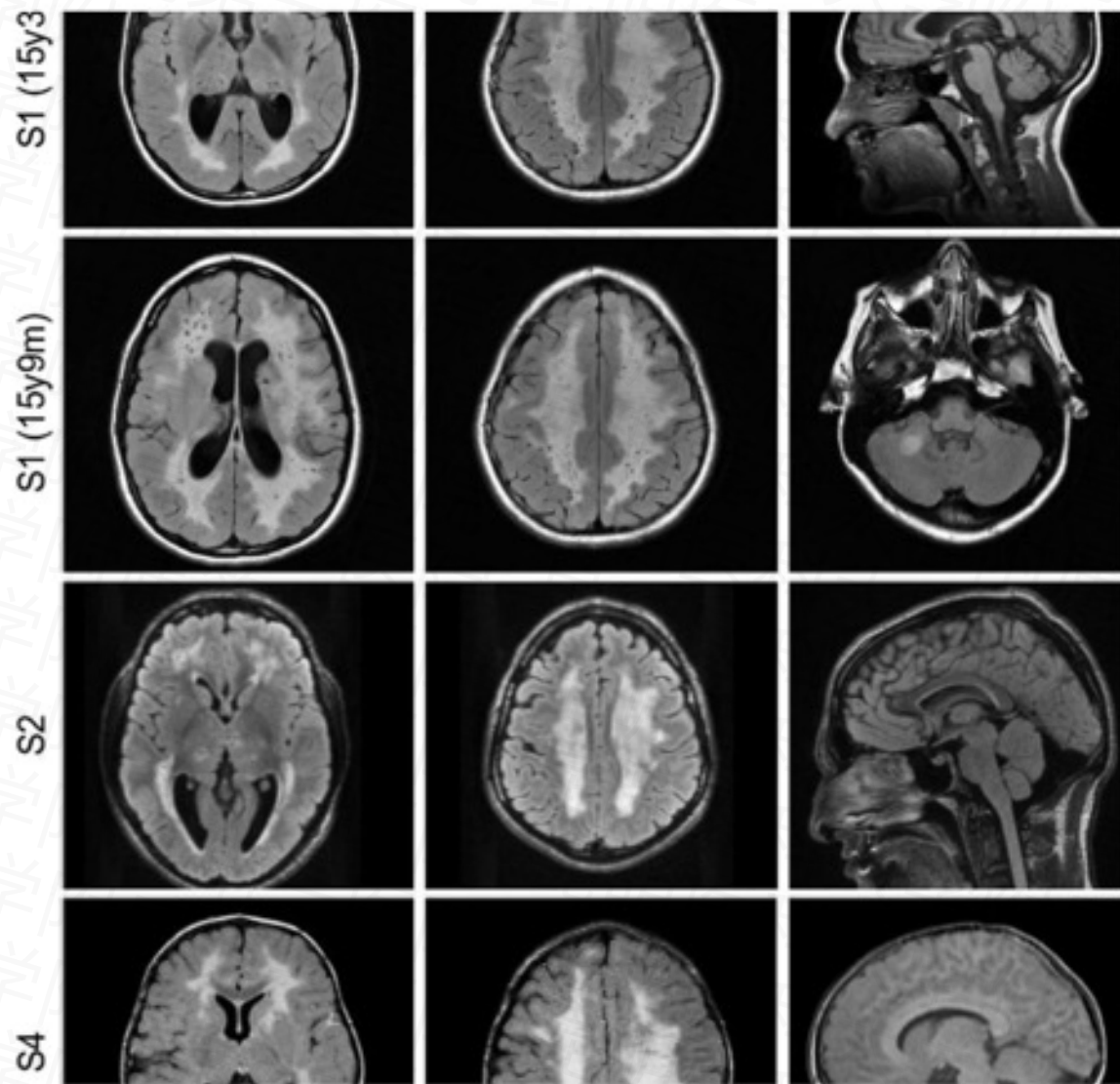


脑卒中 影像学诊断

刘晓蕾

副主任医师·硕士生导师

昆明医科大学第一附属医院神经内科



回顾脑卒中的分类

缺血性卒中
80%



出血性卒中
20%

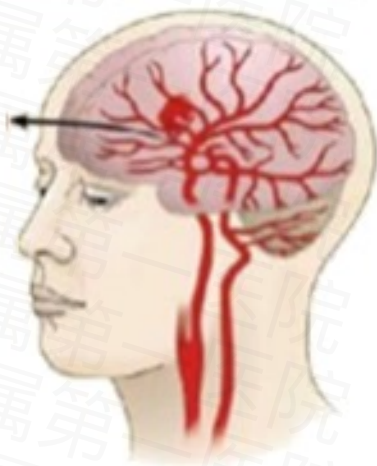


脑梗死



短暂性脑缺血发作

脑出血



蛛网膜下腔出血



影像学在脑卒中诊断中的价值

卒中的诊断

第一步

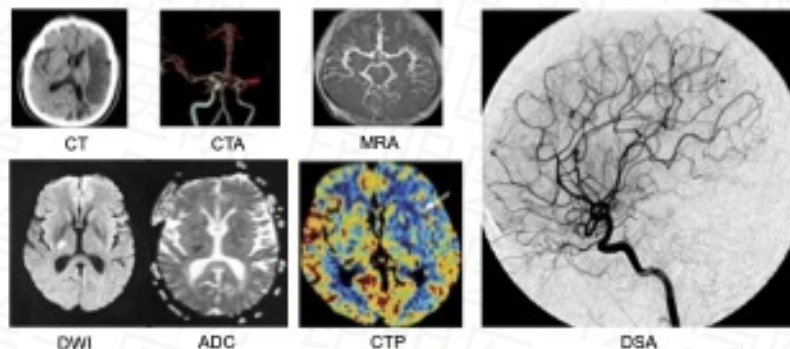
临床表现 + 体格检查



第二步

神经影像学检查：

- 确定卒中性质
- 确定发病机制
- 判断组织溶栓窗



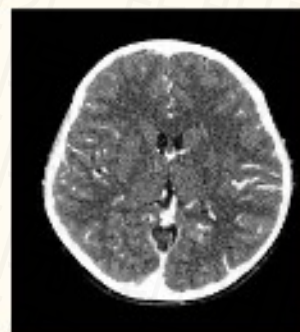
神经影像学分类

CT

Computed
Tomography



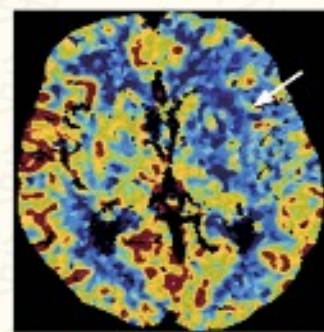
CT



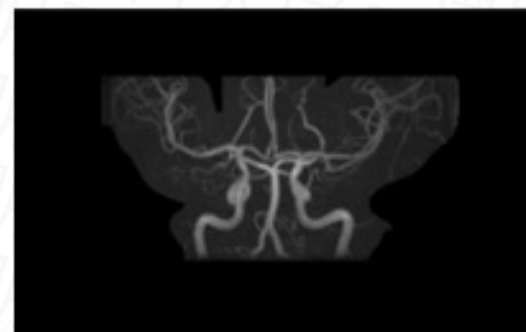
