Splanchnic Vein Thrombosis: Consensus Statements of Panel 8

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Aetiological Work-Up in Primary Thrombosis of the Portal Venous System or Hepatic Venous Outflow Tract

8.1 For patients with primary thrombosis of the splanchnic veins in the absence of cirrhosis, close collaboration with subspecialists is recommended for complete work-up for prothrombotic factors and systemic diseases (A,1). (Changed)
8.2 Various combinations of risk factors for thrombosis can be present so that identification of one risk factor does not deter from a complete work-up (A,1). (New)
8.3 In all adult patients, myeloproliferative neoplasia (MPN) should be searched for by testing for V617F JAK2 mutation in peripheral blood (A,1). (Unchanged)
8.4 In patients with undetectable JAK2 V617F mutation, consider additional investigations for MPN, including somatic calreticulin and JAK2-exon12 mutations, and next-generation sequencing (A,1). (Changed)
8.5 In all adult patients with primary thrombosis of the splanchnic veins without MPN driver mutation, bone marrow biopsy should be discussed in collaboration with haematologists to rule out MPN, irrespective of blood cell counts. Bone marrow biopsy should be considered particularly in patients without major risk factors for thrombosis (B,2). (Changed)

Budd–Chiari Syndrome—Definition

8.6 Budd–Chiari syndrome (BCS) is the consequence of an obstruction to the hepatic venous outflow. Obstruction can be located from the level of the small hepatic veins to the level of the entrance of the inferior vena cava into the right atrium (A,1). (Unchanged)
8.7 BCS is the preferred designation for any primary hepatic venous outflow tract obstruction (HVOTO) (D,1). (New)
8.8 BCS is considered secondary when the mechanism for venous obstruction is extrinsic compression, for example, by a benign or malignant tumour. BCS is considered primary otherwise (A,1). (Changed)

Budd–Chiari Syndrome—Diagnosis

8.9 BCS presentation and manifestations are extremely diverse so that the diagnosis must be considered in any patient with acute, acute-on-chronic, or chronic liver disease (A,1). (Changed)
8.10 BCS is diagnosed by the demonstration of an obstruction of the venous lumen, or by the presence of hepatic vein collaterals together with the absence of patent hepatic veins (A,1). (Unchanged)
8.11 Liver biopsy should not be performed to diagnose BCS when vascular imaging demonstrates obstruction of the hepatic venous outflow tract (B,1). (Unchanged)

8.12 Liver biopsy is necessary to diagnose BCS if obstruction of the small hepatic veins is not seen on imaging (B,1). (Changed)
8.13 In patients with BCS, hepatic nodules are frequent and most often benign. However, HCC may occur and therefore patients should be monitored with periodic imaging and alpha-fetoprotein measurements. (B,1). (Changed)
8.14 A 6-month interval can be proposed for periodic imaging (C,1). (New)
8.15 It is still unclear which ultrasonography or magnetic resonance imaging should be used for periodical imaging screening (C,1). (New)
8.16 Patients developing nodules should be referred to centres experienced in managing BCS (D,1). (Unchanged)
8.17 Characterization of the nodule may first include magnetic resonance imaging using hepatobiliary contrast agents (C,1). Biopsy of the lesion is indicated for a definitive diagnosis of hepatocellular carcinoma (C,1). (New)

Budd–Chiari Syndrome—Management

8.18 Management of BCS should be undertaken using a stepwise approach including anticoagulation, angioplasty/stent/thrombectomy/thrombolysis, TIPS and orthotopic liver transplantation, at experienced centres (B,1). (Unchanged)
8.19 Long-term anticoagulation should be given to all patients with primary BCS (B,1). (Changed)
8.20 Because of the increased risk of heparin-induced thrombocytopenia, the use of unfractionated heparin is generally not recommended and may only be reserved for special situations (e.g. glomerular filtration rate < 30 mL/min, pending invasive procedures) (D,2). (New)
8.21 Stenoses that are amenable to percutaneous angioplasty/stenting (short length stenoses) should be actively looked for and treated accordingly (B,1). (Unchanged)
8.22 TIPS insertion should be attempted by operators with specific experience in BCS when angioplasty/stenting/thrombectomy/thrombolysis is not feasible, and when the patient does not improve on medical therapy including anticoagulants (B,1). (Unchanged)
8.23 Consider improvement as a combination of several of the following outcomes: decreasing rate of ascites formation, decreasing serum bilirubin, serum creatinine and INR when elevated (or increasing factor V in patients receiving vitamin K antagonists) (D,1). (New)
8.24 BCS-TIPS Prognostic Index score can be used to predict outcomes in patients in whom TIPS insertion is considered (B,1). (Changed)
8.25 Liver transplantation should be considered in patients with uncontrolled clinical manifestation despite a stepwise approach, or in patients with high BCS-TIPS Prognostic Index score (>7) before TIPS placement (C,1). (Changed)
8.26 In patients with BCS presenting as acute liver failure, urgent liver transplantation should be considered. Emergency TIPS should be performed, if possible, independently of listing for liver transplantation (C,1). (New)

