11° Riunione Gruppo Studio Piastrine

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RIVASCOLARIZZAZIONE CORONARICA versus CAROTIDEA: VI SONO DIFFERENZE NEL PROFILO DI ATTIVAZIONE PIASTRINICA?

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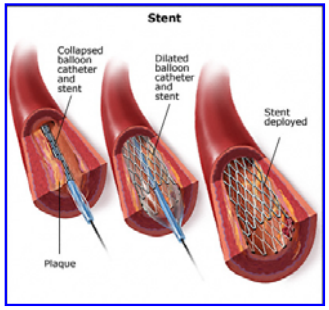
Coronary artery stent



Coronary stenting

has become a mainstay of interventional cardiology.

Stent evolution

Drug Eluting Stent
No Polymer
< 2% Restenosis,
No late stent thrombosis
No Plavix

Drug Eluting Stent
Durable Polymer:
<5% Restenosis
Late thrombosis
Plavix +Aspirin for life

Bare Metal Stent
30% Restenosis

Future

Present

Past

DES – Stent Thrombosis

The rate of stent thrombosis are increased with both PES and SES compared with their bare metal counterpart, a difference that emerges <1 year after stent implantation.

Stone GW N Engl J Med 2007

Late stent thrombosis, defined as any platelet rich thrombus occupaying >25% of lumen >30 days after DES implantation.

Finn AV et al, ATVB 2007

PCI and platelet activation

Acquired platelet activation following stent implantation is well documented* and may affect both short- and long-term outcomes in patients treated with stents.

Gawaz M et al, Circulation 1996
Mak KH et al, JACC 1996
Eeckhout E et al, JACC 1996
Bau J et al, Tranfusion Medicine and Hemotherapy 2001
Gurbel PA et al, J Inv Cardiol 2002
Gurbel PA et al, Am J Cardiol 2002
Gurbel PA et al, Am Heart J 2003
Gurbel PA et al, JACC 2005
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Bliden KP et al, JACC 2007
Price MJ et al, Am J Cardiol 2009
Sibbing D et al, JACC 2009
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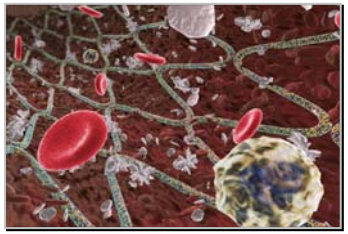


*By means of platelet aggregation measurement as well as by surface receptor expression in circulating blood

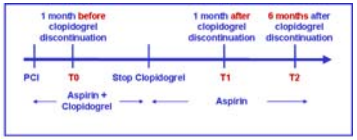
Stent Thrombosis

- Prevention is currently based upon the combination of **aspirin** (75-325 mg/day) plus **clopidogrel** (600 mg loading dose followed by 75 mg/day).

DES, platelet activation and drug treatement

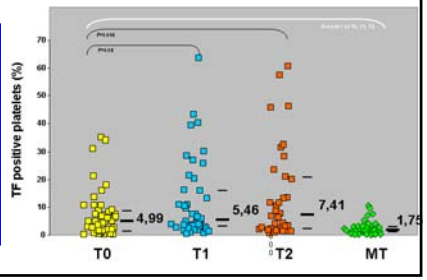
➢ No data are available on platelet behaviour after stopping thienopyridine treatment.

Platelet TF in DES treated patients – *10° GSP*



•During dual antiplatelet therapy TF-positive platelets are significantly higher than in medically treated medically treated (MT) patients.

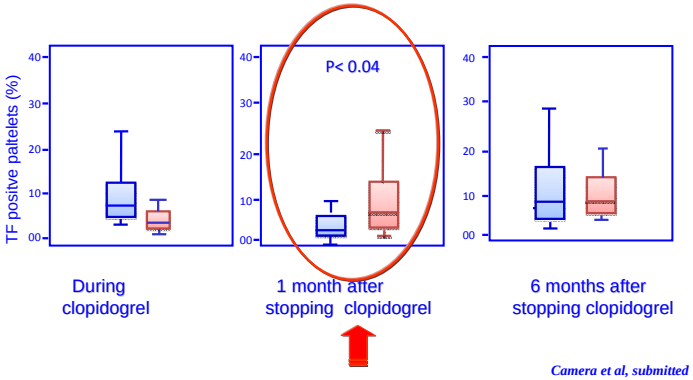
•TF-positive platelets further increase at T1 and T2 (ASA only) remaining significantly higher than those of MT patients.