CT with contrast



CTA



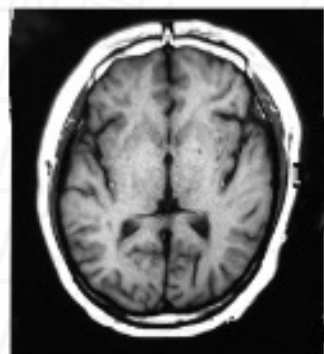
CTP



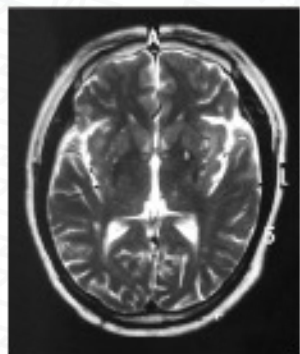
MRA, CE-MRA

MRI

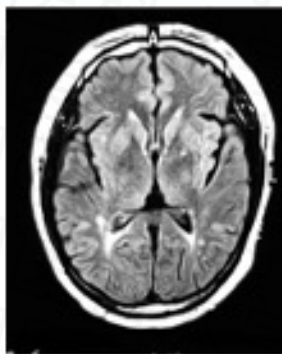
Magnetic
Resonance
Imaging



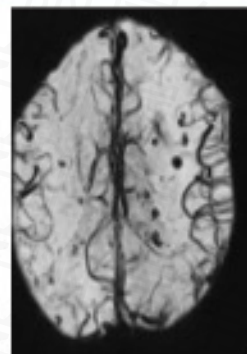
T1



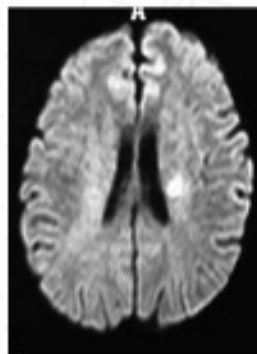
T2



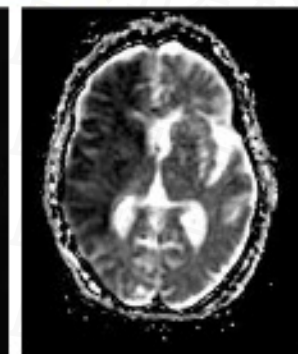
Flair



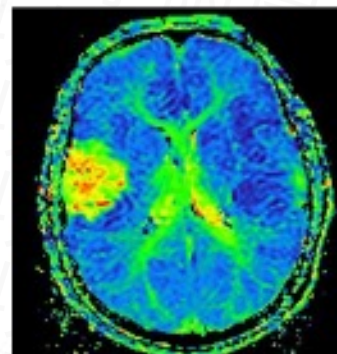
SWI



DWI



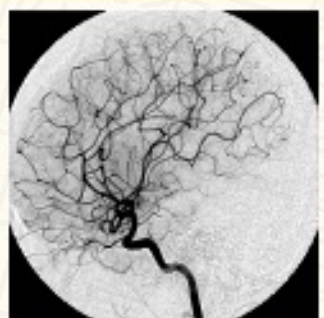
ADC



PWI

DSA

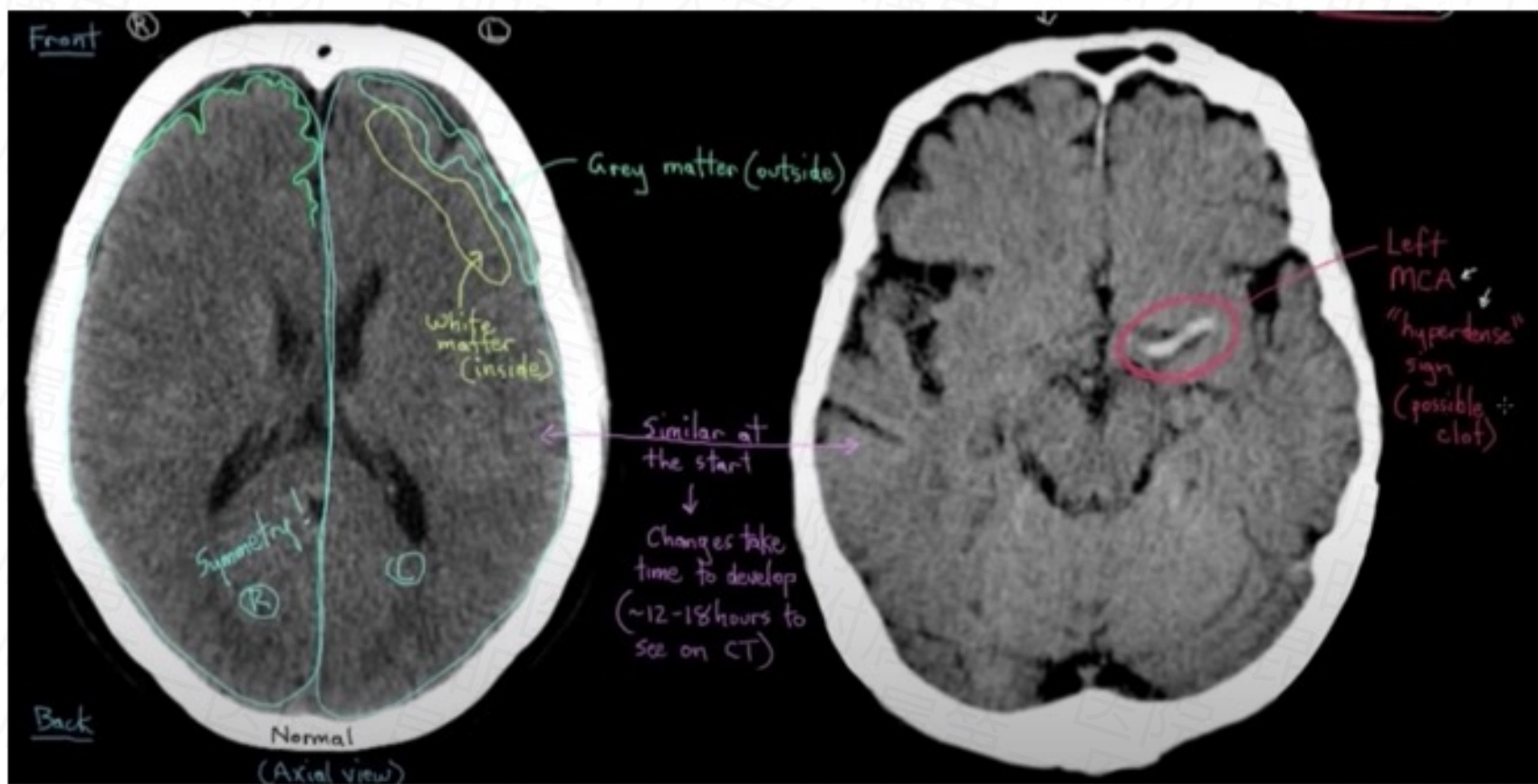
