Medisch Spectrum Twente

Vascular liver diseases

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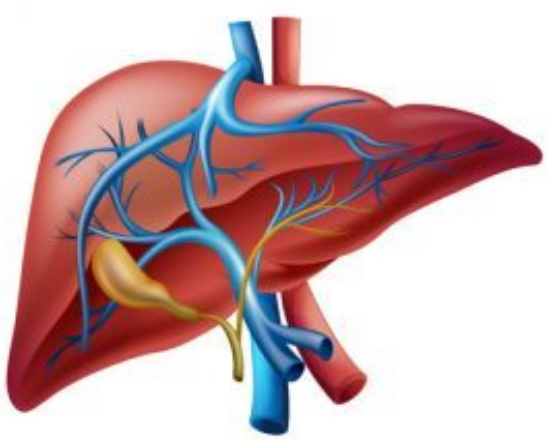


Learning objectives

> Vascular liver diseases

- Thrombotic events + consequences

Diagnostic work up

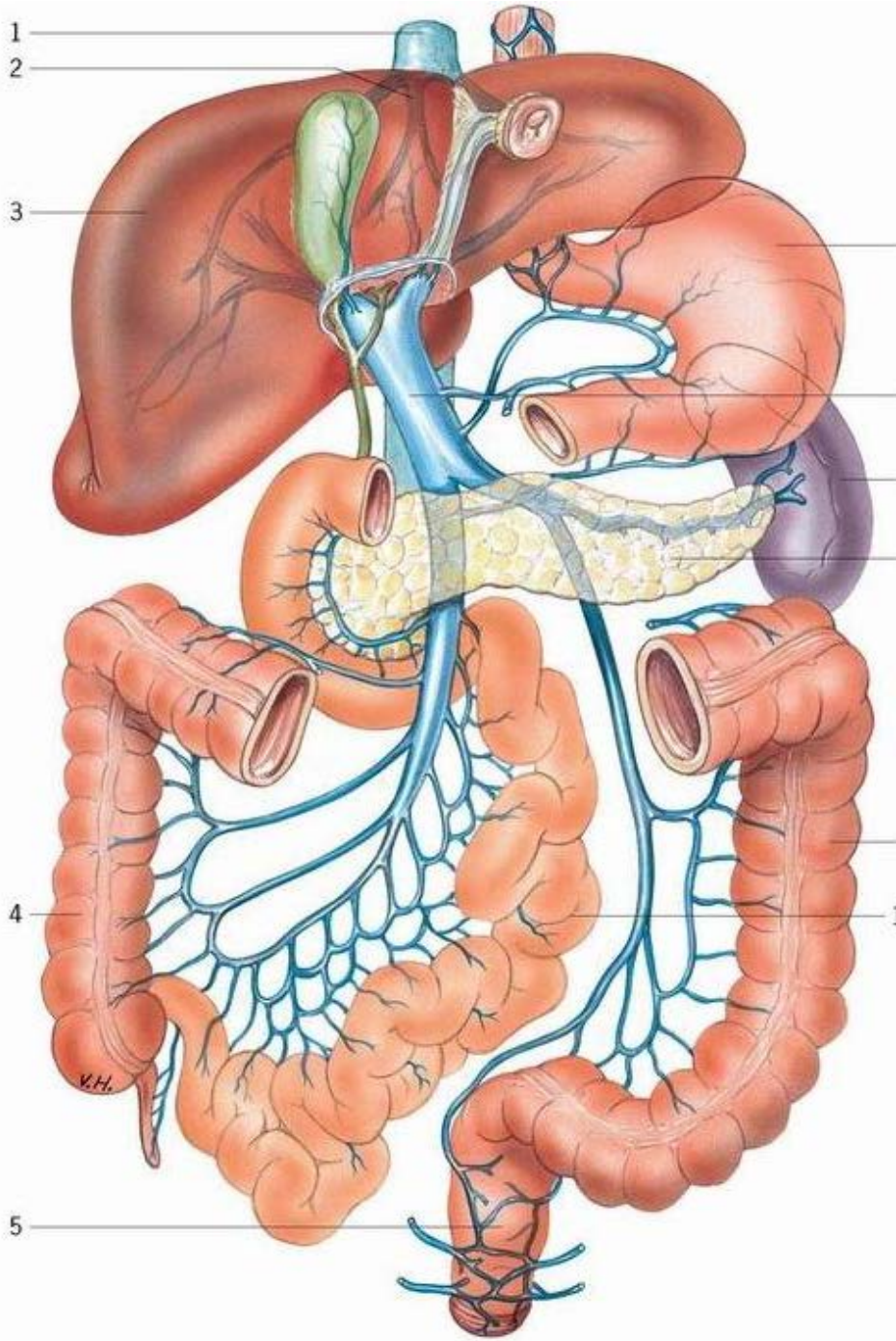
Treatment

Liver

- **Liver only organ with a dual blood supply**
  - Liver artery: 30%
  - Portal vein: 70%

- **Portal vein delivers:**
  - 1.5 liter / blood per minute

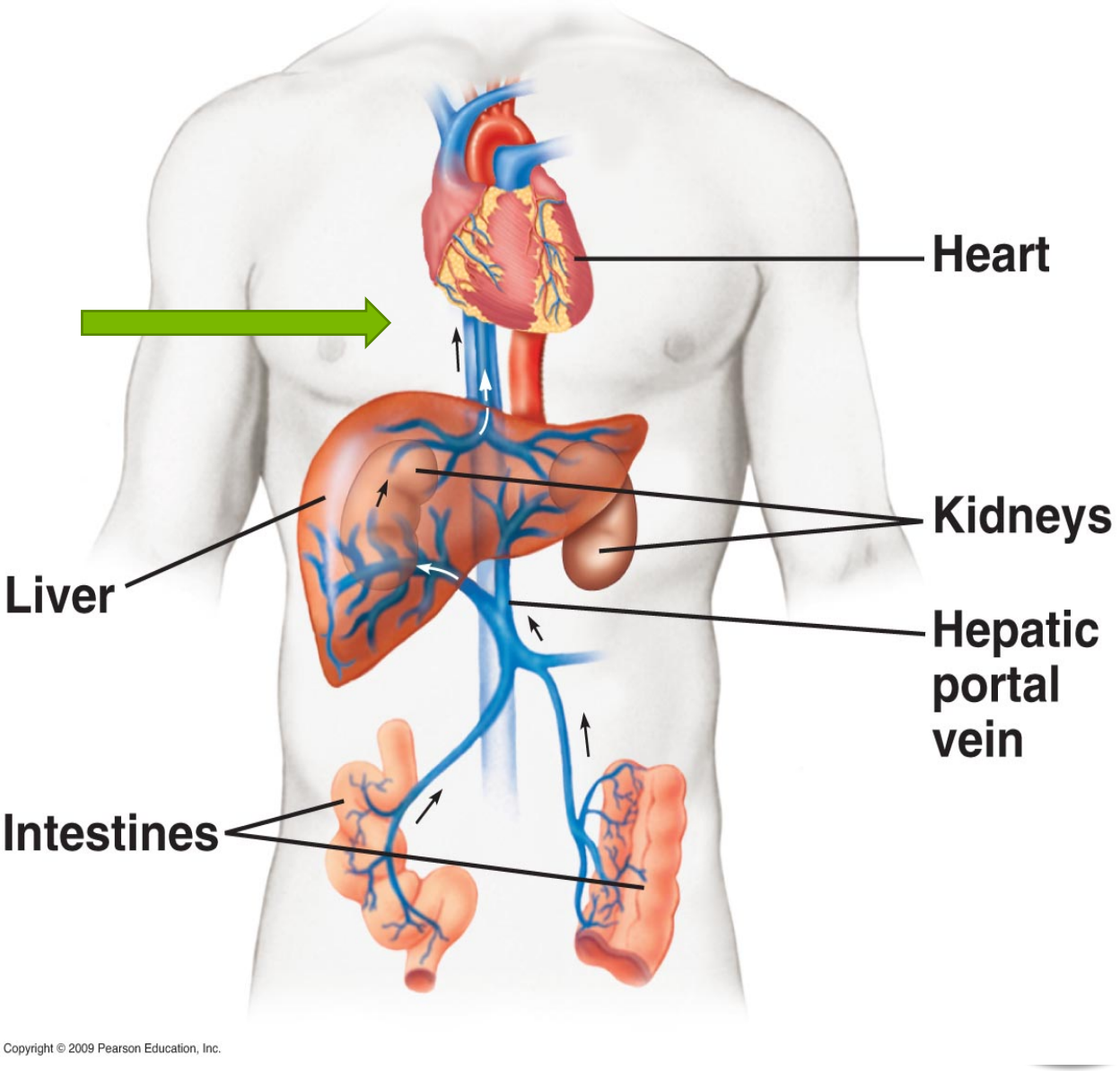
- Vascular liver diseases =
  - **Huge effects on systemic hemodynamics**



Vascular liver diseases

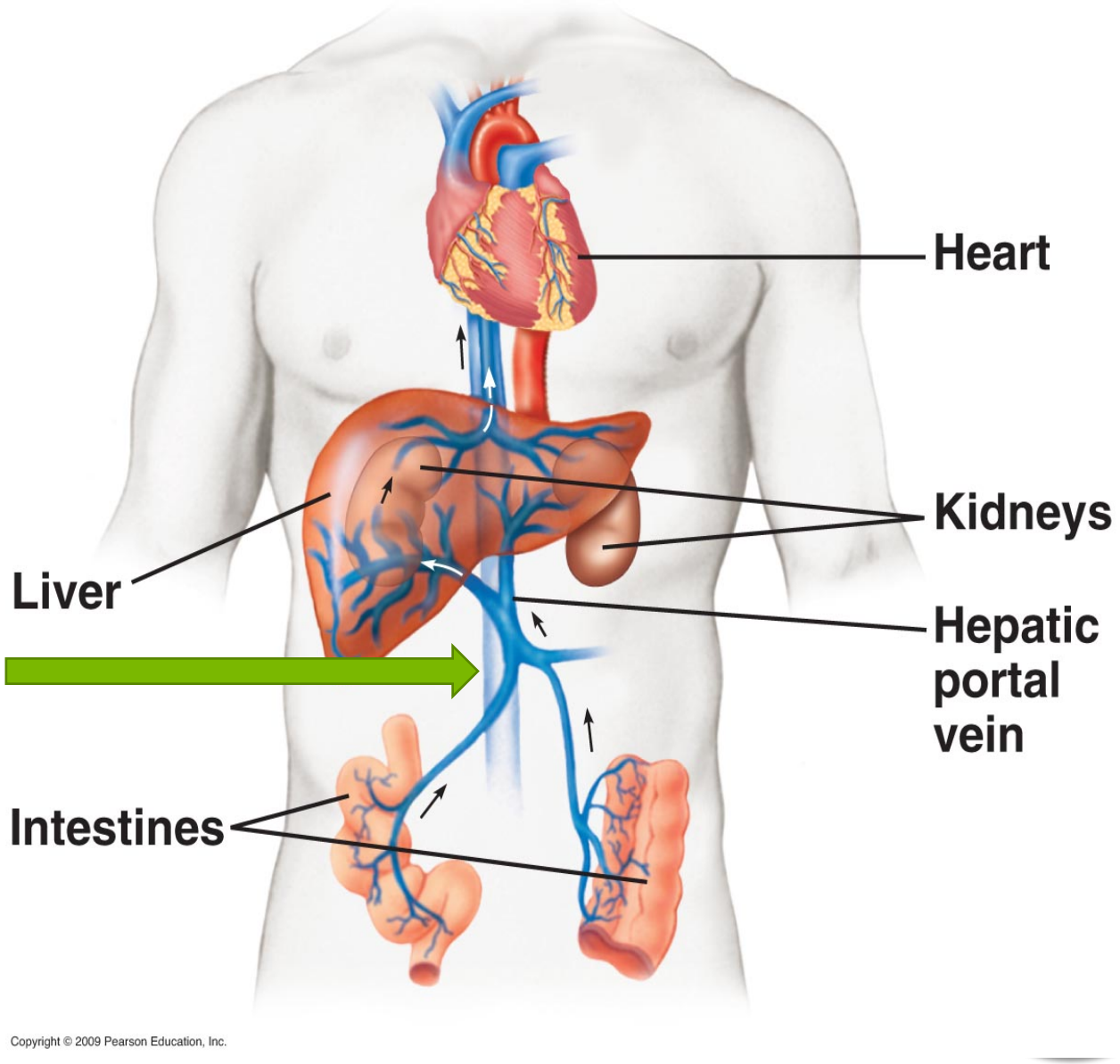
Outflow obstruction:

