



23. ULUSAL KONGRESİ

Göğüs Kalp Damar Anestezi ve Yoğun Bakım Derneği

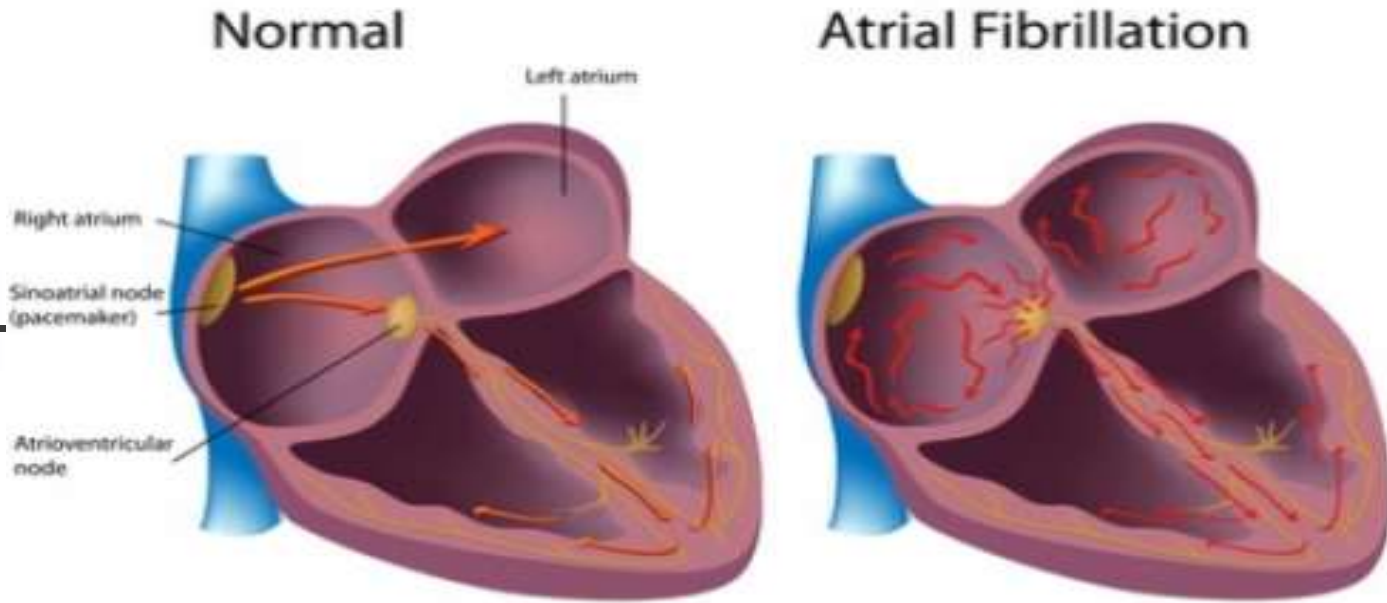
25-28 Mayıs 2017

Marriot Hotel Asia
İSTANBUL



Postoperatif Yoğun Bakımda Atriyal Fibrilasyon

DR. MURAT AKSUN



- POAF kardiyak cerrahi sonrası % 30-50
- Cerrahi sonrası sıklıkla ilk 5 gün içinde (2. gün pik)
- AF'da SA düğüm yerine, birçok farklı uyarı ile atriyumlarda çok hızlı ve kaotik bir ritim
- Atriyumlar kasılamaz ve/veya kanı etkili bir şekilde ventrikül içine itemez
- Atriyumlardaki uyarıların sayısı dakikada 300 - 600 atım

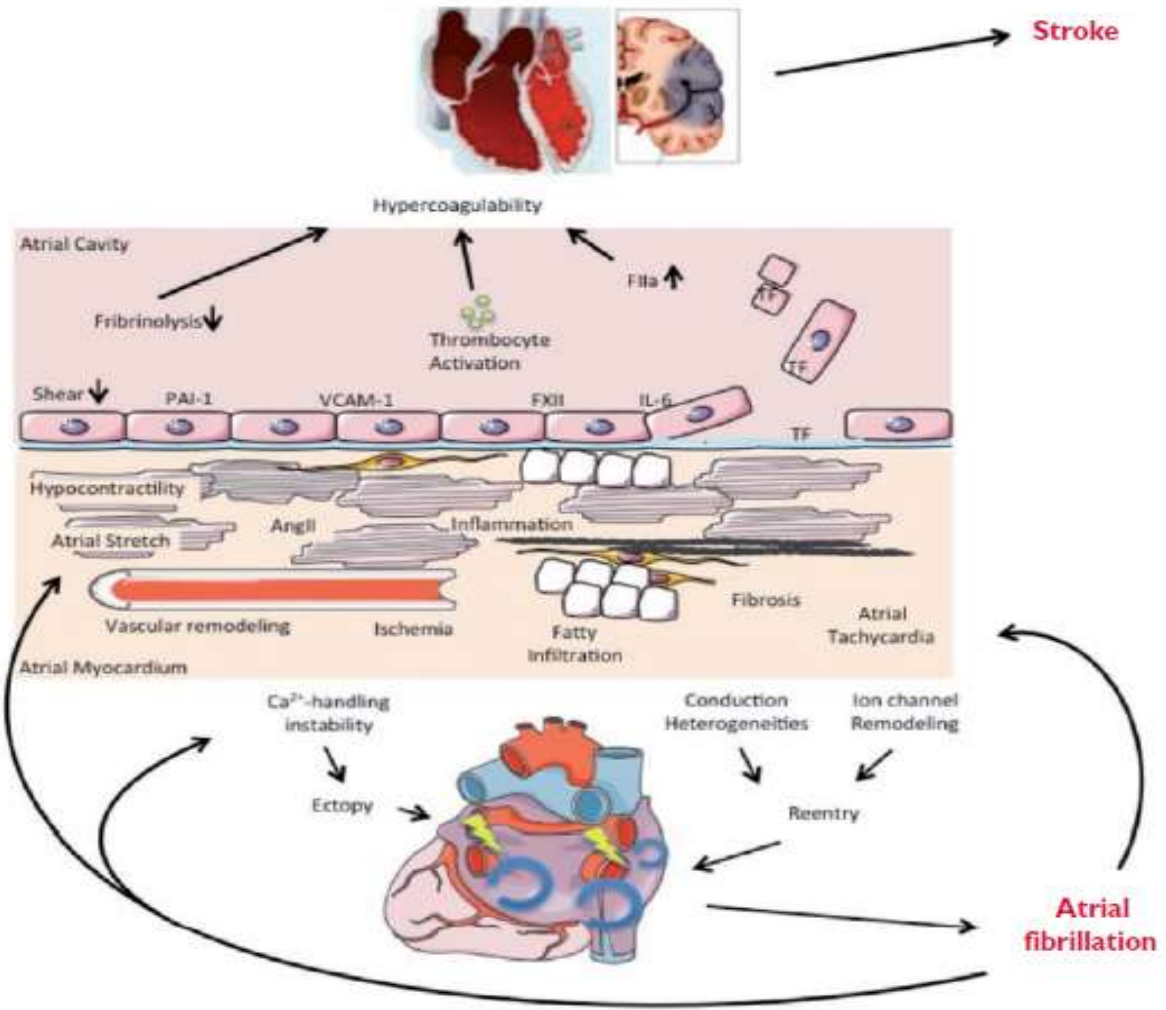
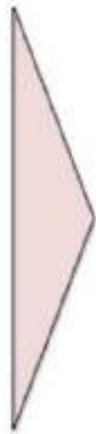
Mitchell LB: Incidence, timing and outcome of atrial tachyarrhythmias after cardiac surgery. In: Steinberg JS (ed). Atrial Fibrillation After Cardiac Surgery. Norwell, MA, Kluwer Academic Publishers, 2000, pp. 37-50



