

Practical Risk Assessment & Management in PE

2014. 05. 10.

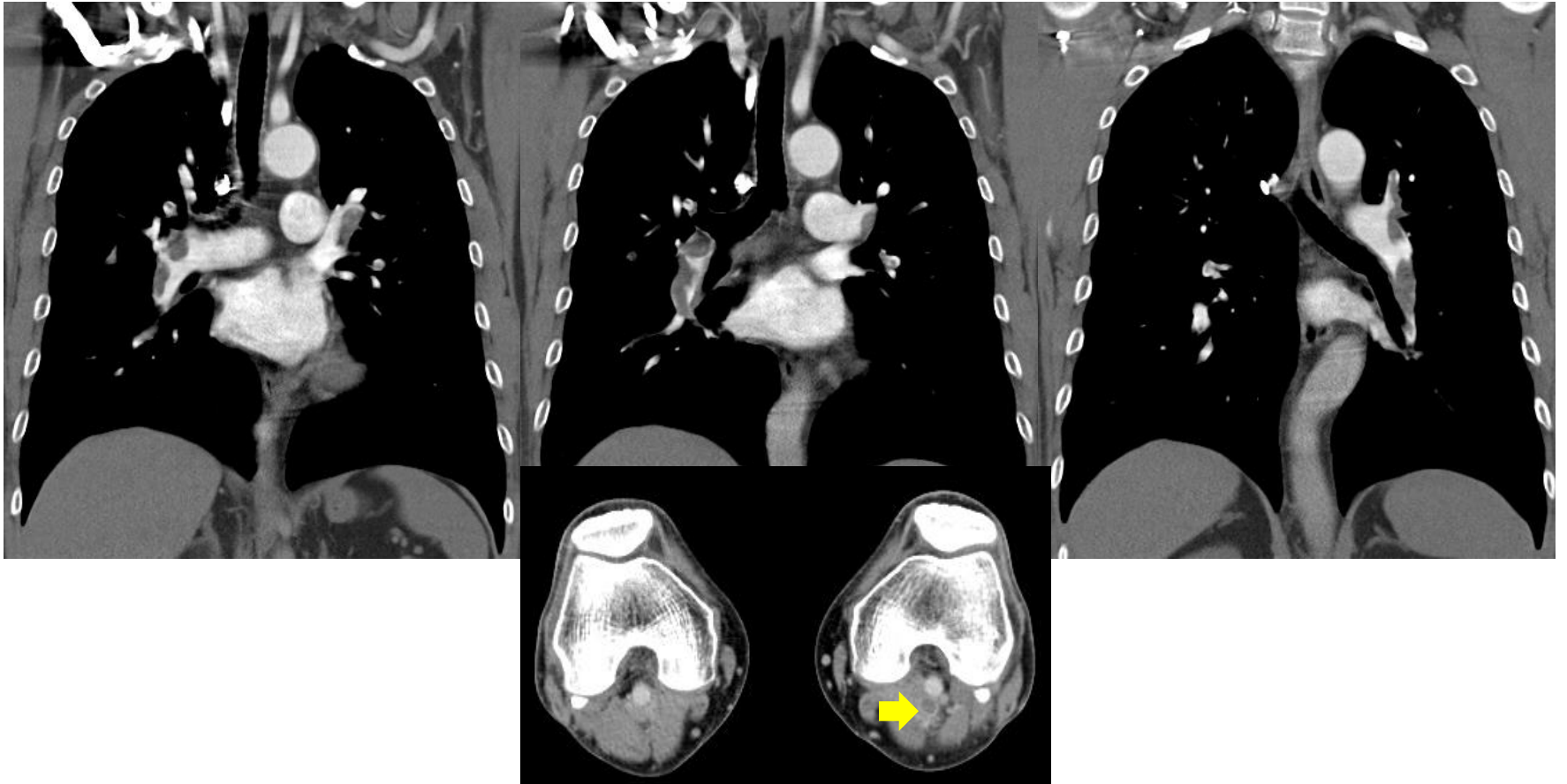
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Case 1

55세 남자로 내원 15일전부터 갑자기 경사진 곳이나 계단 4-5개 정도만 올라가도 숨이 차고 왼쪽 다리의 부종 발생하여 입원.



