to passive smoking. He sleeps for approximately two hours between feedings. The infant is insured through his father's policy through his employer.

*Family History*

The patient was born to a G3 P1→2, 33 year old caucasion female. His father is 39 years old and has no other children. His half sister (through maternal side) is 13 years old and lives in Florida with her biological father. The patient's father has a history of seasonal allergies. His half sister has asthma. His paternal grandmother was diagnosed with hypertension prior to age 50 years and his paternal grandfather has hypercholesterolemia. The remaining family history is negative for deafness, heart disease, anemia, liver disease, diabetes, epilepsy, mental illness and immunodeficiencies.

*Review of Systems*

*General health:* Mom reports infant is playful and alert despite vomiting post feedings. Denies fever. Weight 9 lb 6 oz (increase of 14 oz in 14 days). Some back arching has been noted after feedings.

*Skin/Hair/Nails*: Erythema toxicum resolved. No jaundice. Diaper rash.

*HEENT:* No congestion, excessive tearing or eye discharge. No oral lesions. Good latch.

*Neck/Lymph*: No lumps in neck. No swelling.

*Breast*: No nipple discharge

*Chest/Lungs*: No coughing, grunting, nasal flaring. No retractions.

*CV*: No edema or cyanosis.

*Peripheral vascular*: Capillary refill <2 seconds.

*GI*: Nursing every 2 to 3 hours for 15 minutes on each side with supplementation of milk-based formula two to three times daily. Non-projectile, non-bilious, emesis increasing over the past 3 days with two to three episodes of diarrhea.

*GU:* Urinary output 6 to 8 wet diapers per day.

*Endocrine*: No fever or temperature instability. Weight gain at 1 oz per day (normal rate).

*M/S:* Moves all extremities equally. Raises head slightly when prone. No hypotonia.

*Neurological*: Blinks in reaction to bright light. Responds to sound.
*Psychiatric:* Mom and dad are very anxious. Appear overwhelmed with newborn care. No history of psychiatric illness for either parent.

## Objective Data

### *Physical Exam*

*Vital Signs:*
Ht: 22" (50th percentile) Weight: 9lb 6oz (50th percentile) FOC: 37.2cm Temp: 97.7
HR: 140bpm RR: 30/min

*General:* 4 week old well developed well nourished male in no acute distress. Playful and active on exam.

*Skin/Hair/Nails*: Warm to touch. Pink. Mild excoriation to convex areas of buttocks. No skin breakdown noted in inguinal folds.

*HEENT*: Anterior fontanelle soft and flat. Atraumatic normocephalic. Red reflex noted bilaterally. Pupils equal round and reactive to light. Nose is clear. No congestion. No oral lesions noted. Tympanic membranes clear bilaterally.

*Neck/Lymph*: Supple. No lymphadenopathy.

*Chest/Lungs*: Clear to auscultation bilaterally. No increased work of breathing.

*CV*: Capillary refill <2 seconds.

*Abdomen:* Soft, non tender, nondistended, normoactive bowel sounds, no hepatosplenomegaly, no masses, no CVA tenderness

*Breasts*: Not examined

*M/S*: Moves all extremities equally. No hypotonia. Warm to touch and well perfused. 2+ pulses.

*Genitalia*: Testicles down (bilaterally).

*Rectal:* Deferred.

*Psychiatric:* Alert, playful. Responds appropriately to stimuli.

*Previous Lab/Studies:*

Newborn Screen 1st Test: Normal

| | | |
|---|---|---|
| Newborn Screen 2nd Test: | Normal | |
| Total Bili/Direct Bili (72 hrs): | 10.6mg/dL/0.42 mg/dL | (0.1-1.2/0.00-0.40) |
| Total Bili/Direct Bili (13 days): | 15.5mg/dL/0.62 mg/dL | |
| Total Bili/Direct Bili (16 days): | 10.2mg/dL/0.63mg/dL | |
| Ultrasound Hips (5 days): | Mild Shallow Appearance of R hip with mild laxity with maneuvers. No frank dysplasia. Recommend reevaluation at 2 months of life. | |

Discussion of Findings

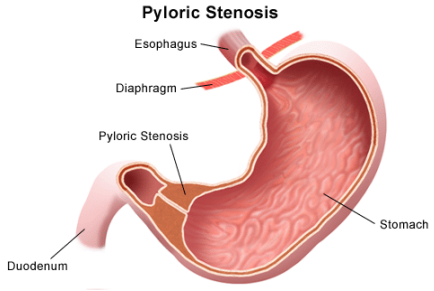
The infant presents with a 3 day history of spit up progressing to non-projectile, non-bilious emesis following most feedings. He has no fever or hypothermia. He has had 2 episodes of diarrhea. He has been breast fed with milk-based formula supplementation since birth. He has had some back arching. Mom reports consuming 1-3 servings of dairy daily. He has no palpable abdominal mass and the abdomen is soft without tenderness. He has mild diaper area skin breakdown without inguinal fold involvement or satellite lesions.

