Strokes and TIA's

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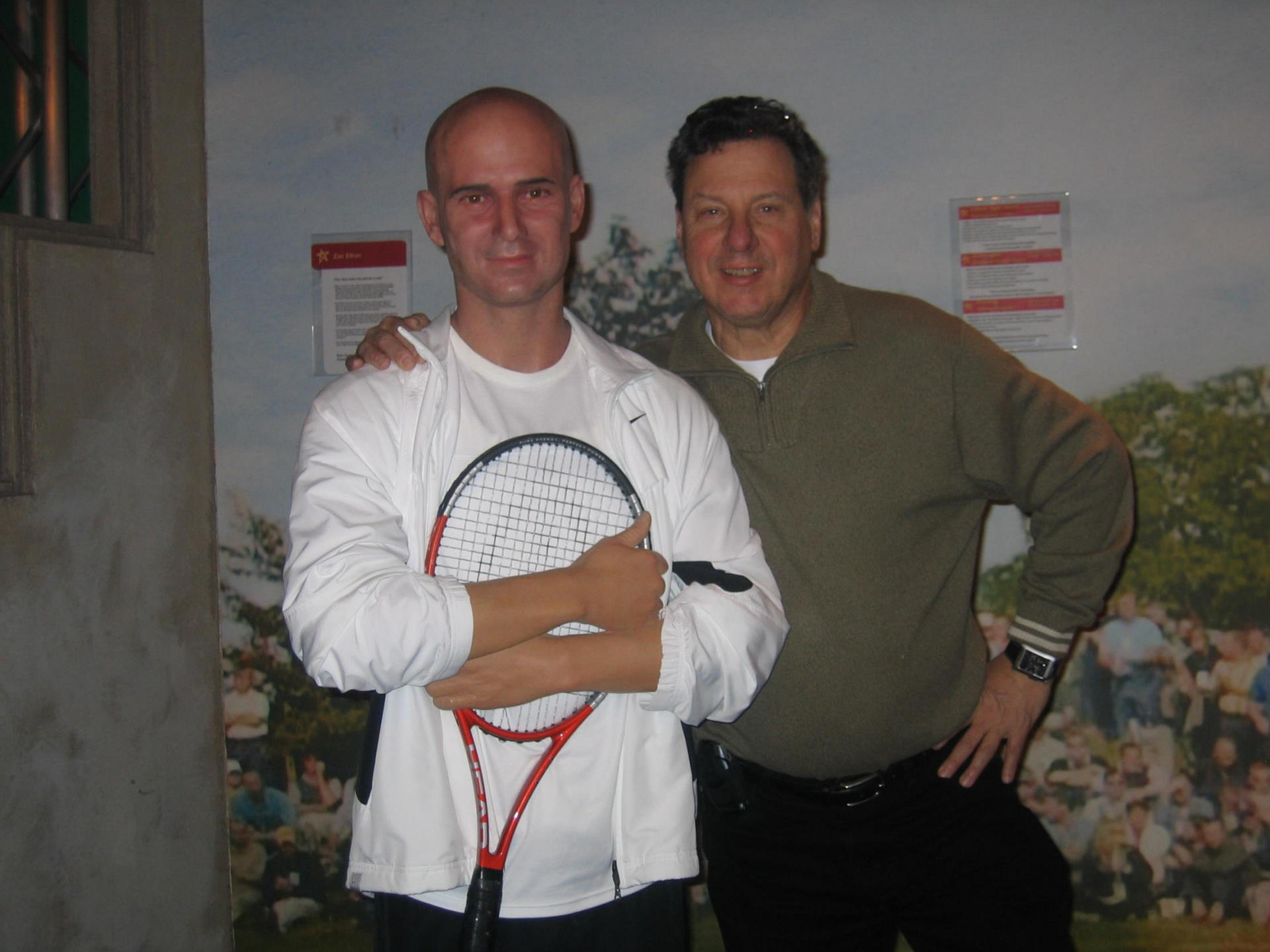

CAT Scan – Acute stroke

Stroke classification

- 1. ISCHEMIC - 90-95% of strokes
- 2. HEMORRHAGIC - 5% of strokes; usually related to hypertension

Ischemic CVA etiology – blood clot in artery

- 1. Small vessels – intracerebral disease 50%
- 2. Large vessels - carotid and aortic arch disease 25%
- 3. Cardiac sources 25%

Stroke etiologies

Artery to artery embolus

Heart - stroke link

Extravasation of Microemboli.

del Zoppo GJ, Hawkins BT. N Engl J Med 2010;363:1282-1284.