- Cardiac abnormalities
- Budd Chiari syndrome



Vascular liver diseases

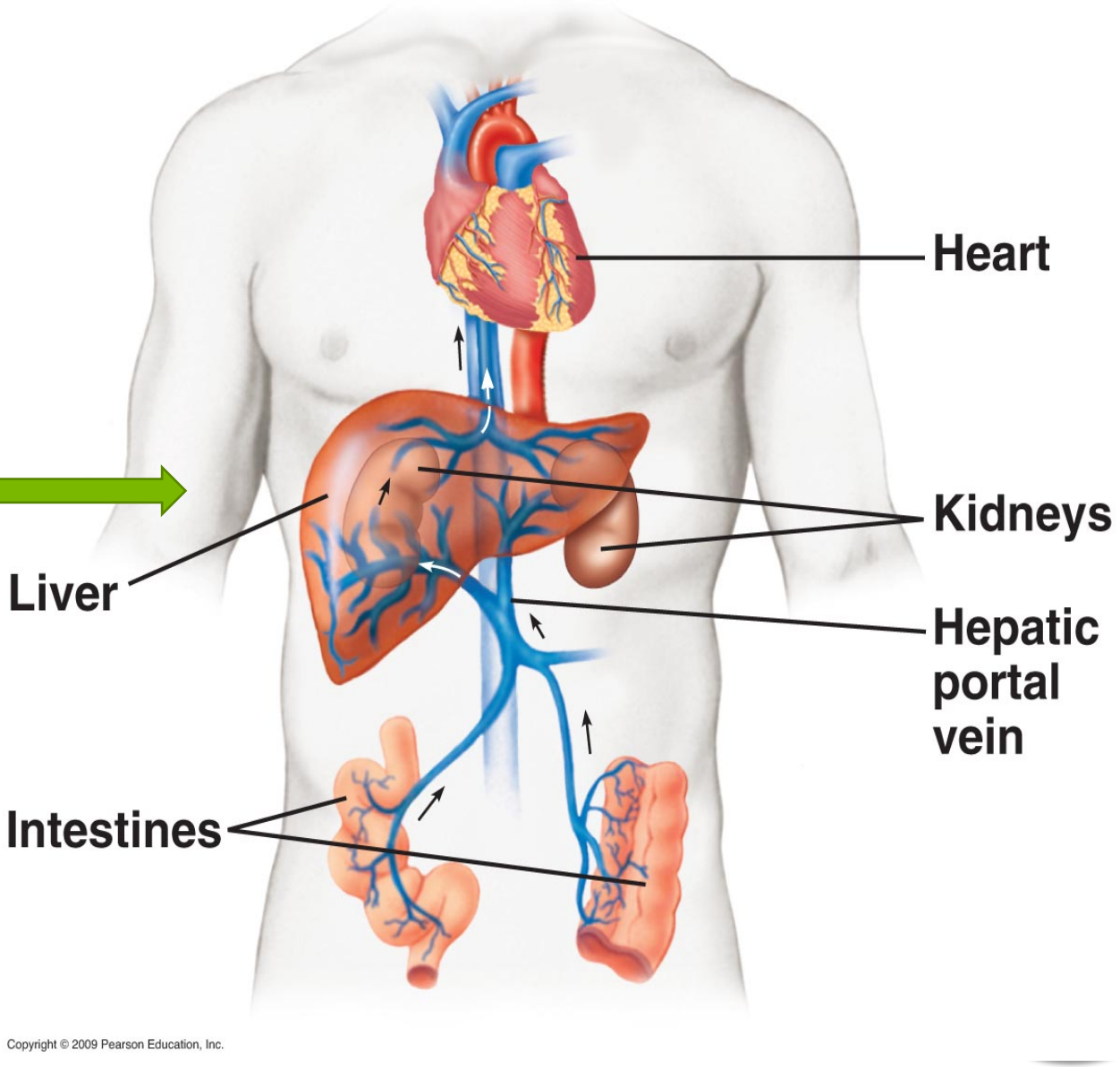
Inflow obstruction:
-portal venous thrombosis, with and without liver cirrhosis



Vascular liver diseases

Liver (intrahepatic)

- Rendu osler weber
- Sinusoidal obstruction syndrome
- Idiopathic non-cirrhotic portal hypertension



Splanchnic venous thrombosis

Outflow obstruction:

- Cardiac abnormalities
- **Budd Chiari Syndrome**

Liver (intrahepatic)

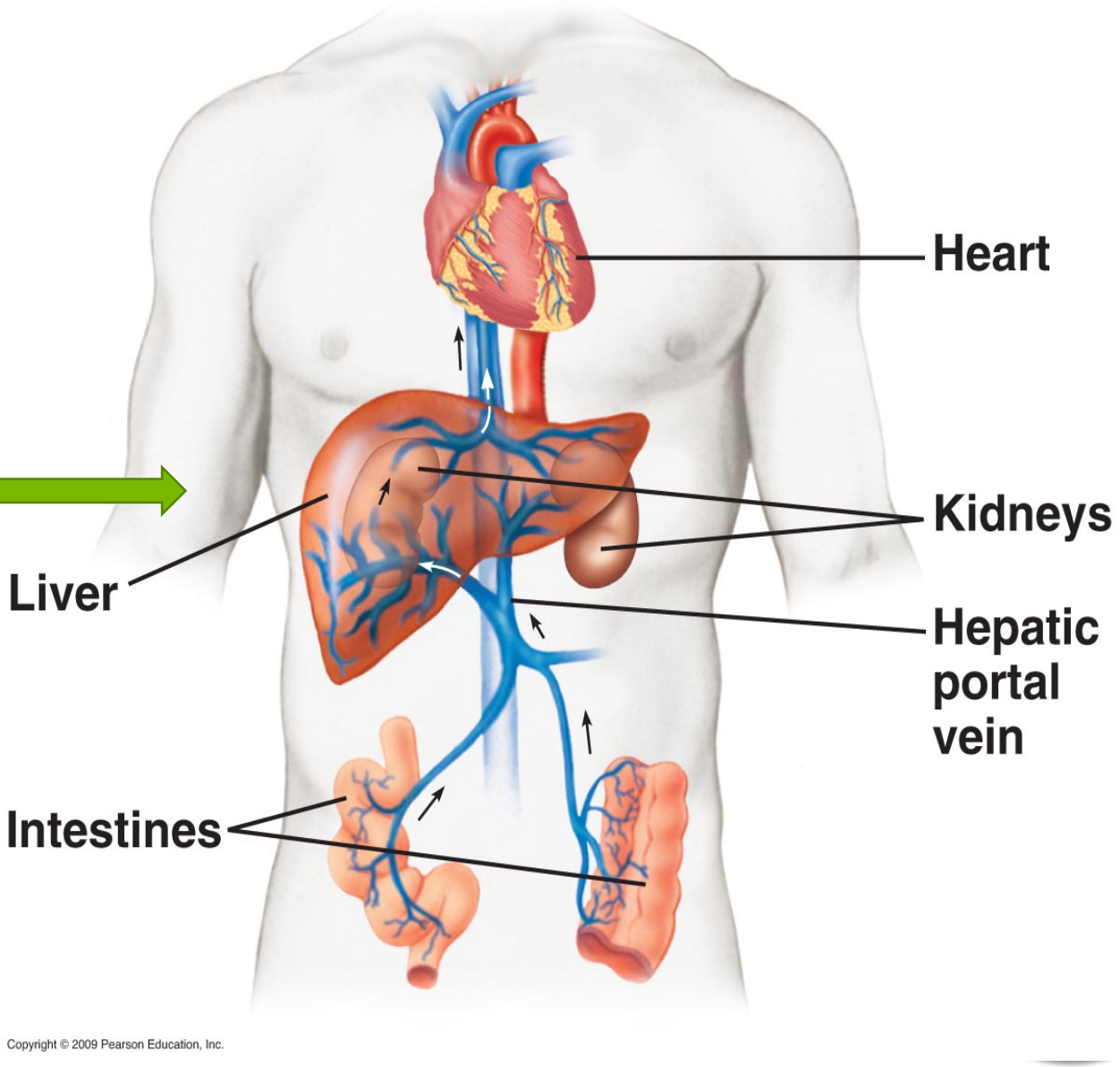
- Rendu Osler weber
- Sinusoidal obstruction syndrome
- Idiopathic non-cirrhotic portal hypertension

Inflow obstruction:

-**Portal vein thrombosis**

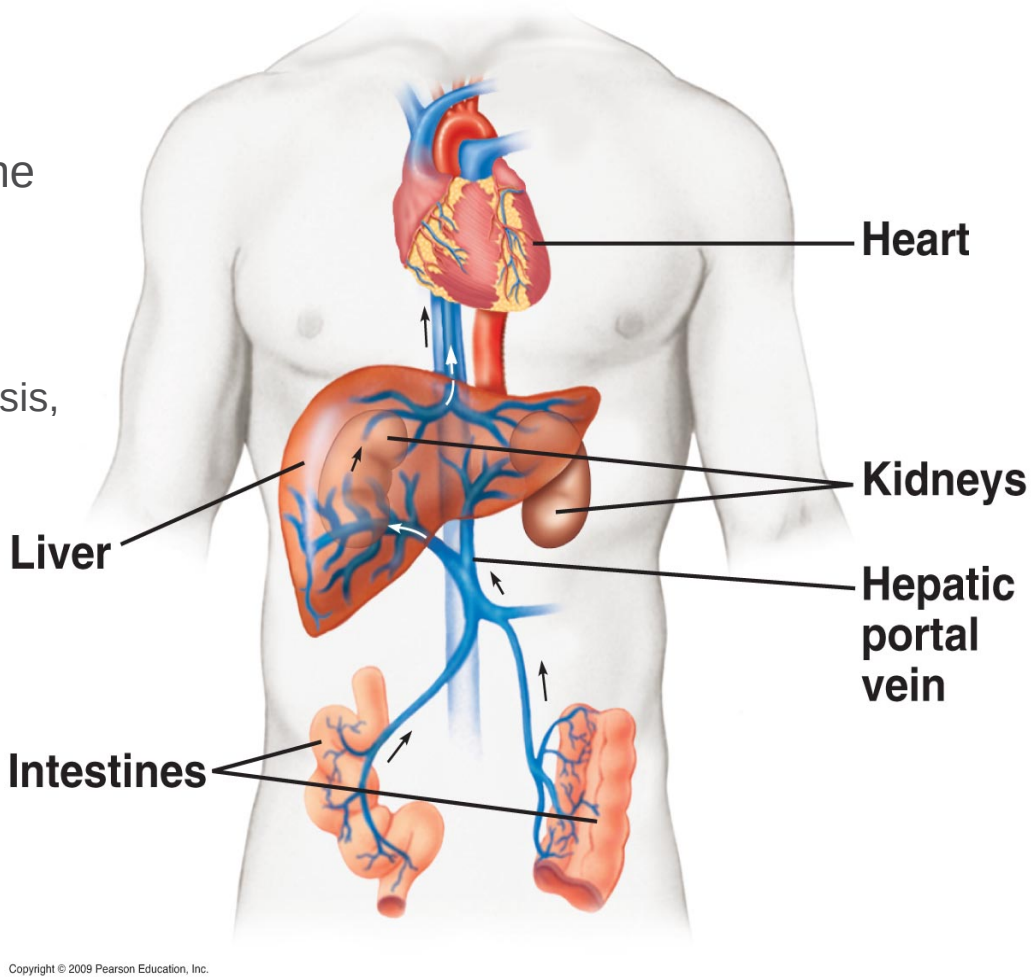
***Acute vs chronic**

***With vs without liver cirrhosis**



Splanchnic vein thrombosis - in patients without liver disease

- **Multifactorial** etiology;
  - Myeloproliferative neoplasms are the leading cause (**30-40% in SVT**)
    - BCS > PVT
    - Essential thrombocytosis, myelofibrosis, polycythemia verae
    - JAK2V617F mutation
  - Thrombophilia
  - Local and systemic factors
    - PVT > BCS



Splanchnic vein thrombosis –

in patients without liver disease

EN-VIE study: Murad SD, et al. Ann Intern Med 2009

- Large multicenter European study, prospective follow-up
  - Consecutive patients included with diagnosis of BCS / PVT (2 yr)

- **Results**

  Budd-Chiari pts = 163 pts

  PVT pts = 105 pts

  Mean followup 17 mo

Splanchnic vein thrombosis - in patients without liver disease

Results

Budd Chiari Syndrome

84% = at least 1 prothrombotic risk factor

46% = 2 or more prothrombotic risk factors
(18% ; 3 risk factors)

Most common: myeloproliferative disorders (49% of 103 tested pts)

Portal vein thrombosis:

10% = 2 or more prothrombotic risk factors

36% = local risk factor + prothrombotic risk factor

Risk factors in BCS and PVT

Risk factor	BCS frequency (%)	PVT frequency (%)
Thrombophilia		
Inherited	21	35
Acquired	44	19
Myeloproliferative neoplasm	49	21
JAK2V617F positive	29	16
Hormonal factors	38	44
Oral contraceptives	33	44
Pregnancy	6	0
PNH (Paroxysmal nocturnal hemoglobinuria)	19	0
Local factors	0	21

Thrombophilia inherited: protein C and S deficiency, antithrombin deficiency, activated protein C resistance, factor V leiden, homocysteinuria

Thrombophilia acquired: cancer, pregnancy, estrogen therapy, nephrotic syndrome, etc.

