Oklahoma Heart Institute

Coronary Angioplasty/Stenting

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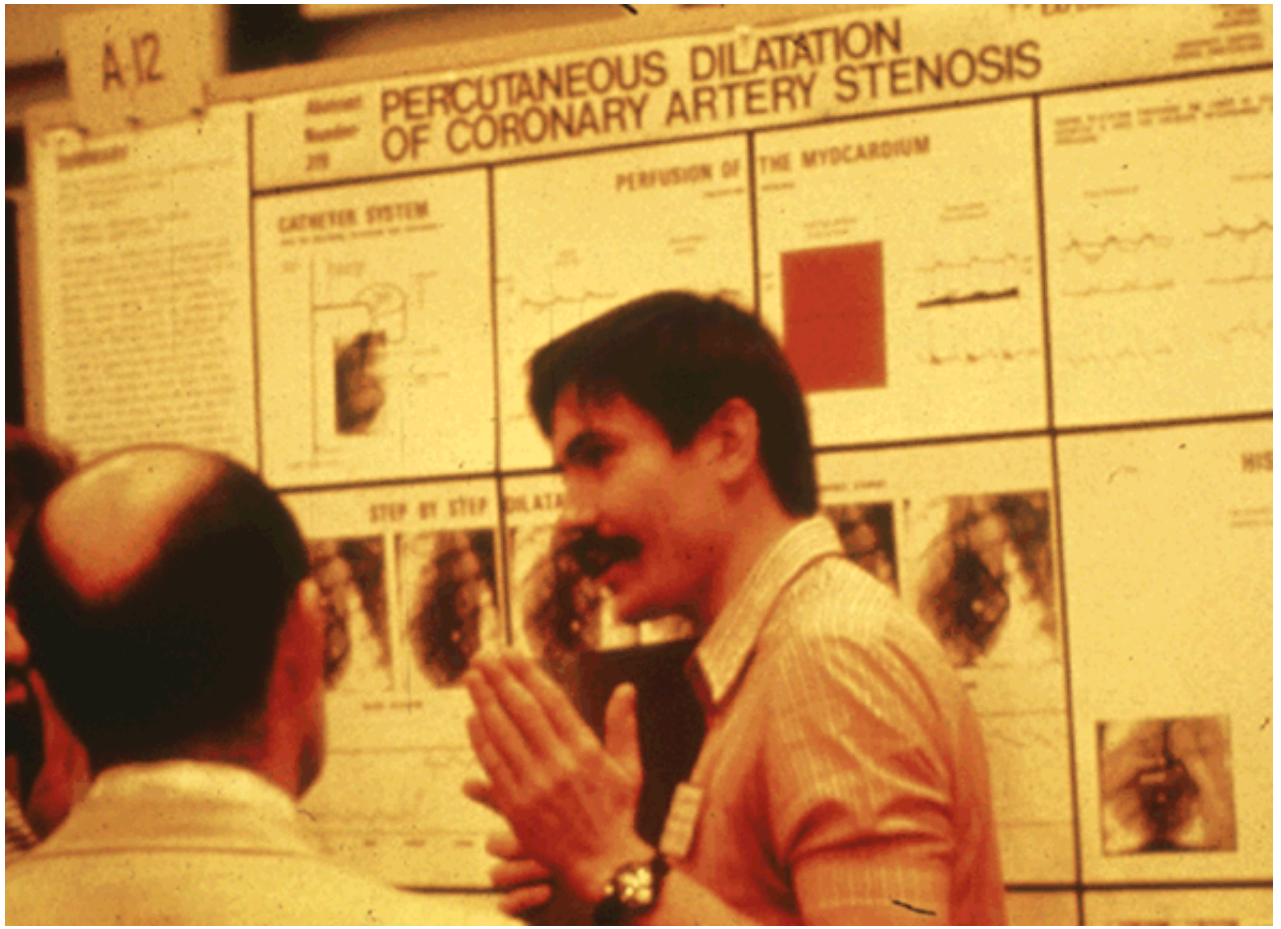
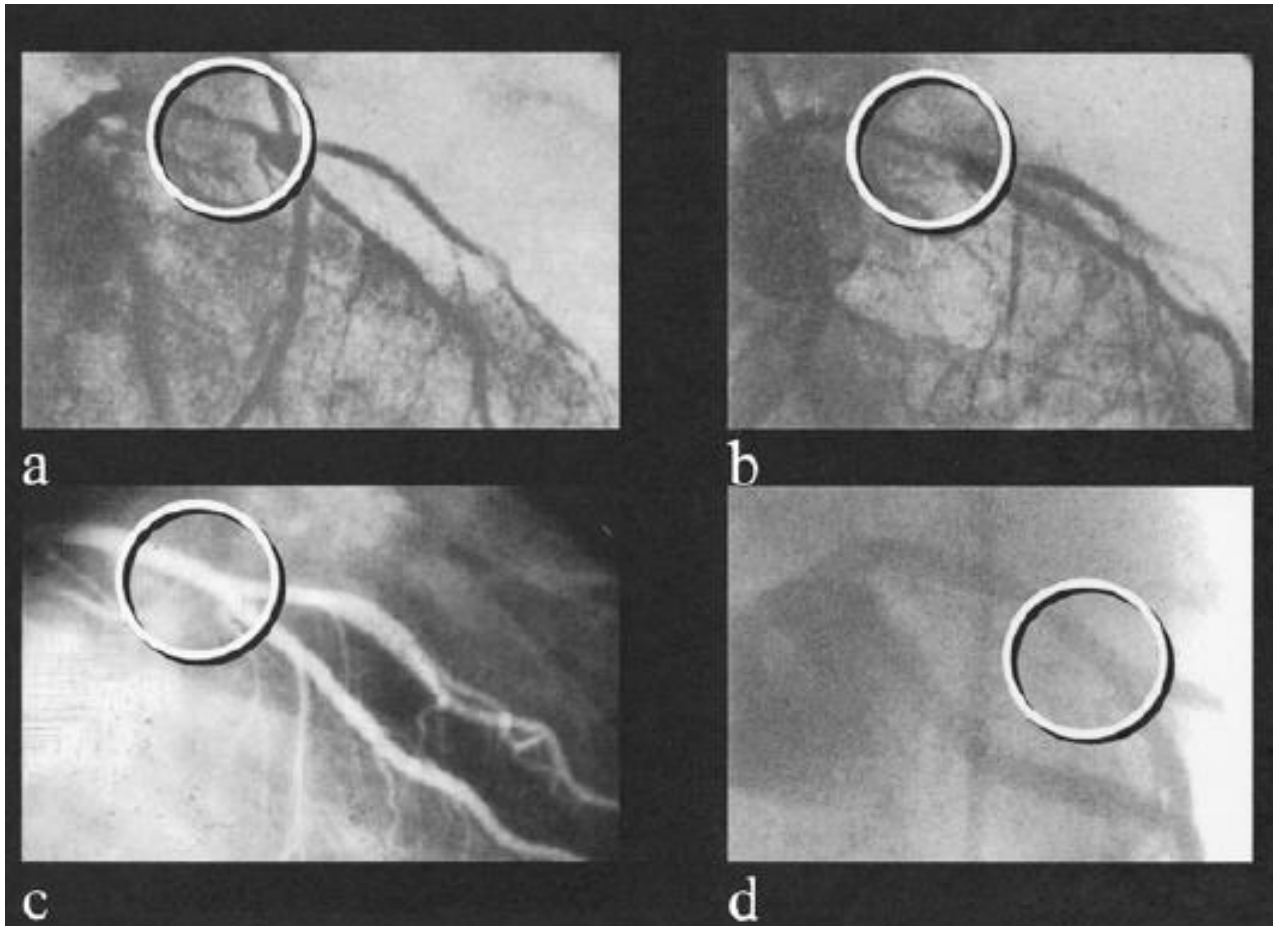
Percutaneous Coronary Intervention