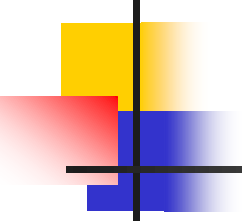
Patofizyoloji

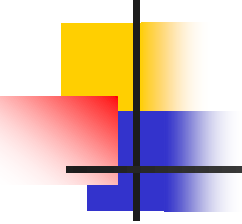
- Multifaktöriyal
- Myokardiyal atriyal fibrozis AF'ye eşlik eden sık bulgu
- En sık tetikleyen alanlar sol pulmoner venlere uzanan atriyal miyokard yastıkları
- Miyokard fiber oryantasyonu ve iletim anormallikleri re-entery başlamasından sorumlu

Diabetes
Heart failure
Obesity
Coronary artery disease
Hypertension
Ageing
Genetic predisposition



AngII = angiotensin II; TF = tissue factor; FXII = factor XII; IL-6 = interleukin 6; PAI-1 = plasminogen activator inhibitor 1; VCAM-1 = vascular cell adhesion molecule 1.

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- Pulmoner venlere ilave nonpulmoner fokus (koroner sinüs, sol atriyum posteriyor duvarı ve septum, vena cava) AF'yi tetikleyebilir
 - Sempatik ve parasempatik stimülasyon (artmış otomasite, uyarılmış aktivite)

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- CPB → sistemik ve lokal inflamasyon
 - Direkt insizyon nedeniyle atriyum hasarı

Maesen B, Nijs J, Maessen J, Allessie M, et al: Post-operative atrial fibrillation: A maze of mechanisms. Europace 14:159-174, 2012

Inflammation, oxidative stress and postoperative atrial fibrillation in cardiac surgery

M. Zakkar^a, R. Ascione^a, A.F. James^b, G.D. Angelini^a, M.S. Suleiman^{a*}

İskemi, Ateroskleroz,
HT, KOAH, Diabet

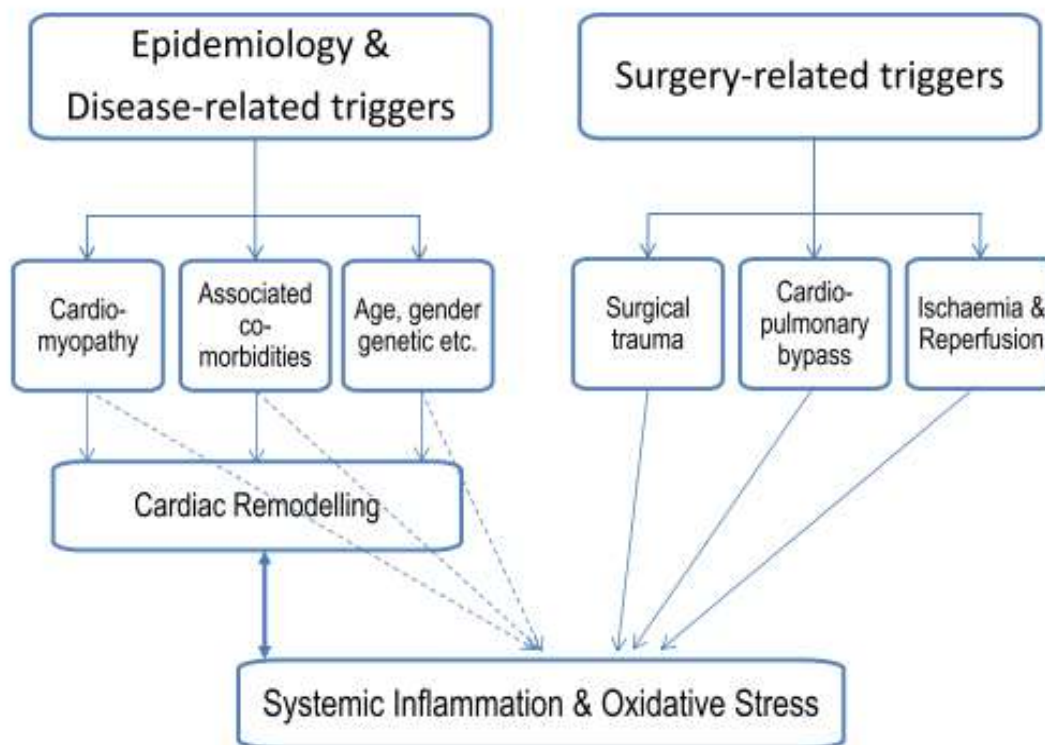


Fig. 1. Flow chart showing the source of inflammation & oxidative stress pre-and postoperatively. See text for details.