EASL CPG VDL. J Hepatol 2016;64:179–202

Diagnostic work-up =SVT

1) Check for **hematological factors** (hematology consult):
   - > Thrombophilia screening should include
     - > Protein S, Protein C and antithrombin levels
     - > Factor V Leiden mutation
     - > Prothrombin G20210A gene variant
     - > Antiphospholipid antibodies

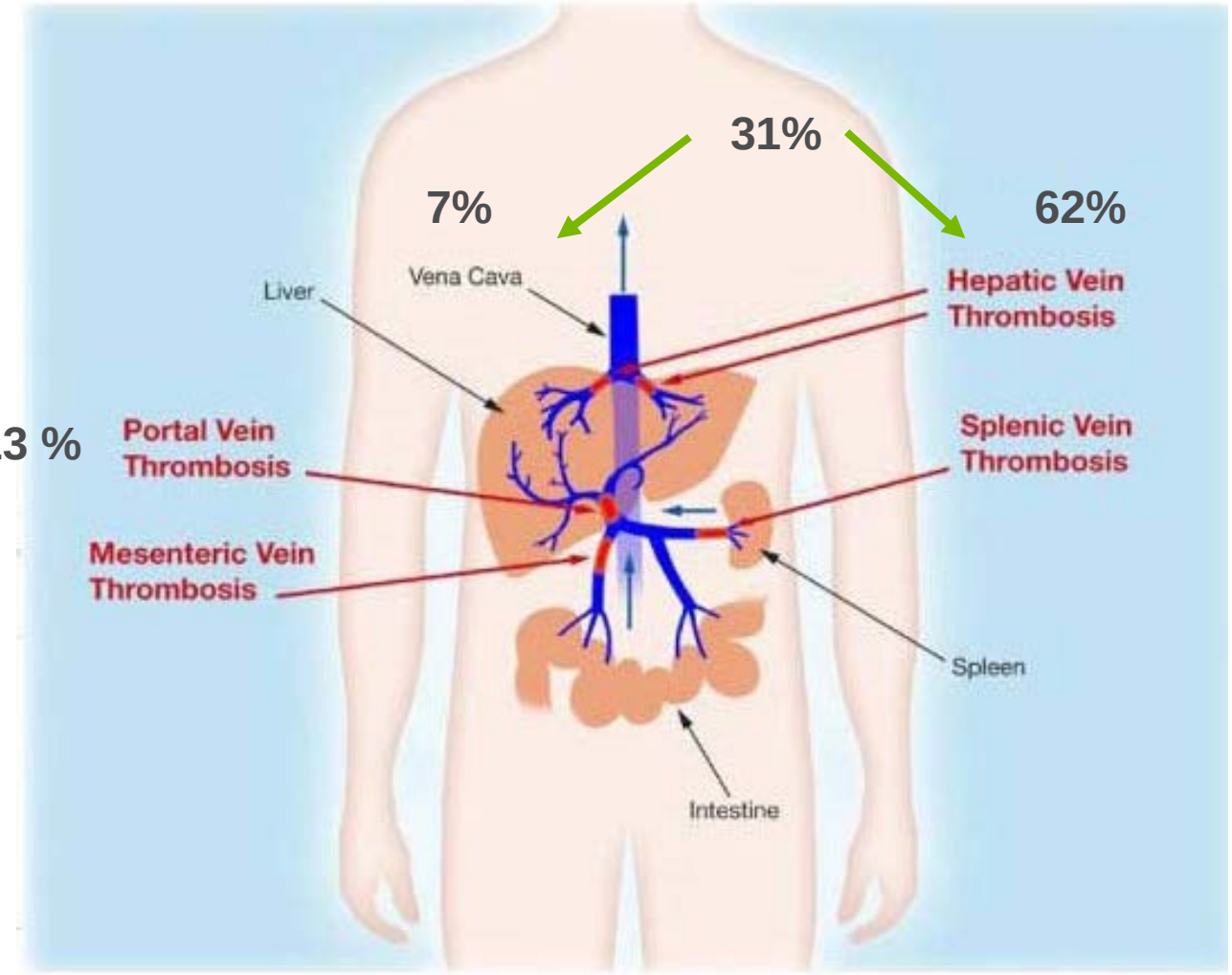
   - > *Myeloproliferative disorder* are a common underlying cause of abdominal vein thrombosis
     - > *JAK2V617F* mutation is of major importance in the diagnostic strategy for MPN

2) Investigate pts for **local risk factors**
   - > Intra-abdominal inflammatory conditions
   - > Abdominal malignancies

Budd-Chiari syndrome

Site of obstruction (n=237) = thrombosis sites

Diagnosis = radiology



Budd chiari syndrome – clinical symptoms

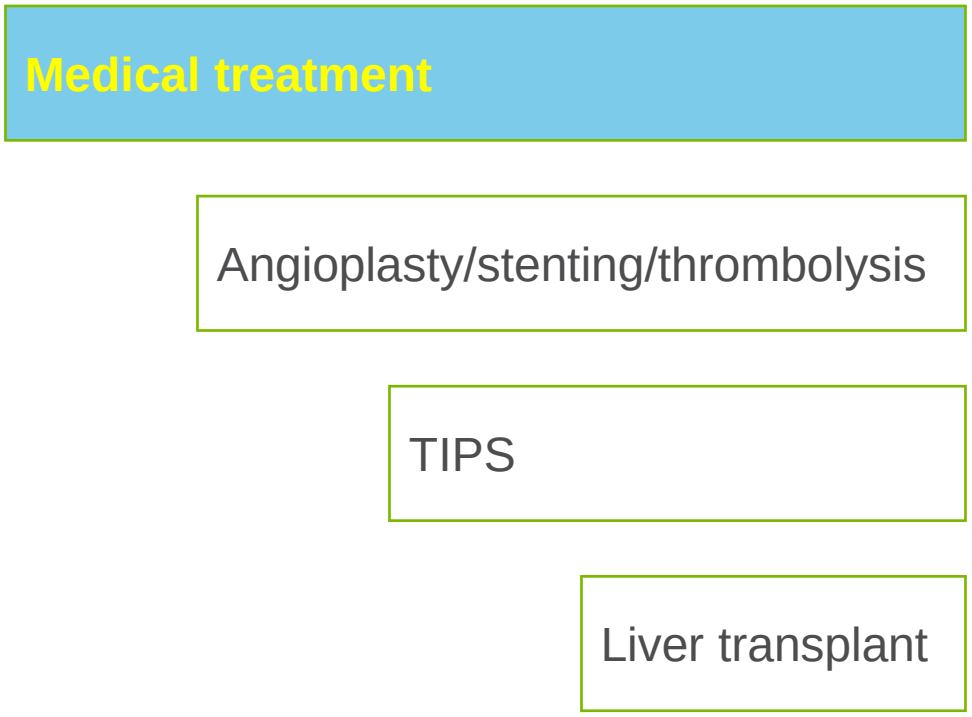
- Heterogenous, ranges from
  - No symptoms to fulminant hepatic failure
    - (No symptoms presence of large hepatic venous collaterals)
  - F > M, third / fourth decade

  - Liver nodules = difficult to distinguish from HCC

- Most common symptoms (Envie –study)
  - Ascites = 83%
  - Hepatomegaly = 67%
  - Abdominal pain = 61%
  - Esophageal varices = 58%
  - GI bleeding = 5%
  - Concomitant PVT = 13%

Stepwise therapeutic algorithm for BCS

- Based on retrospective cohorts and prospective series of patients
  - No RCTs



Patients should receive **anticoagulation** as soon as possible for an indefinite period

Consider potential for bleeding complications

Stepwise therapeutic algorithm for BCS

- Based on retrospective cohorts and prospective series of patients
  - No RCTs

Medical treatment

Angioplasty/stenting/thrombolysis

TIPS

Liver transplant

Patients should receive anticoagulation as soon as possible for an indefinite period

Consider potential for bleeding complications

Treatment of underlying cause (e.g. MPNs) should be logically initiated concomitantly

EASL CPG VDL. J Hepatol 2016;64:179–202

Stepwise therapeutic algorithm for BCS

- Based on retrospective cohorts and prospective series of patients
  - No RCTs

If non-responsive to medical treatment

Medical treatment

Angioplasty/stenting/ thrombolysis

TIPS

Liver transplant

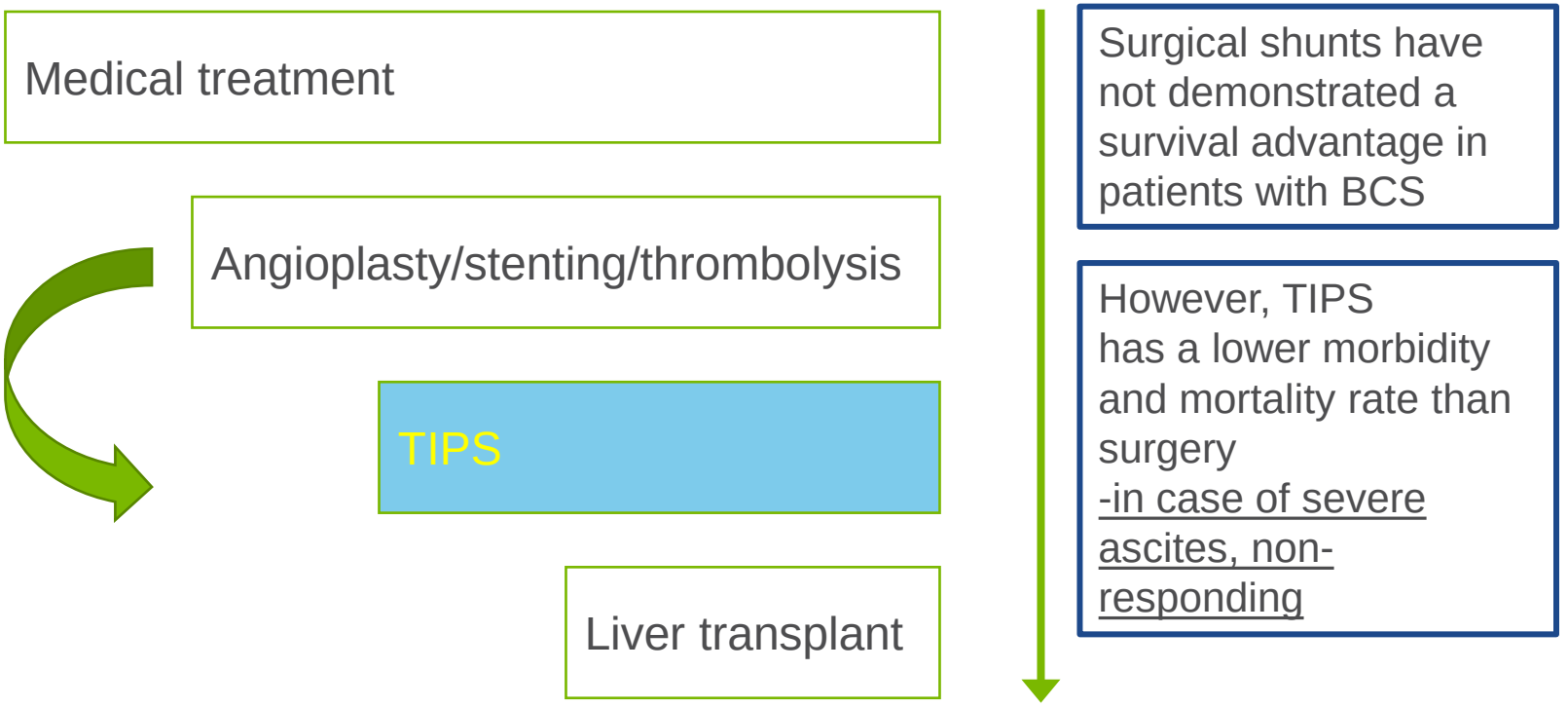
Experience of correcting hepatic venous outflow obstruction with thrombolysis *is limited*

Angioplasty/stenting is the definitive treatment for *less than 10%* of Western BCS patients