- Understand the indications for PCI
  - Medical management vs stenting
- Understand the procedure
  - Consent and the patients perspective
  - Complex vs straight forward
- Understand management post procedure
  - Same day discharge
  - Medications and follow up



1976 AHA annual meeting

Dr. Andreas Gruentzig presenting a poster presentation demonstrating a new technique of coronary angioplasty in pig hearts



Angiograms of the first human coronary angioplasty

Performed by Dr. Andreas Gruentzig in 1977. (a-pre, b-post, c-1 year follow up, d-10 year follow up)

Acute Coronary Syndrome

STEMI

NSTEMI

Unstable angina

- An acute, evolving or recent MI is present when there is a typical rise and fall of bio markers and at least one of the following.
  - Ischemic symptoms
  - Q waves
  - ST elevation, depression, or new LBBB
  - Intracoronary thrombus on angio or autopsy
  - Loss of viable myocardium or new WMA (on MPS/echo).

Stable NSTEMI

- TIMI risk score
  - Age >/= 65
  - CAD risk factors
  - ASA use in the last 7days
  - Severe angina (>/= 2 episodes in 24hours
  - ST change >/=0.5mm
  - Positive cardiac marker

- Patients with a score of 0 or 1 point are at lower risk of adverse outcome (death, MI, urgent revascularization) compared to patients with a higher risk score. However, the risk is not zero.
- Patients with a higher risk score may require more aggressive medical or procedural intervention.
- www.mdcalc.com

To cath or not to cath

- Immediate angiography
  - ACS (unstable patients).
- Invasive strategy
  - Stable patients with increased risk score
- Conservative strategy
  - Medical management

Conservative

This doesn't mean do nothing

- Rapidly intensifying medical therapy, several days to "cool off"
- Many of these patients still benefit from risk stratification with noninvasive testing.
- Cath may still be indicated.

Continued Angina

- Symptoms despite normal/stable testing
  - CCTA with FFR
  - IVUS and intravascular FFR
  - Recanalization of CTO
- Chronic chest pain
  - Antianginal therapy
  - Recanalization of CTO
  - Pain management
  - Non-cardiac causes

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Off to the LAB

- But first
  - INFORMED Consent

The Procedure

What the patient wants to know

- Why was my groin shaved, but they went in my wrist?
- Wish someone had told me about wrist (groin) tenderness
- More detailed regarding the initial first steps (from getting undressed to rolling down the hall)
- Why did they go in my Right groin if the instructions were for a Left heart cath?

Complications

- Major Complications are general well below 1%
  - Death, MI, or major embolization

- Non-major Complications
  - Hematoma and femoral/radial never compression
  - Retroperitoneal bleed
  - AV fistula and Pseudoaneurysm
  - Arterial/Venous Thrombosis

Not all interventions are created equal

"Straight Forward" PCI

- Single vessel disease
- Staged procedures

Complex

- Impella assist
- Intra aortic balloon pump
- Multi-vessel or LMCA
- Treatment of CTOs

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Going Home

- Same day discharge (Shroff, et al. JAMA May 2016)
  - Complications occurring beyond 6 hours of PCI is extremely low.
  - No clinically significant difference between comorbidities, procedure type, access site, closure device used.
  - Radial vs. Femoral sites also had no influence.