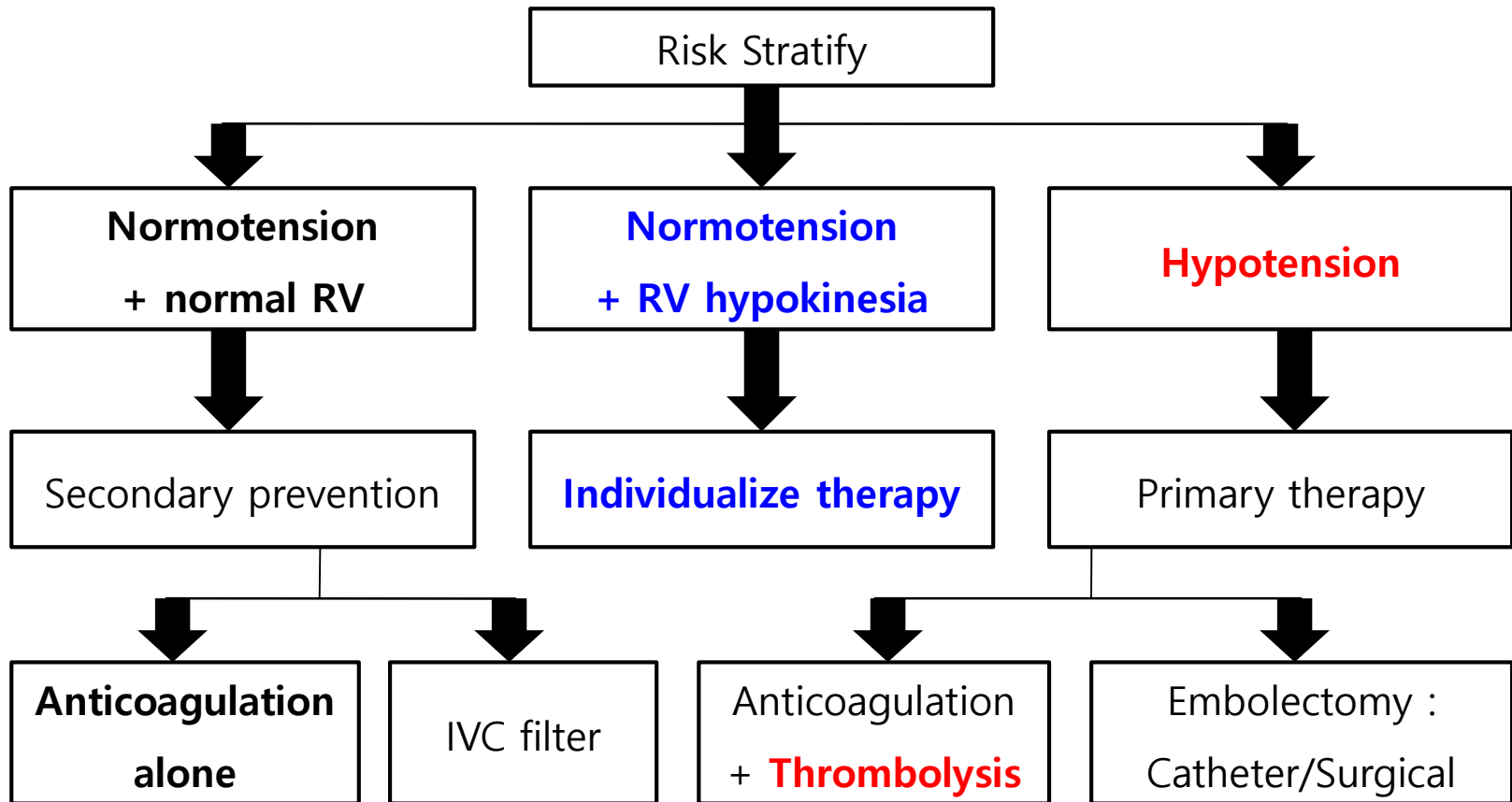
Case 1

- **D-dimer** : 1,930 ng/mL (0 – 243)
- **NT-pro-BNP** : 248.7 pg/mL (0 – 97.3)
- **Troponin-T (hs)** : 0.019 ng/mL (weakly positive 0.015 – 0.099)
- **Echocardiography** : RVE & D-shaped LV without RV hypokinesia