Inflammation, oxidative stress and postoperative atrial fibrillation in cardiac surgery

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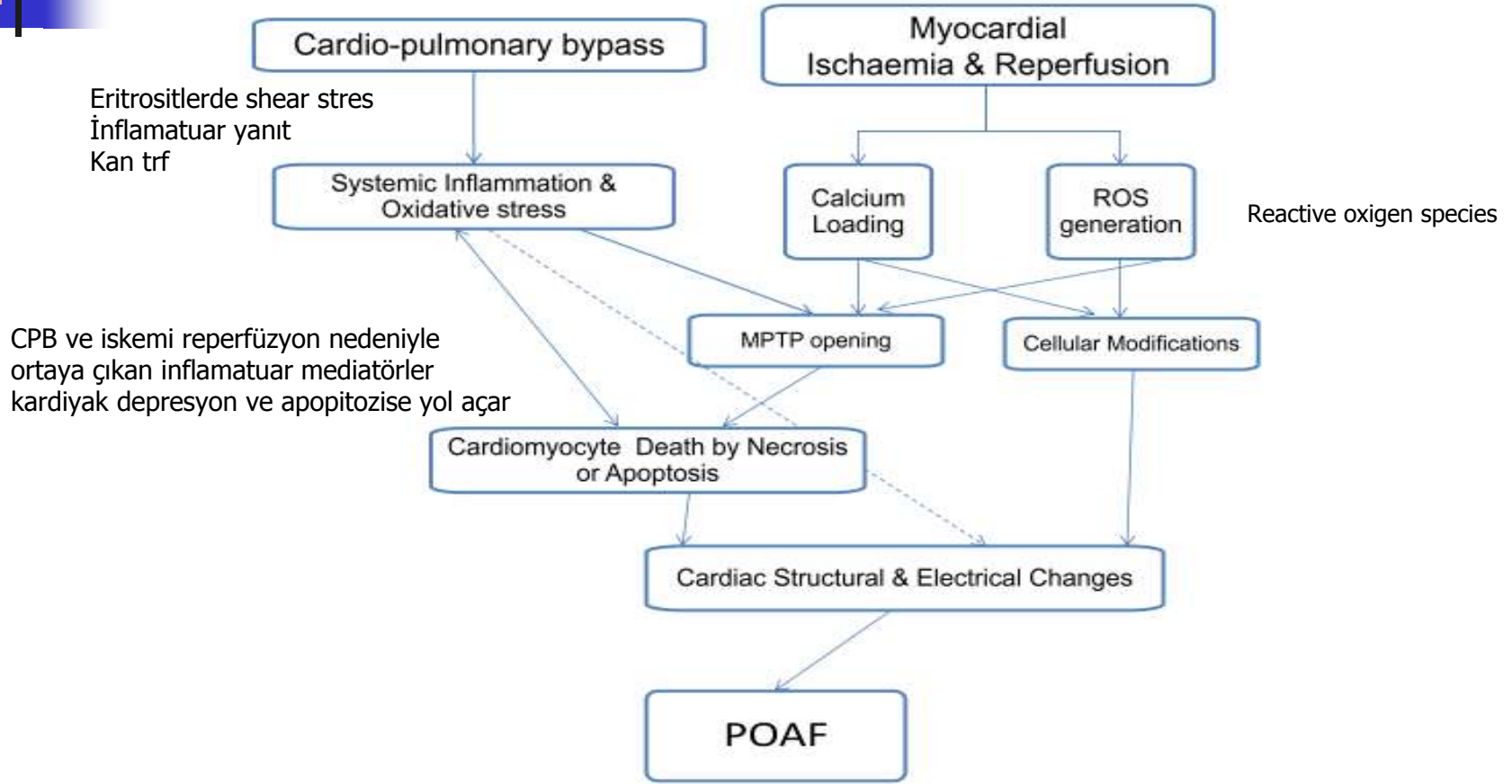
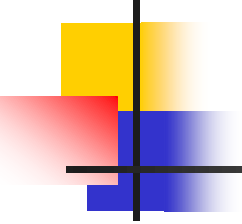


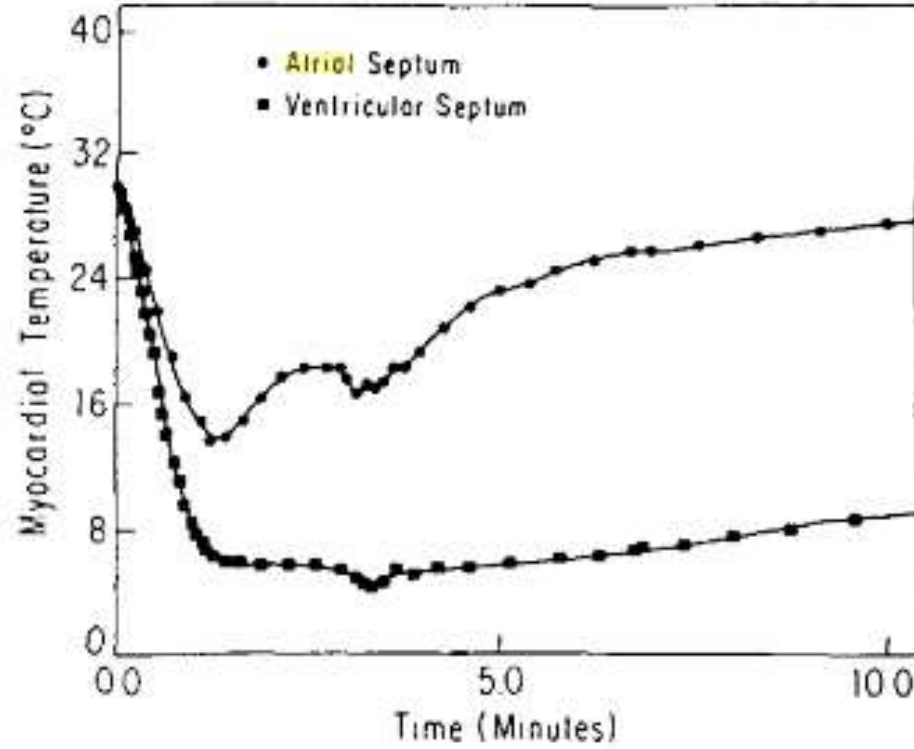
Fig. 2. Flow chart showing the effect of CPB and ischaemia and reperfusion on cardiac re-modelling that can lead to POAF.

