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Dunedin Hospital

Would You Recognise A PE if You Fell Over It? - Main Session (Workshop options scheduled)

Saturday, 17 August 2013

Start 8:30am

Duration: 20mins

Plenary



South GP CME 2013

General Practice Conference & Medical Exhibition

15-18 August | Edgar Centre | Dunedin

PULMONARY EMBOLISM

Making the Diagnosis

South GP CME 2013

CASE 1

28 year old Caucasian woman

Presenting Complaints:

L pleuritic chest pain	}	2 days
Breathlessness		
Denies any leg symptoms		

Past Medical History:

Recently diagnosed with SLE
No personal or family hx of VTE

Personal History:

On 2nd generation oral contraceptive pill
Smoker 15/day

CASE 1

Physical Examination:

Overweight young woman (BMI 34)

Not obviously unwell

Temp. 36.7°C

Respiratory rate 20/min

Pulse 78/min, BP 120/75

Chest - minimal tenderness over L chest wall laterally

Examination legs unremarkable

D-dimer negative

Answer: Case 1

SMS your vote to 0297 702 140 or visit m.smspoll.net

Yes
1559

No
1560

CASE 2

78 year old man

Presenting Complaints:

Worsening pleuritic chest pain	}	3 days
Breathlessness		

Recent d/c from hospital after 2/52 admission
with acute cholecystitis (no surgery)

Past Medical History:

Idiopathic R leg DVT 5 years previously

Hypertension

Previous pulmonary oedema with poor LV fn

CASE 2

Physical Examination:

Temp. 37°C

Respiratory rate 22/min

Pulse 105/min, BP 136/85

Chest - no focal signs

Examination legs unremarkable

D-dimer negative

Chest x-ray & ECG normal

Answer: Case 2

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Yes
1561

No
1562

Pulmonary Embolism - Epidemiology

Venous thromboembolism - common, lethal disease that recurs frequently and causes serious long term complications

- Annual incidence estimated at 0.24%
 - 9600 cases/year
- Predominantly a disease of older age
- Incidence same for men and women

Major Risk Factors for Pulmonary Embolism

Category	Comments
Surgery	Major abdominal/pelvic surgery Hip/knee surgery Post-operative intensive care
Obstetrics	Pregnancy Caesarean section Puerperium
Lower limb problems	Fracture Varicose veins
Reduced mobility	Hospitalisation Institutional care
Malignant disease	Abdominal/pelvic Advanced/metastatic
Miscellaneous	Previous proven venous thromboembolism