Digital
Subtraction
Angiography



急性脑梗死的影像表现

CT

Computed
Tomography



正常头颅CT平扫

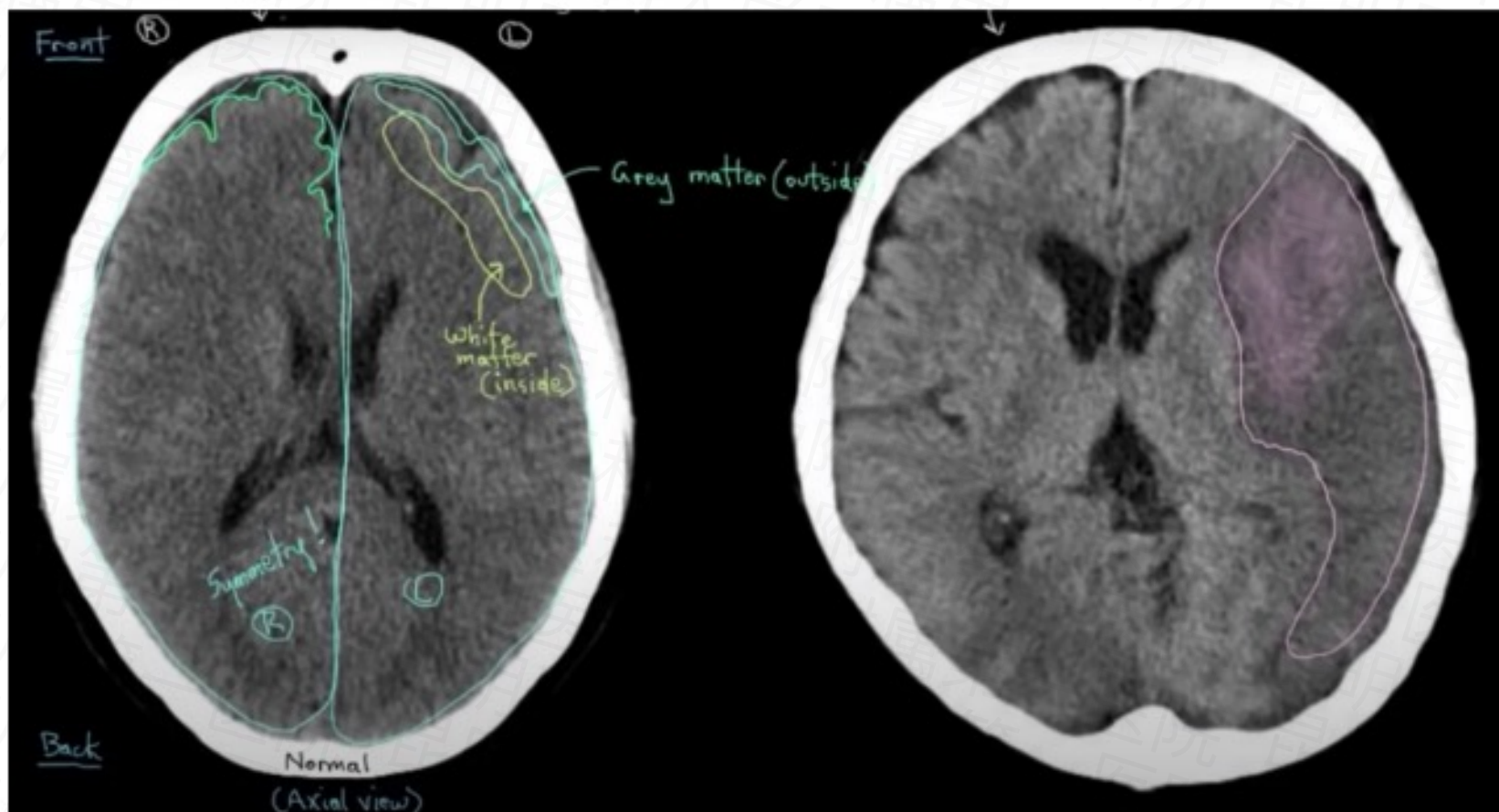
脑梗死数小时头颅CT平扫



急性脑梗死的影像表现

CT

Computed
Tomography



正常头颅CT平扫

脑梗死48小时的头颅CT平扫

急性脑梗死的影像表现

CTA

CT
Angiography



正常头颅CTA

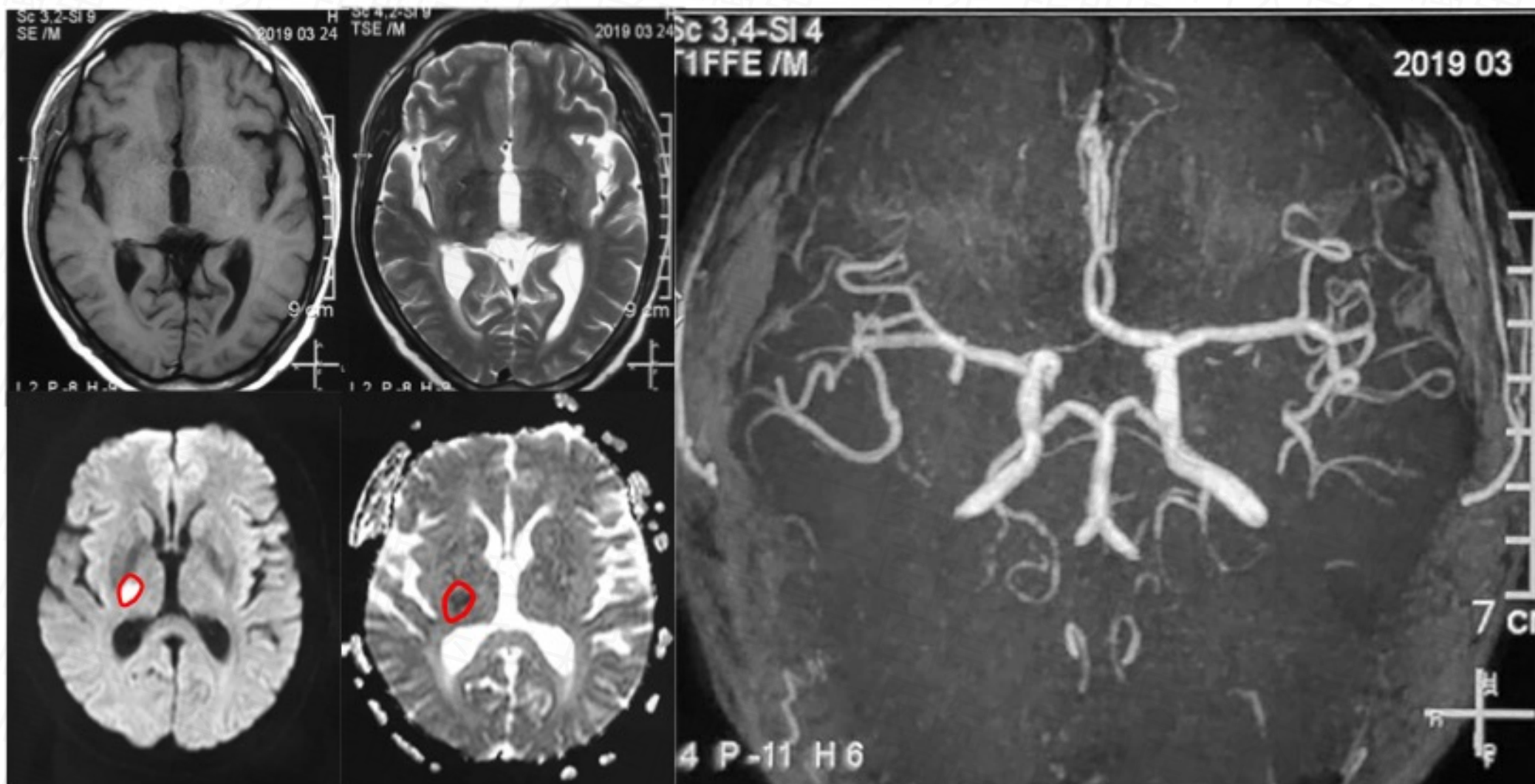


左侧大脑中动脉闭塞患者CT及CTA

急性脑梗死的影像表现

MRI

Magnetic
Resonance
Imaging



急性脑梗死诊治流程

JAMA | Review

Diagnosis and Management of Transient Ischemic Attack and Acute Ischemic Stroke A Review

