

MANAGEMENT OF ATRIAL FIBRILLATION

Asif Serajian, DO FACC
No disclosures

CASE #1

A 45 year old male comes in with atrial fibrillation with rapid ventricular response with symptoms of fatigue for the last 2 weeks and exercise intolerance

Echocardiogram demonstrates normal left ventricular wall thickness and function

He does not have diabetes, hypertension, congestive heart failure or any vascular disease

He is found to have hyperthyroidism

QUESTIONS:

Would rhythm control be a reasonable strategy for this patient?

Which agent would you use?

Should you anticoagulate the patient?

CASE #2

75 year old female comes in feeling “heart jumping” with atrial fibrillation and rapid ventricular response. She has mild left ventricular dysfunction and atrial dilation at 5.5 cm. She receives metoprolol and rate is controlled. Her daughter asks “are we going to fix her back to the normal rhythm?”

What are your treatment options?

Does the patient need anticoagulation?

CASE #3

67 year old male with known compensated cardiomyopathy and has a diagnosis of atrial fibrillation with difficult to control rates. What anti-arrhythmic medications can be tried for this patient?

WHAT ARE THE RISK FACTORS FOR ATRIAL FIBRILLATION?

Think about the typical patient

STATISTICS

Most common arrhythmia in the hospital setting

Preventable cause of stroke

Atrial rate > 300 places the patient at risk for atrial thrombus as well as rapid ventricular response

Rapid ventricular response can lead to hypotension, syncope, congestive heart failure, fatigue

Risks are are CAD, CHF, obesity, diabetes, hypertension, age

WHAT HAVE YOU SEEN TRIGGERING THIS ARRHYTHMIA?

Think about your septic patient in the ICU, what do they have on the monitor prior to atrial fibrillation

TRIGGERS

Excessive premature atrial beats linked with incidence of atrial fibrillation

These PACs originate at the ostium of the pulmonary veins

Increased sympathetic tone (sepsis, surgery) can trigger atrial fibrillation

Increase parasympathetic tone can also trigger atrial fibrillation (vagally mediated atrial fibrillation occurs due to heterogenous vagal innervation of the atria)

CLASSIFICATION

Paroxysmal - terminates within 7 days

Persistent - Past 7 days

Permanent - over 12 months

Recurrence is however 70% with 90% unrecognized by the patient and 17% lasting over 48 hours

Prevention- some evidence that weight loss, mediterranean diet high in olive oil, vitamin C (post op), nuts can reduce risk

DO YOU THINK YOUR PATIENTS HAVE RECURRENCE OF THE
ARRHYTHMIA?

RECURRENCE RATES

Upto 70% at 1 year

Majority of the episodes are asymptomatic even when 17% are over 48 hours in duration

At 5 years 25% of patients will have permanent atrial fibrillation

Patients with left ventricular dysfunction, hypertension, advanced age and enlarged atria are likely to have recurrence

NEW ONSET AFIB

Symptomatic due to RVR

- Rate control (primary symptomatic from this)
- Rhythm control

Treatment for reduction in thrombus embolization

- Asa
- anticoagulation

HOW DO YOU DETERMINE WHO TO ANTICOAGULATE?

PREVENTION OF EMBOLIZATION

CHA2DS2-VASc score is calculated to guide anticoagulation

All patients undergoing pharmacological or DC cardioversion need anticoagulation at least short term

CHADS₂-VASC SCORE

Congestive heart failure 1

Hypertension 1

Age \geq 75 2

Stroke/tia 2

Diabetes 1

Vascular disease (including aortic plaque) 1

Age 65 to 74 1

Female sex 1

ANTICOAGULATION

Embolization can occur with paroxysmal, permanent or persistent atrial fibrillation

Warfarin reduces risk of cerebrovascular accident if score ≥ 2

Anticoagulation reduces cerebrovascular accident by $\frac{2}{3}$

There is 0.4% risk of serious bleeding but this is less than stroke risk

NOAC COMPARED TO WARFARIN

Reduce risk of stroke and bleeding

Significant reduction in hemorrhagic stroke which many times is fatal

Dabigatran has increased risk of gastrointestinal bleeding

WHAT ABOUT ASPIRIN AND CLOPIDOGREL?

