

unisanté

Centre universitaire de médecine générale
et santé publique • Lausanne

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Hématologie

« Red flags » hématologiques

Lorenzo ALBERIO

Médecin chef
Hématologie générale et Hémostase
Service et Laboratoire centrale d'Hématologie
CHUV, Lausanne

Outline

- La Storia di *Domenica*
- La Storia di *Giorgio*
- La Storia di *Falco*

La storia di *domenica.41*

History:

1 week before hospitalization	dark urine
3 days before hospitalization	petechiae (perimalleolar) abdominal pain
2 days before hospitalization	nausea frontal headache
Reason for hospitalization	bicytopenia (Hb, Tc) suspected pancreatic mass

Status:

general conditions: decreased
abdomen: epigastric sensitivity, no defence or relaxation
derma: petechiae on the limbs



La storia di *domenica.41*

Laboratory:

Hb	63	g/l	(117 – 157)
Hct	18	%	(35 – 47)
MCV	87	fl	(81 – 99)
MCH	31	pg	(27 – 34)
MCHC	350	g/l	(310 – 350)

Normocytic normochromic anemia

Tc	13	G/l	(150 – 350)
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Severe thrombocytopenia

Lc	13.2	G/l	(4.0 – 10.0)
- neutrophiles	10.1	G/l	(1.8 – 7.5)
- lymphocytes	2.4	G/l	(1.5 – 4.0)
- monocytes	0.7	G/l	(0.2 – 0.8)
- eosinophiles	0.0	G/l	(0.05 – 0.3)
- basophiles	0.0	G/l	(0.01 – 0.05)

Slight neutrocytosis

Reflex:
Blood film?
(microscope)

