

Caring complication related with anticoagulation induced ICH



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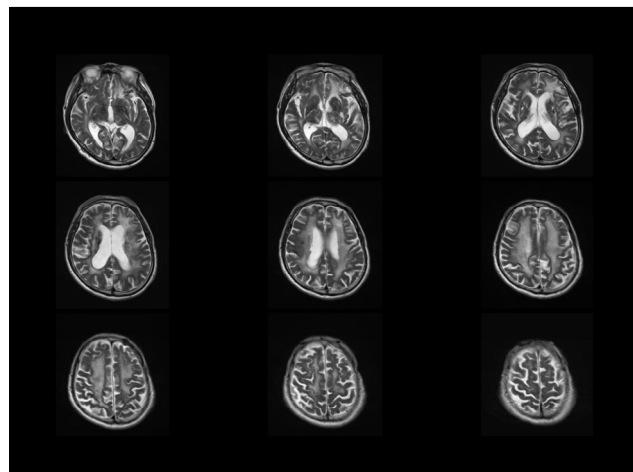
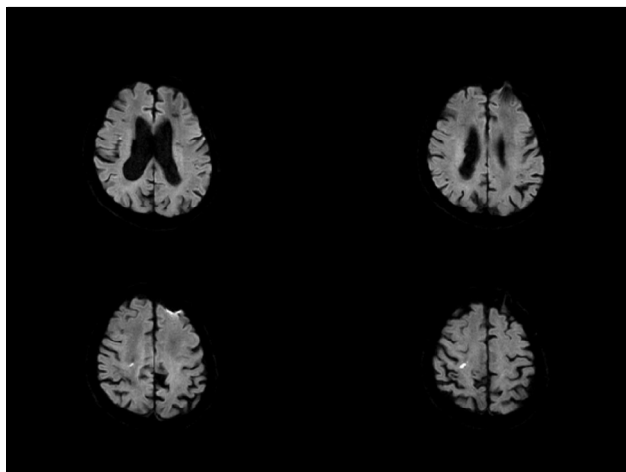

Chi Kyung Kim, MD, PhD

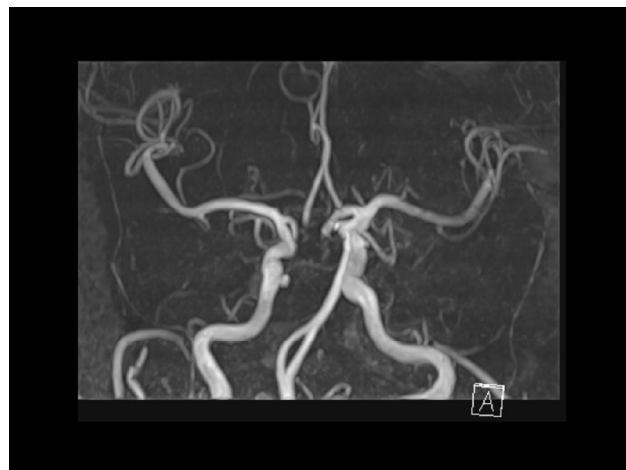
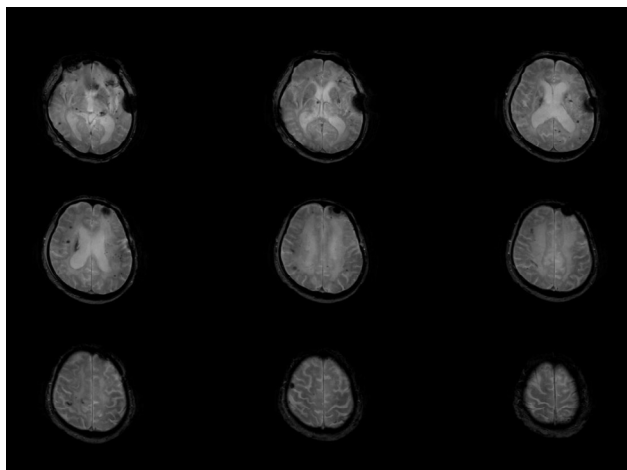
Neurology, College of Medicine, Korea University



Case

- M/78
- Previous SAH (2004), ischemic stroke (2006), ICH (2007)
- Known atrial fibrillation (on warfarin 4mg / poor TTR)
- Known CKD stage 3 and hypertension
- Left side weakness (1 DA)
- Initial NIHSS: 2