-short hepatic vein stenosis or IVC stenosis

Stepwise therapeutic algorithm for BCS

- Based on retrospective cohorts and prospective series of patients
  - No RCTs



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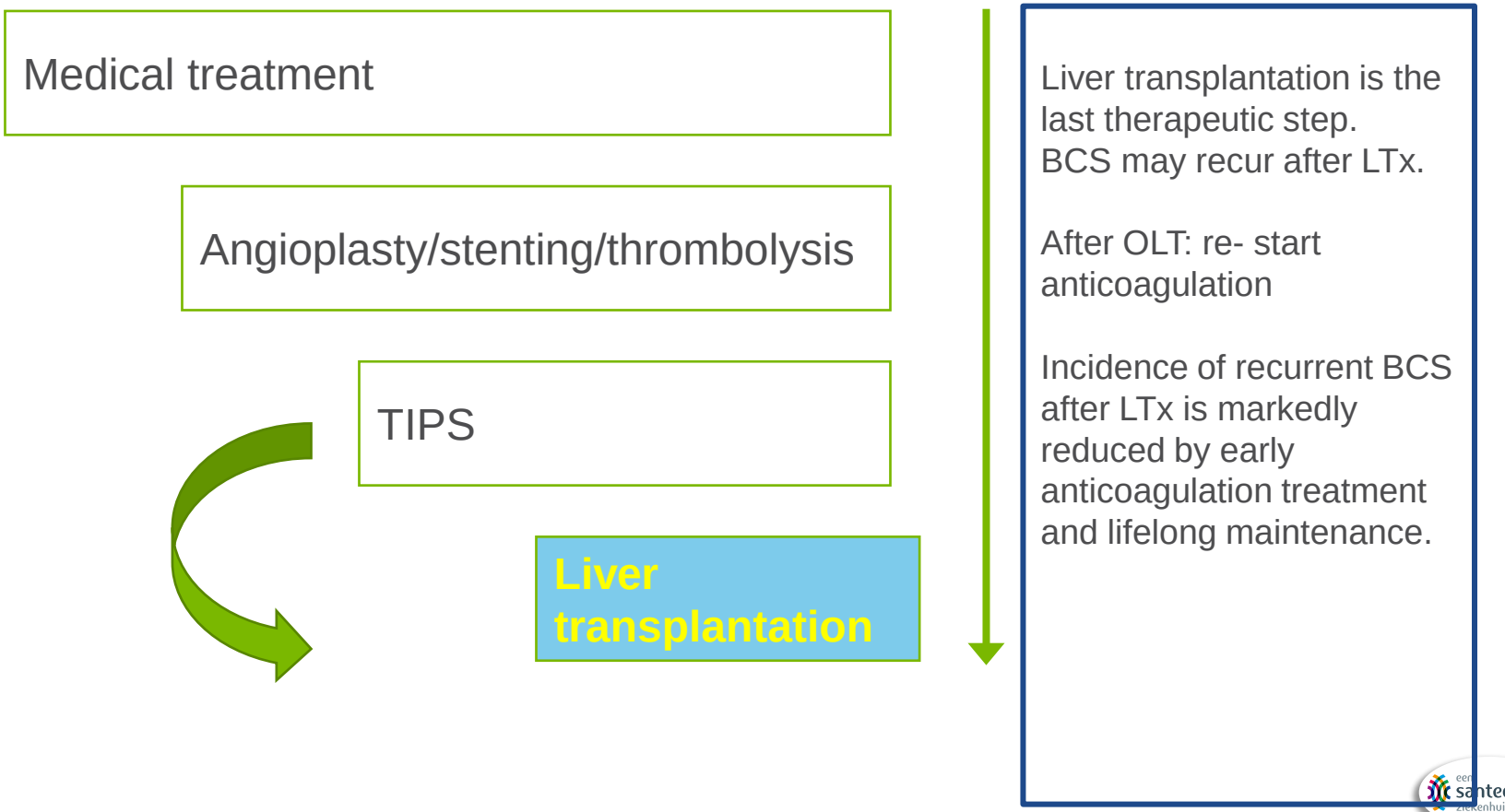

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Vascular liver diseases

Outflow obstruction:

- Cardiac abnormalities
- **Budd Chiari syndrome**

Liver (intrahepatic)

- Rendu Osler weber
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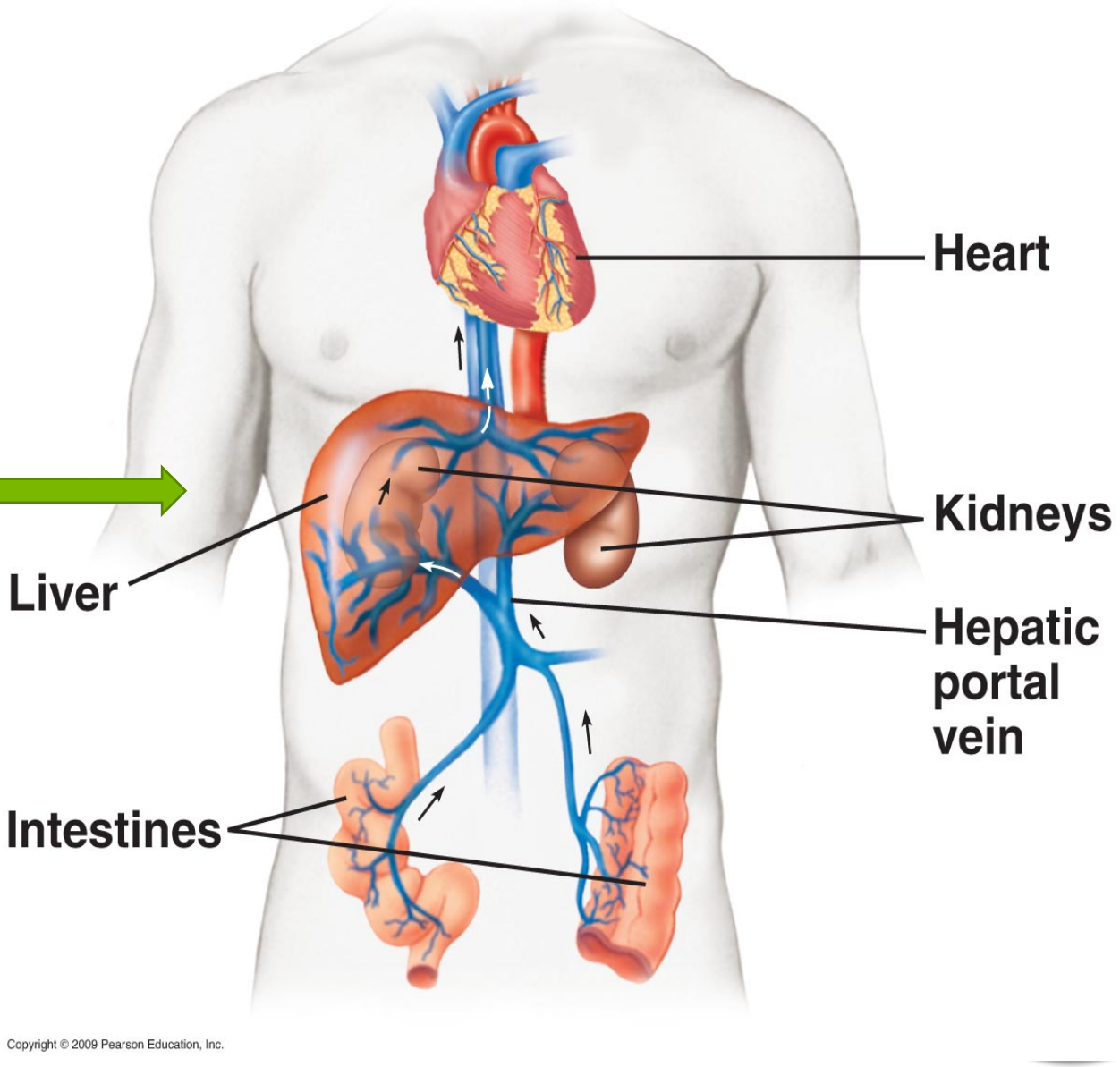
Inflow obstruction:

-**Portal vein thrombosis**

***Acute vs chronic**

***With vs without liver cirrhosis**



Splanchnic vein thrombosis - in patients without liver disease

Results

Budd Chiari Syndrome

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Most common: myeloproliferative disorders (49% of 103 tested pts)

Portal vein thrombosis:

10% = 2 or more prothrombotic risk factors

36% = local risk factor + prothrombotic risk factor

Portal vein thrombosis

Non-cirrhotic, non-malignant

Heterogenous anatomic abnormalities:

- > Thrombus within portal vein and/or right or left branches
- > Thrombus may extent into the mesenteric or splenic veins
- > Occlusion may be complete or partial

Symptoms

> Abdominal pain	90%
> SIRS reaction	85%
> Ascites	50% (often mild)
> Local or systemic infection	20%

Complication

- > Intestinal infarction in 2-20% of pts with acute porto-mesenteric vein thrombosis

Portal vein thrombosis

Non-cirrhotic, non-malignant

Treatment

- LMWH start as soon as possible
  - To stop progress
  - To obtain recanalization

Followup CT → 6 (en 12) months (Re-assess thrombosis)

- PVT recanalization = occur up to 6 mo
- Mesenteric / splenic veins recanalization = occur up to 12 mo

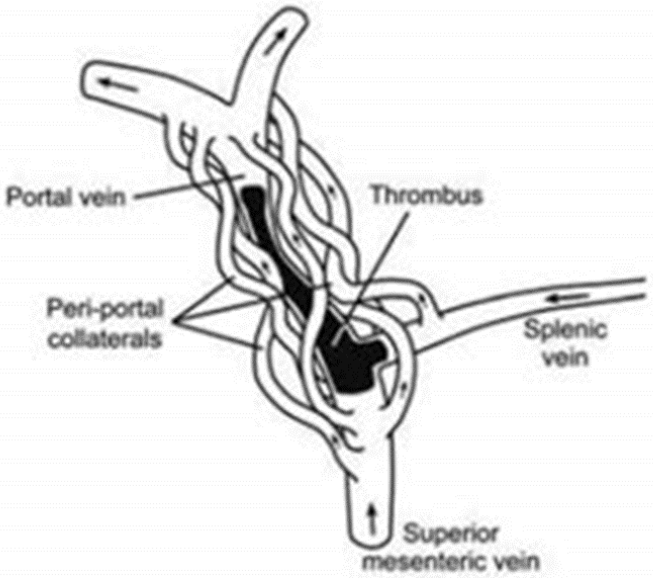
Behandeling middels NOAC / DOAC's?
RCT's: comparable or superior efficacy and safety profiles in AF and venous thromboembolism (when compared to warfarin)

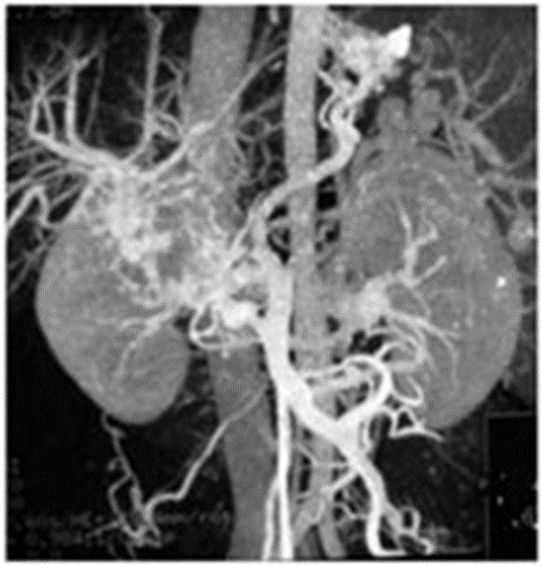
Portal vein thrombosis

Non-cirrhotic, non-malignant

In the **absence** of recanalization =
> Portal venous lumen obliterates
> Porto-portal collaterals develop

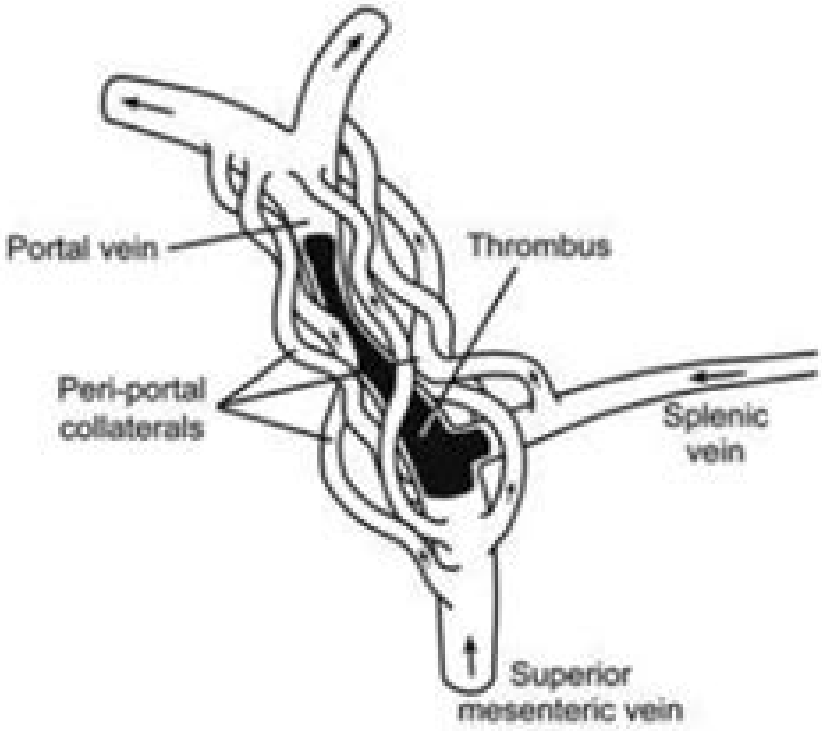
Cavernomatous transformation of the portal vein
= portal cavernoma