DD: normocytic normochromic anemia

Production ? Reticulocytes: 133 G/l (20-120) hyperregenerative

Destruction ? LDH : 1031 U/l (135 – 214) hemolytic

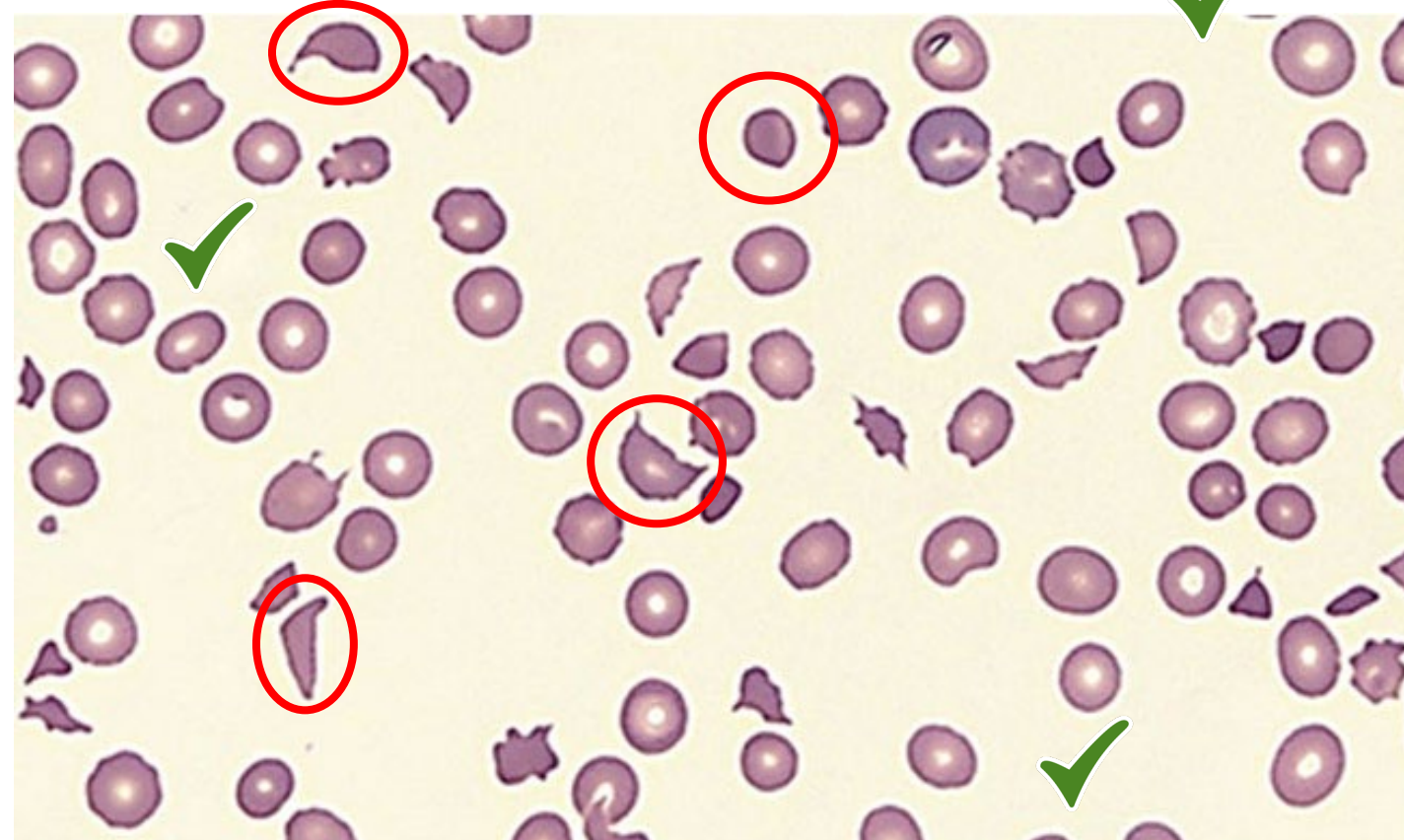
Immune ? DAT: negative ! non-immune

Mechanic ? Blood film?
(microscope)

Legend:

DAT, direct antiglobulin test (= Coombs-test) ; LDH, lactate dehydrogenase ; RBC, red blood cells

Le frottis sanguin : Un regard artistique



Purpura **T**hrombotique **T**hrombopénique

Ça c'est une **urgence** hématologique

La storia di *domenica.41*

Production ? Reticulocytes: **133** G/l hyperregenerative

Destruction ? LDH : **1031** U/l (135 – 214) hemolytic

Immune ? DAT: negative ! non-immune

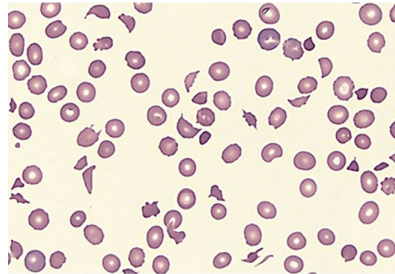
Mechanic ? Fragmentocytes: **9** ‰ (neg.) Mechanic RBC
destruction

**Thrombotic
microangiopathy**

Legend:

DAT, direct antiglobulin test (= Coombs-test) ; LDH, lactate dehydrogenase ; RBC, red blood cells

Pragmatic approach to TMA treatment



Diagnosis of TMA:

- Low Platelet Count and DAT-negative Anemia
- Increased serum LDH
- Fragmented erythrocytes in the peripheral smear

Critically ill patients

- CNS signs
- Dialysis dependent ARF

Urgent plasma exchange with fresh frozen plasma