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- Kardiyomiyozitler iskemi - reperfüzyon ya da hipoksi-reoksijenasyon nedeniyle **IL6** üretirler
 - IL6 negatif inotropik etkiler ve myokardiyal stunningle ilişkili
 - Diğer kalp tarafından üretilen proinflamatuvar sitokinler **IL 18 ve IL 1 β**
 - **IL8** lökosit aktivasyonu ve birikimiyle kardiyak injury yapar



Cerrahi sırasında:

- ✓ Sağ atriumun aşırı manipülasyonu
- ✓ Cerrahi travma (AKK, distal anastomoz sayısı)
- ✓ Sempatik aktivasyon (artmış miyokardiyal uyarılabilirlik ve otomasite)
- ✓ Oksidatif stres, perioperatif basınç ve volüm değişiklikleri (hipo-hiper volemi)
- ✓ Kardiyoplejik solusyonların kullanımı
- ✓ Postoperatif hipoksi
- ✓ Elektrolit imbalansı



- Kardiyoplejik arrest sırasında atrial ısı, ventriküllerden yüksek
- Yetersiz atrial ve atrioventriküler nodal hipotermi, ileti sisteminin iskemik hasarı

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- CPB'in eliminasyonu ise POAF'ı tamamen elimine edememiş

Avoiding cardiopulmonary bypass in multivessel CABG reduces cytokine response and myocardial injury. Ann Thorac Surg 68:52-56, 1999

- Off-pump CABG'de inflamatuvar yanıt şiddeti daha az
- 1251 hastayı içeren çalışmada off-pump teknikle POAF'da azalma görülmüş

Coronary Artery Revascularization (CARE) registry: An observational study of on-pump and off-pump coronary artery revascularization. Ann Thorac Surg 83: 986-991, 2007

- 10716 hastalık Cochrane sistematik review off-pump cerrahi sonrası POAF azaltmada etkili bulunmamış

Off-pump versus on-pump coronary artery bypass grafting for ischaemic heart disease. Cochrane Database Syst Rev 3:CD007224, 2012

Cardioplegic arrest does not increase the risk of atrial fibrillation after coronary artery bypass surgery[☆]

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Abstract

Objective: Atrial fibrillation (AF) is the most common arrhythmia after coronary artery bypass grafting (CABG). It is a considerable source of morbidity, prolongs hospital stay and increases costs of treatment. Atrial cannulation, cardiopulmonary bypass and cardioplegic arrest have been suggested to play a role in the development of AF after CABG. The aim of this case-control study was to evaluate the role of cardiopulmonary bypass and cardioplegic arrest in the development of postoperative AF. **Methods:** Data from 114 patients undergoing CABG without cardiopulmonary bypass and cardioplegic arrest (off-pump) between October, 1998 and December, 2002 were evaluated for the occurrence of postoperative AF. Each patient was individually matched by gender, age (± 3 years), left ventricle ejection fraction ($\pm 5\%$), history of myocardial infarction, unstable angina, and β -blocker medication with patients undergoing CABG with cardiopulmonary bypass and cardioplegic arrest (on-pump) during the same period. The data from off-pump and on-pump groups were compared. **Results:** Off-pump and on-pump groups had similar preoperative characteristics. The number of distal anastomoses was lower in the off-pump (2.3 ± 0.9) than in the on-pump (3.9 ± 1.1 , $P < 0.001$) group. However, the incidence of postoperative AF in the off-pump (36.8%) and the on-pump groups (36.0%) did not differ from each other. Old age was the only independent predictor of AF after CABG. **Conclusions:** Neither cardiopulmonary bypass nor cardioplegic arrest increases the risk of postoperative AF after CABG.

Ameliyat sonrası atriyal fibrilasyon gelişiminde atan kalp ve kardiyopulmoner baypas cerrahisinin karşılaştırılması

A comparison of off-pump and cardiopulmonary bypass for the development of postoperative atrial fibrillation

Yüksel Beşir,¹ Ömer Tetik,¹ Banu Lafçı,² Orhan Gökcalp,² Tefik Güneş,² Arif Gücü,¹ Ali Gürbüz²

Tablo 3. Hastalarda atriyal fibrilasyon gelişimi

	Atan kalp grubu			KPB grubu			p
	Sayı	Yüzde	Ort.±SS	Sayı	Yüzde	Ort.±SS	
Atriyal fibrilasyon gelişimi	3	3,4		77	21,4		0.013
Atriyal fibrilasyon gelişim günü			1,0±0,4			1,9±0,7	0.047

KPB: Kardiyopulmoner baypas; Ort.±SS: Ortalama ± standart sapma.

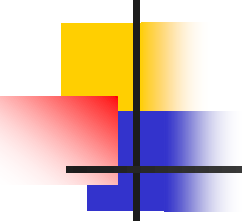
New-Onset Atrial Fibrillation After Cardiac Surgery: Pathophysiology, Prophylaxis, and Treatment

Vladimir V. Lomivorotov, MD, PhD,* Sergey M. Efremov, MD, PhD,*
Eugeniy A. Pokushalov, MD, PhD, FACC, FESC,† and Alexander M. Karaskov, MD, PhD‡

Journal of Cardiothoracic and Vascular Anesthesia, Vol ■, No ■ (Month), 2015: pp ■-■

Table 1. Risk Factors of New-Onset Postoperative Atrial Fibrillation ^{4,8-17}

Preoperative	Advanced age
	History of atrial fibrillation
	Hypertension
	Left atrial enlargement
	Chronic obstructive pulmonary disease
	Decreased left ventricular ejection fraction
	Higher EuroSCORE
	Heart failure
	Coronary artery disease
	Cardiomyopathies
	Valve disease
	Diabetes mellitus
	Obesity
	Smoking
	Alcohol use
	Hyperthyroidism
Genetic predisposition	
Intraoperative	Valve surgery
	On-pump surgery
	Venous cannulation
	Surgical pericardial and atrial injury
Postoperative	Hypervolemia
	Hypovolemia
	Increased afterload
	Hypotension
	Withdrawal of beta-blocker therapy
	Withdrawal of angiotensin-converting enzyme inhibitor therapy

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- Venöz kanülasyonun lokalizasyonu
 - Atriyum insizyonundan kaçınılan bikaval kanülasyonun POAF sıklığını azaltabileceği
 - Pulmoner ven aracılığı ile kalbin vent edilmesi artmış POAF nedeni

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- Kısa AKK süresi
 - İyi miyokardiyal koruma