*Assessment/Impressions*

1. Milk Protein Allergy
2. Pyloric Stenosis
3. Diaper dermatitis

Pyloric stenosis (postnatal muscular hypertrophy of the pyloris) occurs in 1-8 per 1000 births (See Figure 1). It affects males four times more frequently than females. There is a positive family history in as many as 13% of infants diagnosed with pyloric stenosis (Hay, Levin, Sondheimer, & Deterding, 2009). The etiology is unknown but it appears that genetics and environment both have roles in its development (Schmedel, Ashe, & Kuznicki, 2009).

Figure 1. Pyloric Stenosis




www.schneiderchildrenshospital.org/peds_html_...

*Differential Diagnosis:*

1. Gastroesophageal Reflux
2. Acute Gastroenteritis
3. Overfeeding

*Plan*

*Laboratory Tests:*

1. Fecal Occult Blood: Heme Positive

*Diagnostic Tests:*

1. Pyloric Ultrasound: Abnormally thickened and lengthened pyloris.

*Health Maintenance:*

Up to date.

*Medications:*

Vusion Cream. Apply to perineal area q diaper change. Use until 2 days p rash clears.

Trial Prevacid 15mg ODT ½ tab po q day pending outcome of pyloric ultrasound.

*Education:*

The parents were informed about the infant's positive fecal occult blood. Therefore, the concern for milk protein sensitivity is increased. Thus, mom was instructed to remove all dairy

from her diet to reduce transfer of milk protein into breast milk. Supplementation should be with an elemental formula and samples of Alimentum® were provided.

Parents were also instructed regarding the possible diagnosis of pyloric stenosis. A brief overview of the surgical procedure and prognosis were provided. Both parents verbalized understanding. Further, parents were instructed regarding the ultrasound procedure. And, although GER was discussed and samples of Prevacid were provided, the parents were instructed to delay beginning Prevacid until after further diagnostic testing was performed. The infant was sent immediately for a pyloric ultrasound. The radiologist called with results and parents were instructed by telephone to proceed to Medical City Children's Hospital for direct admission by the pediatric surgeon. Plans were made with the surgeon for the child to undergo surgery on the same day following a direct admission to the hospital.

*Referral:*

1. Pediatric surgery

*Follow-up and Continuity of Care*:

Surgical intervention was performed the same day of diagnosis. He was hospitalized for less than 48 hours with full feedings by 12 hours post-op. He was seen for routine well-care visit at 5 ½ weeks of age and exhibited no signs of colic or GERD. Weight gain was at ½ oz. per day (9 lb. 12 oz.). He was breast feeding and being supplemented with 2 to 2 ½ oz of Alimentum® twice daily and experiencing no spit up or emesis. Stools were loose but with no blood. The mom reported having a "new" baby since he had no spit up or emesis since surgery. She was tearful as she expressed her gratitude to our office for being aggressive in the treatment and work-up of her child. Two and one-half weeks following surgery the infant was seen due to an increase in spit up and back arching behavior. The infant was started on Prevacid 15 mg ODT ½

tablet bid with a plan to refer to gastroenterology if Prevacid is ineffective. Additional plans were made to thicken feedings with Simply Thick or rice cereal. Incidentally, mom was noted to have post-partum depression on this visit. One week later the infant was seen for routine two month well child visit and was noted to have increased fussiness with persistent spit up worse with Alimentum® supplementation than with breast feeding. His stool was hemoccult negative. At this point, colic was considered part of the differential diagnosis. He was sent for a second pyloric ultrasound to confirm results of the previous surgical procedure. No recurrence of pyloric stenosis or hypertrophy was found. The formula was changed from Alimentum® to Neocate® for supplementation. A hip ultrasound was ordered to follow-up previous hip click finding which was negative for hip dysplasia.

