

Research Highlights

Highlights from the latest articles in interventional cardiology



Left atrium size and duration of atrial fibrillation predict the success rate of ablation

Evaluation of: Geidel S, Krause K, Boczor S *et al.*: Ablation surgery in patients with persistent atrial fibrillation: an 8-year clinical experience. *J. Thorac. Cardiovasc. Surg.* DOI: 10.1016/j.jtcvs.2010.03.024 (2010) (Epub ahead of print).

Atrial fibrillation is the most common cardiac arrhythmia. Between 2001 and 2009, Geidel *et al.* investigated 325 consecutive patients with persistent atrial fibrillation (pAF) undergoing radiofrequency ablation concomitant to open surgery to identify risk factors for pAF recurrence.

Survival at the time of re-examination at discharge, 3 months and 3 years

were 97.8, 96.2 and 94.4%, respectively. Stable sinus rhythm could be documented in 72.1, 73.9 and 75.6% of surviving patients, respectively. Long-term pAF before surgery (>5 years) and a very large left atrium (>55 mm) were independent predictors for recurrent AF. Age, gender, preoperative left ventricular ejection fraction or concomitant disease (diabetes, arterial hypertension and renal insufficiency) had no significant influence on recurrence.

These surgical data are also of great interest for interventional ablation therapy: short duration of pAF and a small left atrium size are the best factors for establishing a stable sinus rhythm after ablation therapy.

Navid Sotoudeh¹ & Nicolaus Reifart¹

¹Department of Cardiology, Main Taunus Kliniken, Kronbergerstr. 36, 65812 Bad Soden, Germany

^{*}Author for correspondence:

Tel.: +49 619 665 7500

Fax: +49 619 665 7502

nsotoudeh@kliniken-mtk.de

Financial & competing interests disclosure

The authors have no relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript.

This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.

No writing assistance was utilized in the production of this manuscript.

Time of day of nonurgent percutaneous coronary intervention impacts outcome

Evaluation of: Cantor WJ, Strauss BH, Graham MMG *et al.*: Time of day and outcomes of nonurgent percutaneous coronary intervention performed during working hours. *Am. Heart. J.* 159(6), 1133–1138 (2010).

There is evidence that primary percutaneous coronary intervention (PCI) for ST-elevation myocardial infarction is associated with higher procedural failure and mortality during off-hours compared with daytime working hours [1]. The question is whether there is also a difference in results during working hours.

Cantor *et al.* used The Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH) database, a large registry that captures detailed clinical information of all patients undergoing PCI in Alberta, Canada, to evaluate outcomes in relation to timing of a nonurgent PCI procedure. Between 1999 and 2004, a total of 2492 consecutive patients were analyzed. Patients undergoing PCI for acute coronary syndromes, and procedures performed on weekends or after regular working hours (6 p.m.–7 a.m.) were excluded. Patients were separated into two groups based on whether PCI was started in the

future
medicine part of fsg



morning (7 a.m.–12 p.m.; n = 1446) or afternoon (12:01 p.m.–6 p.m.; n = 1037).

Patients undergoing PCI in the afternoon were more likely to receive an inpatient procedure, have congestive heart failure, reduced ejection fraction and Canadian Cardiovascular Society (CCS) class IV or atypical anginal symptoms. They were less likely to have received intravenous glycoprotein IIb/IIIa inhibitors compared with PCI performed in the morning. There were no significant differences in the incidence of procedural complications such as failure to deploy a stent, coronary perforation, transient 'slow-reflow' or 'no-reflow', or new thrombus formation. However, patients undergoing PCI in the afternoon had significantly higher unadjusted rates

of the composite of death, target vessel revascularization at 7 days and 30 days, and death at 1 year. After excluding inpatients from the analysis, the target vessel PCI rates at 30 days remained higher for afternoon procedures but the difference in death at 1 year no longer reached statistical significance. Case selection (patients not suitable for outpatient procedure) and operator fatigue might be a reason for these less favorable results.

Reference

- 1 Henriques JP, Haasdijk AP, Zijlstra F: Outcome of primary angioplasty for acute myocardial infarction during routine duty hours versus during off-hours. *J. Am. Coll. Cardiol.* 41, 2138–2142 (2003).

Percutaneous coronary intervention for left main stenosis as effective as coronary artery bypass graft in long-term outcome

Evaluation of: Kim YH, Park DW, Kim WJ *et al.*: Impact of the extent of coronary artery disease on outcomes after revascularization for unprotected left main coronary artery stenosis. *J. Am. Coll. Cardiol.* 55, 2544–2552 (2010).

Recent trials and registries indicate that percutaneous coronary intervention (PCI) might be a safe alternative to coronary artery bypass graft (CABG) surgery in selected patients with unprotected left main coronary artery stenosis [1–7].

The Revascularization for Unprotected Left Main Coronary Artery Stenosis: Comparison of Percutaneous Coronary Angioplasty Versus Surgical Revascularization (MAIN-COMPARE) registry evaluated 2240 patients with unprotected left main coronary artery stenosis, stratified by number of diseased vessels, who underwent either stenting (318 with bare-metal

stents and 784 with drug-eluting stents) or CABG (1138) between 2000 and 2006.