Be selective for SDD

- Is the patient suitable for SDD
- Procedural outcome
- Rapid and reliable stabilization of access site
- Is the patient able to reliable get DAPT
- Post procedural education and follow up

Post Procedure

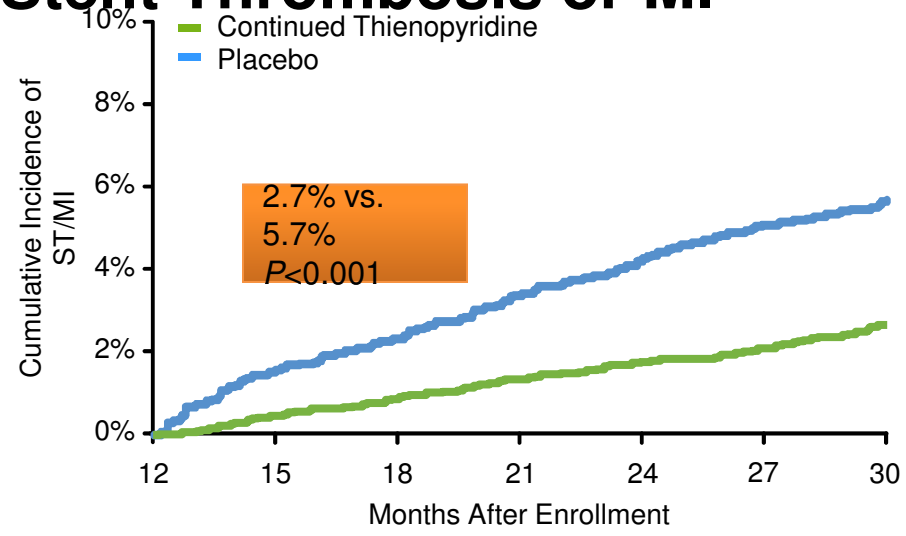
- DAPT
  - How much and how long.
  - Triple therapy

- Know what type of stent was used
  - BMS vs DES (1st or 2nd generation)

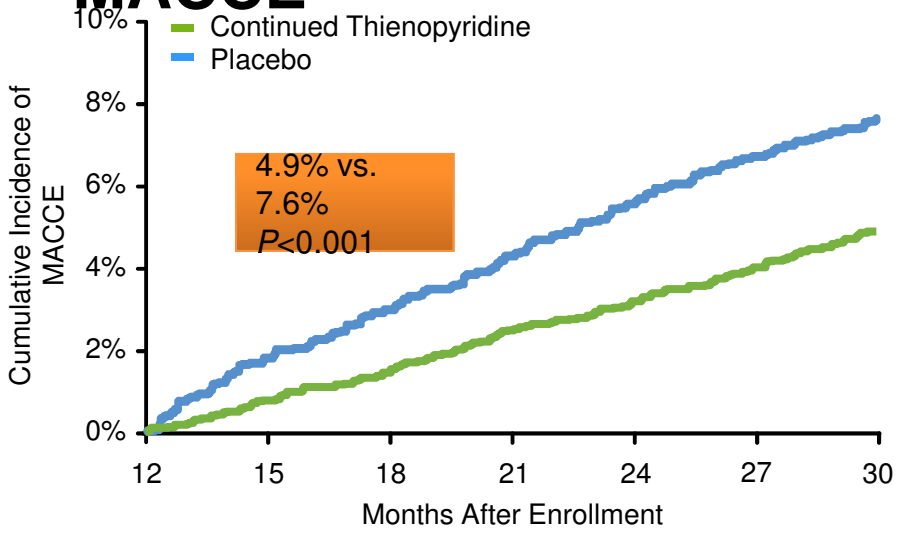
Long Term DAPT

- The DAPT trial
- Following DES treatment, continuation of Antiplt (Clopidogrel) + aspirin beyond 1 year reduces the risk of stent thrombosis and MACCE compared with aspirin alone.