Draw blood before Plasma Exchange!

≤5% ADAMTS13 activity

TTP

Continue plasma exchange with fresh frozen plasma

Consider caplacizumab

Anti-ADAMTS13 autoantibodies

Consider also immunosuppressive therapy including Rituximab

TTP mortality:

- 80% without PEX
- 20% with PEX

Legend
 ARF, acute renal failure
 CNS, central nervous system
 DAT, direct anti-globulin (Coombs) test
 TMA, thrombotic microangiopathy
 TTP, thrombotic thrombocytopenic purpura

Thrombocytopenia + mechanic RBC destruction

**Thrombotic
Microangiopathic
Anemia**

La storia di *giorgio.72*

72 year-old man

Present complain:

- Fatigue (recent onset, progressive)
- Colchicine (because of gout, diagnosed 1 month ago)

Personal history:

- Hyperferritinemia (3 phlebotomies/year)
- Arterial hypertension

La storia di *giorgio.72* – Complete Blood Count

Hb	122	g/l	(133 – 177)
Hk	0.34	l/l	(0.40 – 0.52)
Ec	3.87	T/l	(4.4 – 5.8)
MCV	88	fl	(81 – 99)
MCH	31.5	pg	(27 – 34)
MCHC	360	g/l	(310 – 360)
Retics	42.2	G/L	(20 – 120)
Lc	1.3	G/l	(4.0 – 10.0)
Neutro	1.12	G/l	(1.8 – 7.5)
Lympho	0.16	G/l	(1.5 – 4.0)
Mono	0.01	G/l	(0.2 – 0.8)
Eos	0.01	G/l	(0.05 – 0.3)
Tc	50	G/l	(150 – 350)

Pancytopenia

Next question to the lab ?

