



Early Warning Signs of a Vascular Complication After PCI via Femoral Access

Multiple factors can lead to a bleed after a PCI. It is important that clinicians detect the early warning signs of a bleed. The following table* provides the most common vascular site complications, descriptions, clinical findings and management.

Complication	Definition	Associated Risks	Signs	Diagnostics	Treatment
Hematoma Incidence: 5-23%	<p>The localized blood-filled soft tissue swelling is the most common vascular access site complication.</p> <p>It may happen if puncture is below the femoral bifurcation.</p> <p>Occurs with blood loss at arterial and/or venous access site or arterial/venous perforation</p>	<p>Associated with groin pain at rest or with leg movement</p> <p>Can cause drop in hemoglobin and blood pressure with tachycardia</p>	<p>Visible swelling around puncture site</p> <p>Palpable skin hardening around puncture site</p>		<p>Apply pressure to the site</p> <p>Mark area to evaluate for change in size</p> <p>Hydration</p> <p>Serial CBC</p> <p>Bed rest</p> <p>Stop anticoagulant and antiplatelet medications if necessary</p> <p>May need blood transfusion</p> <p>May need surgical evacuation if serious</p> <p>Many resolve within a few weeks</p>
Retroperitoneal Hemorrhage Incidence: 0.15-0.44%	<p>Bleeding posterior to the serous membrane lining (the retroperitoneum) the abdominal wall and pelvis that may result from puncture below inguinal ligament leading to suprainguinal arterial or posterior wall perforation</p>	<p>Can be fatal</p>	<p>Moderate to severe back pain</p> <p>Ipsilateral flank pain</p> <p>Vague abdominal/back pain</p> <p>Ecchymosis with decreasing hemoglobin and hematocrit are late stage signs</p> <p>Hypotension and tachycardia</p>	<p>CT diagnosis</p>	<p>Hydration</p> <p>Serial blood cell counts</p> <p>Bed rest</p> <p>Stop anticoagulant and antiplatelet medications if necessary</p> <p>May need blood transfusion</p> <p>May need surgical evacuation</p>
Pseudoaneurysm Incidence: 0.5% - 9%	<p>A disruption and dilation of the arterial wall creating a communicating tract between tissue layers. Often occurring between one of the weaker femoral artery walls leading to blood flowing into the tissue</p> <p>May result from arterial cannulation dysfunction, inadequate compression after sheath removal, impaired hemostasis and femoral puncture below the bifurcation</p>	<p>At risk for rupture leading to abrupt swelling and severe pain</p> <p>If pain seems greater than hematoma size, consider nerve compression that can lead to limb weakness</p>	<p>Large, ecchymotic painful, pulsating swelling at insertion site</p> <p>Bruit/thrill heard in the groin</p>	<p>Ultrasound diagnosis</p>	<p>Bed rest</p> <p>Small pseudoaneurysms are monitored and likely to spontaneously close after anticoagulant therapy discontinuation</p> <p>Larger ones treated by ultrasound-guided compression, surgical intervention or ultrasound-guided thrombin injection</p>

This tool is a part of the Bleeding Risk Toolkit available through the ACC Quality Improvement for Institutions program on CVQuality.ACC.org. Reviewed and updated 10/2018 by the ACC Reduce the Risk: PCI Bleed Campaign Steering Committee.



<p>Arteriovenous Fistula Incidence: 0.2% - 2.1%</p>	<p>A direct connection between an artery and a vein that happens when both are punctured such as when sheath is removed</p>	<p>Risk increases with: multiple attempts, high or low punctures and impaired clotting</p> <p>Distal arterial insufficiency and/or DVT can lead to limb ischemia</p> <p>Can be asymptomatic</p>	<p>Swollen, tender extremity</p> <p>Continuous bruit and/or thrill present at access site</p>	<p>Ultrasound Confirms</p>	<p>Some will need ultrasound-guided compression or surgical repair</p>
<p>Arterial Occlusion/Emboli Incidence: <0.8%</p>	<p>Thromboembolic block of an artery</p>	<p>Most common sources are mural thrombus from cardiac chambers, vascular aneurysms and vascular atherosclerotic plaques</p> <p>Catheter tip or sheath site are points for thromboembolic development</p> <p>Anticoagulation, vasodilators and close follow-up can prevent development</p>	<p>Pain Paralysis Parasthesias Pulselessness Pallor Poikilothermia/coolness</p>	<p>Use Doppler to localize Angiogram needed to identify exact occlusion site</p>	<p>Smaller thromboemboli in well-perfused areas may spontaneously lyse.</p> <p>Larger ones may need thromboembolectomy, surgery and/or thrombolytic agents</p> <p>Distal embolic devices such as filters may be needed</p>

Merriweather, N. "Managing Risk of Complications at Femoral Vascular Access Sites in Percutaneous Coronary Intervention". Critical Care Nurse Vol 32, No 5 Available at <http://www.aacn.org/wd/cetests/media/c1253.pdf>. Accessed August 1, 2015