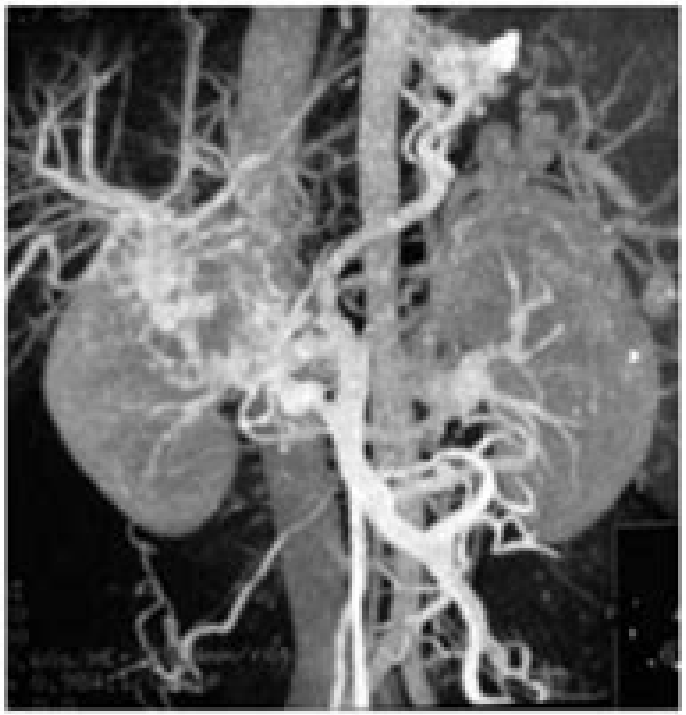




Zhang, World J Gastroenterol, 2011

Extrahepatic portal vein obstruction = **chronic condition**





Zhang, World J Gastroenterol, 2011

Extrahepatic portal vein obstruction

Non-malignant, non-cirrhotic

Clinical presentation:

- **Signs of portal hypertension:**
  - Splenomegaly
  - Reduced blood cell count
  - Gastroesophageal varices / portosystemic collaterals
- Postprandial abdominal pain

Other

- Features of incomplete bowel obstruction related to ischemic stenosis
- Biliary symptoms (biliary pain, pancreatitis, cholecystitis) related to **portal cholangiopathy** (= compression / deformation of intra- and extrahepatic bile ducts)
- Variceal bleeds

Extrahepatic portal vein obstruction

Non-malignant, non-cirrhotic

At diagnosis:

> Test for underlying prothrombotic disorders and local factors

Treatment:

1) **Manage portal hypertension** according to the guidelines elaborated for cirrhosis

2) Once **prophylaxis for GI bleeding** has been implemented

3) Treat underlying prothrombotic conditions + **start anticoagulation**

> Consider permanent anticoagulation in pts
>> with a strong prothrombotic condition, or
>> past history suggesting intestinal ischemia, or
>> recurrent thrombosis on followup

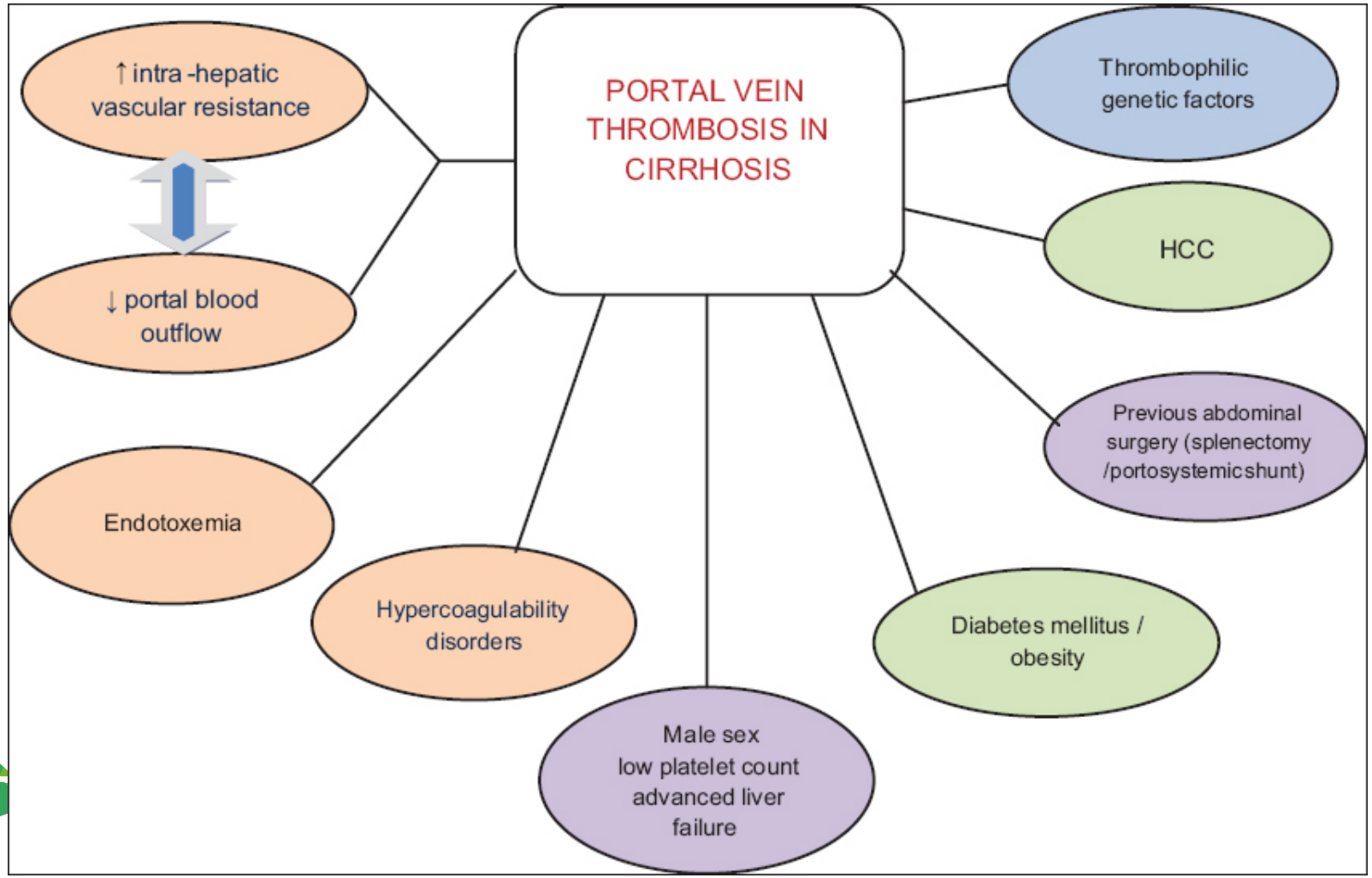
Splanchnic venous thrombosis

Summary

Budd Chiari syndrome	Portal venous thrombosis
Outflow obstruction: vv hepatica	Inflow obstruction: vena portae
Prothrombotic factors + local factors -myeloproliferative neoplasms	Local factors + prothrombotic factors
Symptoms: -ascites ++++ -abdominal pain RUQ -hepatomegaly -portal hypertension	Symptoms: -ascites + -abdominal pain RUG -SIRS reaction / intestinal infarction -portal hypertension
Work-up hematology + local factors Bleeding risk reduction Anticoagulation	Work-up hematology + local factors Bleeding risk reduction Anticoagulation

Portal Vein Thrombosis in liver cirrhosis

Prevalence ~ 8-12%, increases with liver disease severity



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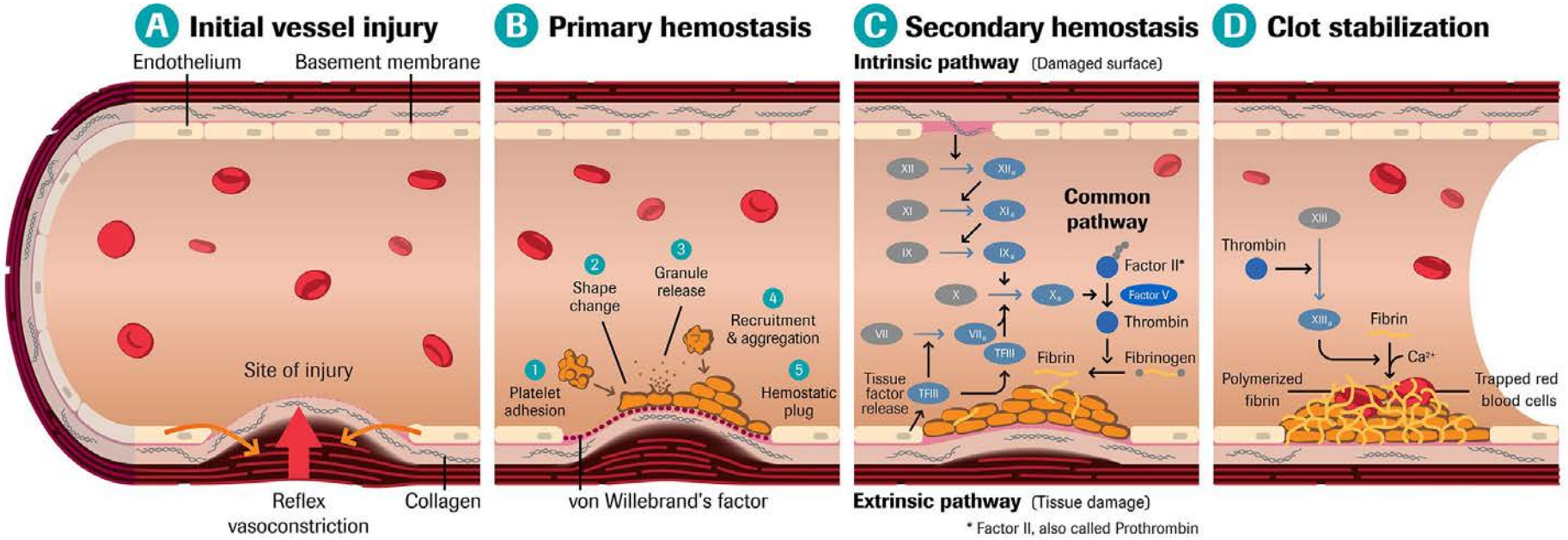
MAY 15, 2018:2162–75

FIGURE 1 Mechanisms Driving Increased Thrombosis and Bleeding in Liver Disease

↑ Thrombosis	↑ Bleeding
Increased Platelet-Vessel Wall Interaction	**Reduced Platelet-Vessel Wall Interaction**
• ↑ von Willebrand factor	• ↓ Platelet count
• ↑ ADAMTS 13	• ↓ Platelet function
High Thrombin Generation	**Low Thrombin Generation**
• ↑ Factor VIII	• ↓ Fibrinogen
• ↓ Protein C, Protein S	• ↓ Factor II, V, VII, IX, X, XI
• ↓ Antithrombin	
• ↓ TFPI	
Low Fibrinolysis	**High Fibrinolysis**
• ↓ Plasminogen	• ↑ Tissue-plasminogen activator
• ↑ PAI	• ↓ Plasmin inhibitor
	• ↓ TAFI

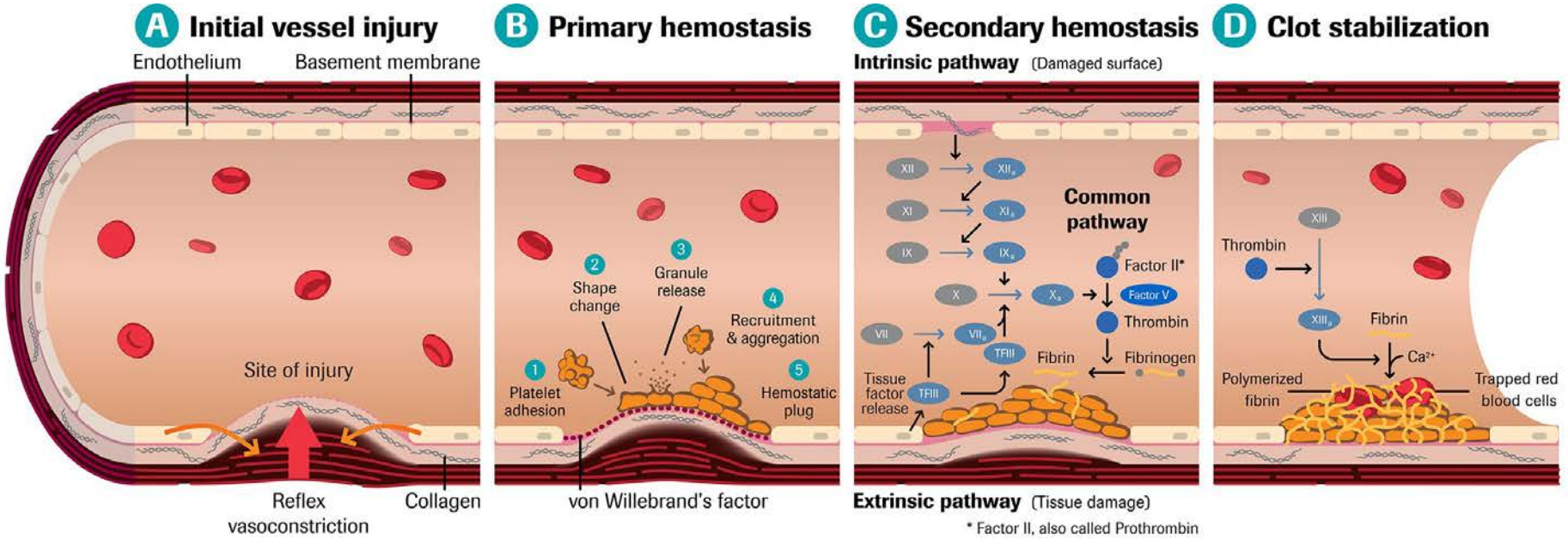
ADAMTS 13 = a disintegrin and metalloprotease with thrombospondin type 1 motif 13; PAI = plasminogen activator inhibitor; TAFI = thrombin-activatable fibrinolysis inhibitor; TFPI = tissue factor pathway inhibitor.