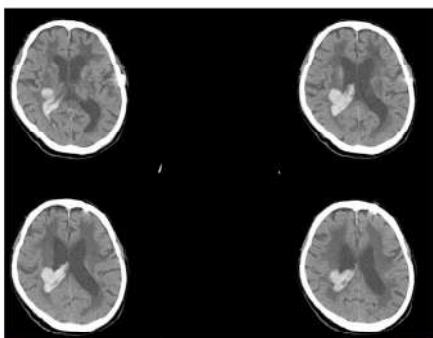
Progress

- EKG: persistent atrial fibrillation
- Initial PT INR: 1.04
- BP: 140/80
- BUN: 36.1 mg/dL, creatinine: 2.00 mg/dL
- eGFR: 35 ml/min/1.73m²
- CCR: 32ml/min (75 kg)
- Start Eliquis 2.5 mg bid

OPD f/u for 5 months

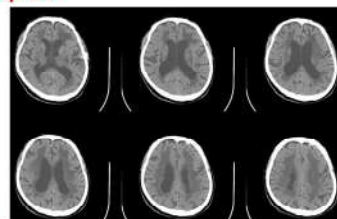
- 3-mo mRS: 3
- Clinic SBP: 120 - 140

5 months after ischemic stroke



Progress after intracerebral hemorrhage (ICH)

- No additional weakness after ICH
- F/U brain CT after 5 month from ICH
- **Next plan?**



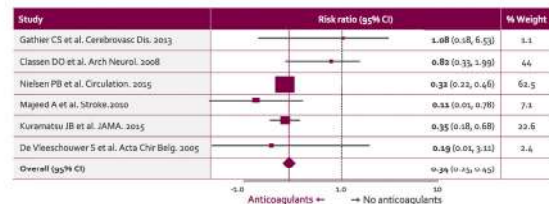
Challenges in secondary prevention for stroke related to atrial fibrillation

- History of previous bleeding episodes, in particular those with previous ICH
- Elderly
- Suffered stroke under NOAC treatment



Use of oral anticoagulants after intracerebral hemorrhage (ICH)

- Resumption of oral anticoagulation therapy and arterial thromboembolic complications after ICH

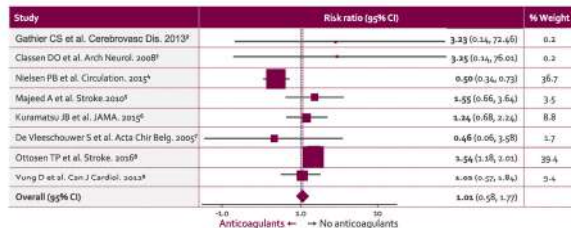


Murthy S et al. Stroke. 2017



Use of oral anticoagulants after intracerebral hemorrhage (ICH)

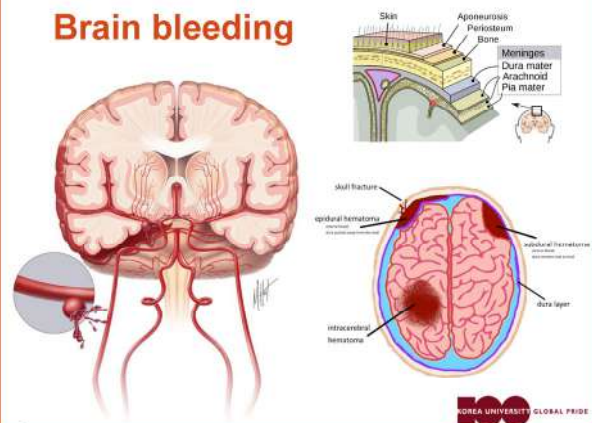
- Resumption of oral anticoagulation therapy and recurrence of intracerebral hemorrhage