Scott J. Mendelson, PhD, MD, Shyam Prashakaran, MD, MS

IMPORTANCE Stroke is the fifth leading cause of death and a leading cause of disability in the United States, affecting nearly 800 000 individuals annually.

OBJECTIVES Sudden neurologic dysfunction caused by focal brain ischemia with imaging evidence of acute infarction defines acute ischemic stroke (AIS), while an ischemic episode with neurologic deficits but without acute infarction defines transient ischemic attack (TIA). An estimated 70% to 75% of patients with TIA will have a stroke in the next 3 months.

Patients presenting with nondoubling AB or high-risk IIA (defined as a score ≥4 on the age, blood pressure, clinical symptoms, duration, diabetes [ABCDD] instrument; range, 0-7) [indicating worst stroke risk], who do not have severe carotid stenosis or atrial fibrillation, should receive dual antiplatelet therapy with aspirin and clopidogrel within 24 hours of presentation. Subsequently, combined aspirin and clopidogrel for 3 weeks followed by single antiplatelet therapy reduces stroke risk from 7.8% to 5.2% (hazard ratio, 0.66 [95% CI, 0.55-0.77]). Patients with symptomatic carotid stenosis should receive carotid revascularization and single antiplatelet therapy, and those with atrial fibrillation should receive anticoagulation. In patients presenting with AIS and disabling deficits interfering with activities of daily living, intravenous alteplase improves the likelihood of minimal or no disability by 30% with intravenous recombinant tissue plasminogen activator (rtPA) vs 26% with placebo (odds ratio [OR], 1.16 [95% CI, 1.1-1.23]) when administered within 3 hours of presentation and by 25.2% with rtPA vs 20.9% with placebo (OR, 1.2 [95% CI, 1.1-1.3]) when administered within 3 to 4.5 hours of presentation. Patients with disabling AIS due to anterior circulation large vessel occlusion are more likely to be functionally independent when treated with mechanical thrombolysis within 6 hours of presentation vs medical therapy alone (46.0% vs 26.5%; OR, 2.49 [95% CI, 1.76-3.53]) or when treated within 6 to 24 hours after symptom onset if they have a large ratio of ischemic to infarcted tissue on brain magnetic resonance diffusion or computed tomography perfusion imaging (modified Rankin Scale score 0-3, 52% vs 18%; OR, 4.10 [95% CI, 2.87-5.84]).

CONCLUSIONS AND RELEVANCE Dual antiplatelet therapy initiated within 24 hours of symptom onset and continued for 3 weeks reduces stroke risk in select patients with high-risk TIA and minor stroke. For select patients with disabling AIS, thrombolysis within 4.5 hours and mechanical thrombolysis within 24 hours after symptom onset improves functional outcomes.

JAMA. 2021;325(11):1088-1098. doi:10.1001/jama.2021.2380

▶ Multimedia

▶ Supplemental content

▶ CME Credit of jamanetwork.com and LME questions page 108

JAMA. 2021;325(11):1088-1098.

Guideline

EUROPEAN
STROKE JOURNAL

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2021, Vol. 6(1) I-LXII
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DOI: 10.1177/1747490721100965
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SAGE

European Stroke Organisation (ESO) guidelines on intravenous thrombolysis for acute ischaemic stroke

Eivind Berge^{1,*}, William Whiteley^{2,*,}, Heinrich Audebert^{3,}
Gian Marco De Marchis^{4,} Ana Catarina Fonseca^{5,}
Chiara Padiglioni^{6,} Natalia Pérez de la Ossa^{7,} Daniel Strbian^{8,}
Georgios Tsivgoulis^{9,10} and Guillaume Turc^{11,12,13}

European Stroke Journal. 2021, Vol. 6(1) I-LXII

AHA/ASA Guideline

2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

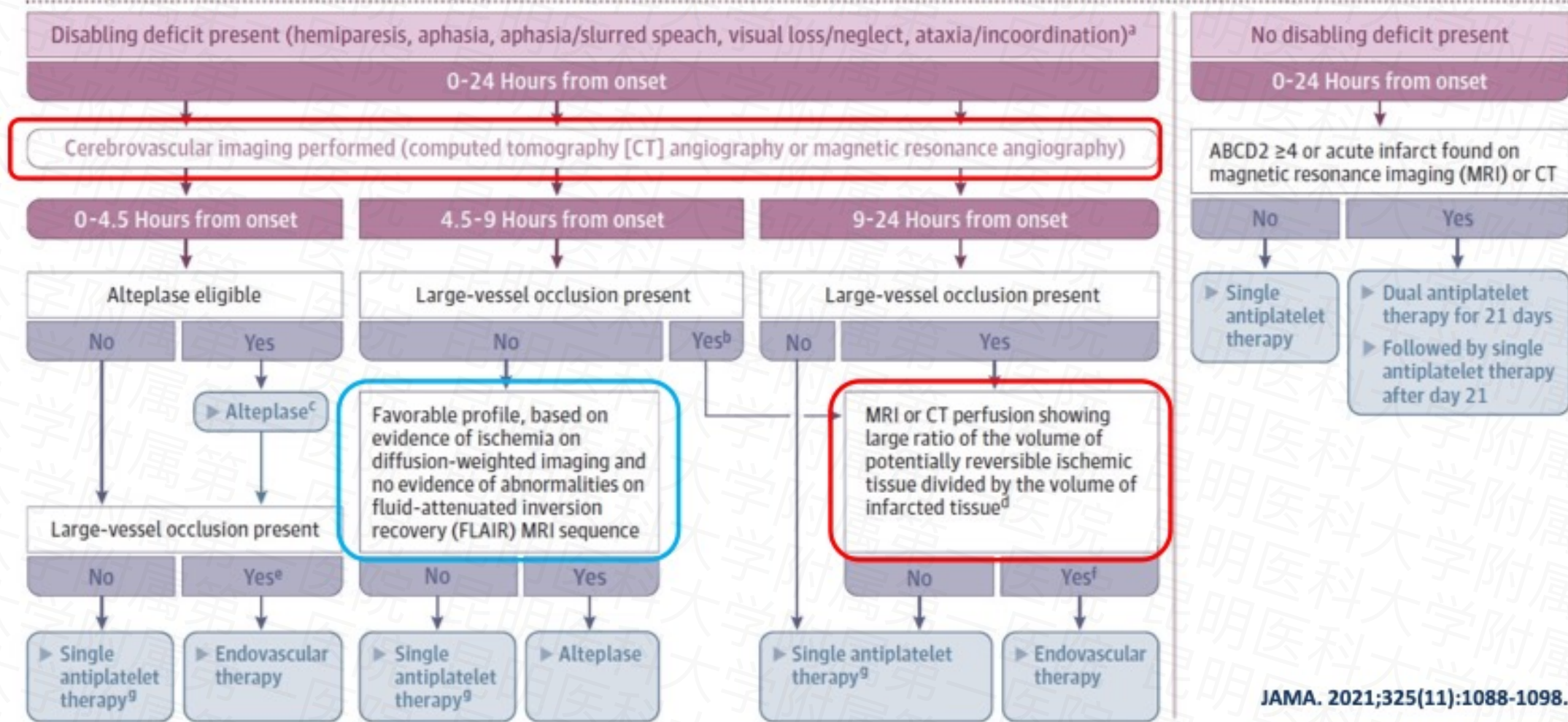
A Guideline for Healthcare Professionals From the American Heart
Association/American Stroke Association