Rivaroxaban 으로 치료를 시작

▶ **이전의 상태를 회복, DOE 및 하지부종 없음**

Algorithm for PE management



In-hospital clinical events in submassive PE

Event	Heparin + alteplase (n=118), n (%)	Heparin + placebo (n=138), n (%)	P value
Primary end point	13 (11.0)	34 (24.6)	0.006
Death from all causes	4 (3.4)	3 (2.2)	0.71
Escalation of treatment	12 (10.2)	34 (24.6)	0.004
Catecholamine infusion	3 (2.5)	8 (5.8)	0.33
Secondary thrombolysis	9 (7.6)	32 (23.2)	0.001
Endotracheal intubation	3 (2.5)	3 (3.2)	0.85
Cardiopulmonary resuscitation	0	1 (0.7)	1.0
Embolectomy or thrombus fragmentation	0	1 (0.7)	1.0

*The numbers shown are based on calculations for the intention-to-treat population.

†P values were calculated with the use of Fisher's exact test (two-sided).

‡Recurrence of pulmonary embolism had to be confirmed by ventilation-perfusion lung scanning, spiral CT, or pulmonary angiography.

§Major bleeding was defined as fatal bleeding, hemorrhagic stroke, or a drop in the hemoglobin concentration by at least 4 g per deciliter, with or without the need for red-cell transfusion.

¶Hemorrhagic or ischemic stroke had to be confirmed by computed tomography or MRI.

Fibrinolysis for patients with intermediate-risk PE

PEITHO trial

Efficacy outcomes				
Outcome	Tenecteplase (N = 506)	Placebo (N = 499)	Odds Ratio (95% CI)	P value
Primary outcome — no. (%)	13 (2.6)	28 (5.6)	0.44 (0.23–0.87)	0.02
Death from any cause	6 (1.2)	9 (1.8)	0.65 (0.23–1.85)	0.42
Hemodynamic decompensation	8 (1.6)	25 (5.0)	0.30 (0.14–0.68)	0.002
Death from any cause between randomization and day 30 - no. (%)	12 (2.4)	16 (3.2)	0.73 (0.34–1.57)	0.42

Fibrinolysis for patients with intermediate-risk PE

PEITHO trial

Safety outcomes intention-to-Treat population				
Outcome	Tenecteplase (N = 506)	Placebo (N = 499)	Odds Ratio (95% CI)	P value
Bleeding between randomization and day 7				
Major extracranial bleeding	32 (6.3)	6 (1.2)	5.55 (2.3–13.39)	<0.001
Minor bleeding	165 (32.6)	43 (8.6)		
Major bleeding	58 (11.5)	12 (2.4)		
Stroke between randomization and day 7				
	12 (2.4)	1 (0.2)	12.10 (1.57–93.39)	0.003
Ischemic stroke	2 (0.4)	0		
Hemorrhagic stroke	10 (2.0)	1 (0.2)		

Case 2

73세 남자로 내원 당일 3m 높이에서 떨어지면서 발생한 두통 및 하지마비 있어 응급실 내원하심.

당뇨와 고혈압으로 고혈압약제 및 아스피린을 복용 중이었음.

응급실 내원 당시 하지의 운동/감각신경 마비가 관찰되었음.

내원 당일 T12 bursting & dislocation Fx. 로

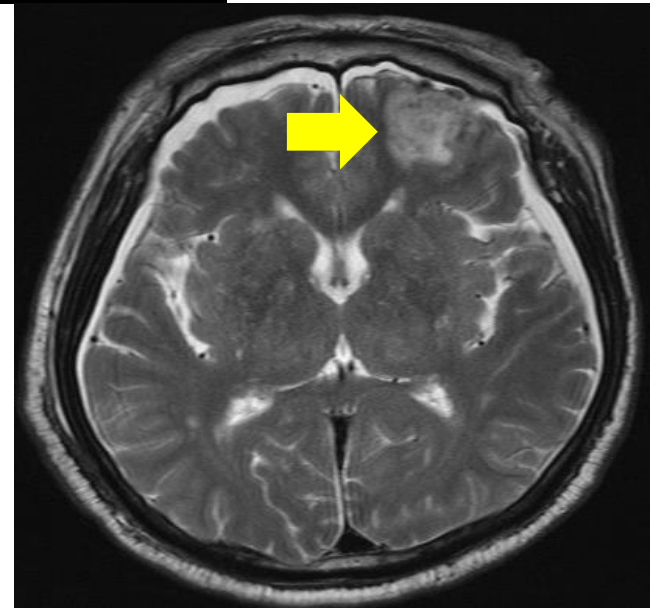
▶ Posterior pedicle screw fixation on T10-12,L1-2