ASPIRIN MONOTHERAPY

Even with CHADS2 score of 0 not be studied adequately

2007 meta analysis demonstrated a 20% risk reduction in CVA but not statistically significant

Did not reduce disabling stroke

In one observational study there is higher incidence of stroke compared to no therapy

ASPIRIN + CLOPIDOGREL

Active A trial demonstrated superiority to aspirin alone

Active W trial demonstrated warfarin superior

Turns out bleeding risk of dual antiplatelet therapy is similar to warfarin anticoagulation and NOACs have less bleeding in comparison to dual antiplatelet therapy so if a patient can take aspirin + clopidogrel, they can take anticoagulation

BRIDGING FOR WARFARIN

Not necessary in patient without history of thromboembolism

In patients who present with cerebrovascular accident the net benefit with heparin bridging is neutral when combined with the ICH risk

NOAC DOSING

Dabigatran (Pradaxa) 150 mg by mouth twice a day is typical dose if normal renal function. There is antidote.

Edoxaban 60 mg by mouth daily if GFR > 50

Apixaban 5 mg by mouth twice a day

Rivaraxiban 20 mg by mouth daily

SHOULD WE BE STARTING AMIODARONE DRIPS ON EVERYONE?

RATE VS RHYTHM CONTROL

Most patients are symptomatic from RVR and therefore rate control needs to be achieved in all patients short term

Long term rhythm vs rate control needs to be decided using antiarrhythmic, catheter or surgical ablation +/- cardioversion

For rate control beta blocker and calcium channel blocker is used

RATE CONTROL VS RHYTHM CONTROL

Associated with similar morbidity and mortality

Treatment choice driven by symptomatic status and evidence of structural heart disease due to tachycardia

Some patients are difficult to rate control and rhythm control strategy may be useful

No data to suggest that preventing episodes of atrial fibrillation reduces mortality

AFIB PRESENTATION

1. Asymptomatic, diagnosed on electrocardiogram
2. Acutely ill patient in the hospital such as sepsis, cardiac surgery, myocardial infarction
3. Arterial embolism presentation
4. Symptomatic a. From the rapid ventricular response with shortness of breath, palpitations or fatigue b. The atrial fibrillation itself with decreased exercise capacity

IMMEDIATE ISSUES

Rapid ventricular response with hypotension needs emergent cardioversion however at the risk of systemic embolization

Congestive heart failure, ischemia may need rate control immediately

Prompt anticoagulation if no contraindications

WORK UP

TSH for hyperthyroidism

Cardiac enzymes

BNP for congestive heart failure

chest X-ray for same

Echocardiogram for structural heart disease

RATE CONTROL

Goal should be to get heart rate < 110

Calcium channel blocker or beta blocker can be used

Amiodarone may be needed for rate control in some resistant patients however at the risk of thromboembolism if cardioversion occurs and risk of toxicity

Digoxin may be used in patients with systolic congestive heart failure however in patients without systolic congestive heart failure it is linked with higher mortality

RESTORATION OF SINUS RHYTHM

Reasonable to have 1 attempt at maintaining sinus rhythm especially if there is a reversible cause such as infection, surgery, hyperthyroidism

In such patients who do not have the substrate for further atrial fibrillation episodes it may reduce symptoms in future, they may not have a second episode

Afib promotes further atrial fibrillation and therefore earlier cardioversion has higher success rate

Best time < 48 hours of onset without TEE or > 48 hours with TEE or wait 3 weeks

ABLATION

Second line to antiarrhythmic for maintaining SR in symptomatic atrial fibrillation patients

Success rate at maintaining sinus rhythm at 1 year is about 80%

Long term studies are not available to see if it reduces the risk of stroke

CARDIOVERSION TECHNIQUE

DC

Pharmacological

Combined above

AFFIRM TRIAL-RHYTHM VERSUS RATE CONTROL

Randomized 4000 patients to rate versus rhythm control

Trend towards lower mortality in the rate control arm

Patients with congestive heart failure and age over 65 had a statistically significant lower mortality

There was reduced hospitalization in the rate control arm

No difference in stroke

RACE TRIAL DEMONSTRATED SIMILAR FINDINGS

No significant difference in quality of life

No difference in mortality

However, both trials allowed for stopping anticoagulation 4 weeks after restoring sinus rhythm

In real world registry however there was similar rate of mortality and strokes as the 2 trials enrolled older patients and rhythm control may be useful in younger patients

PATIENTS NOT GOOD CANDIDATE FOR RHYTHM CONTROL

Asymptomatic > 75 years of age (high risk of recurrence)