Stroke. 2018;49:e46-e99.

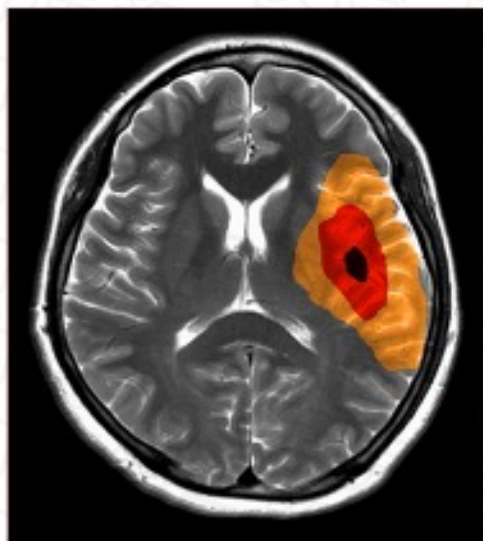


疑似急性脑梗死24小时内影像学检查流程

Patient presentation within 24 hours of symptom onset of confirmed acute ischemic stroke or transient ischemic attack



缺血半暗带的理论基础



正常脑组织：
50-60ml/100g/min

脑灌注不足：
20-50 ml/100 g/min

缺血半暗带：
可以挽救的脑组织

死亡脑组织：
<10 ml/100 g/min

梗死核心

rCBF < 30% (CT perfusion) or
ADC < 620 mm²/s (Diffusion MRI)
or CBV < 1 ml/100 g

缺血低灌注区

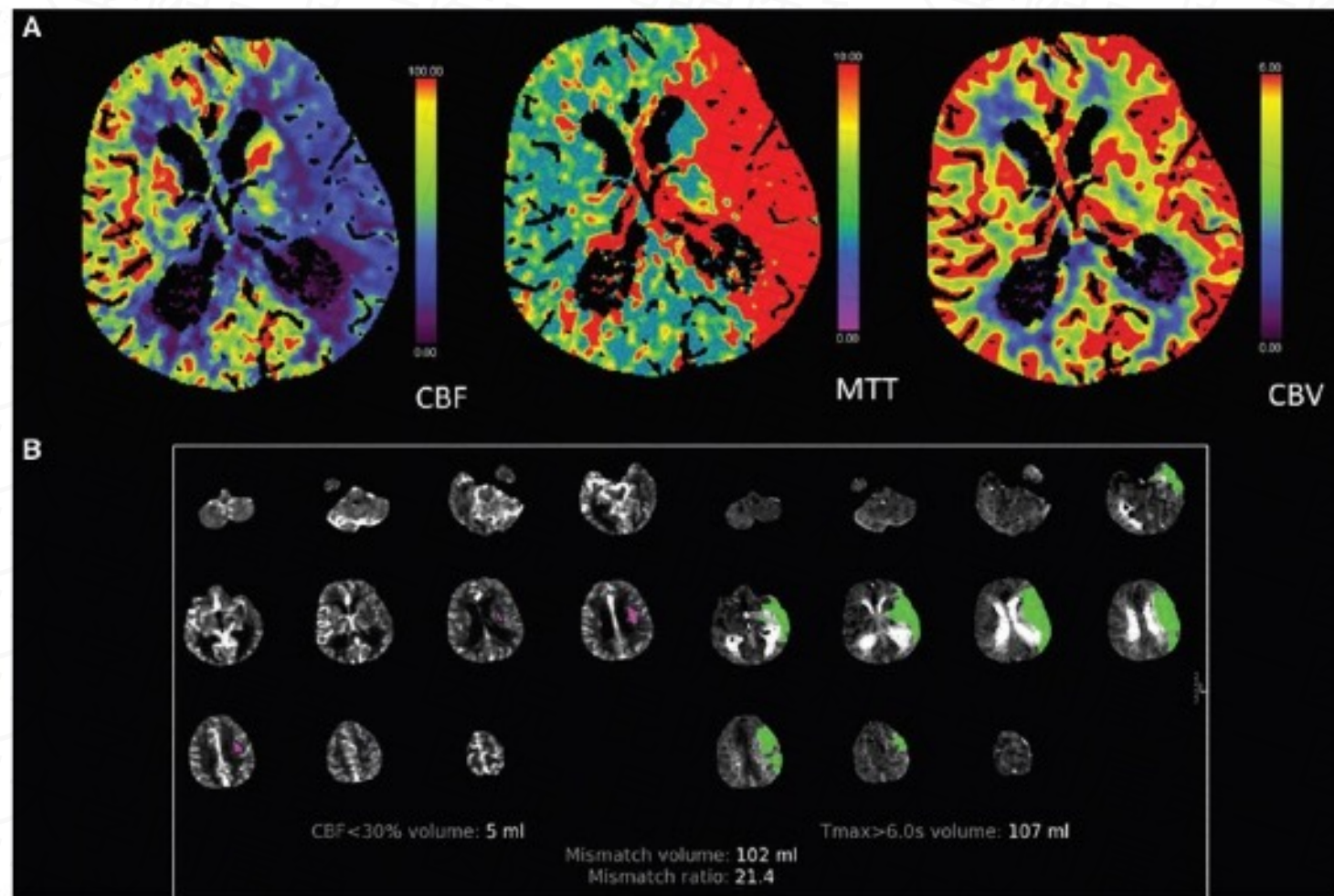
Tmax > 6 s (perfusion CT or
perfusion MRI)

缺血半暗带

去除梗死核心区的缺血低灌注区



急性缺血性脑梗死的灌注评估



1. 梗死体积 (缺血核心 < 70ml)
2. 缺血组织体积/梗死组织体积 > 1.2
3. 绝对可逆缺血组织 (半暗带) 体积 > 10ml.