Posterior fixation & bone fusion 시행

Case 2



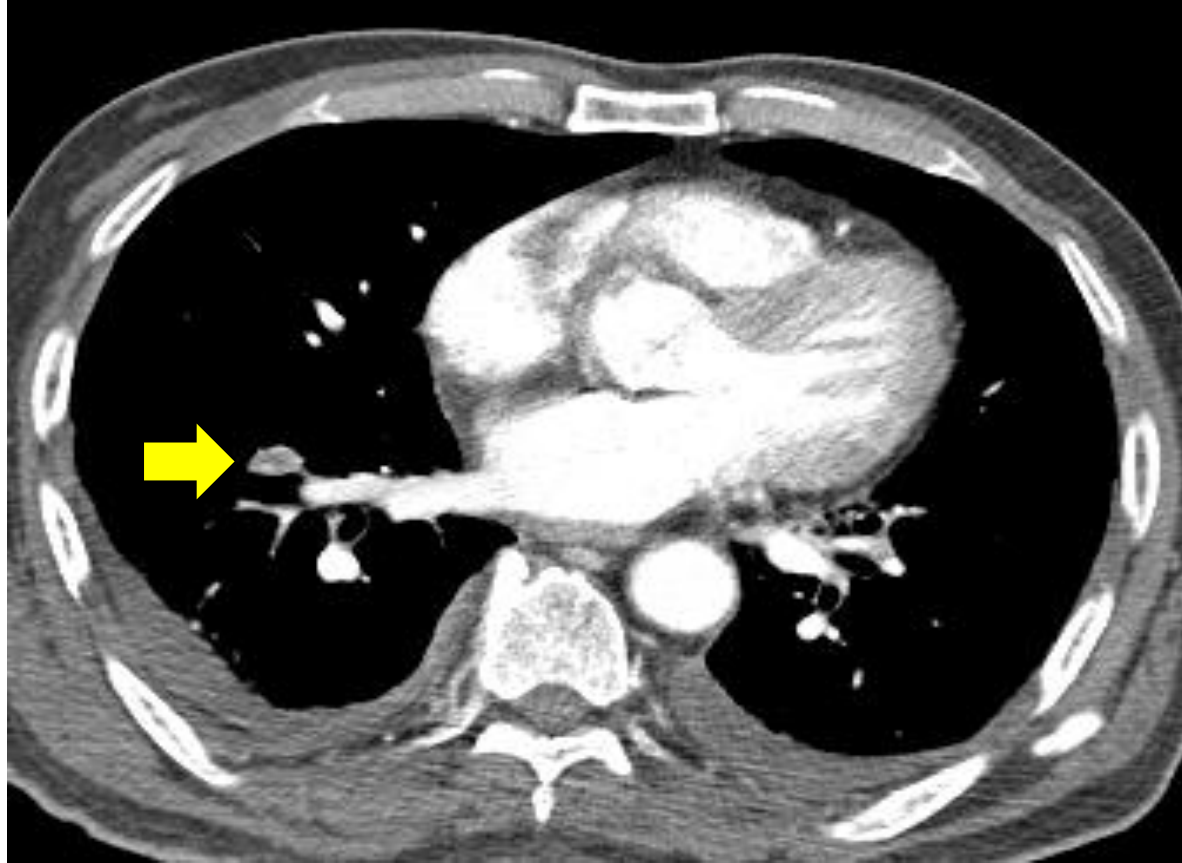
- ◆ Hemorrhagic contusion
- ◆ SAH
- ◆ SDH