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Stroke risk factors

- 1. CVA risk factors similar to cardiovascular risk factors
- 2. Control of BP most important
- 3. Diabetics have more strokes
- 4. Unexplained stroke belt in US
- 5. Aging populations equates to more strokes
- 6. Cigarettes
- 7. Migraine with aura

Stroke and blood pressure

DM and stroke

Increase age and stroke

Stroke Belt

NIH Stroke Scale

- 1. Eleven categories with 1-4 items/category - total 42 points
- 2. No stroke (score is 0)
- 3. Minor stroke (score 1-4)
- 4. Moderate stroke (score 5-15)
- 5. Moderate/severe stroke (score 16-20)
- 6. Severe stroke (score 21-42)

NIH Stroke Scale1

1. LOC
2. Gaze evaluation
3. Visual (hemianopsia)
4. Facial palsy
5. Motor - arm
6. Motor - leg
7. Limb ataxia
8. sensory
9. Language function
10. Dysarthria
11. Extinction and inattention

TIA (transient ischemic attack)

- 1. transient neurological symptom
- 2. symptoms can include slurred speech, numbness or weakness on one side of the body or loss of vision in one eye
- 3. reversible over a period of minutes to hours, but not days

TIA Basics

- 1. Is it a TIA? DDX includes seizure, migraine pinched nerve, panic attack etc.
- 2. TIA vs. stroke - same entity but TIA involves resolution of symptoms (MRI shows infarct in both)
- 3. TIA causes: Afib, sm. Vessel disease, lg. vessel disease, endocarditis

TIA risk stratification – PAGE ONE

- 1. ABCD score
- 2. age > 60 y/0 1 pt
- 3. BP > 140 systolic/90 diastolic 1 pt
- 4. unilateral weakness 2 pts
- 5. speech disturbance 1 pt
- 6. DM 1 pt
- 7. symptom duration > 1 hour 1 pt

TIA risk stratification PAGE TWO

- 1. 6-7 pts. High stroke risk (8%)
- 2. 4-5 pts. Moderate stroke risk (4%)
- 3. 0-3 pts Low stroke risk (1%)

Stroke: time-based therapy

- 1. Most important question: when was last time patient was normal
- 2. Time of onset 0-3 hrs: use iv TPA
- 3. Time of onset 0-6 hrs: use intra-arterial TPA (requires neurointerventionist)
- 4. Mechanical embolectomy – trial data is lacking

MRA showing MCA blockage

MCA embolectomy

Lt. Hemisphere bleed from TPA

TPA clot busting

Stroke and BP regulation

- 1. Concept of BP not to high and not too low
- 2. Edema with acute stroke causes increased perfusion pressure
- 3. Need higher BP to adequately perfuse brain
- 4. Lowering BP will increase ischemic penumbra

Low CNS blood flow with lower BP

Impaired CNS perfusion during CVA

Ischemic penumbra

CT and MRI comparison

Perfusion vs. Diffusion

Carotid plaque and stroke

Carotid Disease and Stroke

- 1. Endarterectomy for pts. With symptoms with 70-99% stenosis
- 2. Little benefit CEA with 50-70% stenosis
- 3. Consider carotid stenting in high risk patients (MI, CHF, bad COPD etc)
- 4. Carotid stenosis in asymptomatic patients rarely need surgery

ICA stenosis

Carotid plaque

Carotid artery blockage

Carotid artery disease interventions

- 1. Stenting
- 2. Carotid endarterectomy

Carotid endarterectomy

Carotid Artery blockage corrected after surgery

Carotid Stenting

Bleeding after TPA

Carotid ultrasound

Transcranial Doppler

- 1. Insonation of intracranial arteries (anterior and posterior circulations)
- 2. Role in cerebrovascular disease evaluation
- 3. Assess down stream significance of flow alterations secondary to carotid or vertebral occlusive disease
- 4. Assess intracerebral artery stenoses

