

TABLE 345-2 MANAGEMENT OF ANTITHROMBOTIC DRUGS BEFORE ENDOSCOPIC PROCEDURES

Drug	Bleeding Risk of Procedure	Management	Interval Between Last Dose and Procedure	Comments
Warfarin	Low ^a	Continue	N/A	Ensure that INR is not supratherapeutic
	High ^b	Discontinue	3–7 days (usually 5), INR should be ≤ 1.5 for procedure	Consider bridging therapy with heparin ^c
New oral anticoagulants (dabigatran, rivaroxaban, apixaban)	Low ^a	Continue	N/A	
	High ^b	Discontinue	Varies from 1 to 5 days, depending on the drug and the patient's renal function	Bridging therapy generally unnecessary
Heparin	Low ^a	Continue	N/A	
	High ^b	Discontinue	4–6 h for unfractionated heparin	Skip one dose if using low-molecular-weight heparin
Aspirin	Any	Continue	N/A	Low-dose aspirin does not substantially increase the risk of endoscopic procedures
Aspirin with dipyridamole	Low ^a	Continue	N/A	
	High ^b	Discontinue	2–7 days	Consider continuing aspirin monotherapy
Thienopyridines	Low ^a	Continue	N/A	
	High ^b	Discontinue	5 days (clopidogrel or ticagrelor), 7 days (prasugrel), 10–14 days (ticlopidine)	Consider bridging therapy with aspirin

^aLow-risk endoscopic procedures include esophagogastroduodenoscopy (EGD) or colonoscopy with or without biopsy, endoscopic ultrasound (EUS) without fine-needle aspiration (FNA), and endoscopic retrograde cholangiopancreatography (ERCP) with stent exchange. ^bHigh-risk endoscopic procedures include EGD or colonoscopy with dilation, polypectomy, or thermal ablation; percutaneous endoscopic gastrostomy; EUS with FNA; and ERCP with sphincterotomy or pseudocyst drainage. ^cBridging therapy with heparin may be considered for patients discontinuing warfarin who are at high risk for thromboembolism, including those with mitral valve replacement or aortic valve replacement with other risk factors; those with nonvalvular atrial fibrillation with a history of stroke, embolic event, cardiac thrombus, or CHADS₂ score ≥ 4 ; and those with venous thromboembolism within the past 3 months or severe underlying thrombophilia.

Source: TH Baron et al: *N Engl J Med* 368:2113, 2013; MA Anderson et al: *Gastrointest Endosc* 70:1060, 2009; MJ Zuckerman et al: *Gastrointest Endosc* 61:189, 2005.

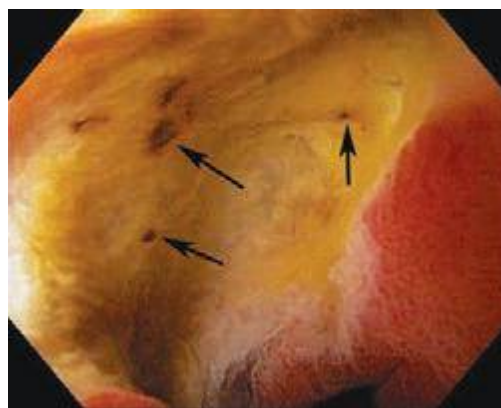
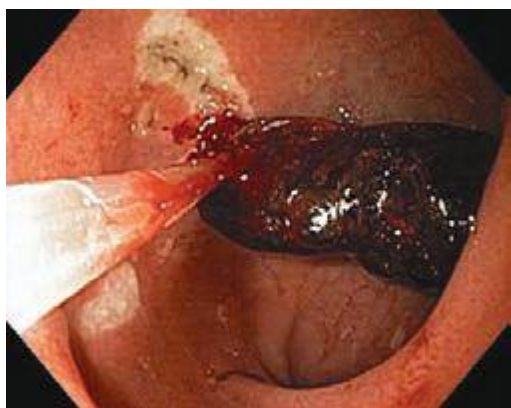
**A****B****C****D****E**

FIGURE 345-21 Stigmata of hemorrhage in peptic ulcers. **A.** Gastric antral ulcer with a clean base. **B.** Duodenal ulcer with flat pigmented spots (arrows). **C.** Duodenal ulcer with a dense adherent clot. **D.** Gastric ulcer with a pigmented protuberance/visible vessel. **E.** Duodenal ulcer with active spurting (arrow).