*Formation of a primary platelet plug
-platelets adhere to surface, mediated by VWF



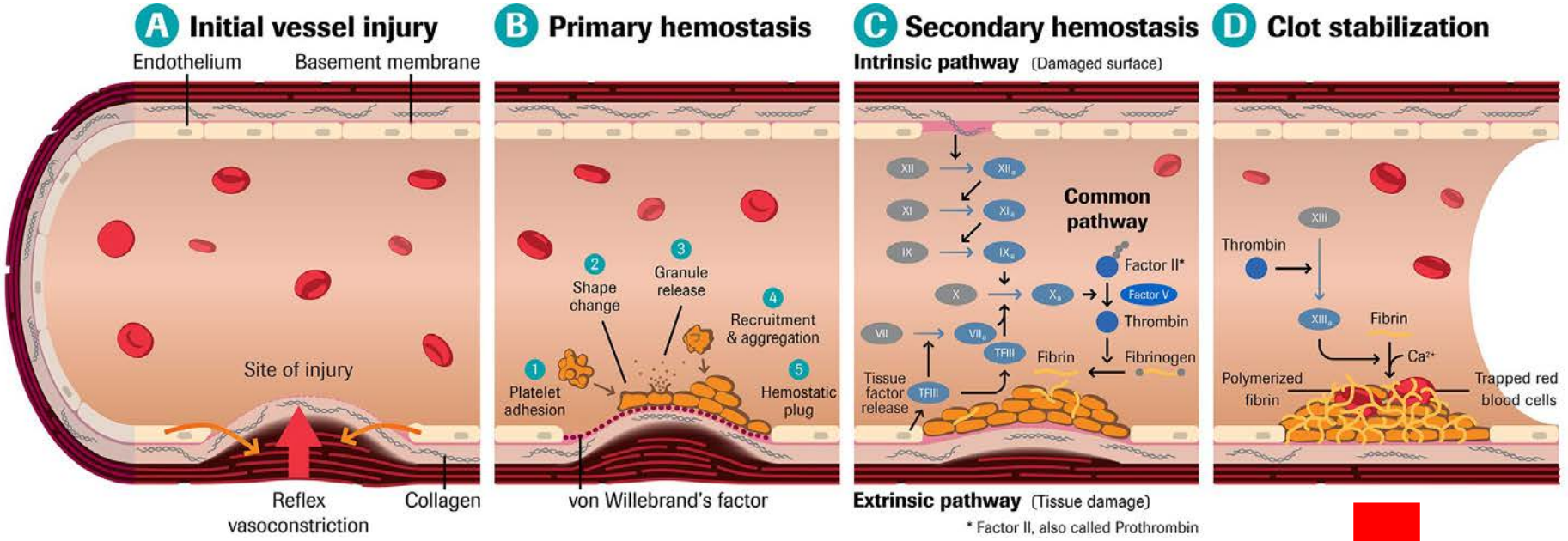
Increased Platelet-Vessel Wall Interaction	Reduced Platelet-Vessel Wall Interaction
• ↑ von Willebrand factor	• ↓ Platelet count
• ↑ ADAMTS 13	• ↓ Platelet function

*Formation of insoluble, cross-linked fibrin by activated coagulation factors (esp.thrombin.)



High Thrombin Generation	Low Thrombin Generation
• ↑ Factor VIII	• ↓ Fibrinogen
• ↓ Protein C, Protein S	• ↓ Factor II, V, VII, IX, X, XI
• ↓ Antithrombin	
• ↓ TFPI	

*Fibrin stabilizes the primary platelet plug



Low Fibrinolysis	High Fibrinolysis
• ↓ Plasminogen	• ↑ Tissue-plasminogen activator
• ↑ PAI	• ↓ Plasmin inhibitor
	• ↓ TAFI

Portal vein thrombosis in liver cirrhosis

- **Complications PVT:**
  - GI bleeding (incl variceal)
  - Intestinal infarction
  - Hepatic decompensation
  - Portal cholangiopathy

Digestion 2016;93:149–159

Portal vein thrombosis in liver cirrhosis

- **Treatment goals:**
  - Achieve recanalization
  - Additional benefit: anticoagulation causes reduction of fibrogenesis due to thrombin antagonism

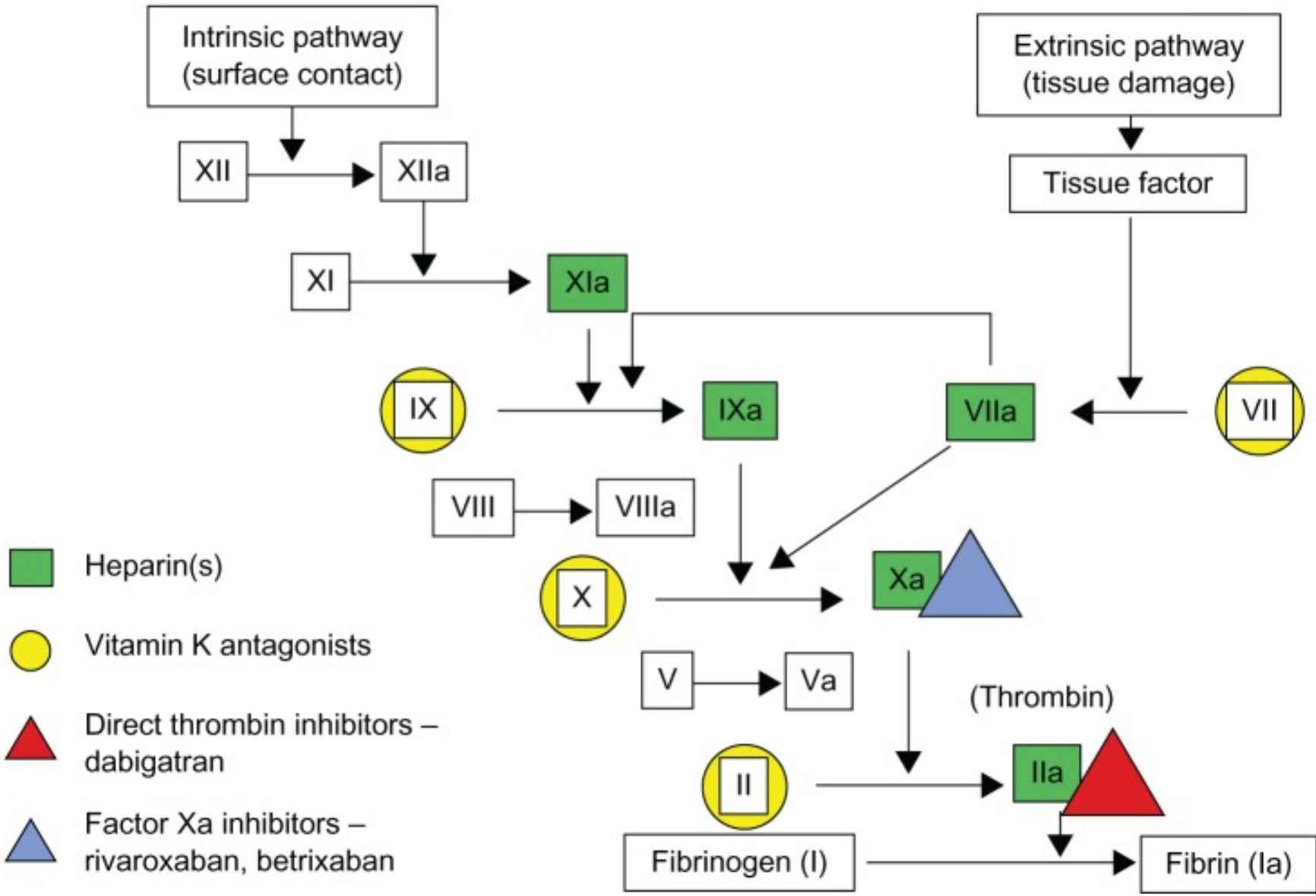
Table 2. Trial of cirrhotic patients with PVT treated with anticoagulation

Reference	Number of patients	Therapy	Bleeding complication	Results
Delgado et al. [38]	55 (treated)	LMW and VKA	6 (variceal) 5 (non-variceal)	25 patients had complete recanalization, 8 had partial. Less incidence of hepatic decompensation in those with recanalization platelet count <50,000/mm^3 increased bleeding risk
Amitrano et al. [37]	28 (treated)	LMWH (after endoscopic eradication of varices)	None	Complete recanalization of portal vein occurred in 33.3%, partial recanalization in 50% and no response in 16.7% of patients. Complete recanalization increased to 75% at 12 months
Francoz et al. [36]	19 (treated)	LMWH followed by VKA	None	Partial or complete recanalization and survival was significantly higher in those who received (8/19) than in those who did not receive (0/10, p = 0.002) anticoagulation

Portal vein thrombosis in liver cirrhosis

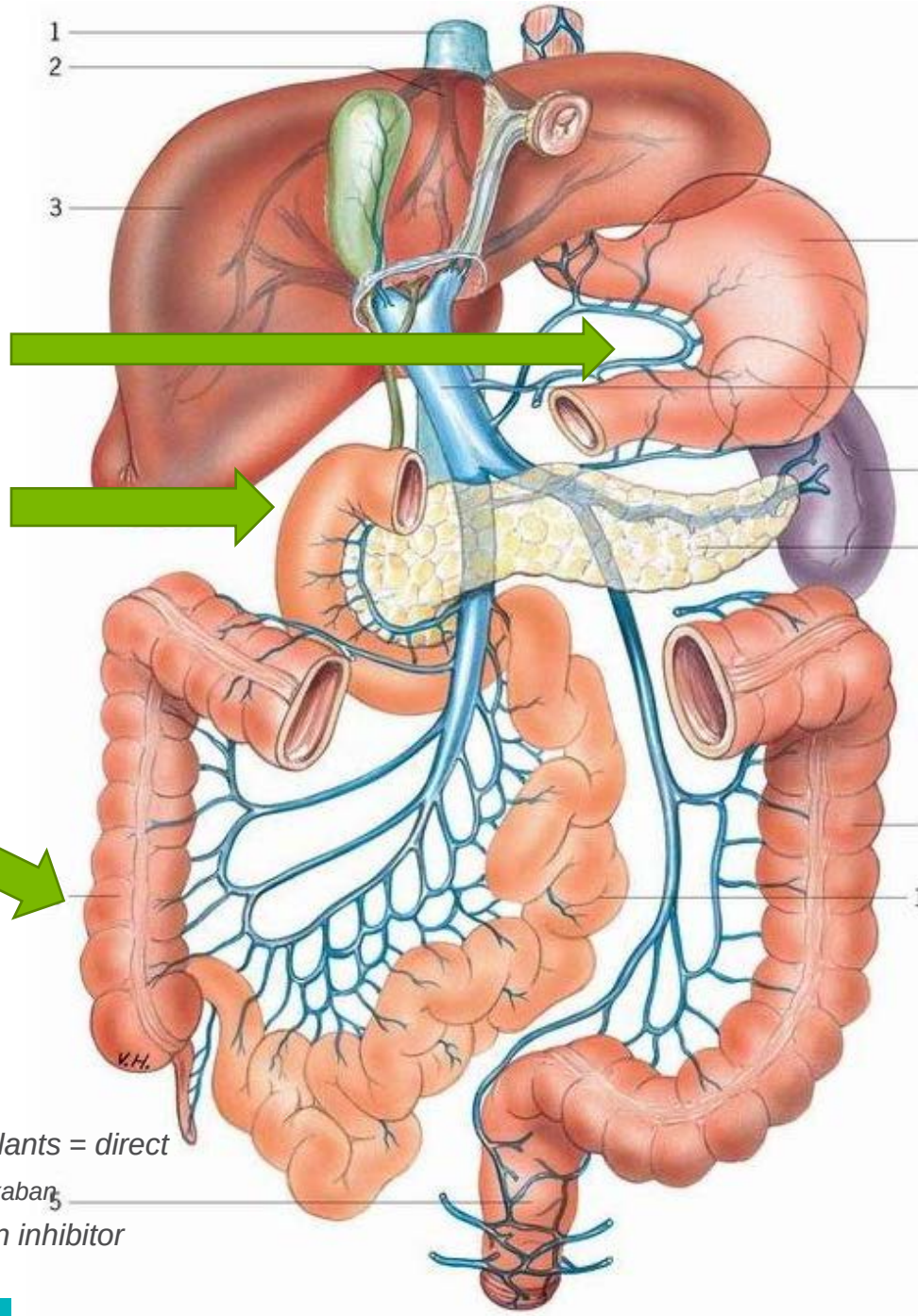
- **Treatment goals:**
  - Achieve recanalization
  - Additional benefit: anticoagulation causes reduction of fibrogenesis
- **Treatment:**
  - Screening for esophageal varices + ligation
  - Start anticoagulation: LMWH
    - 3-6 months + Radiologic followup
  - Stop treatment = recurrent PVT?