Patients in permanent atrial fibrillation

Patients with marked dilation of left atrium

INDICATIONS FOR RHYTHM CONTROL

Persistent symptoms despite rate control

Inability of obtain good rate control

No evidence that shows rates of survival or thromboembolism is improved with rhythm control

Cardioversion in young patients

After cardioversion, beta blocker is recommended and not antiarrhythmic in those patients with transient cause

CARDIOVERSION

Can be done without TEE if documented < 48 hours in onset

3 weeks of anticoagulation prior to cardioversion if > 48 hours or use TEE

4 weeks post cardioversion patient should be anticoagulated regardless of long-term risk

ANTI-ARRHYTHMICS

Class IC agents (flecainide or propafenone) needs to be used with a CCB or BB due to risk of RVR

Patients may use pill in the pocket approach with propafenone if infrequent afib episodes

Most common agents: -amiodarone -dofetilide

-flecainide -propafenone

-sotalol

WITHOUT STRUCTURAL HEART DISEASE

Flecainide and propafenone are the agents of choice

WITH STRUCTURAL HEART DISEASE

- Amiodarone: Highest efficacy at the risk of highest toxicity with liver and thyroid damage
- Dronedarone : Less toxicity in comparison to above but not as efficacious as amiodarone or sotalol
- Sotalol: More efficacious than dronedarone but patient needs to be monitored for 3 days. Can be used in patients with coronary artery disease. Not recommended if LV wall thickness > 1.4 cm on echo, increases mortality in CHF
- Flecainide and propafenone are contraindicated

WHAT ABOUT PATIENTS UNDERGOING PCI?

NEJM Dec 2016

Trial randomizing over 2000 patients to:

rivaroxiban (Xarelto) at 15 mg daily with P2Y12 inhibitor (clopidogrel)

Very low dose Xarelto 2.5 mg mg by mouth twice a day (not available in US) and dual antiplatelet therapy

Warfarin with dual antiplatelet therapy

RESULTS

The rates of clinically significant bleeding were lower in the two groups receiving rivaroxaban than in the group receiving standard therapy (16.8% in group 1, 18.0% in group 2, and 26.7% in group 3).

The rates of death from cardiovascular causes, myocardial infarction, or stroke were similar in the three groups (Kaplan–Meier estimates, 6.5% in group 1, 5.6% in group 2, and 6.0% in group 3; P values for all comparisons were nonsignificant).

CONCLUSION

In participants with atrial fibrillation undergoing PCI with placement of stents, the administration of either low-dose rivaroxaban plus a P2Y12 inhibitor for 12 months or very-low-dose rivaroxaban plus DAPT for 1, 6, or 12 months was associated with a lower rate of clinically significant bleeding than was standard therapy with a vitamin K antagonist plus DAPT for 1, 6, or 12 months.

The three groups had similar efficacy rates, although the observed broad confidence intervals diminish the surety of any conclusions regarding efficacy.

NONPHARMACOLOGICAL

Most patients with afib should receive anticoagulation but not all patients are candidates due to bleeding risk

Catheter ablation of the afib has not been proven to prevent systemic embolization as the long term success rate is 50-85%

LAA is the usual source of thrombus with 90% of thrombus originating here

LAA exclusion procedures that physically prevent thrombus embolization have been developed for this purpose