AF insidansı azaltılabilir

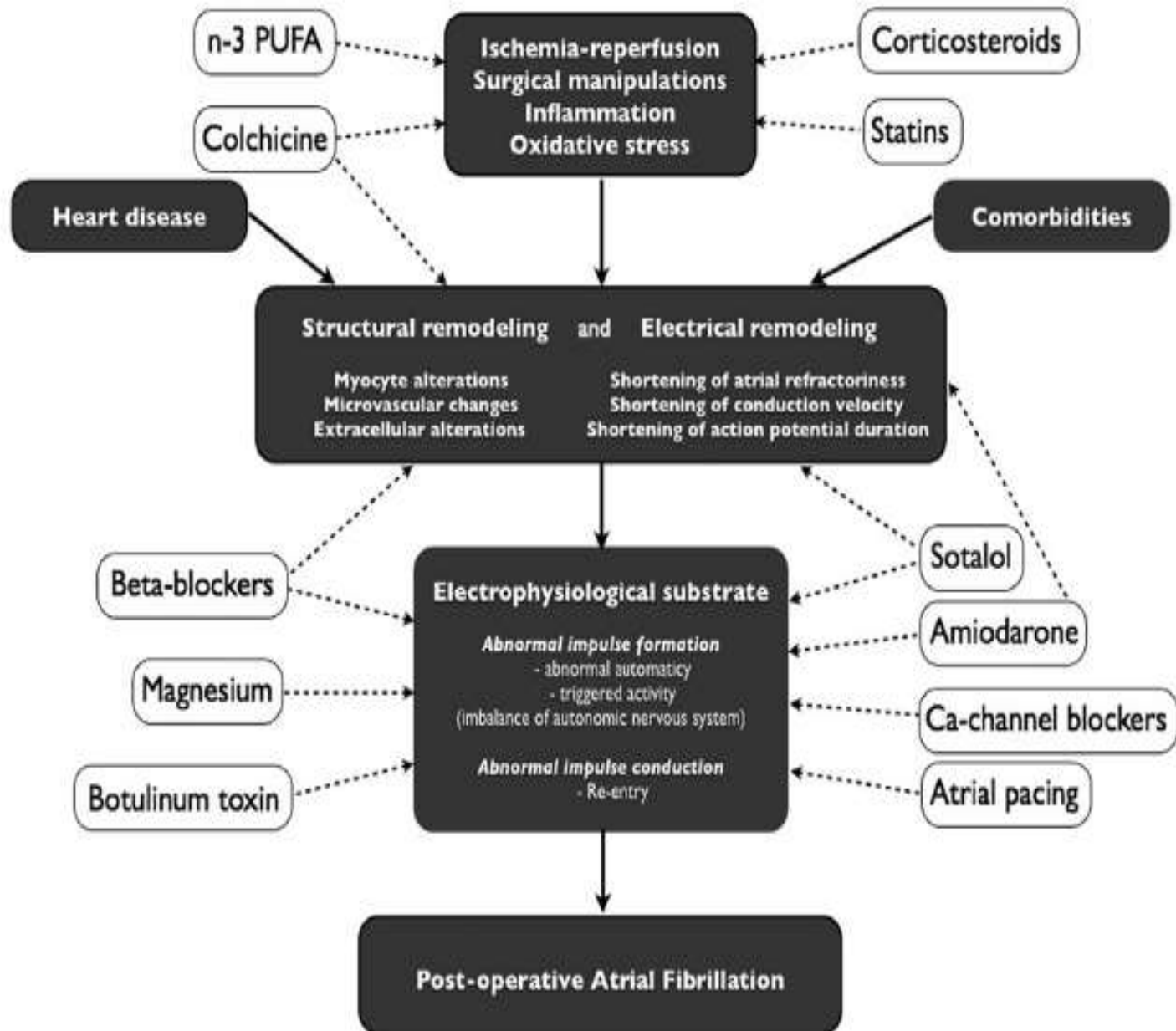


Table Drugs Used for the Prevention of Postoperative Atrial Fibrillation

Intervention	Indications	Dosages	Side Effects
Beta-blockers	AF prophylaxis; myocardial ischemia prophylaxis	Metoprolol 150 mg/d orally for 14 days after the patient's arrival in the intensive care unit Carvedilol 40-50 mg/d orally from 10 days before surgery	Bradycardia, hypotension, bronchospasm, heart failure exacerbation
Sotalol	AF prophylaxis	160-240 mg/day orally, starting from the morning of the first postoperative day, up to the sixth day after surgery	Bradycardia, QT-interval prolongation, fatigue, dizziness, headache, palpitations
Amiodarone	AF prophylaxis	5-15 mg/kg/d orally 1-6 days before surgery up to 6 days after surgery IV amiodarone (1 g/day for 2 days) immediately after surgery	Hypotension, bradycardia, QT-interval prolongation, GI-tract upset, constipation, pulmonary toxicity
n-3 PUFAs	AF prophylaxis	2 g/d orally for at least 5-7 days before surgery until hospital discharge	Increased risk of bleeding, eructation
Statins	Stabilization of atherosclerotic plaques, AF prophylaxis	Atorvastatin 40 mg/d orally beginning 7 days before surgery	Rhabdomyolysis, increased concentrations of liver enzymes, increased risk of diabetes
Corticosteroids	Reduction of inflammatory response	Dexamethasone 0.6-1 mg/kg IV after induction of anesthesia; 100 mg of hydrocortisone: the first dose in the evening of the operative day, then 1 dose every 8 hours during the next 3 days	Hyperglycemia, osteoporosis, peptic ulceration, hypertension, retinopathy
Magnesium	AF prophylaxis	10 mmol of magnesium sulfate IV for 3 days after surgery or 6 mmol of magnesium both preoperatively and postoperatively	Hypotension, bradycardia, nausea, vomiting, diarrhea
Colchicine	Prevention of post-pericardiotomy syndrome; AF prophylaxis	1.0 mg twice daily orally starting on postoperative day 3 for the first day, followed by a maintenance dose of 0.5 mg twice daily for 1 month	GI upset, peripheral neuropathy, neutropenia, anemia, hair loss
NSAIDs	Reduction of inflammatory response	Ketorolac 30 mg IV every 6 hours until the patient is able to take oral medications, then ibuprofen 600 mg orally 3 times a day up to 7 days	Renal failure, dyspepsia, gastric ulceration/bleeding, diarrhea

Postoperative atrial fibrillation, oxidative stress, and inflammation

Mehmet ÖZAYDIN

Özet: Postoperatif atriyal fibrilasyon kardiyak cerrahinin en sık görülen komplikasyonudur ve artmış komplikasyon riski ile ilişkilidir. Son zamanlarda yapılan araştırmalar inflamasyon ve oksidatif stresin atriyal fibrilasyon patofizyolojisinde anahtar rol alabileceğini göstermiştir. Statinler, kortikosteroidler, N-asetil sistein, vitamin C ve balık yağı gibi antiinflamatuvar ve antioksidan ajanların postoperatif atriyal fibrilasyon sıklığını üzerine etkisini araştıran çalışmalarda ümit verici bulgular elde edilmesine rağmen; kesin birşey söylemek için farklı doz rejimlerinin kullanıldığı büyük randomize kontrollü çalışmalara ihtiyaç vardır.