Case 2

HAD #7 (POD#6) 호흡곤란 없으나 객담 증가, 흉수 및 늑골골절 있어 흉부

CT 시행



Case 2

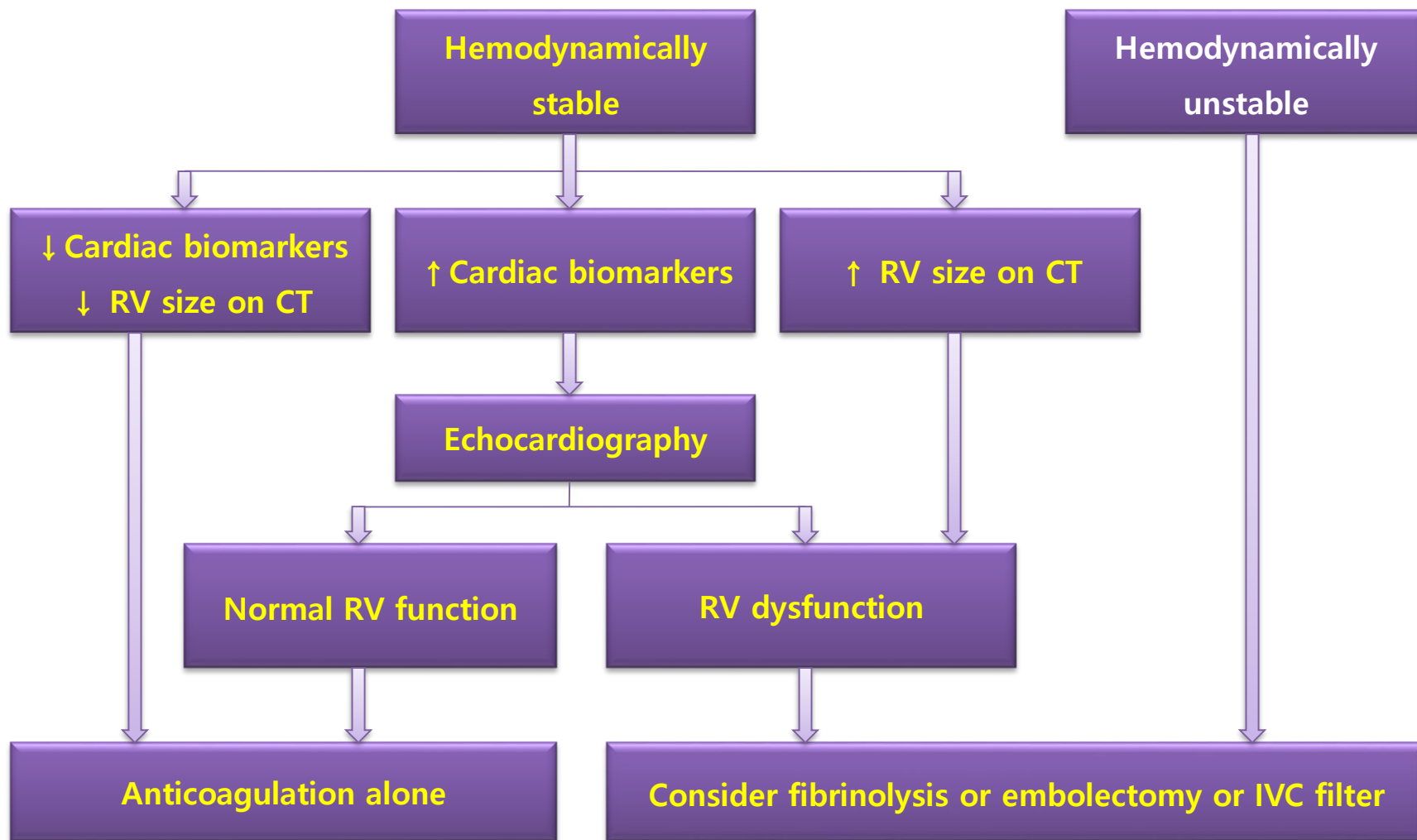
Simplified Pulmonary Embolism Severity Index (PESI)

Variable	Points
Age > 80 y	1
History of cancer	1
History of chronic cardiopulmonary disease	1
Pulse \geq 110 beats/min	1
Systolic blood pressure < 100 mm Hg	1
Arterial oxygen saturation < 90%	1

► Simplified PESI score : 0

Simplified PESI Risk categories	Points	Mortality
Low	0	1.0 (0.0-2.1)
High	1 or more	10.9 (8.5-13.2)

Algorithm for risk stratification of patients with acute PE



Case 2

PE 진단



HAD	8	9	10	11	12	13	14	15	16
POD	7	8	9	10	11	12	13	14	15
Troponin				0.016					
proBNP				143					
RV size on CT	정상								