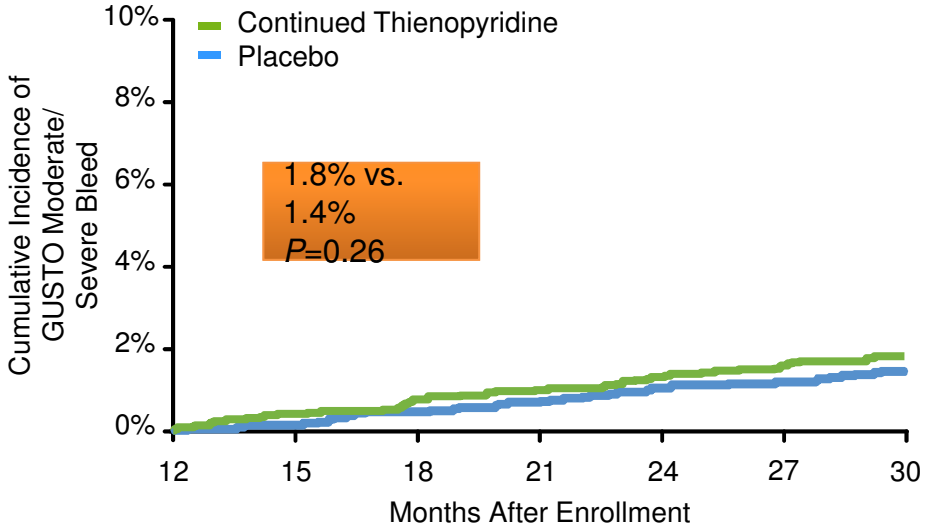
Stent Thrombosis or MI



MACCE



GUSTO Moderate/ Severe Bleeding



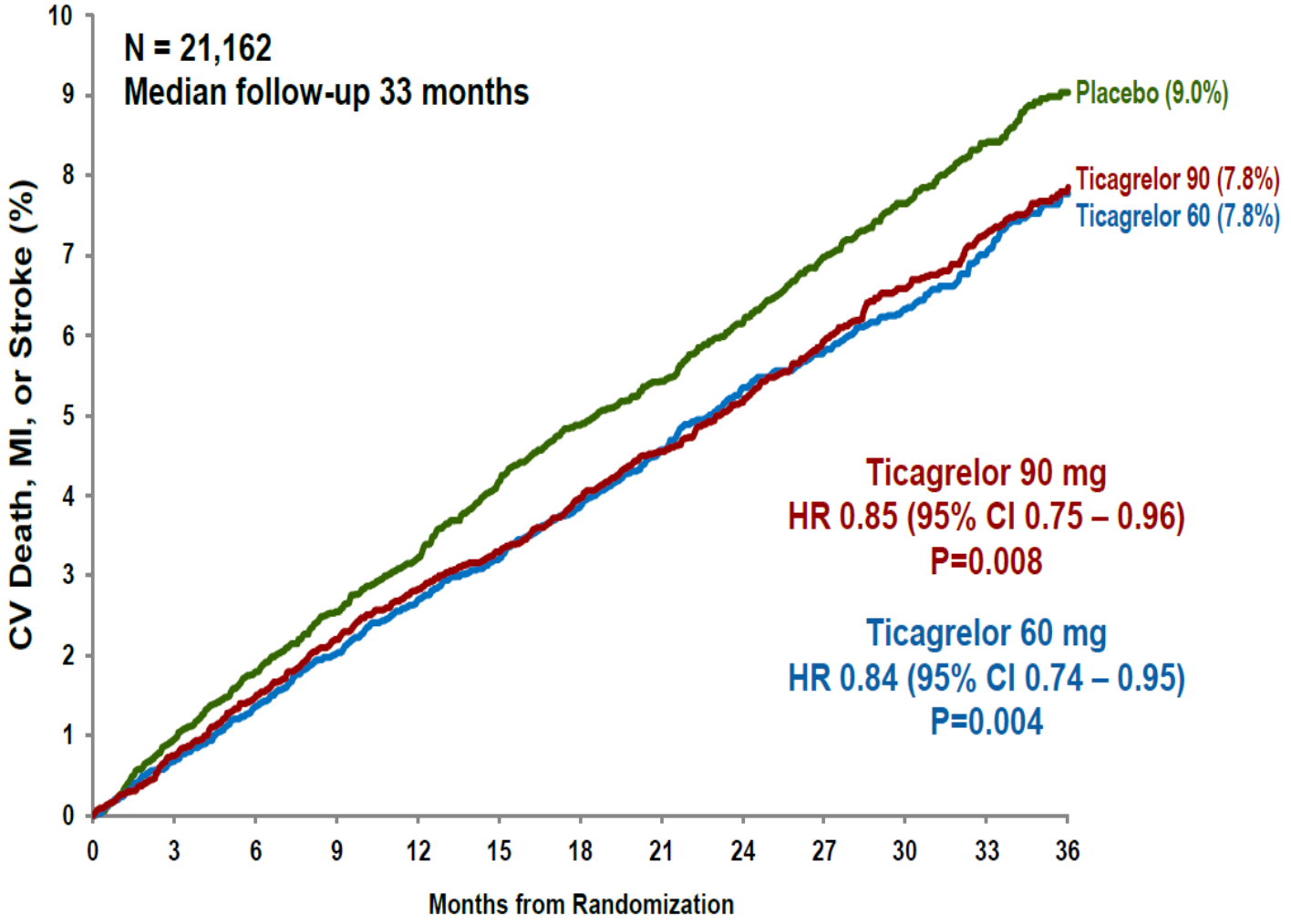
Pegasus TIMI54

- The potential benefit of dual antiplatelet therapy beyond 1 year after a myocardial infarction has not been established. We investigated the efficacy and safety of ticagrelor, a $P2Y_{12}$ receptor antagonist with established efficacy after an acute coronary syndrome, in this context.

Conclusions

- **Even in the contemporary era, patients with prior MI with diabetes mellitus have an elevated risk of ischemic events compared with non-diabetic patients**
- **Long-term ticagrelor reduces the composite of cardiovascular death, MI, or stroke in diabetic patients, with a greater absolute risk reduction than in non-diabetic patients**
- **There is an increase in TIMI major bleeding, but not fatal bleeding or intracranial hemorrhage**
- **Within the diabetic subgroup, there was a reduction in cardiovascular and coronary heart disease deaths with ticagrelor versus placebo**

PEGASUS TIMI- 54 Overall Results



Bonaca MP, Bhatt DL, Cohen M, et al. Sabatine MS. NEJM. 2015.

Meta analysis - American Journal of Medicine Nov 2017.

- 12-month DAPT significantly reduced major bleeding at the expense of increased risk for myocardial infarction compared with extended DAPT.
- There was no significant difference in cardiovascular or all-cause mortality between 12-month and extended DAPT.
