Management of Upper Gastrointestinal Bleeding in Children: Variceal and Nonvariceal

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KEYWORDS

• Upper gastrointestinal bleeding • Hematemesis • Coffee-ground emesis
• Nonvariceal bleeding • Variceal bleeding • Therapeutic endoscopy

KEY POINTS

- It is vital to obtain a detailed history to evaluate for the possible cause behind upper gastrointestinal (UGI) bleeding, paying close attention to comorbid conditions, medications, and exposures in addition to the severity, timing, duration, and volume of bleeding.
- Physical examination, laboratory evaluation, and trending vital signs are important in assessing for possible sources of UGI bleeding and can help differentiate between a medical (GI) or surgical case as well as the need for appropriate resuscitation.
- Acid suppression with proton-pump inhibitors is recommended to minimize bleeding and the risk of rebleeding, particularly in the intensive care setting.
- For nonvariceal bleeding, various endoscopic modalities, such as injection, cautery, and mechanical therapy, can be used to control bleeding.
- Endoscopic variceal ligation or banding is the modality of choice for esophageal varices and has been used with good success, but pediatric research and data are lacking.

INTRODUCTION

Upper gastrointestinal (UGI) bleeding can generally be defined as bleeding proximal to the ligament of Treitz, which leads to hematemesis.[1] More specifically, an UGI bleed is often characterized by vomiting bright red blood or coffee ground–like emesis. Melena, characterized by black, tarry stools, can also be a manifestation of UGI bleeding.

In the pediatric population, UGI bleeding has been noted to account for up to 20% of all GI bleeding in children.[1] In the critical care setting, a large prospective study

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noted 6.4% of pediatric intensive care unit (PICU) admissions were secondary to UGI bleeding.[2] Further study of the risk factors for UGI bleeding in critical care settings, such as the PICU, have found that comorbid conditions (ie coagulopathy, pneumonia, multiple trauma, and so forth) increase the risk for pediatric UGI bleeds, particularly in patients not given prophylactic therapy.[3–5] Fortunately though, as noted by a recent study looking at emergency department data, most children presenting for care with UGI bleeds do not require hospitalization or intervention.[5]

CAUSE

Common and unusual causes of UGI bleeding depend on patient age, as noted in **Table 1**.[6–10] In addition, there may be geographic variability that can dictate the need for endoscopy (ie, prevalence of *Helicobacter pylori*). Outside of the United States, variceal bleeding may be more common in children, increasing their likelihood of requiring endoscopy and/or intervention to ensure hemostasis.[11] For example, schistosomiasis is a common infection in many parts of the developing world that can lead to periportal fibrosis, cirrhosis, and portal hypertension without overt hepatocellular injury. In areas where schistosomiasis is prevalent, such as sub-Saharan Africa and Southeast Asia, hepatic infestation and the possibility of variceal bleeding needs to be considered when presented with a patient with UGI bleeding. In these children, liver chemistries may return as normal and the singular presenting issue may strictly be the hematemesis.[11–13]

NEONATES

In the first few months of life, UGI bleeding is uncommon; however, it can still occur.[14,15] The most common cause of UGI bleeding in newborn infants is swallowed maternal blood from breastfeeding. An Apt test can be done to differentiate maternal blood from fetal blood by denaturing adult hemoglobin with sodium hydroxide (NaOH) causing a color change.[16,17]

Another consideration in this age group is vitamin K deficiency, particularly in babies born outside of the hospital setting and/or not receiving vitamin K prophylaxis at birth.[18] In severely ill newborns, stress gastritis and ulcers can also occur.[2–4] Coagulopathy

Table 1
Common and rare causes of pediatric UGI bleeding by age group

Neonates	Infants/Toddlers	Older Children/Adolescents
Swallowed maternal blood	Foreign bodies	Mallory-Weiss tears
Vitamin K deficiency	Mallory-Weiss tears	Ulcers/gastritis
Stress gastritis/ulcers	Ulcers/gastritis (NSAIDs, critically ill)	Esophagitis (ingestions, pill, and so forth)
Congenital anomalies (intestinal duplications, vascular anomalies)	Esophagitis (caustic ingestions)	Varices
Coagulopathy (infections, liver failure, hematologic issues, and so forth)	Varices	Rare: Dieulafoy, telangiectasia, AV malformation, parasites, and so forth
Milk protein intolerance (lower GI bleeding more common)	Rare: Dieulafoy, telangiectasia, AV malformation, parasites, and so forth	—

Abbreviations: AV, arteriovenous; NSAIDs, nonsteroidal antiinflammatory drugs.