脑出血的影像表现

CT

Computed
Tomography

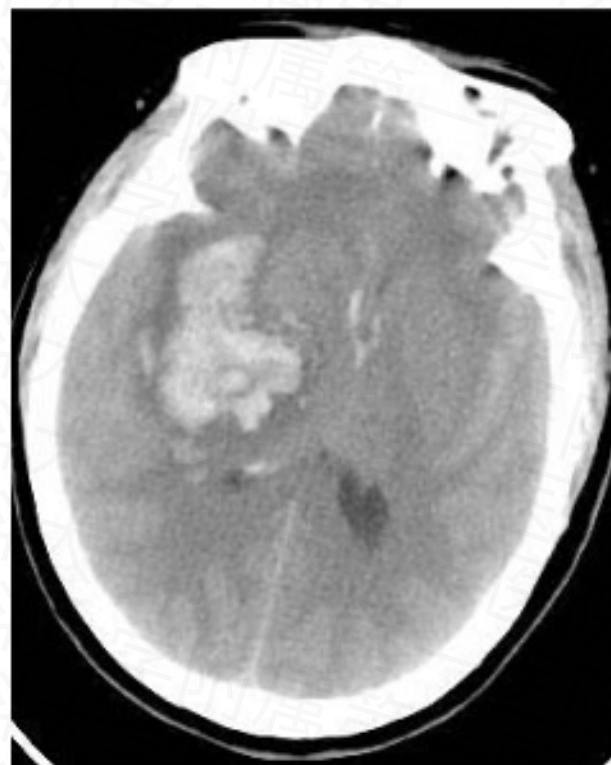


FIRST
CHOICE



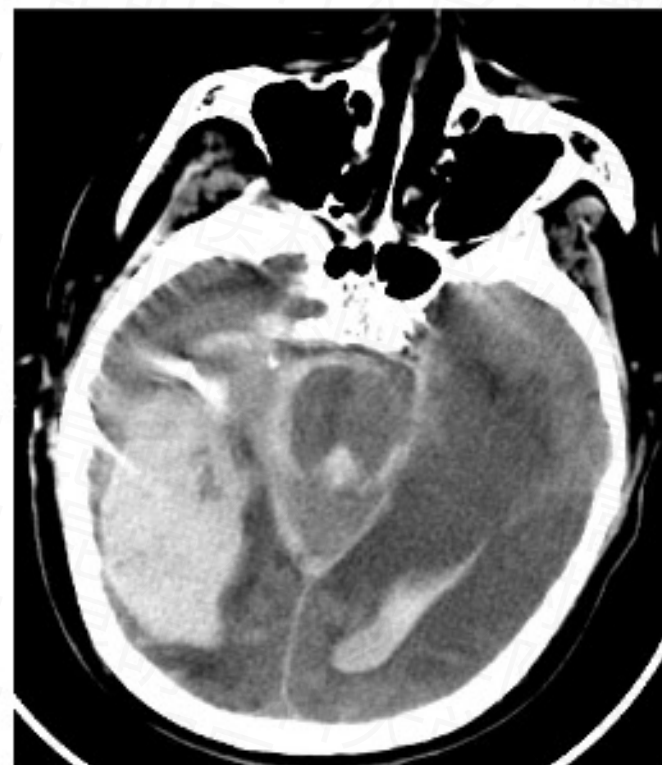
急性期

密度高、边缘清
水肿少、占位效应轻



急性期

脑出血并破入脑室



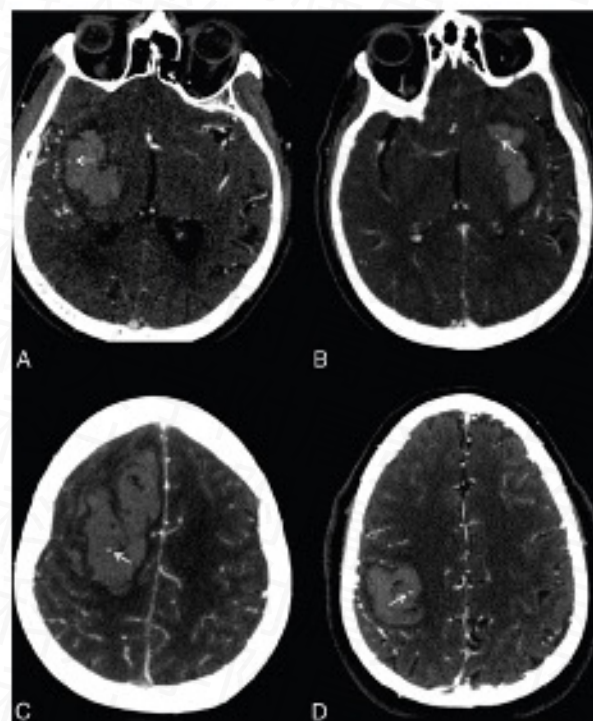
急性期

脑出血并破入蛛网膜下腔

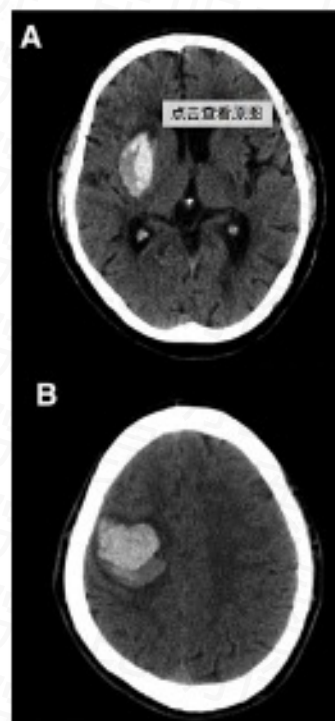


提示血肿扩大的影像表现

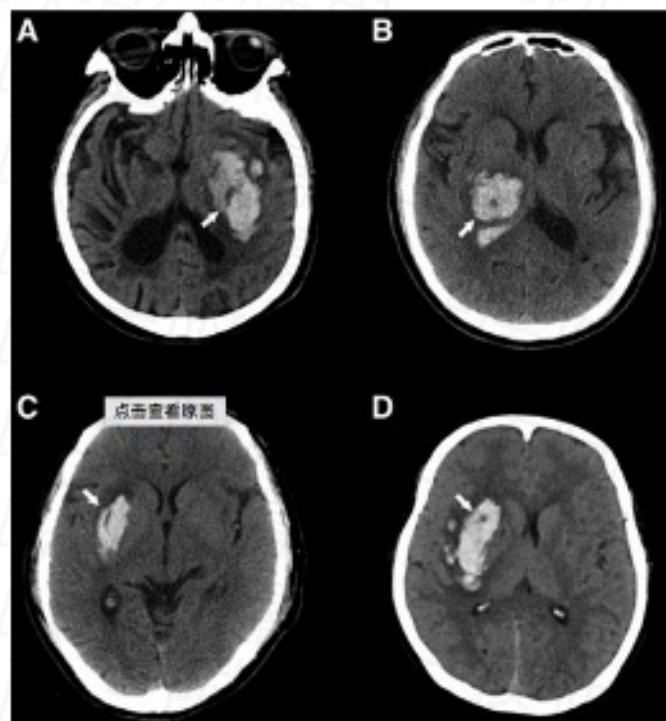
■ CTA点状征



■ 混杂征



■ 黑洞征



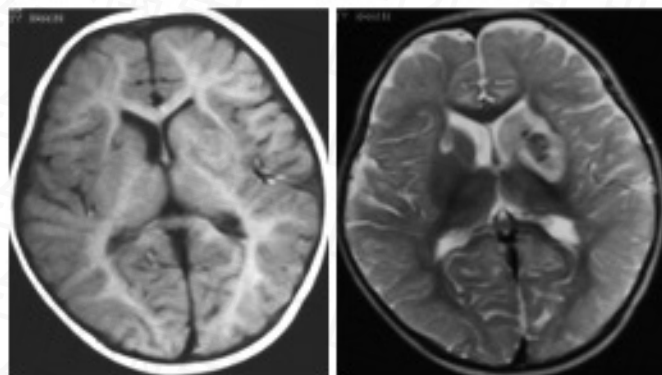
■ 岛征



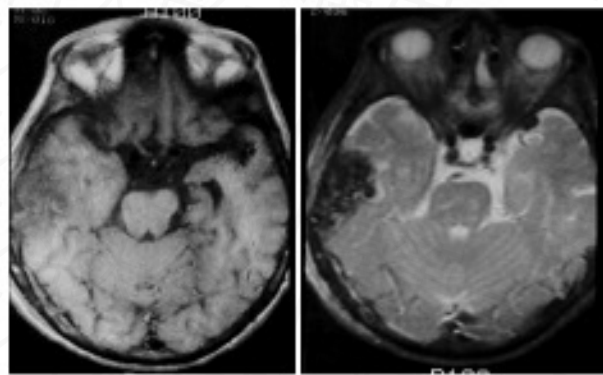
脑出血的影像表现

MRI