TCD transorbital approach

TCD waveforms in MCA stenosis

Cardiac issues for stroke

- 1. Study: 231 stroke/tia pts underwent TTE or TEE – 127 had cardiac source of emboli
- 2. TEE superior to TTE (especially lt. atrial appendage, aortic arch and rt. To lt. shunts)
- 3. Detecting atrial fibrillation - minimum of 48 hrs monitoring; sometimes 30 day monitoring required

ASSERT Study

- 1. risk of stroke in atrial fibrillation
- 2. patients with hypertension and cardiac pacemaker/defibrillator
- 3. Patients with increased numbers and increased duration of Afib episodes had increased risk of stroke
- 4. Pacemaker did not protect against stroke incidence

The Risk of Clinical Atrial Tachyarrhythmias and of Ischemic Stroke or Systemic Embolism, According to the Presence or Absence of Subclinical Atrial Tachyarrhythmias.

Healey JS et al. N Engl J Med 2012;366:120-129.

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Extended monitoring for Atrial Fibrillation

Anticoagulation

- 1. Warfarin is drug of choice for cardiac etiologies of stroke
- 2. INR optimal between 2-3
- 3. Stroke risk 25% or more with atrial fibrillation
- 4. Multiple medications interact with warfarin

Anticoagulation benefit in AFib

Anticoagulation benefits in AFib

-Risk factors after cardio-embolic stroke

Risk of CNS bleed with coumadin

Blood clot in atrium – stroke cause

Blood clot in atrium

Atrial septal defect

Atrial septal defect

Atherosclerosis of aortic arch

Atrial fibrillation – major cause of stroke

Stroke studies you should know about

- 1. CAPRIE Trial - plavix
- 2. ESPS II – Aggrenox
- 3. MATCH Trial – ASA + plavix risks
- 4. PROFESS Trial – Aggrenox vs. Plavix

CAPRIE Trial

- 1. Beneficial effects of plavix in myocardial infarction, stroke and peripheral arterial disease
- 2. As safe as ASA
- 3. About 8% difference cf. to ASA for secondary stroke prevention

ESPS 2 Study

- 1. Comparison of ASA vs. ASA with delayed release dipyramidole (Aggrenox) vs. placebo
- 2. large study > 6,600 pts. – end point of secondary stroke prevention
- 3. ASA vs. placebo – 18% reduction of stroke or death with ASA
- 4. Aggrenox vs. placebo – 36% reduction of stroke or death with Aggrenox

MATCH study

- 1. Comparison of ASA/plavix vs. plavix alone for secondary stroke and TIA prevention
- 2. No significant difference between ASA/plavix vs. plavix alone for stroke/TIA prevention
- 3. Markedly increased risk of life threatening hemorrhage (CNS and GI) with ASA/plavix

PROFESS trial

- 1. Comparison of Aggrenox vs. Plavix for secondary stroke prevention
- 2. No statistically significant differences between both drugs

Other drugs for stroke

- 1. Statins: protective effect even if pt. is eulipidemic
- 2. ACE inhibitors
- 3. Folic acid: lowers homocystine
- 4. Pradaxa etc. in lieu of Warfarin for cardiogenic etiologies

Chance Study 2013

Increased incidence of seizures with increased age

Stroke Rehab – after acute hospital

- 1. After stroke 1/3 patients to SNF, 1/3 home health care, remaining to outpatient or inpatient rehab facility
- 2. much better results with early rehab
- 3. best results; inpatient rehab facility

Stroke rehab – other factors

- 1. prevention of aspiration
- 2. medication reconciliation (hospital meds vs. rehab meds vs. home meds
- 3. patient education
- 4. outpatient f/u with PCP and neurologist

Causes of fainting

Stroke - Final Thoughts

- 1. Peri-ventricular white matter disease – significance for strokes is unknown
- 2. Stroke management in community – only 30-50% of pts. get to hospital within 8 hrs of symptoms
- 3. Carotid screening in elderly; does it really change anything
- 4. Cost effectiveness of Plavix and Aggrenox vs. ASA are fairly minimal

Diffusion scan - acute CVA