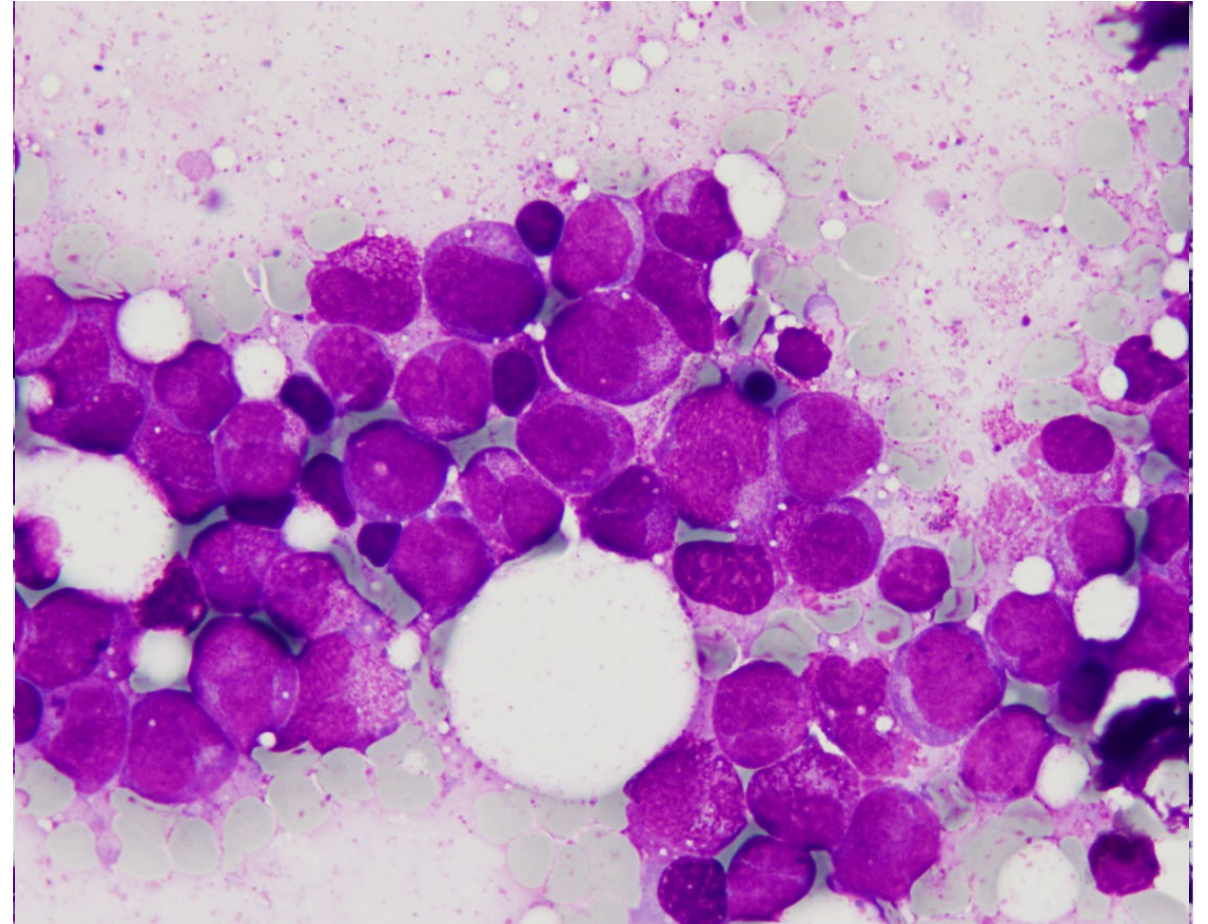
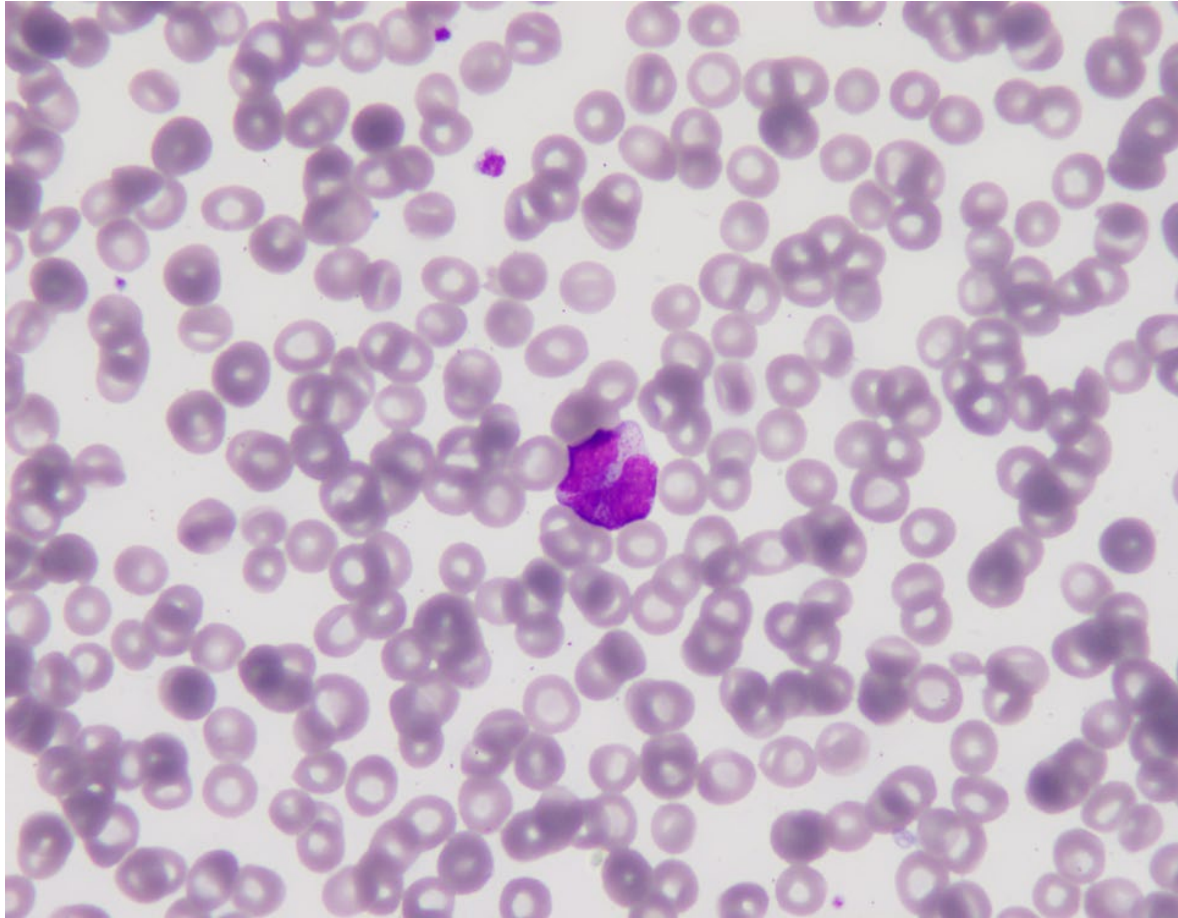
Coagulation studies ?