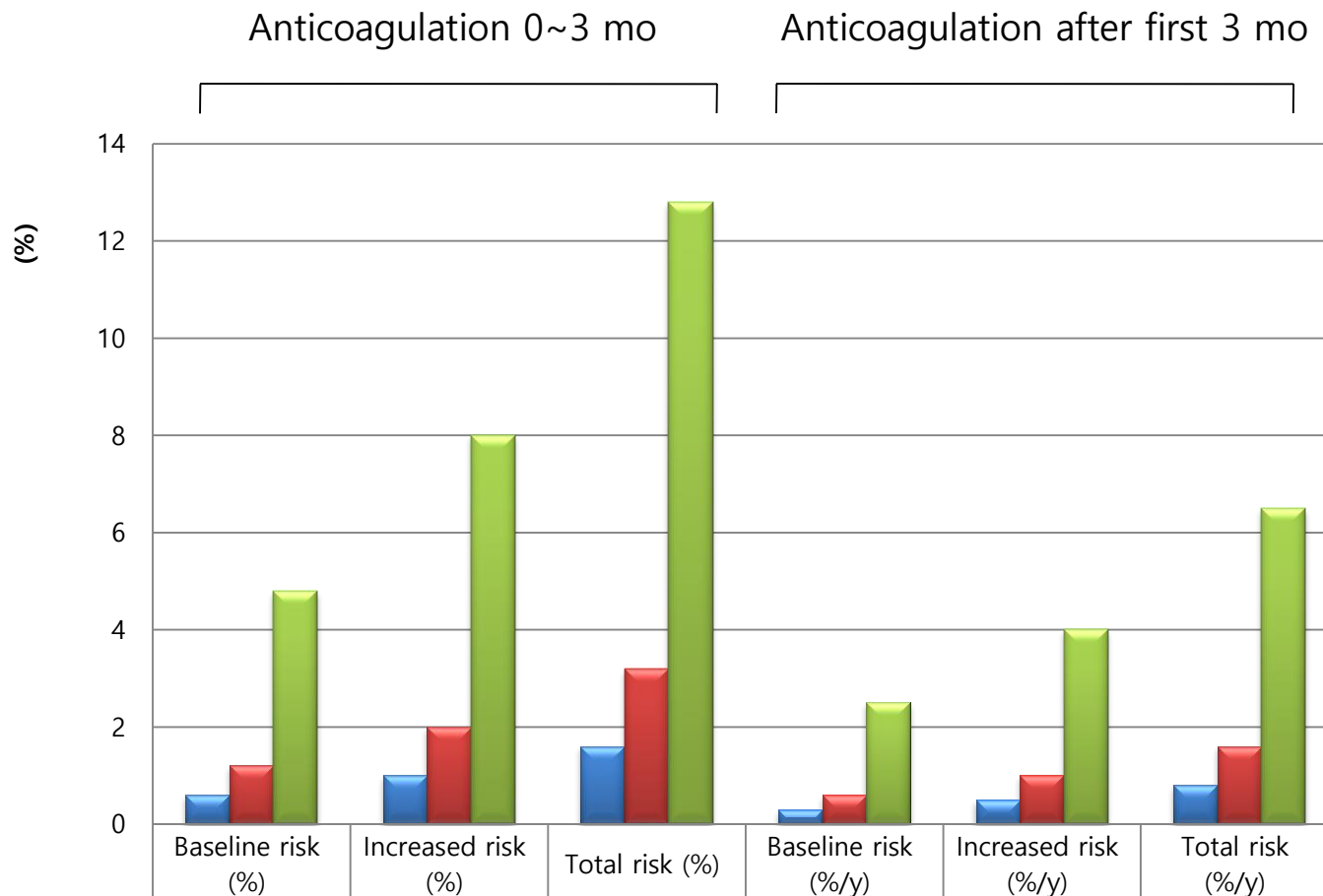
Troponin-T(hs) : 0.015-0.099 ng/mL (weakly positive), NT-pro-BNP : 0-285 pg/mL (normal)

Risk factors for bleeding with anticoagulant therapy in VTE

Risk factors ^a for bleeding with anticoagulant therapy		
Age > 65 y	Liver failure	Poor anticoagulant control
Age > 75 y	Thrombocytopenia	Comorbidity and reduced functional capacity
Previous bleeding	Previous stroke	Recent surgery
Cancer	Diabetes	Frequent falls
Metastatic cancer	Anemia	Alcohol abuse
Renal failure	Antiplatelet therapy	