After adjustment for baseline covariates, PCI and CABG had similar risks of death and composite outcome of death, Q-wave myocardial infarction or stroke in all subgroups, regardless of the number of diseased vessels over 4 years. Death/Q-wave myocardial infarction of the stent group versus CABG group were 4.4/0.4 versus 5.6/1.5 for isolated left main coronary artery (LM), 8.6/0.4 versus 5.9/0.8 for LM with one vessel, 5.7/0.7 versus 7.8/0.4 LM with two vessels and 10.6/1.6 versus 13.3/1.5 for LM with three vessels. However, stenting resulted in significantly more target vessel revascularization.

In conclusion this registry shows that the long-term outcomes of PCI appear as safe as CABG in the treatment of left main stenosis, but similar to the Syntax trial, it appears obvious that CABG is the superior therapy in patients with more complex morphology.



References

- Chieffo A, Morici N, Maisano F *et al.*: Percutaneous treatment with drug-eluting stent implantation versus bypass surgery for unprotected left main stenosis: a single-center experience. *Circulation* 113, 2542–2547 (2006).
- Palmerini T, Marzocchi A, Marrozzini C *et al.*: Comparison between coronary angioplasty and coronary artery bypass surgery for the treatment of unprotected left main coronary artery stenosis (the Bologna Registry). *Am. J. Cardiol.* 98, 54–59 (2006).
- Lee MS, Kapoor N, Jamal F *et al.*: Comparison of coronary artery bypass surgery with percutaneous coronary intervention with drug-eluting stents for unprotected left main coronary artery disease. *J. Am. Coll. Cardiol.* 47, 864–870 (2006).
- Buszman PE, Kiesz SR, Bochenek A *et al.*: Acute and late outcomes of unprotected left main stenting in comparison with surgical revascularization. *J. Am. Coll. Cardiol.* 51, 538–545 (2008).
- Seung KB, Park DW, Kim YH *et al.*: Stents versus coronary-artery bypass grafting for left main coronary artery disease. *N. Engl. J. Med.* 358, 1781–1792 (2008).
- Kim YH, Park DW, Lee SW *et al.*; on behalf of Revascularization for Unprotected Left Main Coronary Artery Stenosis: Comparison of Percutaneous Coronary Angioplasty Versus Surgical Revascularization Investigators: Long-term safety and effectiveness of unprotected left main coronary stenting with drug-eluting stents compared with bare-metal stents. *Circulation* 120, 400–407 (2009).
- Park SJ, Kim YH, Park DW *et al.*; on behalf of MAIN-COMPARE Investigators: Impact of intravascular ultrasound guidance on longterm mortality in stenting for unprotected left main coronary artery stenosis. *Circ. Cardiovasc. Interv.* 2, 167–177 (2009).

Time to reperfusion has a critical impact on the clinical outcome in acute MI

Evaluation of: Lambert K, Brown K, Segal E *et al.*: Association between timeliness of reperfusion therapy and clinical outcomes in ST-elevation myocardial infarction. *JAMA* 303(21), 2148–2155 (2010).

International guidelines emphasize the great importance of rapid reperfusion of patients with acute ST-elevation myocardial infarction (STEMI) on outcome [1,2]. Timely guideline-based reperfusion specify a maximum delay of 30 min for fibrinolysis and 90 min for primary percutaneous coronary intervention (PCI).

In their systematic evaluation of STEMI, Lambert *et al.* investigated 80 hospitals treating more than 95% of the patients in Quebec, Canada, between 2006 and 2007. During the study period, 6734 patients presented to the emergency department with final diagnosis of acute myocardial infarction (AMI), of whom 2361 (35%) had STEMI. A total of 1832 patients with STEMI received reperfusion therapy. Of these patients, 1440 (78.6%)

received primary PCI. In 68% of these patients the intervention was untimely (>90 min after emergency department arrival). A total of 392 (21.4%) of the patients received fibrinolysis, which was untimely (>30 min) in 54%.

At 1 year, 13.5% of fibrinolysis patients and 13.6% of primary PCI patients had died or were readmitted for AMI or heart failure. Combining the two treatment groups, the investigators found that patients treated in an untimely fashion had a greater than twofold adjusted risk of death at 30 days (6.6 vs 3.3%; odds ratio: 2.14) and a 57% adjusted higher risk for combined outcome (death, AMI or heart failure; 15.0% vs 9.2; odds ratio: 1.57). Adjusted analysis indicates that for each 10% increase in patients treated in a timely fashion, there was an associated 20% decrease in overall 30-day mortality.

The data from this study suggest that the time to reperfusion rather than treatment strategy may be more important in terms of outcomes and that in regions

where PCI is not readily available fibrinolysis (<30 min) is an acceptable standard of STEMI care.

References

- Van de Werf F, Bax J, Betriu A *et al.*; ESC Committee for Practice Guidelines: Management of acute myocardial infarction in patients presenting with persistent ST-segment elevation: the Task Force on the Management of ST-Segment Elevation Acute Myocardial Infarction of the European Society of Cardiology. *Eur. Heart J.* 29(23), 2909–2945 (2008).
- Kushner FG, Hand M, Smith SC Jr *et al.*; American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. 2009 Focused updates: ACC/AHA guidelines for the management of patients with ST-elevation myocardial infarction (updating the 2004 guideline and 2007 focused update) and ACC/AHA/SCAI guidelines on percutaneous coronary intervention (updating the 2005 guideline and 2007 focused update): a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 120(22), 2271–2306 (2009).