Portal Vein Thrombosis and Portal Cavernoma in the Absence of Cirrhosis—Definition

8.27 Portal vein thrombosis is characterized by the presence of a thrombus in the portal vein trunk or its branches. Portal cavernoma is a network of porto-portal collaterals that develops as a consequence of prior portal vein obstruction (D,1). Obstruction leading to cavernoma is mostly related to thrombosis in adults, but less likely so in children and young adults (B,1). (Changed)

8.28 Portal vein thrombosis should be distinguished by imaging tools from the extravascular compression of the venous lumen by a neighbouring space-occupying formation (D,1). (New)

8.29 Cirrhosis and/or malignancy should be ruled out and other underlying liver diseases (e.g. PSVD or other chronic liver diseases) should be investigated (D,1). (Changed)

Portal Vein Thrombosis and Portal Cavernoma in the Absence of Cirrhosis—Diagnosis

8.30 For diagnosis of portal vein thrombosis or cavernoma, Doppler ultrasound, CT or MR angiography should demonstrate solid intraluminal material not showing enhancement after injection of vascular contrast agents; or a network of porto-portal collaterals, respectively (B,1). If diagnosed by Doppler ultrasound, confirmation with contrast-enhanced CT or MR angiography is needed (D,1). (Changed)

8.31 A standardized documentation (as proposed in Table 55.1) of the initial site, extent degree of luminal obstruction and chronicity of clot formation is

Table 55.1 Recommended standardized nomenclature for the description of portal vein thrombosis and portal cavernoma in both the clinical and research setting [18]

Feature	Definition
Time course	
Recent	PVT presumed to be present for <6 months
Chronic	PVT present or persistent for >6 months
Percent occlusion of main PV	
Completely occlusive	No persistent lumen
Partially occlusive	Clot obstructing >50% of original vessel lumen
Minimally occlusive	Clot obstructing <50% of original vessel lumen
Cavernous transformation	Gross Porto-portal collaterals without original PV seen
Response to treatment or interval change	
Progressive	Thrombus increases in size or progresses to more complete occlusion
Stable	No appreciable change in size or occlusion
Regressive	Thrombus decreases in size or degree of occlusion

required to allow subsequent evaluation of the spontaneous course and/or response to treatment (D,1). (New)

8.32 Portal vein thrombosis and portal cavernoma in adults are frequently associated with one or more risk factors for thrombosis, which may be occult at presentation and should be investigated (B,1). (Unchanged)

8.33 In patients with portal vein thrombosis following abdominal surgery or pancreatitis, invasive procedures (e.g. bone marrow biopsy and liver biopsy) should be discussed on an individual basis considering the expected low diagnostic yield in such populations and the risk of morbidity associated with these procedures (C,2). (New)

8.34 If the liver is dysmorphic on imaging or liver tests are persistently abnormal, liver biopsy and HVPG measurement are recommended to rule out cirrhosis or PSVD (B,1). Liver stiffness by TE may be useful to exclude cirrhosis, although precise cut-offs cannot be proposed yet (C,2). (Changed)

Portal Vein Thrombosis and Portal Cavernoma in the Absence of Cirrhosis—Management

8.35 In the absence of cirrhosis, recent portal vein thrombosis rarely resolves spontaneously. Therefore, anticoagulation should be started at a therapeutic dosage immediately at diagnosis (B,1). (Changed)

8.36 Because of the increased risk of heparin-induced thrombocytopenia, the use of unfractionated heparin is not generally recommended and may only be reserved for special situations (e.g. glomerular filtration rate < 30 mL/min, pending invasive procedures) (D,2). (New)

8.37 As a primary treatment option for recent portal vein thrombosis in the absence of cirrhosis, start with low molecular weight heparin and switch to vitamin K antagonists when possible (B,1) (Changed). DOACS can be considered as the primary option in selected cases in the absence of the so-called 'triple positive' anti-phospholipid syndrome, although data are limited (C,2). (New)