► **high risk for bleeding (≥ 2 risk factors)**

Estimated absolute risk of major bleeding, %



	Baseline risk (%)	Increased risk (%)	Total risk (%)	Baseline risk (%/y)	Increased risk (%/y)	Total risk (%/y)
Low risk (0 risk factors)	0.6	1	1.6	0.3	0.5	0.8
Moderate risk (1 risk factor)	1.2	2	3.2	0.6	1	1.6
High risk (≥ 2 risk factors)	4.8	8	12.8	2.5	4	6.5

► bleeding without anticoagulation (baseline risk), the increase with anticoagulation (increased risk), and the sum of these two risks (total risk)(ie, risk of bleeding on therapy).

Case 2

HAD	8	9	10	11	12	13	14	15	16
POD	7	8	9	10	11	12	13	14	15
LMWH		50%	50%	50%					
Xarelto					20mg	20mg	20mg	20mg	20mg



Case 3-1

48세 여자로 내원 1일전 갑자기 발생한 호흡곤란으로 인근병원 내원하여 기흉 진단하여 흉관 삽관 후 본원으로 전원됨.

MDR TB 로 30 여년 전부터 치료와 중단을 반복하였고 내원 7개월 전부터 본원에서 항결핵치료를 시행 중이었음.

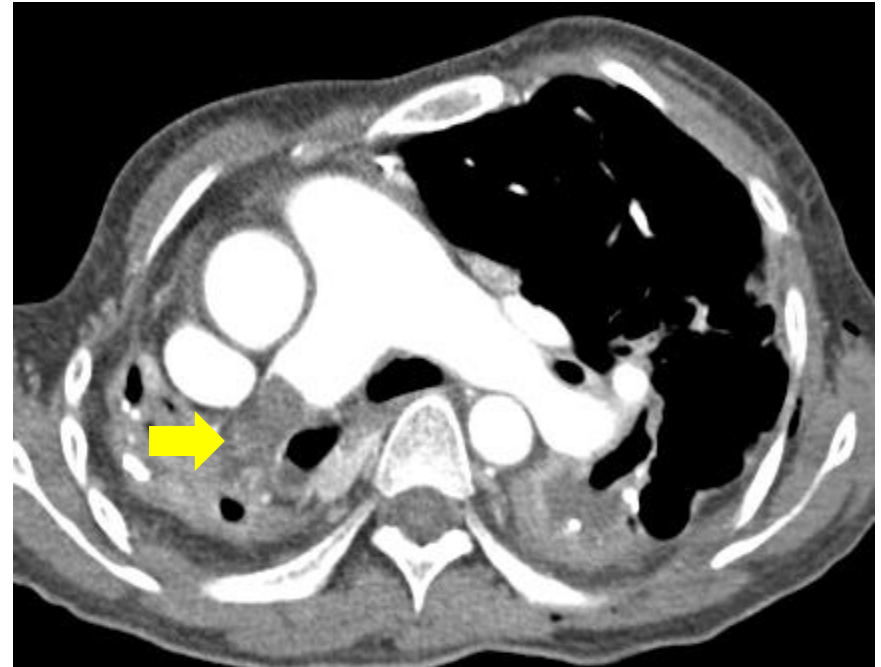
EKG : sinus tachycarida (100회 내외)

Troponin-T 0.43 ng/mL(0-0.1), **NT-pro-BNP** 130 pg/mL(0-121),

CK-MB 11.6 ng/mL(0-5.8), **D-dimer** 831 ng/mL(0-243)

Echocardiogram : Mild systolic dysfunction (EF = 52%), Aneurysmal dilatation of apex ► "Stress-induced cardiomyopathy"