- Furthermore, short-term DAPT may be reasonable for some patients, whereas extended DAPT may be appropriate in select others. An individualized approach is needed, taking into account the competing risks of bleeding and ischemic events.

So I've got a stent. Now what?

- Educating the patient
  - Medications
  - Diet
  - Recurrent symptoms
  - Follow up expectations

Intracoronary Stent Restenosis

- Defined as reduction of lumen diameter after PCI due to arterial damage/neointimal tissue proliferation.
- Usually occurs between 3-12 months
- BMS has a higher incidence – 7-8% at 6 months and 12-14% at 1 year.
- DES (both 1st and 2nd generation) reduce ISR by 75% compared to BMS

Case Study

Case Study

- 77yo Male normal state of health until the AM 8/31/18. Patient reports chest discomfort and lightheadedness. Patient states he thought he would pass so he sat in his recliner but it got more intense. He took a 2 NTG after 10 mins the pain continued so he took a 3rd. The pain abated but then felt like it moved into the center of his chest and he got very nauseated, his wife stated that he turned pale and clammy. They called 911, he was told to chew 4 aspirin after which his pain subsided further. He was taken to HHC and by the time he arrive his pain had gone from a 6 down to a 0. He has been chest pain free ever since.
- EKG has revealed sinus rhythm with RBBB. His troponin initially was 0.38 and has climbed to 8.692.

Thank You!