8.38 Anticoagulation should be given for at least 6 months in all patients with recent portal vein thrombosis in the absence of cirrhosis (B,1). (Unchanged)

Recent Portal Vein Thrombosis in the Absence of Cirrhosis—Management

8.39 After 6 months, long-term anticoagulation is recommended in patients with the permanent underlying prothrombotic state (B1) and should also be considered in patients without an underlying prothrombotic state (B,2). (New)

8.40 If anticoagulation is discontinued, D-dimers <500 ng/mL 1 month after discontinuation may be used to predict a low risk of recurrence (C,2). (New)

8.41 In patients without cirrhosis who do not develop complications of recent portal vein thrombosis, despite the absence of portal vein recanalization, interventions other than anticoagulation are not required (B,2). (Changed)
8.42 A follow-up contrast-enhanced CT scan should be performed 6 months after recent portal vein thrombosis (C,1). (New)
8.43 Because of the risk of recurrence of splanchnic vein thrombosis, patients need to be followed up, irrespective of anticoagulation discontinuation (C,1). (New)
8.44 The risk of intestinal infarction and organ failure is increased in patients with recent portal vein thrombosis and (i) persistent severe abdominal pain despite anticoagulation therapy, (ii) bloody diarrhoea, (iii) lactic acidosis, (iv) bowel loop distention, or (v) occlusion of second-order radicles of the superior mesenteric vein. Therefore, a multidisciplinary approach with early image-guided intervention, thrombolysis and surgical intervention should be considered in referral centres (C,2). (New)

Past Portal Vein Thrombosis or Cavernoma in the Absence of Cirrhosis—Management

8.45 In patients with past portal vein thrombosis or cavernoma, including those with incomplete resolution of recent portal vein thrombosis at 6 months, long-term anticoagulation is recommended in patients with a permanent underlying prothrombotic state (B,1) and should also be considered in patients without an underlying prothrombotic state (B,2). (New)
8.46 No data are available to recommend or discourage anticoagulation in childhood-onset past portal vein thrombosis or cavernoma in the absence of an underlying prothrombotic state (C,1). (New)
8.47 In patients with past portal vein thrombosis or cavernoma not yet receiving anticoagulants, anticoagulation should be started after adequate portal hypertensive bleeding prophylaxis has been initiated in patients with high-risk varices (C,2). (Changed)
8.48 Mesenteric-left portal vein bypass (Meso-Rex operation) should be considered in all children with complications of portal cavernoma, and these patients should be referred to centres with experience in treating this condition (B,1). (Unchanged)
8.49 Patients with refractory complications of portal vein thrombosis or cavernoma should be referred to expert centres to consider percutaneous recanalization of the portal vein or other vascular interventional procedures (C,1). (New)

Treatment of Portal Hypertension in EHPVO

8.50 There is insufficient data on whether beta-blockers or endoscopic therapy could be preferred for primary prophylaxis of portal hypertension-related bleeding in patients with past portal vein thrombosis or cavernoma. Guidelines for cirrhosis should be applied (C,2). (Changed)

8.51 Oesophageal variceal band ligation can be performed safely without withdrawing vitamin K antagonists (C,2). (New)
8.52 All patients in whom thrombosis have not been recanalized should be screened for gastroesophageal varices within 6 months of the acute episode. In the absence of varices, endoscopy should be repeated at 12 months and 2 years thereafter (B,1). (Unchanged)
8.53 In patients with acute portal hypertension-related bleeding, recommendations for patients with cirrhosis may be applied (D,1). (Changed)
8.54 Based on the recommendations for cirrhosis, combination of non-selective beta-blockers and band ligation is recommended for secondary prophylaxis (D,1). (New)

Research Agenda

Budd–Chiari Syndrome

- Risk factors for hepatocellular carcinoma in patients with BCS
- Non-invasive diagnosis of hepatocellular carcinoma in patients with BCS
- Short-term (8 days) evolution criteria predicting a good mid-long-term outcome (i.e. criteria for 'treatment response') in patients with BCS

Portal Vein Thrombosis Without Cirrhosis

- Predictors of development, progression and spontaneous resolution of PVT
- Influence of beta-blockers on the natural history of PVT
- Effect of early recanalization using interventional radiology or TIPS vs. fibrinolytic agents and/or anticoagulants in patients with recent PVT
- Efficacy of anticoagulation in children/young adults with PVT on recanalization and on prevention of progression of PVT
- Pathophysiology and management of cytopenia in patients with non-cirrhotic portal hypertension