Nagarakanti E, Ellis CR. Dabigatran in clinical practice. Clin Ther 2012;34:2051-60,



Site of absorption

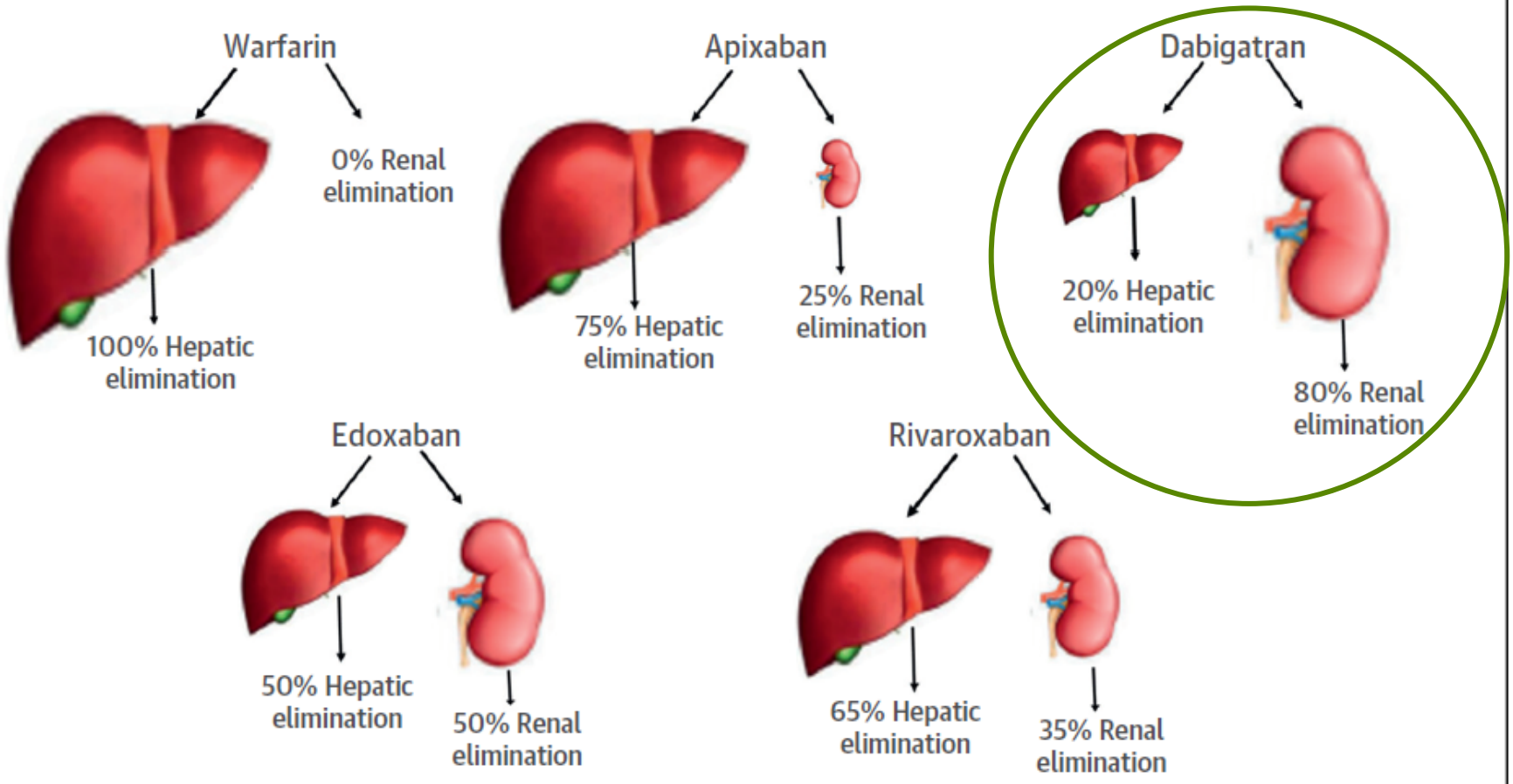
- **Factor Xa inhibitors - NOAC:**
  - Rivaroxaban (Xarelto®): = Absorbed in stomach
  - Edoxaban: (Lixiano®):
    - Absorbed mainly in small intestine
  - Apixaban (Eliquis®): :
    - Absorbed predominantly in distal small bowel + ascending colon
- **Direct Thrombin inhibitors - DOAC:**
  - Dabigatran (Pradaxa®): poor absorption GI tract = dyspepsia



NOAC = Non-vitamin K antagonist oral anti-coaugulants = direct factor Xa inhibitors *Rivaroxaban, apixaban, edoxaban*

DOAC = Direct oral anticoagulants = direct thrombin inhibitor (Dabigatran)

FIGURE 2 Pharmacokinetic Characteristics and Primary Routes of Clearance of Oral Anticoagulant Agents



In the figure, the size of the liver or kidney denotes the extent of the organ's contribution to the clearance of the anticoagulant agent.

TABLE 1 Pharmacological Characteristics of Oral Anticoagulant Agents Approved for Use in Select Patients With Liver Disease

	Warfarin	Apixaban	Dabigatran	Edoxaban	Rivaroxaban
Target	VKORC1	Factor Xa	Factor IIa	Factor Xa	Factor Xa
Half-life, h	20-60	~12	12-17	10-14	7-13
Prodrug	No	No	Yes	No	No
Oral bioavailability, %	100	50	3-7	60	66
Renal clearance, %	None	25	80	50	35
Hepatic clearance, %	100	75	20	50	65
Requires CYP450	Yes	Yes	No	Minimal	Yes
Plasma protein binding, %	99	87	35	55	95
Substrate for P-gp	No	Yes	Yes	Yes	Yes
Coagulation monitoring required	Yes, INR	No	No	No	No
Coagulation assay	INR	Anti-Xa activity*	TT, ECT	Anti-Xa activity*	Anti-Xa activity*
Reversal agent	4F-PCC + vit K	4F-PCC	Idarucizumab	4F-PCC	4F-PCC

*Anti- factor Xa activity assay calibrated to specific anticoagulant agent.

CYP = cytochrome P; ECT = ecarin clotting time; INR = international normalized ratio; P-gp = P-glycoprotein; PPB = plasma protein binding; TT = thrombin time; vit = vitamin; VKORC1 = vitamin K epoxide reductase complex subunit 1; 4F-PCC = 4 factor prothrombin complex concentrate.

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Review Article

Direct oral anticoagulants in patients with liver cirrhosis: A systematic review

Evert Willian Hoolwerf*, Noémie Kraaijpoel, Harry Roger Büller, Nick van Es

Department of Vascular Medicine, Academic Medical Center, Meibergdreef 9, 1105 AZ Amsterdam, The Netherlands

Table 1
Study characteristics of the included studies.

Study	Design	Inclusion period	Sample size, n	Follow-up duration (months)
De Gottardi et al. '16 [28]	Retrospective cohort	2014 & 2016	36[a]	–
Kunk et al. '16[b] [29]	Retrospective cohort	2012–2016	69	–
Intagliata et al. '16 [30]	Retrospective cohort	2012–2015	39	–
Hum et al. '17 [31]	Retrospective cohort	2012–2015	45	–
Nagaoki et al. '17 [32]	Retrospective cohort	2011–2016	50	6

Abbreviations: DOAC: direct oral anticoagulant, LMWH: low-molecular-weight heparin, VKA: vitamin K antagonist.

[a] Only 18 patients with follow-up data.

[b] Conference abstract.

Table 2
Patient characteristics of the included studies.

Study	Type of anticoagulant treatment	Age, years (median/ mean)	Male (%)	Child Pugh Score (median/ mean)	Indication for anticoagulant treatment, n (%)			
					VTE[a]	SVT	AF	Other
De Gottardi et al. '16 [28]	DOAC (n = 36)[b]	65	21 (58)	A	4 (10)	27 (75)	5 (14)	–
Kunk et al. '16 [29]	DOAC (n = 69)	73	53 (77)	B	DVT or SVT: 47 (68)		22 (32)	–
Intagliata et al. '16 [30]	DOAC (n = 20)	57	10 (50)	B	4 (20)	12 (60)	4 (20)	–
	LMWH/VKA (n = 19)	60	12 (63)	B	12 (63)	6 (32)	1 (5)	–
Hum et al. '17 [31]	DOAC (n = 27)	61	18 (67)	B	12 (44)	4 (15)	15 (56)	–
	LMWH/VKA (n = 18)	58	14 (78)	B	8 (44)	3 (17)	9 (50)	1 (6)
Nagaoki et al. '17 [32]	DOAC (n = 20)	69	13 (65)	A	–	20 (100)	–	–
	VKA (n = 30)	67	17 (57)	B	–	30 (100)	–	–

Abbreviations: AF: atrial fibrillation, DOAC: direct oral anticoagulant, DVT: deep vein thrombosis, SVT: splanchnic vein thrombosis, VTE: venous thromboembolism.
[a] None of the studies included patients with pulmonary embolism.
[b] Only 18 patients with follow-up data.

> Liver cirrhosis patients excluded from phase III Trials

> Retrospective studies, with or without comparison of conventional therapies

> ***Analyses of these studies:***

Rates of thrombolic + bleeding events were comparable between DOAC's and Warfarin/ LMWH

Efficacy idem

***Suggestive of a feasible alternative**

Effectiveness and Safety of Non–Vitamin K Antagonist Oral Anticoagulant and Warfarin in Cirrhotic Patients With Nonvalvular Atrial Fibrillation

Hsin-Fu Lee, MD;* Yi-Hsin Chan, MD;* Shang-Hung Chang, MD, PhD; Hui-Tzu Tu, MS; Shao-Wei Chen, MD, PhD; Yung-Hsin Yeh, MD; Lung-Sheng Wu, MD; Chang-Fu Kuo, MD, PhD; Chi-Tai Kuo, MD; Lai-Chu See, PhD

Methods:

-Taiwan: nationwide retrospective cohort study

-n = 2428 cirrhotic patients with AF

- 171 apixaban
- 535 dabigatran
- 732 rivaroxaban
- 990 warfarin

-Effectiveness + safety studied

(*J Am Heart Assoc*. 2019;8:e011112. DOI: 10.1161/JAHA.118.011112.)

. The definition of advanced liver cirrhosis was those cirrhotic patients who presented with any complications including ascites, hepatic encephalopathy, spontaneous bacterial peritonitis, or esophageal varicose bleeding. In

IS – Ischemic stroke
SE – Systemic thrombo-embolism
I

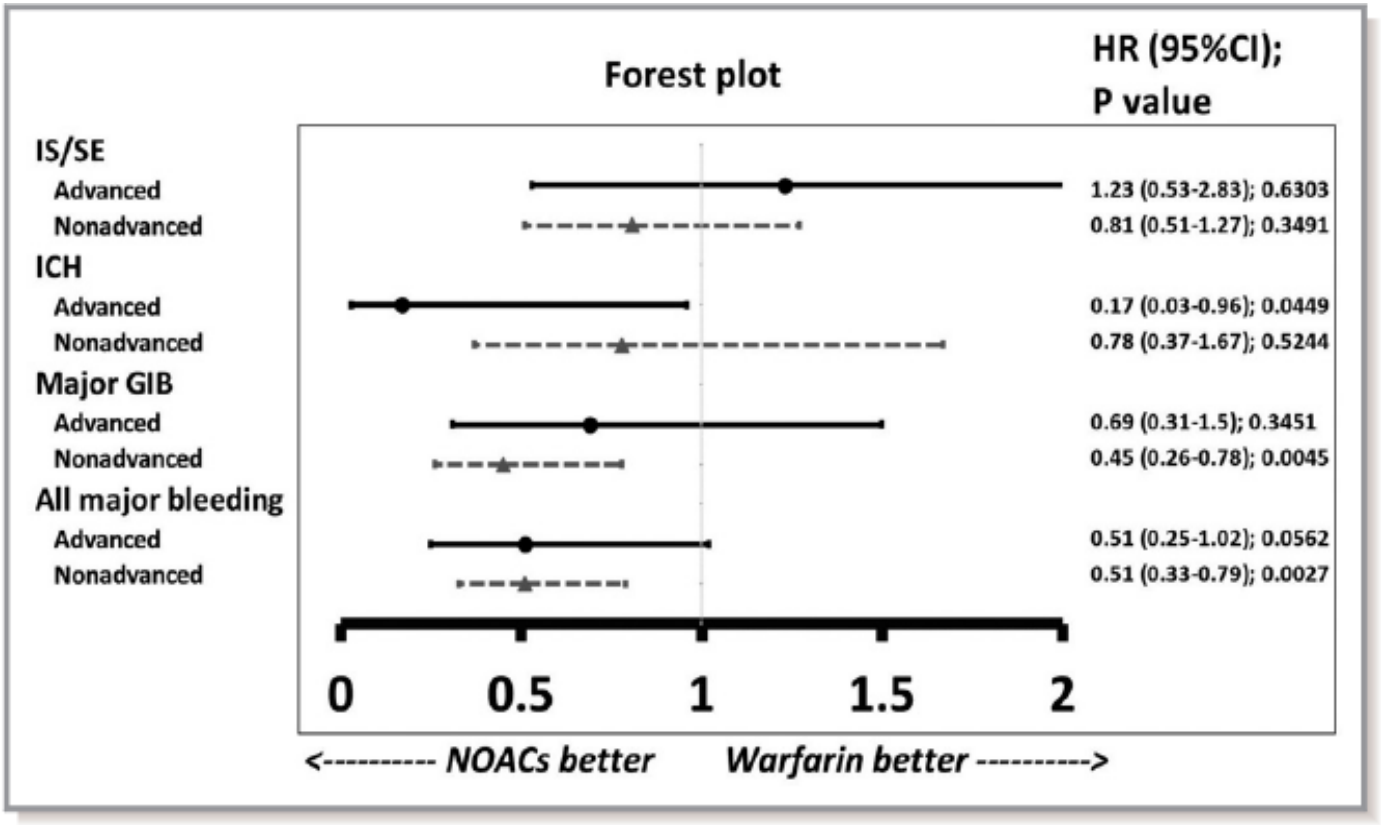


Figure 5. Forest plot of HRs for NOAC vs warfarin among patients with either advanced or nonadvanced liver cirrhosis taking oral anticoagulants. In total, 271 (19%) and 273 (27%) patients with advanced liver cirrhosis were taking NOACs and warfarin, respectively. For those patients with advanced liver cirrhosis, the NOAC group has lower risk of intracranial hemorrhage than the warfarin group. For those patients with nonadvanced liver cirrhosis, the NOAC group has lower risks of major GIB and all major bleeding than the warfarin group. GIB indicates gastrointestinal bleeding; HR, hazard ratio; ICH, intracranial hemorrhage; IS/SE, ischemic stroke/systemic embolism; NOAC, non–vitamin K antagonist oral anticoagulant.