Anterior yağ yastığının korunması

- Aorta pulmoner pencerede parasempatik ganglionu içeren yağ yastığı tanımlanmış
- CPB için aortik kross-klemp ve aortik kanül aorta-pulmoner pencerede epikardiyal yağ yastığının diseksiyonunu içerir
- CABG cerrahisine giden ve anterior yağ yastığının korunduğu olgularda POAF düşük bulunmuş

Preservation of the anterior fat pad paradoxically decreases the incidence of postoperative atrial fibrillation in humans.

J Am Coll Cardiol 43: 994-1000, 2004



Cerrahi Ablasyon

- Paroksizmal AF kardiyak cerrahide POAF için bir risk
- Paroksizmal AF'li CABG cerrahisine giden ve epikardiyal pulmoner ven izolasyonu (PVI) yapılan ve yapılmayan hastalar 18 ay sonra değerlendirilmiş
- CABG+PVI grubunda AF yokken, CABG grubunda % 47 AF görülmüş
- AF hikayesi olmayan hastalarda AF için proflaktik intraoperatif ablasyon yapılması konusunda yeterli data yok



Tanı:

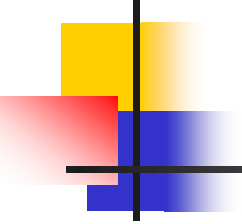
- Hipotansiyon, çarpıntı, azalmış idrar çıkışı, halsizlik
- Bazen asemptomatik
- CABG sonrası en az 48 saat EKG monitorizasyonu önerilmekte (Class 1 öneri, kanıt düzeyi B) (AHA ve ACC)
- Şüpheli durumda 12 lead EKG
- Ventriküler cevap genelde 90-180 arası



Klinik Önem

- AF insidansı izole CABG için % 30, kapak cerrahisi sonrası % 40 ve kombine prosedürlerde % 50
- Kognitif bozukluk
- Nörolojik (TIA, strok) ve iatrojenik (aritmi tedavisi) komplikasyonlar
- Uzamış hastane yatışı ve maliyet

OutcomeResearchGroup; CARE InvestigatorsoftheDukeHeart Center. The impact of post-operative atrial fibrillation on neurocognitive outcome after coronary artery by pass graft surgery. *AnesthAnalg* 94:290-295,2002
Major themes for 2013 in cardiothoracic and vascular anaesthesia and intensive care. *HeartLung Vessel* 6:79-87,2014

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- 3 kat artmış tromboemboli riski
 - Kısa dönemde ölümcül bir komplikasyon değil
 - Kalp debisi düşer ve hızlı ventrikül cevabı ile kalbin oksijen tüketimi artar
 - Özellikle sol ventrikül disfonksiyonu olan hastalarda !
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- 10 yıllık yaşam POAF % 55, non-AF grupta % 70

New-onset atrial fibrillation predicts long-term mortality after coronary artery by pass graft. J Am Coll Cardiol 55:370-376,2010



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European Heart Journal (2016) 37, 2893–2962

doi:10.1093/eurheartj/ehw210

ESC GUIDELINES

2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS

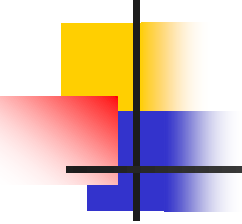
Recommendations for preventing postoperative atrial fibrillation

Recommendations	Class ^a	Level ^b
Peri-operative oral beta-blocker therapy is recommended for the prevention of post-operative AF after cardiac surgery.	I	B
Restoration of sinus rhythm by electrical cardioversion or antiarrhythmic drugs is recommended in postoperative AF with haemodynamic instability.	I	C
Long-term anticoagulation should be considered in patients with AF after cardiac surgery at risk for stroke, considering individual stroke and bleeding risk.	IIa	B
Antiarrhythmic drugs should be considered for symptomatic postoperative AF after cardiac surgery in an attempt to restore sinus rhythm.	IIa	C
Peri-operative amiodarone should be considered as prophylactic therapy to prevent AF after cardiac surgery.	IIa	A
Asymptomatic postoperative AF should initially be managed with rate control and anticoagulation.	IIa	B
Intravenous vernakalant may be considered for cardioversion of postoperative AF in patients without severe heart failure, hypotension, or severe structural heart disease (especially aortic stenosis).	IIb	B



Tedavi

- Çoğunlukla geri döndürülebilen faktörler
- Altta yatan bozukluğun düzeltilmesi
- Elektrolit bozuklukları (hipokalemi, hipomagnezemi)
- Volüm durumu
- Oksijenasyon
- Kanama
- Perfüzyon
- Enfeksiyon

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- Tedavi yaklaşımı:
 - hız kontrolü
 - ritm kontrolü
 - antikoagülan tedavi

 - Tedavi protokolünde 3 önemli soru
 - Hasta hemodinamik olarak stabil mi ?
 - POAF başlangıcından kaç saat geçti ?
 - Strok riski var mı ? (CHA2DS2-VASc skoru)