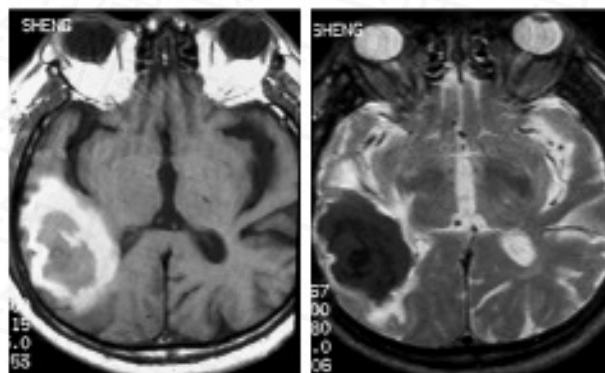
Magnetic
Resonance
Imaging



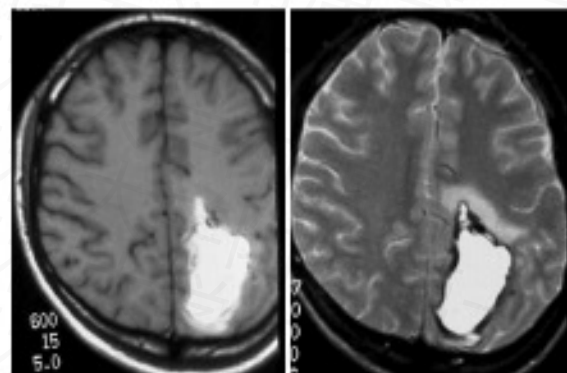
超急性期
含氧Hb, T1等、T2高



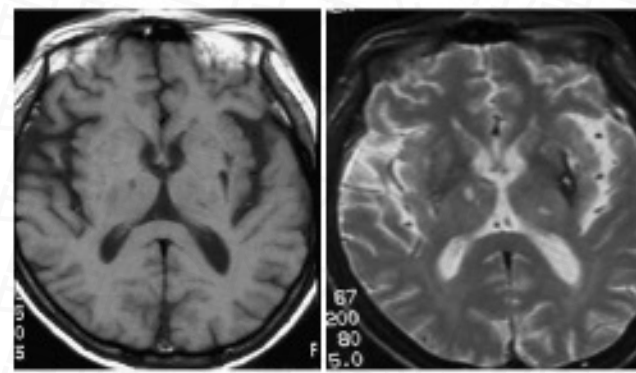
急性期
脱氧Hb, T1低、T2低



亚急性早期
中央: 等T1/短T2 外围: 短T1/长T2



亚急性晚期
中央: 短T1/长T2 外围: 短T1/短T2



慢性期
囊变区: 长T1/T2 囊壁环: 长T1/短T2

蛛网膜下腔出血的影像表现

CT

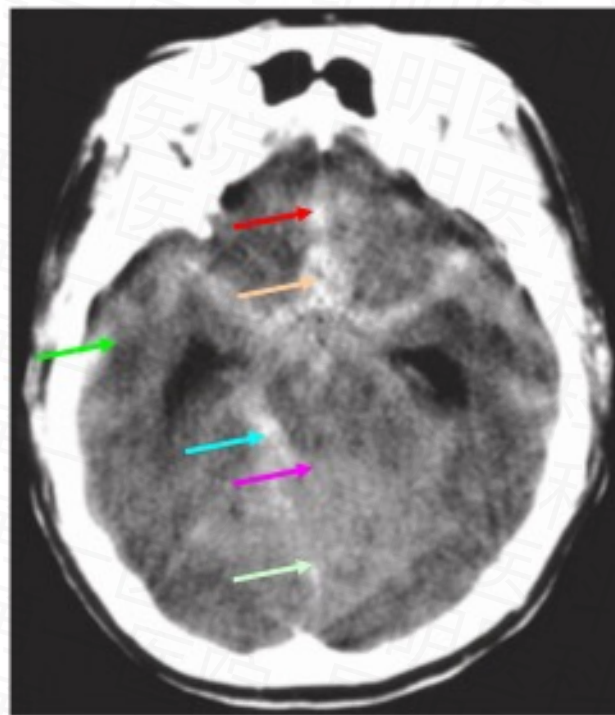
Computed
Tomography



FIRST
CHOICE

可检出90%以上的SAH

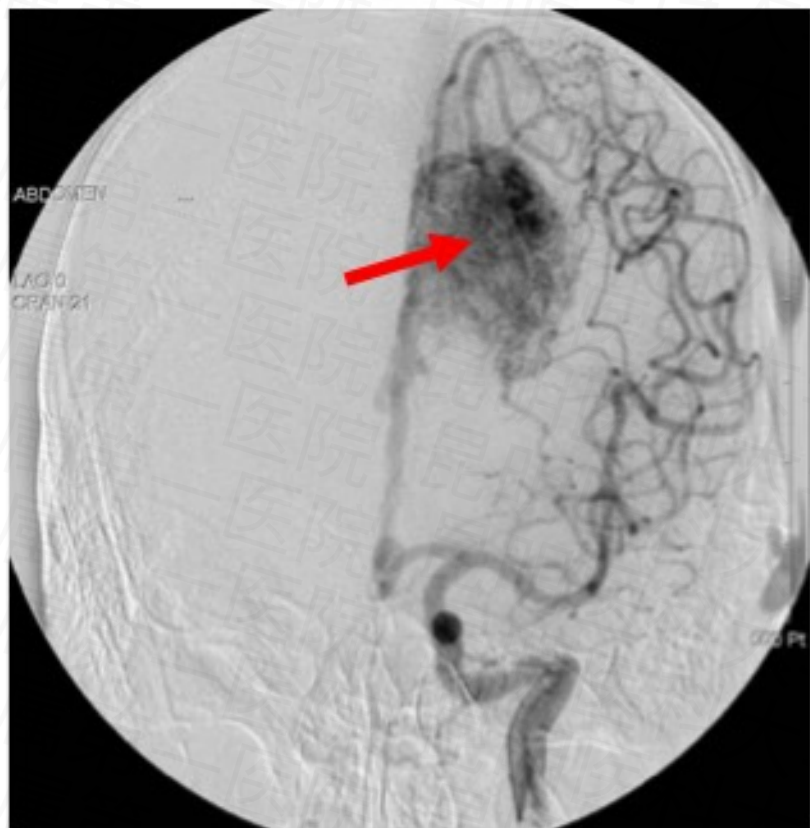
- 大脑外侧裂池
 - 前纵裂池
 - 鞍上池
 - 桥小脑角池
 - 环池
 - 后纵裂池
- 高密度出血征象