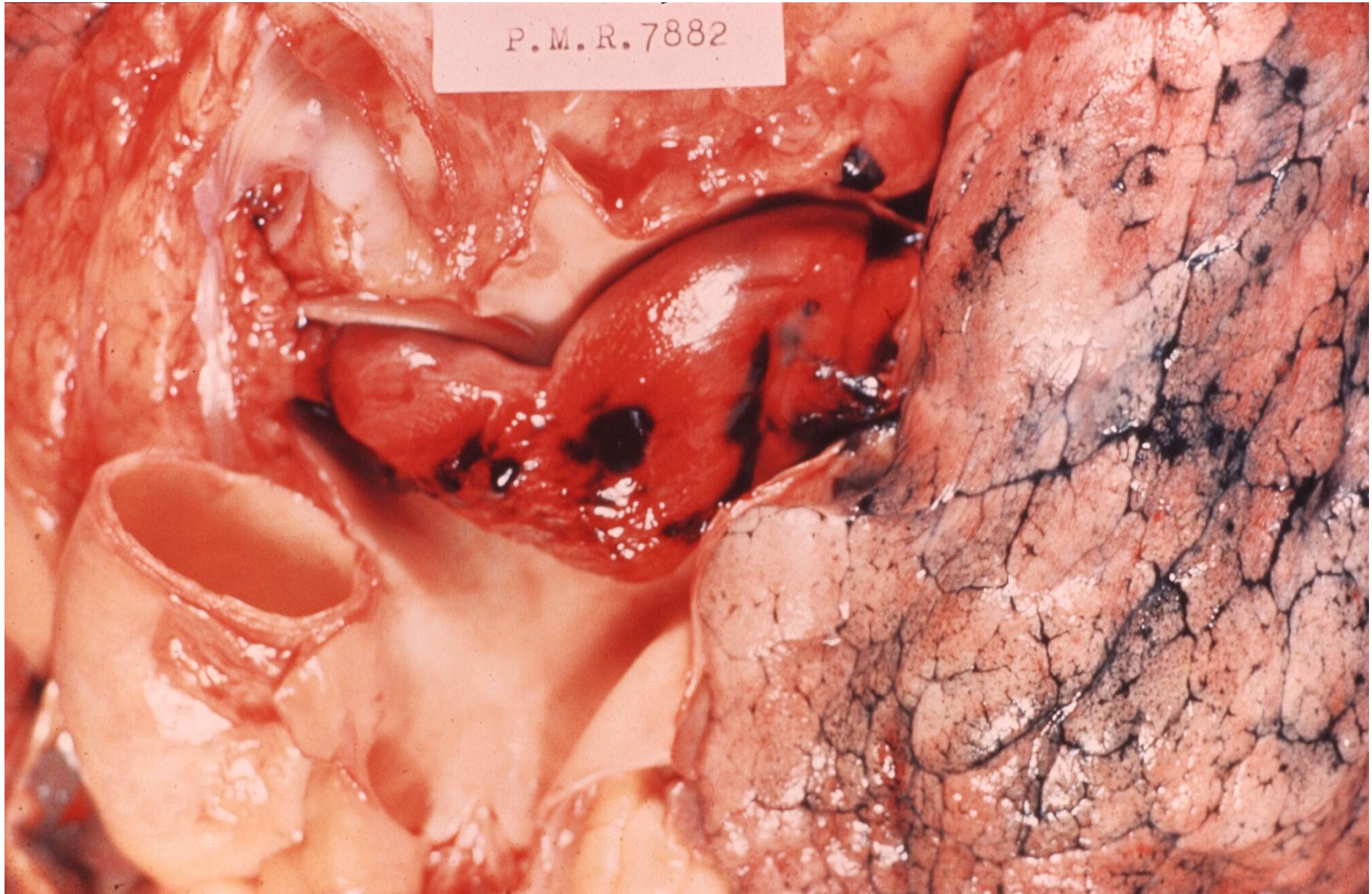
Pulmonary Embolism - Survival

Poor early survival predicted by:

- syncope
- hypotension

Up to 30% mortality rate if pulmonary embolism is undiagnosed/untreated

P.M.R. 7882



Pulmonary Embolism - Diagnosis

Diagnostic error in medicine

- Analysis of 583 physician-reported errors
- Pulmonary embolism most common missed or delayed diagnosis (4.5% of total cases)
- More likely to be *cognitive* rather than *system* error

Pulmonary Embolism - Diagnosis

Diagnostic performance assessed by autopsy

- Primary referral hospital over 10 year period
- 970 medical reports compared retrospectively with autopsy reports
- Most frequently missed diagnoses were myocardial infarction and pulmonary embolism

Overdiagnosis of PE?

CT scan

- huge surge in use
- greater sensitivity compared with V/Q scan

US data - 80% increase in PE diagnoses from 1998-2006
with introduction of CTPA

- no change in age adjusted mortality from PE
- reduction (dilution) of age adjusted case fatality rates

Are subsegmental pulmonary artery occlusions significant?

Missed/Untreated PE → 30% Mortality?

Barritt & Jordan 1960

Prospective randomised controlled study of anticoagulation in PE

- No deaths from PE in patients receiving anticoagulation
 - 5 (26%) deaths from PE
 - 5 (26%) nonfatal recurrent PE
- } no anticoagulation

Diagnosis based on clinical criteria

Dalen & Alpert 1975

Analysis of early studies, incl. Barritt & Jordan data
Calculated 30% mortality

Pulmonary Embolism - Symptoms & Signs

Breathlessness, pleuritic chest pain, palpitations, cough & haemoptysis, syncope

Tachycardia, tachypnoea, fever, pleural rub, signs of pleural effusion, signs of DVT

‘the Great Masquerader’