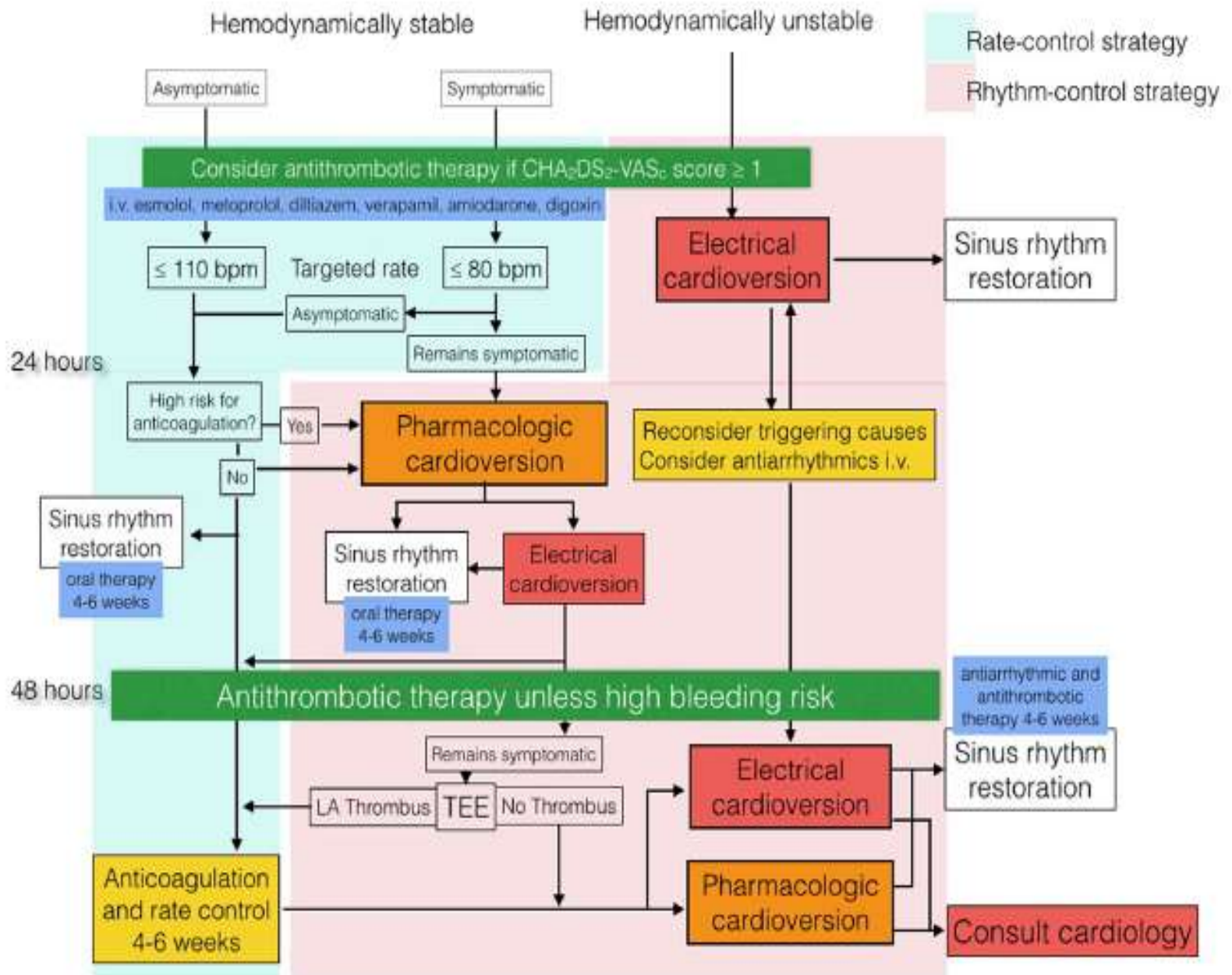



Table Drugs Used to Treat New-Onset Postoperative Atrial Fibrillation

Strategy	Drug	Dosage	Side Effects	Comment
Rate control	Esmolol	IV bolus of 500 mcg/kg over 1 min, then continuous infusion of 50-300 mcg/kg/min	Heart failure, hypotension bradycardia, bronchospasm	
	Metoprolol	IV bolus 2.5-5.0 mg over 2 min	Heart failure, hypotension, bradycardia, bronchospasm	Maximum 3 doses
	Diltiazem	0.25 mg/kg IV loading dose over 2 min, then 5-15 mg/h IV continuous infusion	Heart failure, hypotension, bradycardia, ileus	Contraindicated in patients with an accessory pathway
	Verapamil	0.075-0.15 mg/kg IV bolus over 2 min; may give an additional 10.0 mg after 30 min if no response, then 0.005 mg/kg/min infusion	Heart failure, hypotension, bradycardia	Contraindicated in patients with an accessory pathway
	Digoxin	Initial loading IV dose of 0.5-0.75 mg with additional IV boluses of 0.25 mg repeated every 2-4 h to a maximum dose of 1.5 mg over 24 h	AV block, ventricular arrhythmias, nausea, vomiting, anorexia, confusion	Contraindicated in patients with an accessory pathway and obstructive hypertrophic cardiomyopathy Accumulates in acute kidney injury and chronic renal disease
Rhythm control	Ibutilide	1 mg IV over 10 min; may repeat 1 mg once if necessary (weight <60 kg, use 0.01 mg/kg)	QT prolongation, torsades de pointes, hypotension	
	Flecainide	Conversion to sinus rhythm: 200-300 mg single oral dose Maintenance of sinus rhythm: 50-150 orally once every 12 h	Hypotension, atrial flutter with 1:1 AV conduction, ventricular proarrhythmia	Avoid in patients with CAD and structural heart disease Not available in parenteral form
	Dofetilide	CrCl (mL/min) Dose Dose (mcg twice a day) >60 500 40-60 250 20-40 125 <20 Not recommended	QT prolongation, torsades de pointes	Not ideal for patients with undesirable anticoagulant therapy because conversion to sinus rhythm may take 2-3 days; Not available in parenteral form
	Propafenone	Conversion to sinus rhythm: 450-600 mg single oral dose Maintenance of sinus rhythm: 150-300 mg orally every 8 h (immediate release) or 225-425 mg orally every 12 h (extended release)	Hypotension, atrial flutter with 1:1 AV conduction, ventricular proarrhythmia	Avoid in patients with CAD and structural heart disease Not available in parenteral form
	Amiodarone	150-300 mg IV over 1 h, followed by 10-50 mg/h IV continuous infusion over 24 h	Bradycardia, QT-interval prolongation	Contraindicated in patients with an accessory pathway
	Dronedronone	400 mg twice a day	Bradycardia, heart failure, long-standing persistent AF/flutter, prolonged QT interval, diarrhea	Contraindicated in patients with severe systolic heart failure and hemodynamic instability
	Disopyramide	Immediate release: 100-200 mg once every 6 h Extended release: 200-400 mg once every 12 h	Heart failure, prolonged QT interval, prostatism, glaucoma	Contraindicated for patients with decreased left ventricular function, but preferable for patients with hypertrophic cardiomyopathy
	Quinidine	324-648 mg every 8 h	Prolonged QT interval Diarrhea	Possible negative effect on mortality Possible negative effect on mortality
	Sotalol	40-160 mg once every 12 h	Sinus bradycardia, AV block, QT-interval prolongation, torsades de pointes, heart failure, bronchospasm	Effective for maintaining sinus rhythm



Is new-onset postoperative atrial fibrillation a benign complication?

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J Thorac Cardiovasc Surg 2017;■:1-2

new-onset AF, common after heart surgery, may have no significant impact on early and late survival if sinus rhythm is effectively and permanently restored early after the onset of the arrhythmia and before the patient's discharge from the hospital

New-onset postoperative atrial fibrillation after aortic valve replacement: Effect on long-term survival.

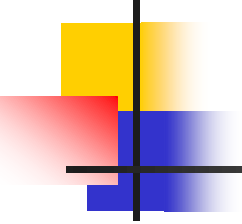
Swinkels BM¹, de Mol BA², Kelder JC³, Vermeulen FE⁴, Ten Berg JM³.

CONCLUSIONS: New-onset POAF after AVR does not affect long-term survival when treatment is aimed to restore sinus rhythm before discharge home.