Case 3-1



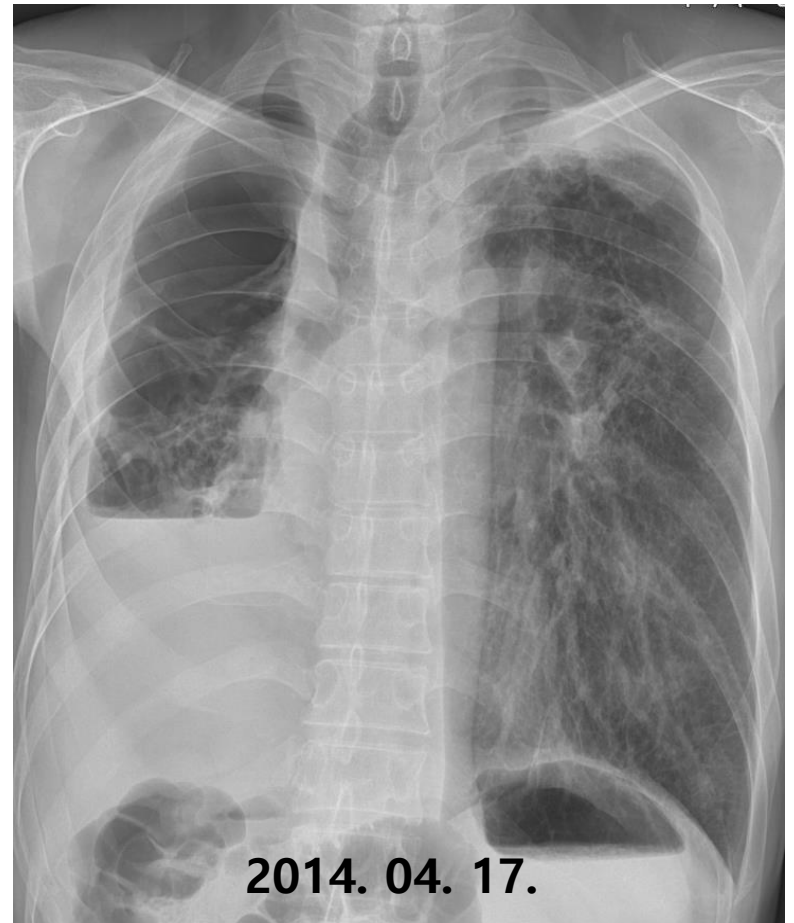
► Supportive care without anticoagulant

Case 3-1



Case 3-2

57세 남자로 내원 1주전부터 발생한 기침, 객담, 호흡곤란으로 내원. 10 여년 전 결핵으로 인한 BPF 로 여러 병원을 반복하여 입원하고 약물치료를 자의로 중단하였던 알코홀 의존성 환자임.



2010. 03. 30.

Case 3-2

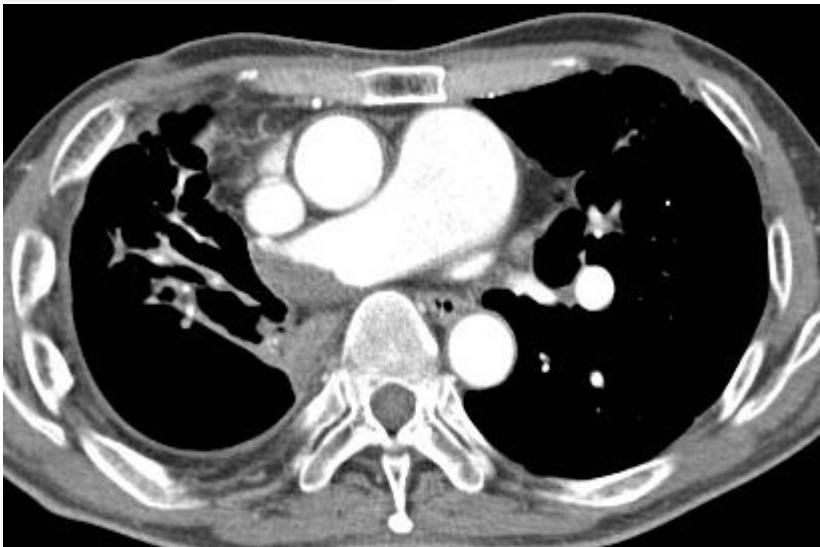
2011. 08. 29.



2012. 06. 02.

Anticoagulation 2011.08.29. ~ 2011.11.07.

2014. 04. 15.



Case 3-2

Troponin-T 0.006 ng/mL(0-0.1), **D-dimer** 490 ng/mL(0-243)

항응고치료를 시작하시겠습니까?

2014. 04. 16. 부터 Rivaroxaban 20 mg 을 투여하기 시작

경청해주셔서 감사합니다.