Follow up of DES–treated patients

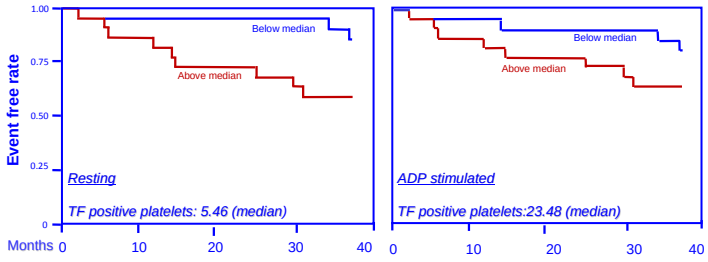
Of the 48 patients enrolled, 16 (33%) underwent a *de novo* PCI on another coronary lesion over a 3 year period of time.

Patients who underwent a new PCI within three years (■) had TF levels in ***resting platelets*** significantly higher than patients who were event-free (□)



Camera et al, submitted

Patients' stratification according to the TF positive platelet value 30 days after clopidogrel withdrawal



Patients with the TF positive platelet value at one month after clopidogrel withdrawal above the median had higher risk to undergo a new PCI within three years (RR=1.5 for 10 points % increase).

Camera et al, submitted

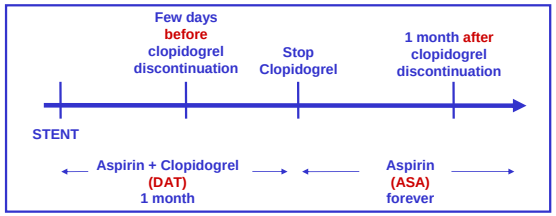
Carotid artery stenting

- Carotid Artery Stenting (CAS) is an evolving method to treat carotid stenosis.
- Platelet activation in CAS occurs as a result of vessel wall damage and subendothelium exposure.
- The dual antiplatelet regimen has a significant impact on reducing adverse neurological outcomes.

No data on platelet activation during dual antiantiplatelet therapy and after thienopyridine discontinuation have been examined in CAS.

Study Aim & Design

To compare platelet activation in patients who underwent **carotid** revascularization (n=38) versus stable angina patients who underwent **coronary** revascularization (n=16) with bare metal stent (BMS) implantation.



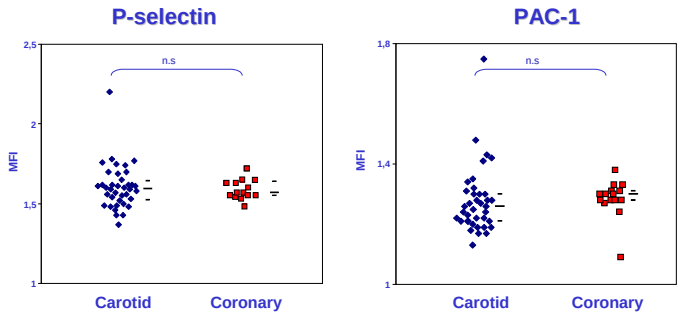
Methods

➢**Platelet activation markers:**

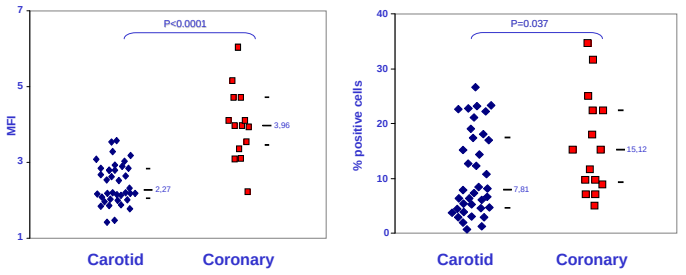
- •GPIIb/IIIa activated complex (PAC1)
- •P-Selectin (CD62P)
- •Tissue Factor (TF)
- •Percentage of total monocyte-platelet aggregates
- •Percentage of TF-positive monocyte-platelet aggregates

were assessed by whole blood flow cytometry in resting conditions and after *in vitro* ADP stimulation (10 µM, 15 min).

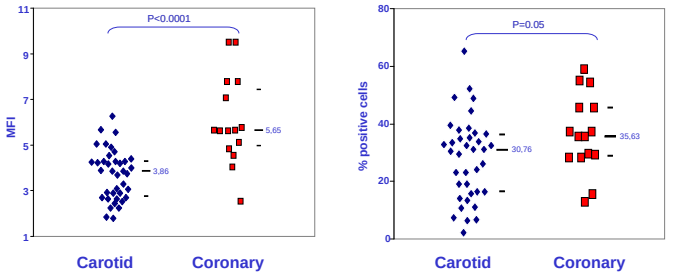
Platelet activation markers during DAT – ***Resting conditions***