Elektriksel kardiyoversiyon

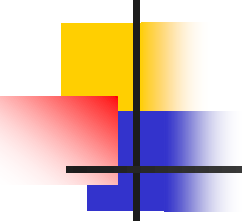
- Hemodinamik instabilite
- Hemodinamik olarak stabil hastalarda 48 saat içindeki POAF'da kanama riski olan veya antikoagülandan kaçınılan hastalarda
- POAF 48 saatten daha fazla sürede başlamışsa antikoagülan tedavi mümkün olur olmaz başlanır ve en az 4 hafta devam etmeli

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- Kardiyoversiyonda tromboemboli riski artar !
 - **Mekanizma:**
 - Oluşan trombüsün mekanik kuvvetini kazanan atriyum kontraksiyonu ile atılması
 - Kardiyoversiyon sonrası atriyal stunning ile yeni trombüs oluşumu



Farmakolojik kardiyoversiyon

- Flekainid, dofetilid, propafenon ve ibutilid kontrendikasyon yoksa ilk sıklıkla
- İbutilid QT uzaması, hipokalemi ve düşük EF de kontrendike
- Flekeinid ve propafenon miyokard infarktüsü geçirmiş ve sol ventrikül disfonksiyonu olan hastada kaçınılmalı

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- Amiodaron hem farmakolojik kardiyoversiyonda hem de sinüs ritminin sürdürülmesinde
 - Sinüs ritminin sürdürülmesinde toksisite (pulmoner, karaciğer, tiroid, cilt) nedeniyle ilk seçenek değil
 - Sol ventrikül difonksiyonunda ilk seçenek
 - Dronedaron amiodaron analogu, daha az yan etki ve daha az etkinliğe sahip



Cerrahi Yaklaşım

- Kateter ablasyon ve AV nodal ablasyon yeni başlangıçlı POAF için tedavide yer almaz
- POAF persistan AF formuna döndüğünde düşünülebilir



Tromboflaksi

- 48 saatten uzun süreli AF'da antitrombotik tedavi uygulanır
- Strok riski olan (CHA2DS2-VASc skoru ≥ 1) hastalarda ilk 48 saat içinde düşünölmeli
- AF süresi 48 saatten kısa ise elektriksel kardiyoversiyon antikoagölan olmadan yapılabilir

CHADS ₂		CHA ₂ DS ₂ -VASc	
Risk factors	Points	Risk factors	Points
<u>C</u> HF	1	<u>C</u> HF/LVEF ≤ 40%	1
<u>H</u> TN	1	<u>H</u> TN	1
<u>A</u> ge ≥ 75	1	<u>A</u> ge ≥ 75	2
<u>D</u> M	1	<u>D</u> M	1
<u>S</u> troke/TIA/embolism	2	<u>S</u> troke/TIA/embolism	2
	Max 6	<u>V</u> ascular disease (prior MI, PAD, or aortic plaque)	1
		<u>A</u> ge 65-74 years	1
		<u>S</u> ex category (Female)	1
			Max 9

CHADS₂ → CHA₂DS₂VASc

CHADS ₂ score	Patients (n = 1733)	Adjusted stroke rate %/ year
0	120	1.9
1	463	2.8
2	523	4.0
3	337	5.9
4	220	8.5
5	65	12.5
6	5	18.2

CHA ₂ DS ₂ -VASc score	Patients (n = 7329)	Adjusted stroke rate %/ year
0	1	0
1	422	1.3
2	1230	2.2
3	1730	3.2
4	1718	4.0
5	1159	6.7
6	679	9.8
7	294	9.6
8	82	6.7
9	14	15.2

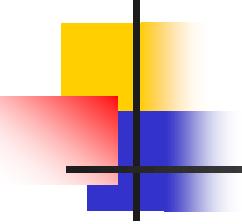
Table HAS-BLED Scoring System for Prediction of Major Bleeding Risk in Patients Treated With Anticoagulation for Atrial Fibrillation.⁶

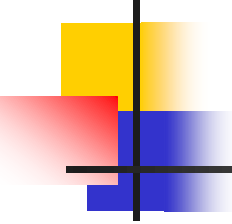
Risk Factor	Score	HAS-BLED Score	Bleeding Rate (%/year)
Hypertension	1	0	1.13
Abnormal renal/hepatic function	1 (each)	1	1.02
Stroke	1	2	1.88
Bleeding	1	3	3.74
Labile INRs	1	4	8.70
Elderly (≥ 65 years)	1	≥ 5	Insufficient data
Drugs or alcohol use	1 (each)		

HEMORR₂HAGES

Letter	Clinical Characteristic	Points
H	Hepatic or Renal Disease	1
E	Ethanol Abuse	1
M	Malignancy	1
O	Older Age	1
R	Reduced Platelet Count or Function	1
R	Rebleeding Risk	2
H	Hypertension	1
A	Anemia	1
G	Genetic Factors	1
E	Excessive Fall Risk	1
S	Stroke	1
Maximum Score		12

HEMORR ₂ HAGES	Sangrado c/ 100 pacientes (95% IC)
0	1,9 (0,6-4,4)
1	2,5 (1,3-4,3)
2	5,3 (3,4-8,1)
3	8,4 (4,9-13,6)
4	10,4 (5,1-18,9)
≥ 5	12,3 (5,8-23,1)

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- 48 saatten uzun süren ve acil kardiyoversiyon yapılacak olgularda en az 4 hafta tromboflaksi yapılmamışsa TEE ile sol atriyal trombüs araştırılmalı
 - Sol atriyal trombüs saptanan olgularda en az 4 hafta antikoagölan uygulanmadan kardiyoversiyon yapılmamalı

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- Vit K İnhibitörleri (warfarin), unfraksiyone ve LMWH, antiplatelet ilaçlar (aspirin ve klopidogrel) ve yeni oral antikoagölan ilaçlar (dabigatran, apixaban ve rivaroxaban) antitrombotik tedavide kullanılabilir
 - Aspirin ve klopidogrel strok önlenmesinde warfarinden daha az efektif ve intrakraniyal kanama için daha az risklidir

- Yeni antikoagülanlarda daha düşük intrakranial kanama, INR monitorizasyonununun gerekmemesi
- Prostatik kapak hastalığında, ciddi mitral stenozda ve son dönem böbrek yetmezliğinde kontrendike
- Perkütan yerleştirilen Watchman device (Left Atrial Appendage Closure device) warfarinin kontrendike olduğu hastalarda kullanılabilir
(Class 2b Kanıt düzeyi B)