Wells Criteria for Pulmonary Embolism

Variable	No. of Points
Risk factors	
Clinical symptoms & signs of deep venous thrombosis	3.0
An alternative diagnosis is deemed less likely than pulmonary embolism	3.0
Heart rate >100 beats/min	1.5
Immobilisation or surgery in the previous 4 weeks	1.5
Previous deep venous thrombosis or pulmonary embolism	1.5
Haemoptysis	1.0
Cancer (receiving treatment, treated in the past 6 months, or palliative care)	1.0
Clinical probability	
Low	<2.0
Intermediate	2.0-6.0
High	>6.0

Revised Geneva Scoring System

Risk Factors	Points
Age older than 65 years	1
Previous deep venous thrombosis or pulmonary embolism	3
Surgery (under GA) or fracture (of the lower limbs) within 4/52	2
Active malignant condition (current or considered cured <1 yr)	2
Symptoms	
Unilateral lower limb pain	3
Haemoptysis	2
Clinical Signs	
Heart rate 75-94 beats/min	3
Heart rate ≥ 95 beats/min	5
Pain on lower limb deep venous palpation & unilateral oedema	4
Clinical Probability	Total Score
Low	0-3
Intermediate	4-10
High	≥ 11

Role of Clinical Gestalt

Assessing pretest probability for PE
Experienced clinicians better than junior RMO

	Low	Moderate	High
PIOPED 1990	9%	30%	68%
Miniati 1996	8%	47%	91%
Perrier 1996,97,99	9%	33%	66%
Sanson 2000	19%	29%	46%
Musset 2002	12%	26%	68%

D-Dimer

- Assay specific for fibrin derivatives
- Detects cross-linked d-dimer domain in venous blood sample
- Diagnostic for lysis of fibrin clot
- Commercially available assays - latex agglutination and ELISA