*Discussion:*

*Milk protein allergy.* Milk protein allergy and milk protein intolerance is responsible for gastrointestinal symptoms in as much as 50 to 80% of infants under the age of one year (Ewing & Allen, 2005). Symptoms of milk protein intolerance develop within the first four weeks of life and include diarrhea, vomiting, bloody stools, failure to thrive, and fussiness. Milk protein intolerance occurs in approximately 3% of infants in developed countries (Ewing & Allen). Children with milk protein intolerance improve once the milk protein is removed from the diet. This is unlike infants with GER or pyloric stenosis who continue to exhibit vomiting, fussiness, and failure to thrive despite removal of cow milk protein. Diagnostic testing for milk protein allergy (vs. intolerance) should is carried out only to determine the necessity for epinephrine to be “on hand” in the home. Otherwise, treatment is the same for both. Removal of the milk protein from the breastfeeding mother’s diet is essential to the plan of care. The first line therapy for infants with milk protein intolerance is to use a soy based formula. If symptoms persist,

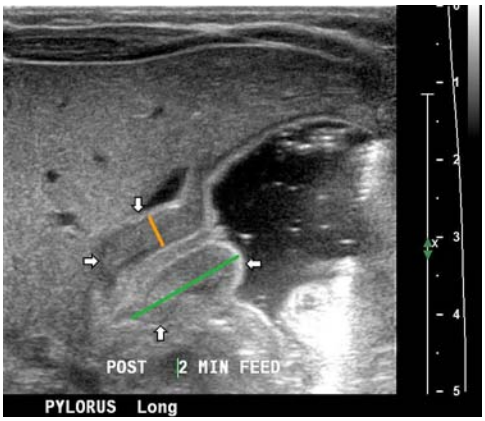
second line therapy is to use an extensive hydrolyzed formula such as Alimentum® or Nutramigen®. A small percentage of infants will be intolerant to the elemental formulas and must use the third line therapy of amino acid formulas such as Neocate® (Berseth, Mitmesser, Ziegler, Marunycz, & Vanderhoof, 2009).

*Pyloric Stenosis.* Infants with pyloric stenosis are reported to begin vomiting as early as two weeks but tend to show increase in frequency and severity between four and six weeks. Infants appear hungry and nurse vigorously but are often fretful, constipated and exhibit weight loss. Often an olive-shaped mass is palpable at the right upper abdomen. This mass is felt in only a small portion of patients. Infants with pyloric stenosis present similarly to those infants with Gastroesophageal Reflux Disease (GERD). Both may have fussiness. However, infants with GER tend to have spit up instead of forceful vomiting. Babies with pyloric stenosis tend to have a poor weight gain while those with reflux (non-severe) tend to gain weight easily. Gastroenteritis is among the differential diagnosis due to the presence of diarrhea. However, milk protein sensitivity or allergy is more likely the cause for this symptom in this infant due to the presence of blood in the stool.

Repair of pyloric stenosis is surgical via a pyloromyotomy. Infants who have had prolonged vomiting are likely to have electrolyte imbalances that must be corrected prior to the surgical intervention. Thus, surgical repair is not considered emergent. The pyloromyotomy consists of an incision lengthwise to the mucosa for the entire length of the pyloris. Figure 2 shows a pyloric stenosis that is unrepaired. This can be carried out through laparoscopy or open procedure although laparoscopic is becoming the preferred method (Lange, Rey, & Dominguez Fernandez, 2008). In a retrospective analysis of 157 patients who underwent pyloromyotomy (129 open and 28 laparoscopic), researchers found that the patients who underwent laparoscopic

repair experienced less time in the operating room (25 minutes versus 34 minutes), experienced shorter recovery times, and were discharged in 3.5 days versus 7 days for the open procedure (Lange et al.).

Figure 2. Ultrasound of unrepaired pyloric stenosis.




www.radpod.org/2007/01/07/pyloric-stenosis/

*Diaper dermatitis*. Diaper dermatitis is a common finding in infants with diarrhea. It is the most common skin disorder of infancy (Bookout, 2008). Diaper dermatitis is caused by a reaction between enzymes in stool and urine. Infants who are breast fed have a lower frequency of diaper dermatitis than those who are formula fed due to a higher stool pH and increased enzymatic activity (Bookout). Treatment for diaper dermatitis includes the use of zinc oxide based products, petrolatum based products, and, if necessary, antifungals when a candidal infection is diagnosed. In order to diagnose a candidal infection, the clinician evaluates for a confluent rash with satellite lesions not sparing the inguinal folds. Conversely, irritant dermatitis is typically present on the convex surfaces only and treatment with a zinc oxide is sufficient (Bookout). If, however, the rash is present longer than 72 hours, candidal infections are isolated in as much as 80% of isolates and antifungals must be initiated (Bookout). Thus, prescribing a combination product is an appropriate alternative in patients who have a prolonged diaper dermatitis that is unresponsive to routine, over-the-counter products such as Desitin®.

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