PATIENT SELECTION

Patients at high risk of bleeding, inconvenience

Gastrointestinal bleeding

ICH in the past

Compliance

Falls

Coagulation defects or anemia that increase risk of bleeding

Patients however need to take anticoagulation for 6 weeks

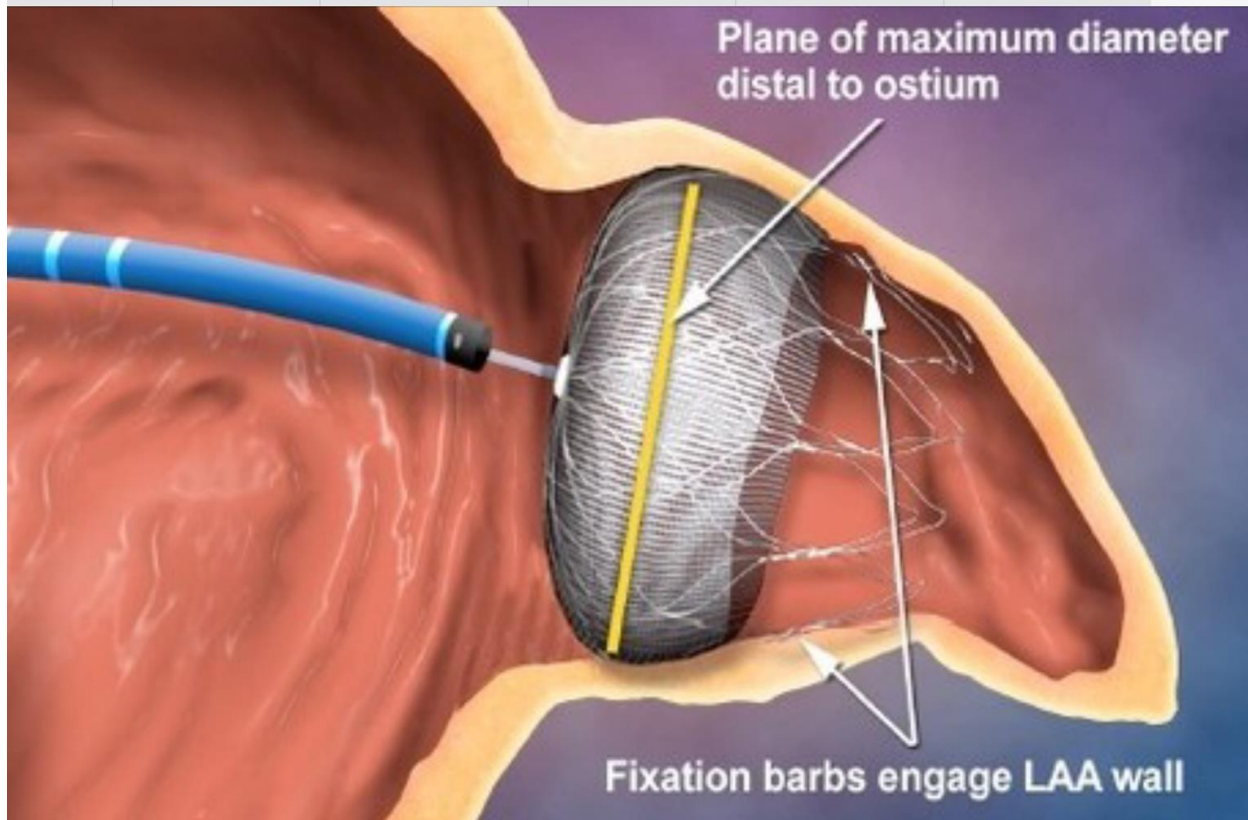
WATCHMAN DEVICE

For patients who are high-risk for systemic embolization but need long-term anticoagulation the Watchman device can be considered

This device has been shown to have similar safety and efficacy compared to long-term anticoagulation for prevention of stroke and systemic embolization

This device is a nitinol cage deployed in the left atrial appendage using a transseptal approach

The device is covered by a layer of membrane which is endothelialized within 45 days



WATCHMAN DEVICE

PROTECT AF TRIAL

Over 700 patients were randomly assigned in at 2 to 1 ratio to either device or long-term anticoagulation

Patients were anticoagulated for a minimum of 45 days followed by aspirin and clopidogrel for 6 months

After a mean follow up of 2.3 years the device was shown to be non-inferior to warfarin

At 3.8 years there was also noted to be a 60% relative risk reduction of cardiovascular death driven by hemorrhagic stroke

Other devices being studied

ANSWERS TO CASE #1

Rhythm control may be a reasonable strategy in this patient who is symptomatic

Class IC antiarrhythmic along with beta blocker or calcium channel blocker can be used since patient has no structural heart disease

A cardioversion should be performed with TEE since onset is over 48 hours

Patient needs to be anticoagulated for 4 weeks minimum

May consider ablation if AA fail

ANSWERS TO CASE #2

The patient is symptomatic probably from rapid ventricular response and rate is easily controlled.

The probability of maintaining sinus rhythm is lower due to left ventricular dysfunction and left atrial dilation.

Patient needs to be anticoagulated.

If patient is well controlled with rate control strategy it may be superior to rhythm control in an elderly patient.

ANSWER TO CASE #3

Amiodarone, dofetilide along with dronedarone can be used for this patient

At his age, ablation can be discussed as well

If he has recent exacerbation of congestive heart failure, dronedarone should be avoided

THANK YOU