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Heparin-induced Thrombocytopenia and PCI

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Conflicts and disclosures – none

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HIT(T) in PCI Patients – Learning Objectives

Understand HIT in context of Acute Coronary Syndromes and PCI

Recognition and diagnosis

Management

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Heparin Induced Thrombocytopenia

2 to 5% of patients exposed to heparin

Lower incidence with LMWH than UFH

HITT – catastrophic venous or arterial thrombosis

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Heparin in Cardiology Practice

STEMI and NSTEMI

PCI

Mechanical cardiac valves

Atrial fibrillation

ACS in medical and surgical patients who may be receiving VTE prophylaxis

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>37,000 admissions in 2014

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HIT in Cardiology Practice

Failure to monitor or recognize

Over diagnosis leading to
- Unnecessary cessation of heparin
- Increased costs
- Unnecessary bleeding risks

Inadequate treatment
- HIT without evident thrombosis

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Case example #1

75 yr old male DM2 otherwise no prior illness

NSTEMI – Troponin positive

Initial treatment

- UFH, clopidogrel, ß blocker and statin

2 days later prior to planned CA

- Platelet count fallen from 160 x 10^9/L on admission to 98 x 10^9/L

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Question 1

Is this likely to be HIT?

1. Yes
2. No

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Question 2

What would you recommend?

1. Nothing and proceed to CA as planned
2. Switch to LMWH
3. Discontinue UFH and check ELISA - Ab to PF4:heparin complex
4. Discontinue UFH and start bivalirudin
5. Discontinue UFH and start argatroban

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Case example #2

68 yr old female hospitalized for 48 hours with recent NSTEMI and treated with UFH

PMHx: DM2, CKD stage 3B

Transferred for CA and possible PCI

UFH continued and preloaded with clopidogrel

Labs on arrival:

Platelets 300 x 10^9/L and creatinine 3.0 mg/dL

Coronary angiography is postponed

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Day 6:

Recurrent chest pain overnight

Platelet count = 138 x 10^9/L

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Question 3

Is this likely to be HIT?

1. Yes
2. No

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Question 4

What would you recommend?

1. Nothing – continue UFH
2. Switch to LMWH
3. Discontinue UFH and check ELISA - Ab to PF4:heparin complex
4. Discontinue UFH and start bivalirudin
5. Discontinue UFH and start argatroban

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Types of HIT

Type 1: Non immune type (case #1)

- Common within first 2 days of heparin
- Mild fall in platelets then returns to normal
- Benign – no treatment

Type 2: Immune type (case #2)

- Frequency of 2.5 to 5%
- Serious

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The diagnosis of HIT is primarily clinical

– supported by appropriate lab tests

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Diagnosis of HIT
Clinical Suspicion – the 4Ts

	Points
Thrombocytopenia	0-2
Drop >50% of prior count; nadir >20 k/μL	
Timing	0-2
Classical 5-10 days (the most frequent)	
Early <5 days (if recent exposure)	
Delayed >10 days	
Thrombosis – evident?	0-2
No o**T**her cause of thrombocytopenia	0-2

Warkentin TE: Circ 2004

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Pretest Probability – Point Score

Warkentin TE: Circ 2004

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Lab Testing

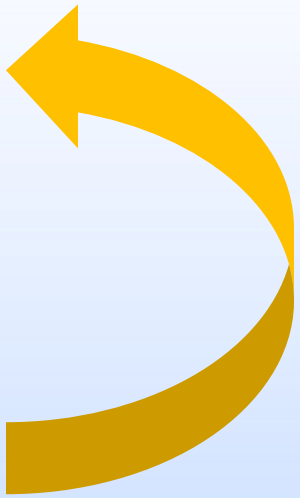
Re-emphasis on clinical predictors – 4Ts

Immunologic assay results ~ 24 hours

- Highly sensitive
- Low specificity
- Equivocal results not uncommon

Functional assay

- Outsourced
- Considerable delay



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Thrombocytopenia in ACS Patients