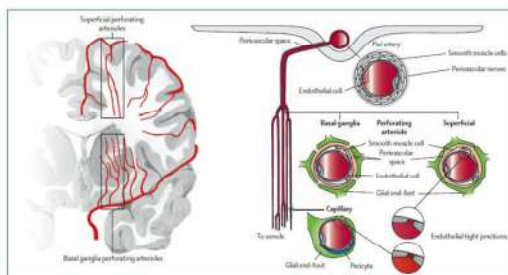
Murthy S et al. Stroke. 2017



Brain bleeding



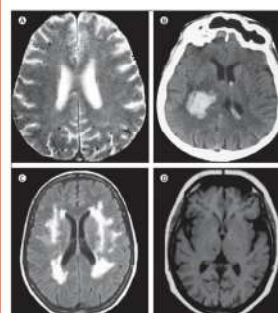
Small vessel disease and ICH



Wardlaw et al. Lancet Neurol. 2013



Cerebral small vessel diseases



French Antiparkinsonian classification of cerebral small vessel diseases

Type 1: arteriopathy/leukoencephalopathy (age-related and vascular risk factor-related small vessel disease)

- Arteriopathy
- Leukoencephalopathy
- Microangiopathy

Type 2: sporadic and hereditary cerebral amyloid angiopathy

Type 3: inherited or genetic small vessel disease distinct from cerebral amyloid angiopathy

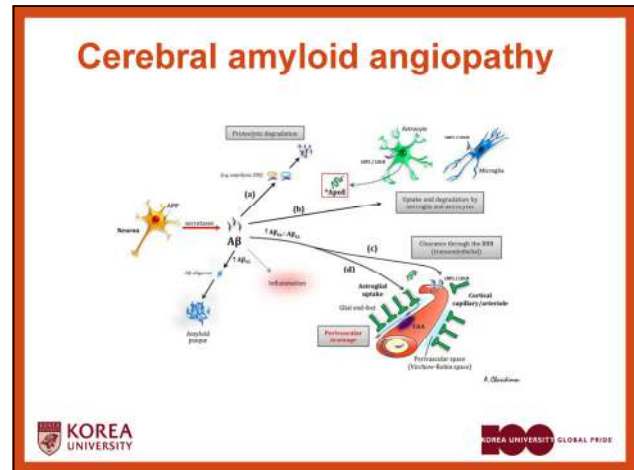
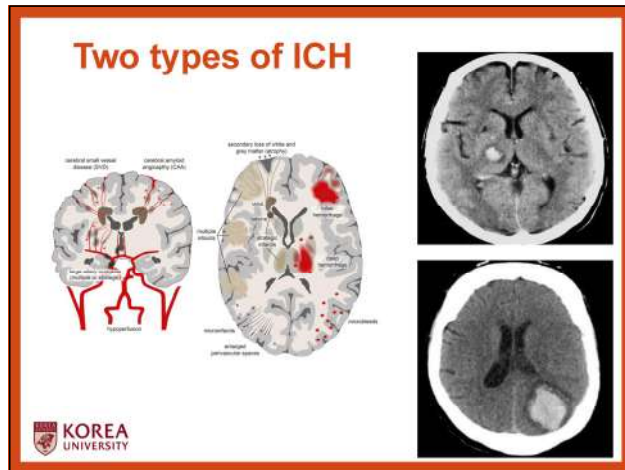
Type 4: inflammatory and immunologically mediated small vessel disease

Type 5: venous collagenosis

Type 6: other small vessel diseases

Pantoni. Lancet Neurol. 2010

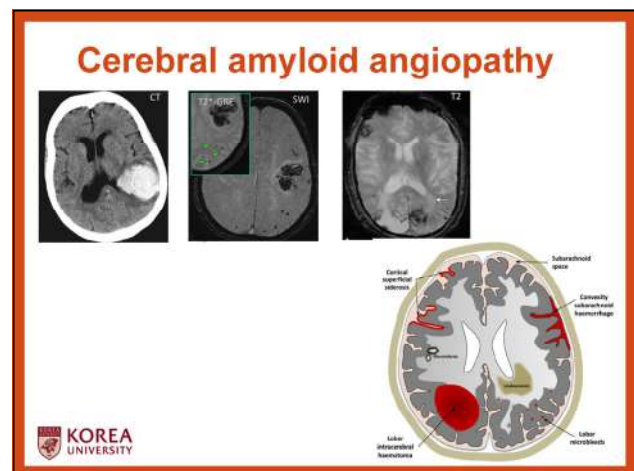




Cerebral amyloid angiopathy

- 노년층에서 흔하다 (70대 이상)
- Population based autopsy studies
 - 20-40% in non-demented elderly population
 - 50-60% in demented elderly population
- Alzheimer's disease (AD) 환자에서는 부검 소견상 90% 이상에서 CAA가 발견됨
 - 대부분은 mild CAA이고 severe CAA는 25%정도에서 발견
- Sporadic CAA는 60대에도 보고가 거의 없음