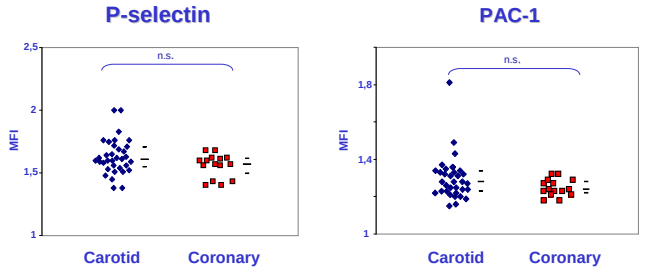
Platelet **Tissue Factor** expression during DAT – ***Resting conditions***



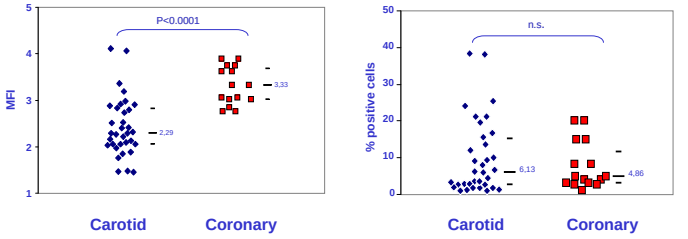
Platelet **Tissue Factor** expression during DAT – ***ADP-stimulated***



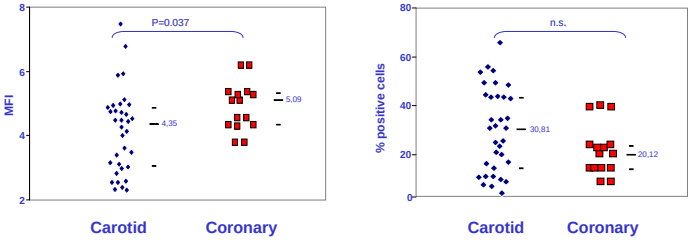
Platelet activation markers during ASA – ***Resting conditions***



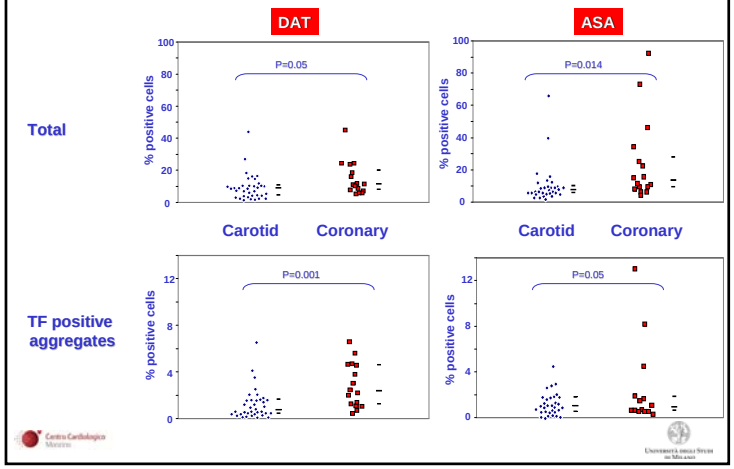
Platelet **Tissue Factor** expression during ASA – ***Resting conditions***



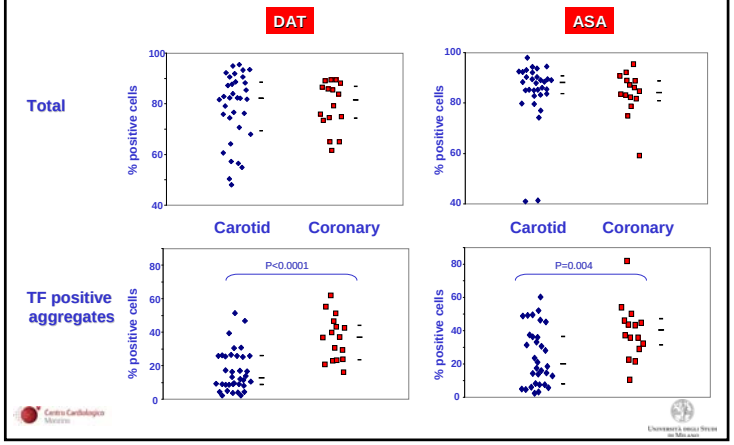
Platelet **Tissue Factor** expression during ASA – ***ADP-stimulated***



Monocyte-platelet aggregates – *Resting conditions*



Monocyte-platelet aggregates – *ADP-stimulated*



Conclusions

- **Significant higher levels of TF-positive platelets and TF-positive MPA were observed in peripheral blood of coronary patients who underwent revascularization with BMS implantation compared to patients with carotid artery stenting, both 1 month after stenting and 1 months after thienopyridine discontinuation.**
- **This prothrombotic platelet phenotype may have implications for thrombotic complication in coronary patients.**