Pseudothrombocytopenia

Drugs

- Abciximab, eptifibatide
- Clopidogrel – TTP

Consumption

- Bleeding
- DIC in shock patients
- IABP

Hemodilution

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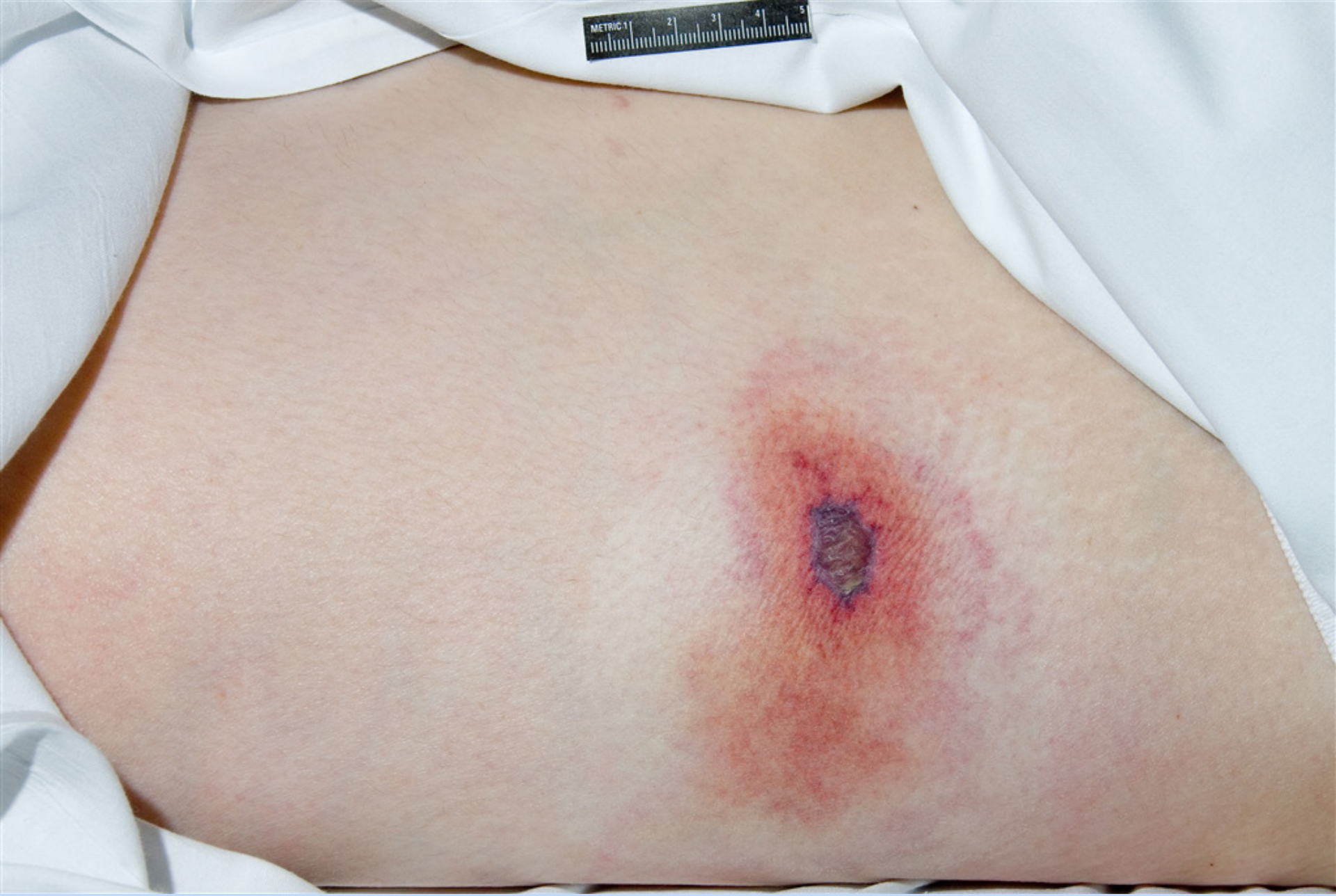