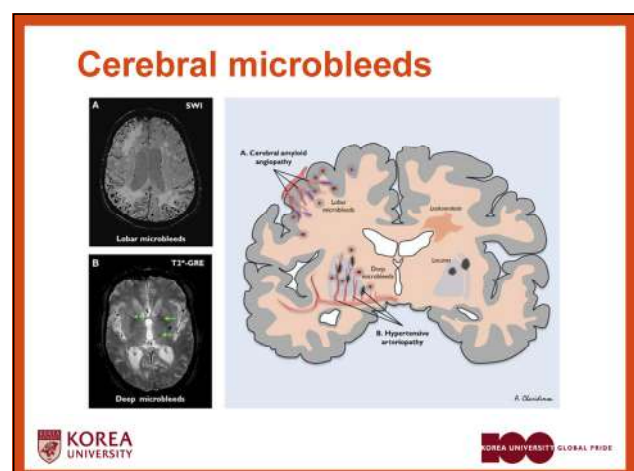
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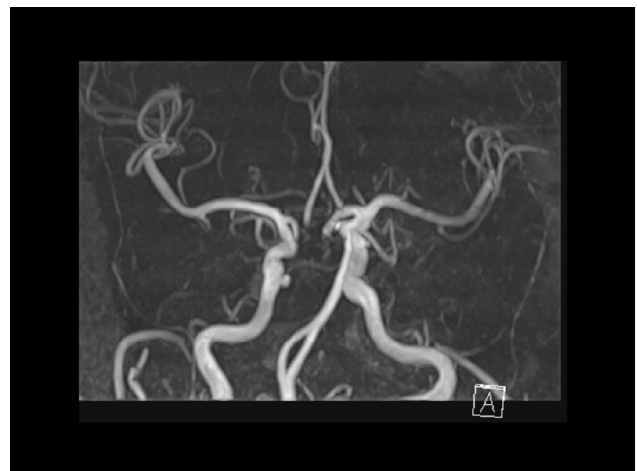
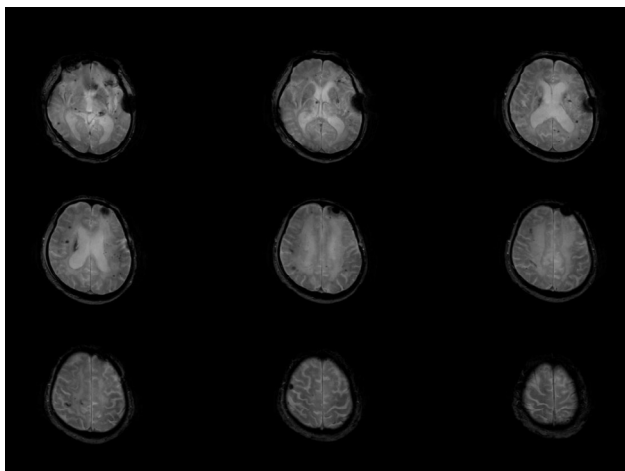
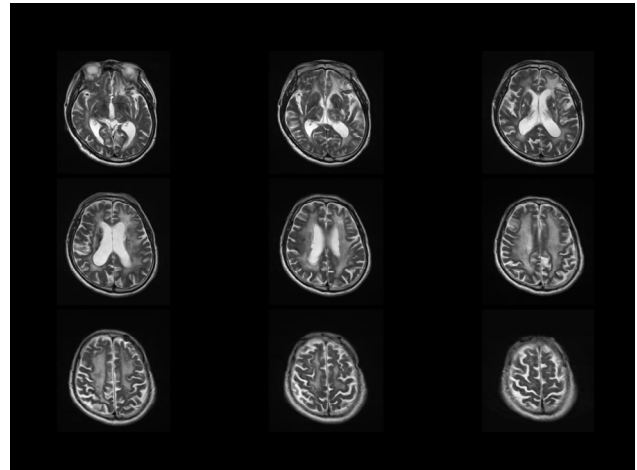
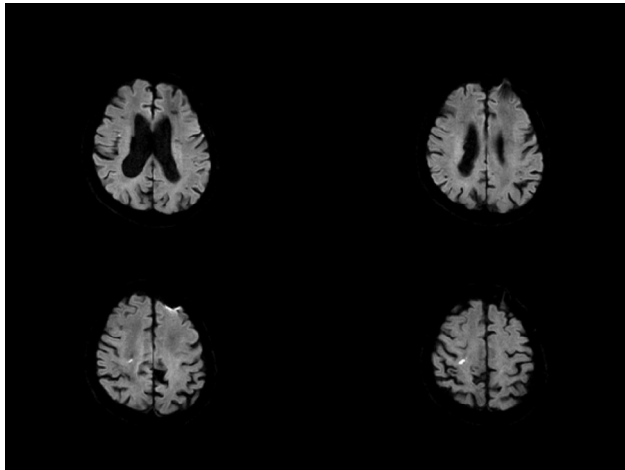