La storia di *giorgio.72* – Coagulation studies

PT	30	%	(80 – 120)
aPTT	33	sec	(26 – 37)
Thrombin time	20	sec	(14 – 19)
Fibrinogen	0.5	g/l	(2.0 – 4.0)
D-dimers	50'600	ng/ml	(<500)

**Disseminated
Intravascular
Coagulation**

La storia di *giorgio.72* – Blood film & bone marrow



Valentin Basset

Pancytopenia + DIC =

AML M3

**Acute
Promyelocytic
Leukaemia**

La storia di *falco.66*

Acquired bleeding diathesis

Isolated prolonged aPTT

Confirmed several times over several weeks

Medical records: "*Administer FFP & check aPTT afterwards*"

Emergency room

Intracerebral haemorrhage

Exitus letalis

La crase, la crase ... !

Coagulation

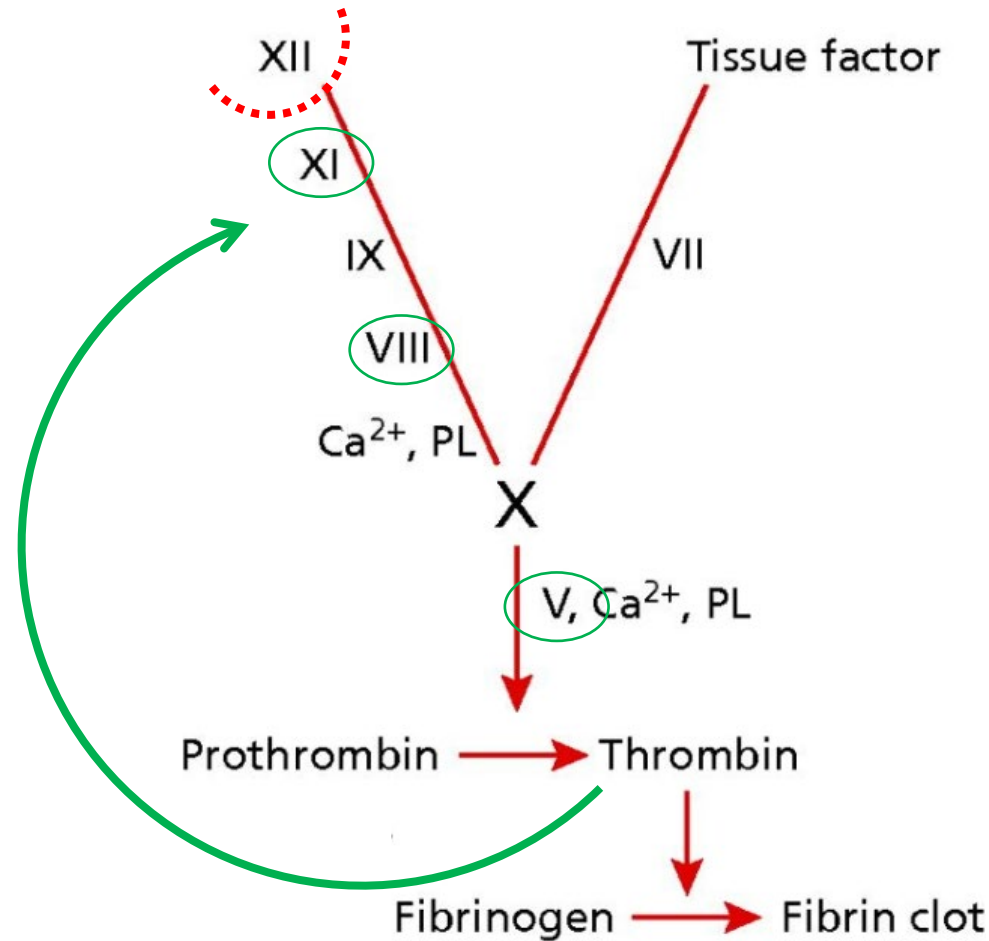
INTRinsic pathway

EXTRinsic pathway

97% of *in vivo* thrombin generation

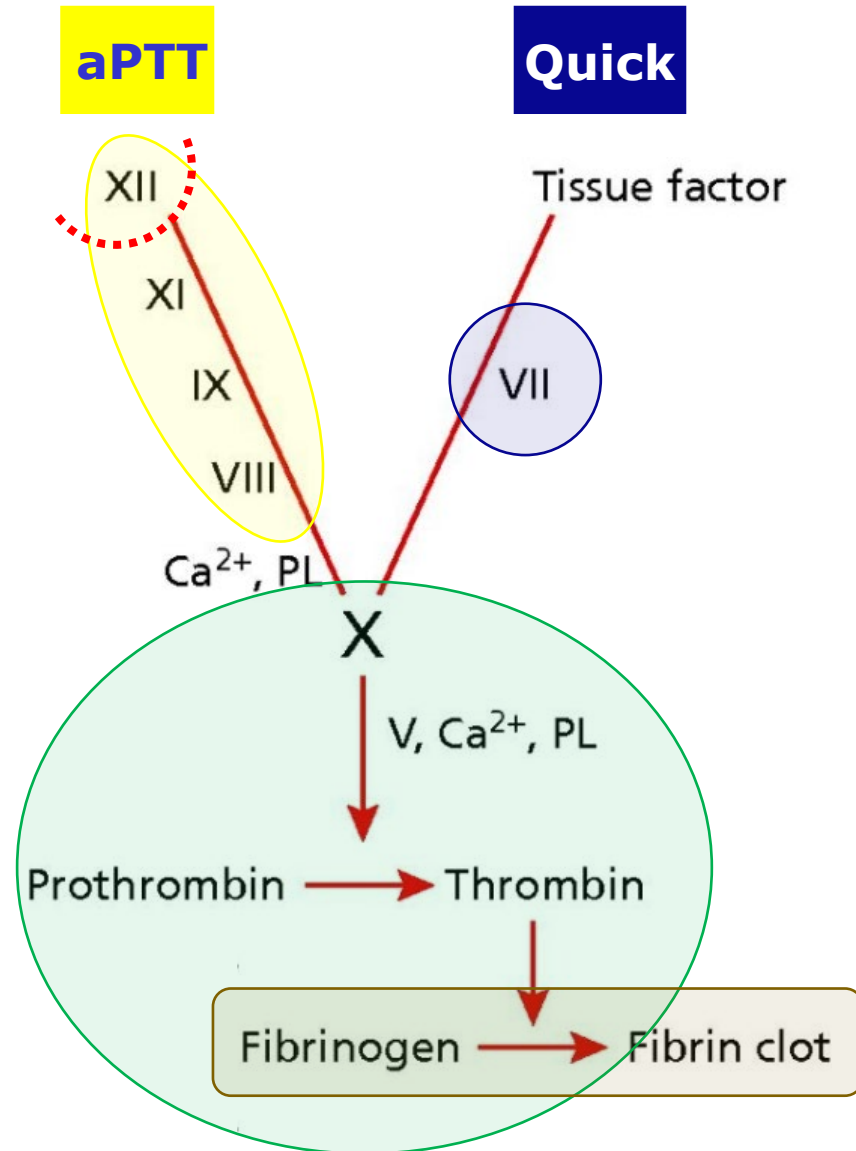
3% of *in vivo* thrombin generation

Positive feed-back mediated by thrombin
→ Activates the “**amplification/propagation**” pathway of coagulation.



Legend:
PL, Phospholipids (negatively charged)

Coagulation assays



Thrombin time / Fibrinogen

Legend:
PL, Phospholipids (negatively charged)

Isolated prolonged aPTT

DD:

- Déficit en facteurs
- Inhibiteurs

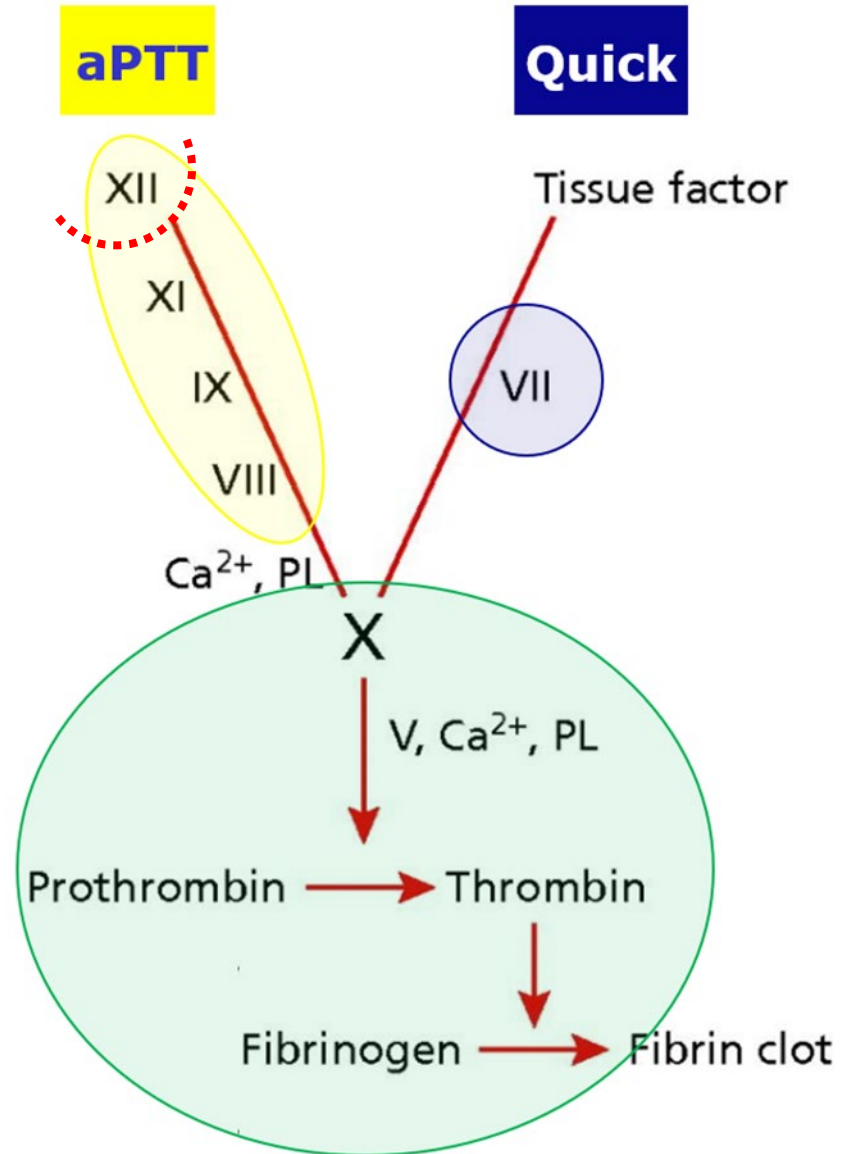
DD:

- Test de mélange de l'aPTT

La storia di falco.66

- Inhibiteur lent

Hémophilie acquise



Normal Quick

- VII ✓
- X ✓
- V ✓
- Prothrombin ✓
- Fibrinogen ✓

Normal Thrombin time

- Fibrinogen ✓
- No thrombin inhibitors

New-onset bleeding + isolated prolonged aPTT

**Think of Acquired
Haemophilia**

« Red flags » hématologiques

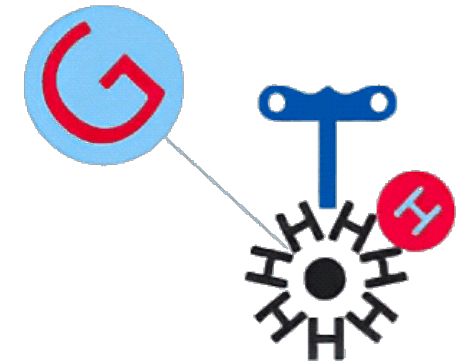
- *Domenica: Purpura thrombotique thrombocytopenique*
Anémie hémolytique + thrombopénie → DAT, schizocytes ?
- *Giorgio: Leucémie promyélocytaire*
Pancytopénie → CIVD ?
- *Falco: Hémophilie acquise*
Nouvelle tendance à saigner → aPTT prolongé, mix ?



Advances
Research
Technology
Education

GTH 2025 Lausanne

18 - 21 February 2025



GTH 2025 | ARTE in Lausanne
Society of Thrombosis
and Hemostasis Research

in

Thrombosis and Haemostasis

Register now on www.gth2025.com

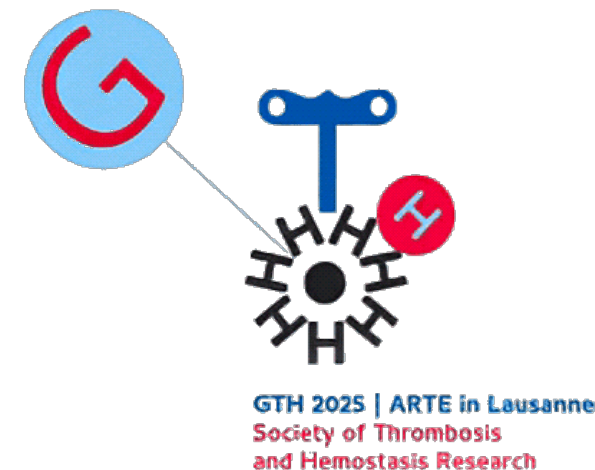
Opportunities GTH 2025 in Lausanne (18-21.02.2025)

Workshops for young haemostaseologists

- Communication skills
- HEAD-US
- Artificial intelligence
- Leadership

Museums (special discounts)

- Alimentarium
- Aquatis
- Chaplin's World
- Château de Chillon
- Château de Prangins
- Collection de l'Art Brut
- Espace des inventions
- Fondation l'Hermitage
- Fort de Chillon
- Musée d'Art de Pully
- Musée de la main
- Musée historique
- Musée Jenisch
- Musée Olympique
- Musée Romain
- Palais de Rumine
- Plateforme 10



A MAD networking dinner and a lot more !

Register now on www.gth2025.com