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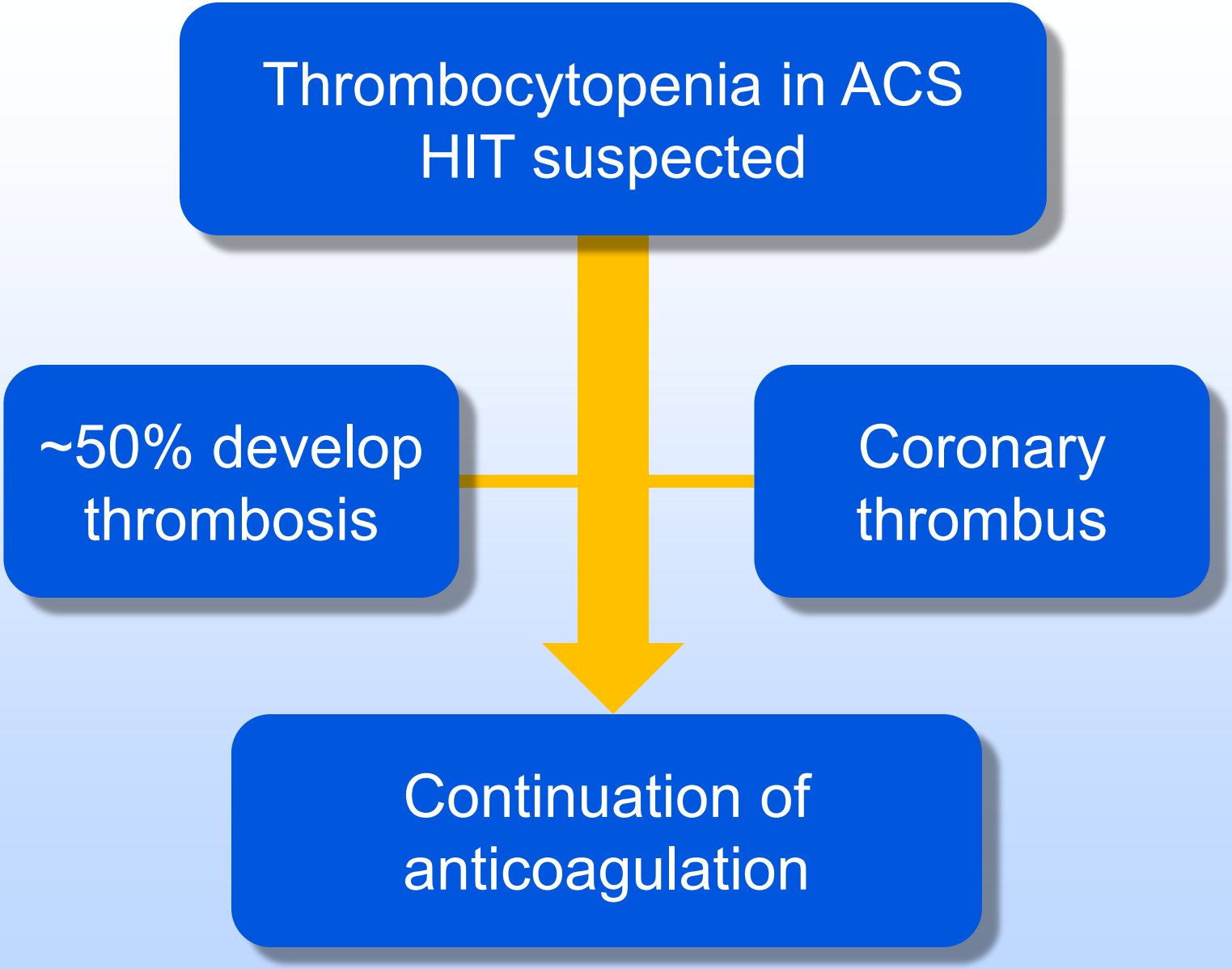

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HIT Treatment Goals

Stop immune response → Stop heparin

Prevent thrombin formation existing + new → Non-heparin anticoagulant

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Management in ACS Patient – Don't delay!

Stop all heparin including LMWH

- Don't wait for lab confirmation

ELISA – Ab to PF4:heparin complex

Look for thrombosis

Begin DTI – even if no thrombosis evident

- Argatroban – preferred
- Bivalirudin – off label
- Lepirudin – no longer available

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Argatroban: Practical Issues

Reduce dose if liver dysfunction

Prolongs APTT and INR

$t_{1/2}$ = 24 min

Transition to warfarin – never alone!

- Once platelet count >150 x 10^9/L
- Overlap with DTI no less than 5 days
- Check for INR >2 after interrupting infusion

Warfarin for 3-6 months

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Alternative anticoagulants

Danaparoid

- Used frequently in past but unavailable in USA

Fondaparinux

- Off label
- No randomized outcome data
- Often recommended if no thrombosis
- Can it cause HIT (or “FIT”) – controversial

NOACS

- Off label
- Limited experience – need more research

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PCI in the HIT(T) Patient

Delay PCI if severe thrombocytopenia
- Bleeding risk
- Wait for counts to increase