Cerebral microbleeds (CMBs)

- Visualized typically by GRE sequence
- Small round signal loss lesion (< 5 mm)
- Throughout the whole brain area
- Confused with calcification, small angioma or vessel signal

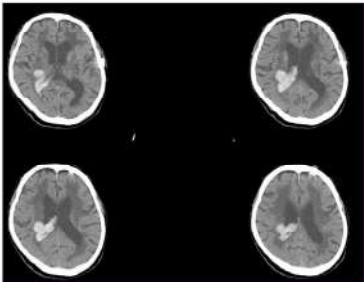
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Case

- Cerebral amyloid angiopathy (probable)
- Can we restart NOAC?
- Just aspirin?



The image displays four axial CT scan slices of a human brain. Each slice shows a cross-section of the brain with various structures visible. There are several bright, white, irregularly shaped spots scattered throughout the brain tissue, particularly in the cortical and subcortical regions. These spots are hyperdense compared to the surrounding brain tissue, which is a characteristic finding in cerebral amyloid angiopathy (CAA). The spots are distributed across all four slices, indicating a widespread process.

ARTICLES	Published online ahead of print as part of the Special Issue
	<h2 style="text-align: center;">Outcome of intracerebral hemorrhage associated with different oral anticoagulants</h2> <p style="text-align: center;">(OPEN)</p>
<p>Thomas Tzounis, MD David J. Leung, MD A. Christopher Frazee, MD Giles S. Garg, MD, PhD</p>	<p>ABSTRACT In an international collaborative multicenter pooled analysis, we compared mortality, major bleeding, and intracerebral hemorrhage (ICH) rates between patients treated with vitamin K antagonists (VKAs) and direct oral anticoagulants (DOACs) in association with ICH. Mortality and intracerebral hemorrhage rates were similar between VKA and DOAC groups.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>BACKGROUND We compared outcomes in patients with ICH treated with VKAs or DOACs using a 5-year retrospective analysis. Mortality, major bleeding, and intracerebral hemorrhage rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>RESULTS The study included 10,000 patients with ICH treated with VKAs or DOACs. Mortality, major bleeding, and intracerebral hemorrhage rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>CONCLUSIONS In this retrospective analysis, mortality, major bleeding, and intracerebral hemorrhage rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>KEYWORDS Intracerebral hemorrhage, anticoagulants, mortality, bleeding, outcomes.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>INTRODUCTION Intracerebral hemorrhage (ICH) is a leading cause of death and disability. The use of anticoagulants for the prevention and treatment of thrombotic events has increased significantly in recent years. However, the use of anticoagulants is associated with an increased risk of bleeding, particularly ICH.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>OBJECTIVES The purpose of this study was to compare the outcomes of patients with ICH treated with VKAs or DOACs. We hypothesized that patients treated with DOACs would have lower mortality and bleeding rates compared to those treated with VKAs.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>DESIGN This was a retrospective cohort study. We reviewed medical records of patients with ICH treated with VKAs or DOACs from 2010 to 2015. The primary outcome was mortality, and the secondary outcome was major bleeding.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>SETTING The study was conducted in a tertiary care hospital. Patients were identified through a review of the hospital's electronic medical records.</p>
<p>David J. Leung, MD Thomas Tzounis, MD Giles S. Garg, MD, PhD A. Christopher Frazee, MD</p>	<p>MEASUREMENTS AND MAIN RESULTS The study included 10,000 patients with ICH treated with VKAs or DOACs. Mortality, major bleeding, and intracerebral hemorrhage rates were similar between VKA and DOAC groups. ICH rates were similar between VKA and DOAC groups.</p>