ESC European Society of Cardiology
European Heart Journal (2018) 39, 1330–1393
doi:10.1093/eurheartj/ehy136

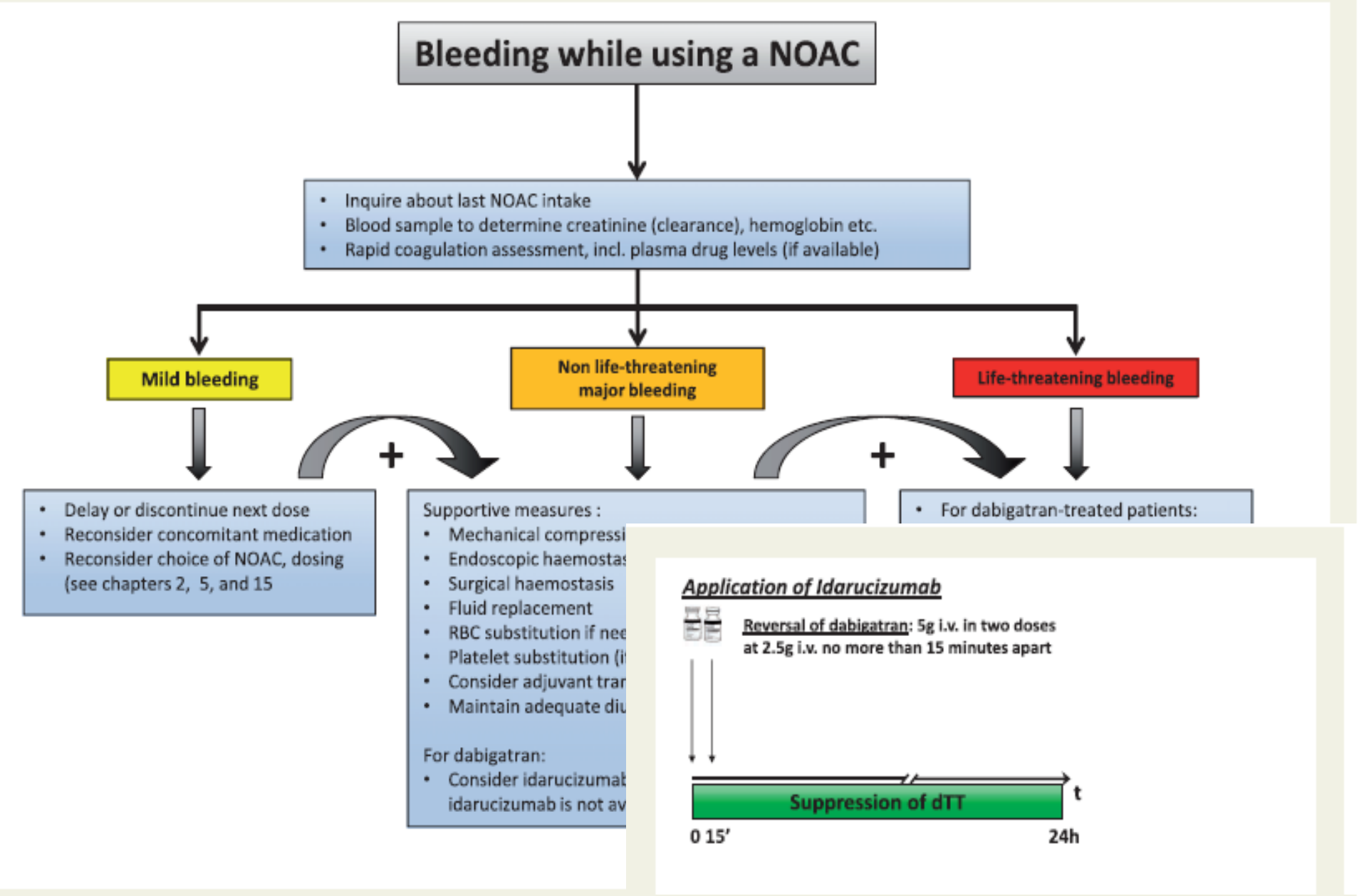
SPECIAL ARTICLE

The 2018 European Heart Rhythm Association Practical Guide on the use of non-vitamin K antagonist oral anticoagulants in patients with atrial fibrillation

Table 8 Calculation of the Child-Turcotte-Pugh score and use of NOACs in hepatic insufficiency

Parameters	1 point	2 points	3 points
Encephalopathy	No	Grade 1–2 (suppressed with medication)	Grade 3–4 (refractory/chronic)
Ascites	No	Mild (diuretic-responsive)	Moderate–severe (diuretic-refractory)
Bilirubin	<2 mg/dL	2–3 mg/dL	>3 mg/dL
	<34 μmol/L	34–50 μmol/L	>50 μmol/L
Albumin	>3.5 g/dL	2.8–3.5 g/dL	<2.8 g/dL
	>35 g/L	28–35 g/L	<28 g/dL
INR	<1.7	1.71–2.30	>2.30

Child–Pugh category	Dabigatran	Apixaban	Edoxaban	Rivaroxaban
A (5–6 points)	No dose reduction	No dose reduction	No dose reduction	No dose reduction
B (7–9 points)	Use with caution	Use cautiously	Use cautiously	Do not use
C (10–15 points)	Do not use	Do not use	Do not use	Do not use



re 5 Management of bleeding in patients taking non-vitamin K antagonist oral anticoagulants.

Portal venous thrombosis – liver cirrhosis patients = Summary

Liver cirrhosis:
- > Increased antithrombotic - increased prothrombotic factors

Prevalence: ~ 10% of pts with liver cirrhosis
- > Increases risk of decompensation / bleeding

Treatment:
- > Preventive measures bleeding risk + Anticoagulation
- > Duration? Check local status 3 months
- > Continuation in subgroup of patients
  - > Bridge to OLT
  - > At presentation worsening liver status
  - > Additional benefit: reduction fibrogenesis

NOAC / DOAC :

Seem feasible

Equally effective – possibly safer

Case study

- **Young men 23 yrs of age**
  - Presented at ER because of abdominal complaints –DD : appendicitis
    - No clinical signs of appendicitis
    - Trombocytopenia
  - **Referred to Internal medicine**
    - Deficient of vitamin D, vitamin B12, folic acid
    - Echo / CT = splenomegaly, pathologic lymph nodes in abdomen, pathological wall in colon and duodenum
      - Suspicious of **lymphoma**

***Next diagnostic steps?**

Case study

- CT guided biopsies = no representative data
- PET-CT : no uptake
- Endo-echo:
  - No puncture due to extensive signs of portal hypertension
    - Esophageal varices, portal gastropathy

??

Case study

MRI T2-gewogen opname + schematische weergave bevindingen zoals gezien met MRI opname

> i) **Lever** zonder aanwijzingen voor parenchymateuze afwijkingen,

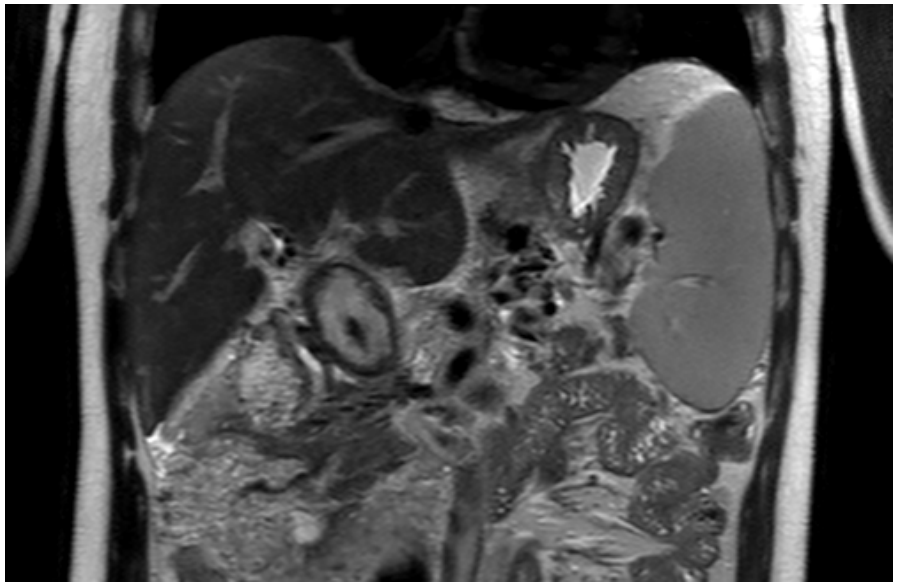
> ii) **carverneuze malformatie** met daarin kalkdeposities en centrale lokalisatie van het duodenum pars descendens. Op basis van de CT-beelden was dit aanvankelijk verdacht voor maligne tumormassa.

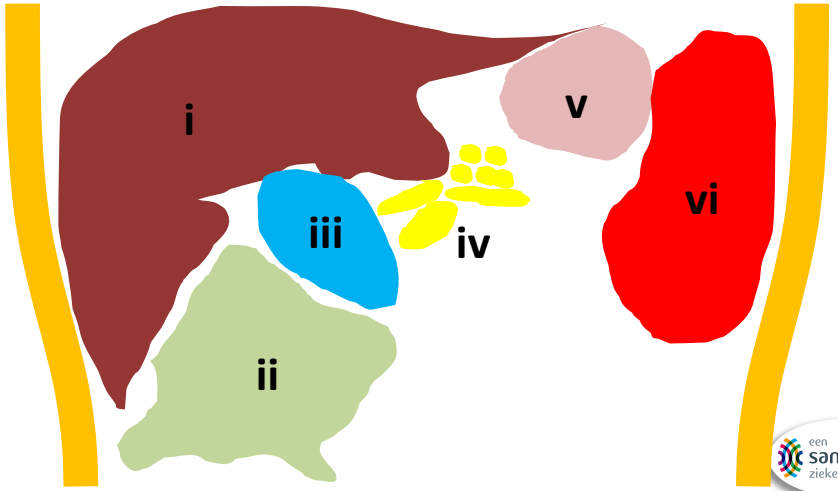
> iii) **trombus in de vena porta**. Op de CT aanvankelijk verdacht voor vergrote lymfeklier,

> iv.) **Veneuze collateralen**,

> v.) maag,

> vi.) **splenomegalie**





Case study

Diagnosis

- MRI abdomen:
  - Cavernous transformation of thrombosed portal vein
  - Extensive collateral formation
  - Splenomegaly

- **Extrahepatic portal vein obstruction with signs of portal hypertension**

- **What would you do next?**

Case

Diagnosis

> Refer to hematologist
>> No signs of inherited thrombophilia, no MPN, etc

> Detect acquired thrombophilia
>> No signs of IBD disease
>> No signs of lymphoma or other malignancies

> **How to treat portal hypertension?**

Case study

- Start Carvediol
  - Side effects
- Elective esophageal ligation
- Back in ER = upper GI bleed
  - DD:
  - **What would you do?**

Patient

- Start Octreotide + PPI

- Upper GI endoscopy
  - Bleeding source in duodenum pars horizontalis

  - DD?

- **Ectopic varices**
  - More common in patients with extrahepatic portal vein obstruction

  - Splenic vein embolization
    - Complicated by splenic abcesses
    - So far no new variceal bleeds anymore

Dank u !