Preload with ASA and P_2Y_{12} inhibitor

Bivalirudin and argatroban – both approved

Trans radial access – less bleeding

Avoid IV GP IIb/IIIa inhibitors

Remove ALL heparin from flushes, tubing etc

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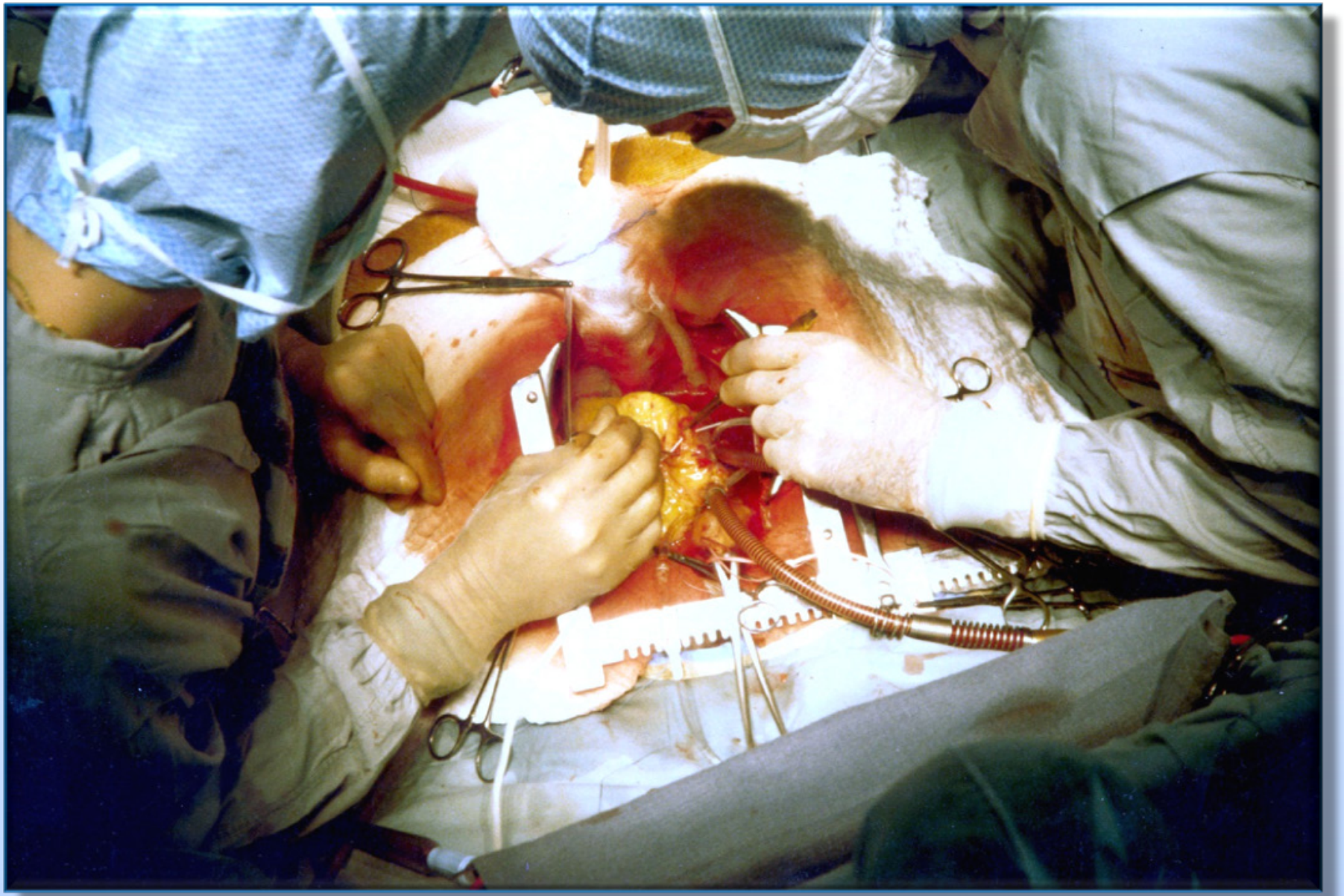

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Is re-exposure to heparin safe if prior history of HIT?

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Re-exposure to Heparin if Remote HIT(T)

Antibody absent >100 days in most HIT patients

No anamnestic response

PCI:	Brief intraprocedural use Is UFH safe? ACCP recommend bivalirudin*
ACS:	Bivalirudin or fondaparinux
CABG:	UFH safe if functional assay negative

*Linkins L: Chest 2012

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Conclusions

HIT(T) not uncommon in CV patients

Recognition and management remain challenging

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