蛛网膜下腔出血的影像表现

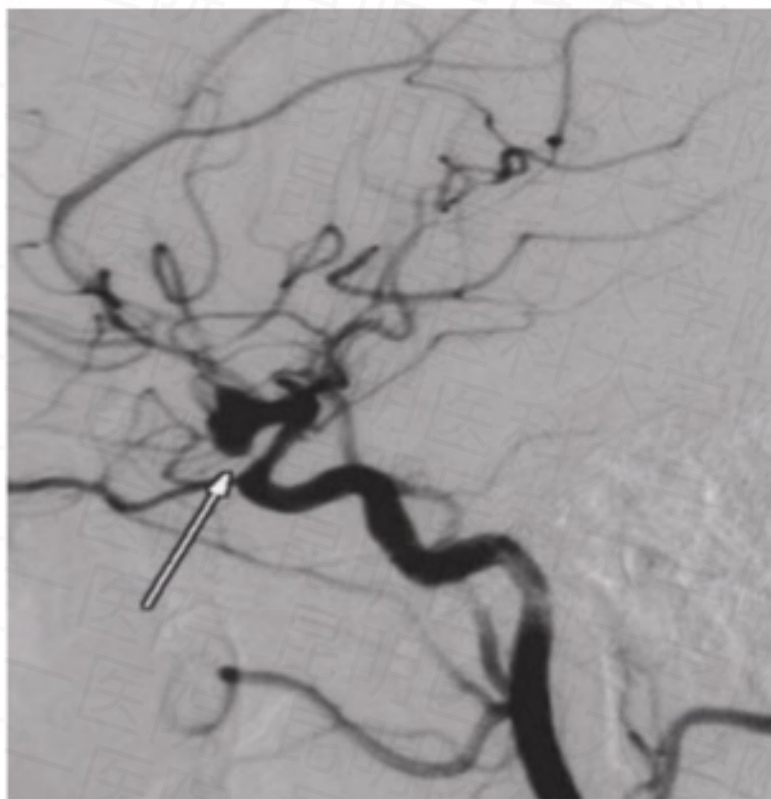
CTA

CT
Angiography



DSA

Digital
Subtraction
Angiography





思考

- 一位70岁老人早餐时突发右侧偏身肢体麻木无力，送到医院应立即选择的影像学检查是什么？

头颅CT

头颅MRI

头颅CTA

头颅PWI



Take Home Message

- 脑卒中的诊断：急性卒中样起病的神经系统功能缺损症状体征+影像学表现
- 影像学检查首选头颅CT排除脑出血
- 脑梗死急性期有条件应进行灌注成像，分析缺血半暗带以判断有无组织溶栓窗
- 脑梗死尚可通过MRI的表现分析发病机制
- 脑出血及蛛网膜下腔出血均首选头颅CT检查

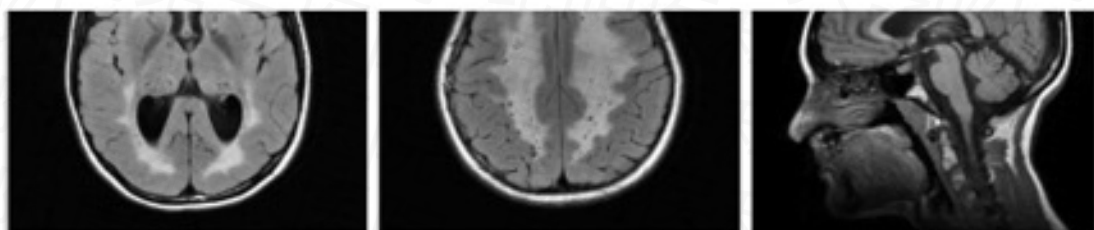
谢谢!

刘晓蕾

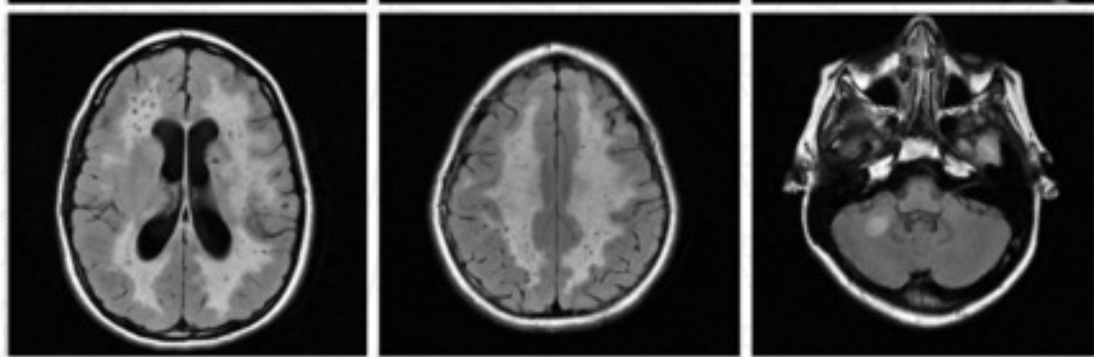
副主任医师·硕士生导师

昆明医科大学第一附属医院神经内科

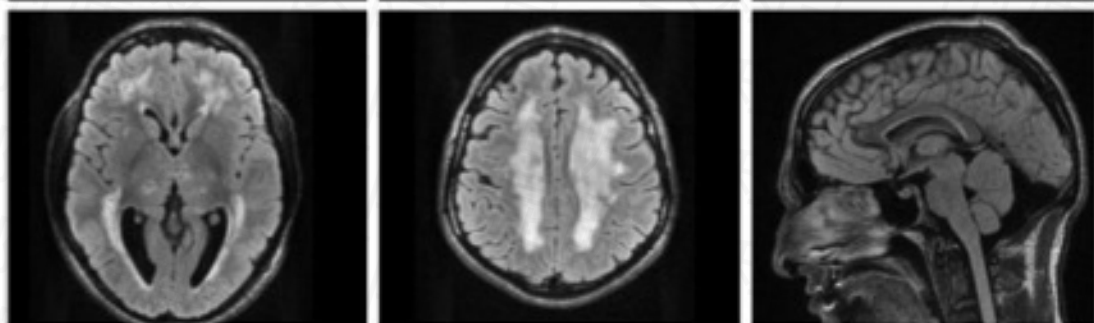
S1 (15y3)



S1 (15y9m)



S2



S4