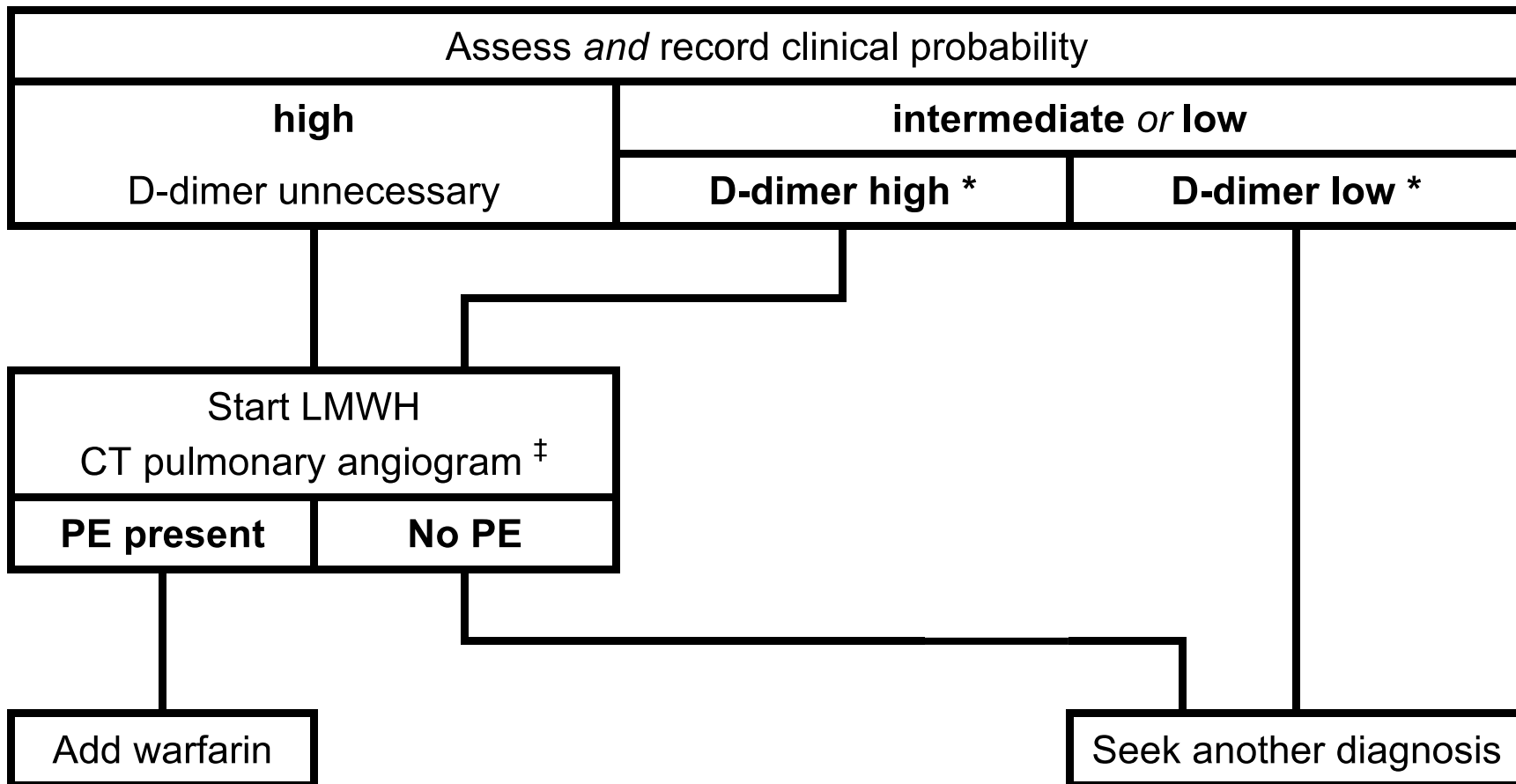
D-Dimer in Suspected Pulmonary Embolism

Low specificity:

- Sepsis
- Recent myocardial infarction or stroke
- Recent surgery or trauma
- Pregnancy or recent delivery
- Disseminated intravascular coagulation
- Metastatic cancer
- Liver disease

D-Dimer in Suspected Pulmonary Embolism

- Only a **normal** result (which excludes PE) is of any clinical value;
- an abnormal result (however high) does **not** imply a significantly increased probability of PE.



Risk Stratification

Determination of prognostic indicators

Pulmonary embolism severity index (PESI):

- age
- co-morbidities
- clinical presentation

Simplified PESI → age, cancer, cardiopulmonary disease,
HR, BP, SaO₂

Estimates risk of 30 day mortality in acute PE

PE-related early MORTALITY RISK		RISK MARKERS			Potential treatment implications
		CLINICAL (Shock or hypotension)	RV Dysfunction	Myocardial injury	
HIGH > 15%		+	(+)*	(+)*	Thrombolysis or Embolectomy
NON HIGH	Inter mediate 3 - 15%	—	+	+	Thrombolysis? Hospital Admission
			+	—	
			—	+	
	Low <1%	—	—	—	Early discharge or home treatment

Pulmonary Embolism - Recurrence

Recurrence rate is less than 5% whilst on anticoagulant therapy

Recurrence occurs in up to 30% by 10 years - unrelated to duration of initial anticoagulation

Risk factors include:

- unprovoked PE
- occult malignancy

D-dimer after cessation of anticoagulation can predict recurrence

?Role of prolonged (lifelong) anticoagulant therapy

Chronic Thromboembolic Pulmonary Hypertension

Complicates less than 5% of PE

Important to recognise

- presents with symptoms and signs of pulmonary hypertension
 - don't necessarily have history of VTE
 - surgical intervention
- Screen with V/Q scan
 - Pulmonary thromboendarterectomy

Preventive Therapy for Venous Thromboembolism

Identify patient with risk factors for VTE

- Early ambulation
- Compression stockings
- Low dose heparin

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CASE 1

No clear alternate diagnosis
Wells score 3

28 year old Caucasian woman

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Denies any leg symptoms		

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CASE 1

Wells score 3

Probability of PE $\rightarrow$ 20%

D-dimer negative

Probability of PE $\rightarrow$ 5%

Perfusion scan normal

CASE 2

78 year old man

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Breathlessness } 3 days

Recent d/c from hospital after 2/52 admission
with acute cholecystitis (no surgery)

Past Medical History:

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Hypertension, previous LVF

CASE 2

Physical Examination:

Temp. 37°C

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Pulse 105/min, BP 136/85

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D-dimer negative

Chest x-ray & ECG normal

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Recent d/c from [hospital after 2/52 admission](#)
with acute cholecystitis (no surgery)

Past Medical History:

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Hypertension, previous LVF

CASE 2

No clear alternate diagnosis
Wells score 7.5

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