

“Transcranial Doppler Monitoring During Carotid Artery Stenting: Comparison between Flow Reversal and Filter for Cerebral Protection”

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Ex-vivo analysis of mean # of fragments released with each manipulation.

- Guide wire passage = 24
- Pre-dilatation = 97
- Stenting = 68
- Post-angioplasty = 172.

Rapp JH *et al.* J Vasc Surg 2000;32:68-76

DW-MRI “silent infarcts”

- 21% at 24 hours
- 17.3% at 24 hours

Elke AM, *et al.* AJNR 26:2336-2341

Pinero P, *et al.* AJNR 27:1338-45

Cerebral emboli: cause for Alzheimer's ? (TCD study)

- Alzheimer's – 40 HITS
- Age matched controls – 14.5 HITS

Purandare N, *et al.* BMJ

There is increasing evidence that cumulative burden of ischemic brain injury (silent?) causes neuropsychological deficits or aggravates vascular dementia.

New Concept (“Silent” Infarcts)

HITS (TCD)



DWMRI – Silent Infarcts

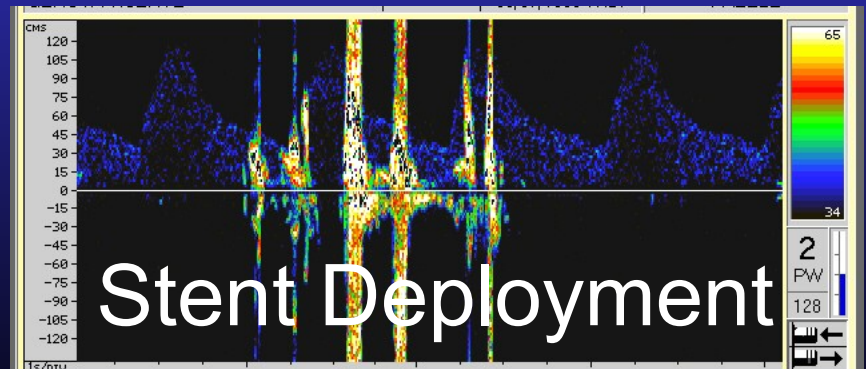
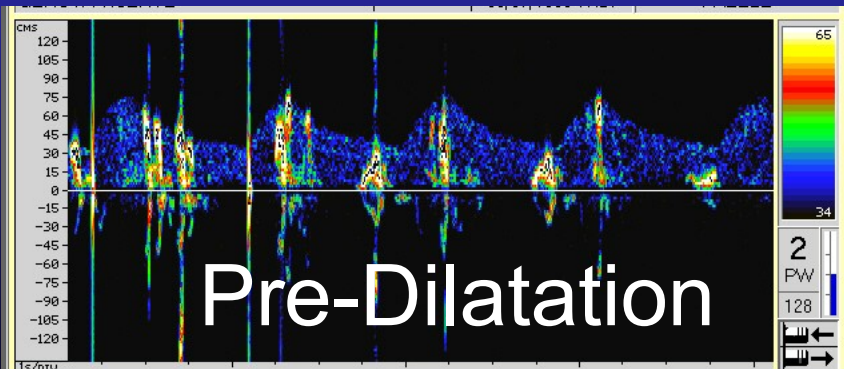
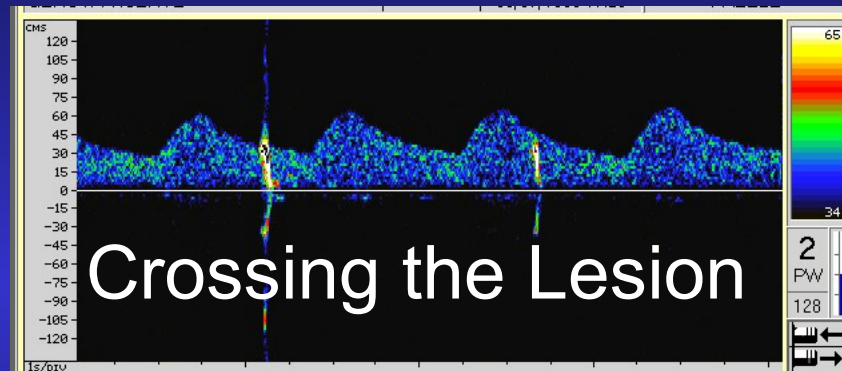


?Vascular Dementia

TCD

- Transcranial Doppler (TCD) is the only non-invasive technique available to detect and quantify the occurrence of microembolism in the cerebral arteries during the procedure.

CAROTID STENTING WITHOUT CEREBRAL PROTECTION



TCD Setup

Bilateral Monitoring

14:12:03

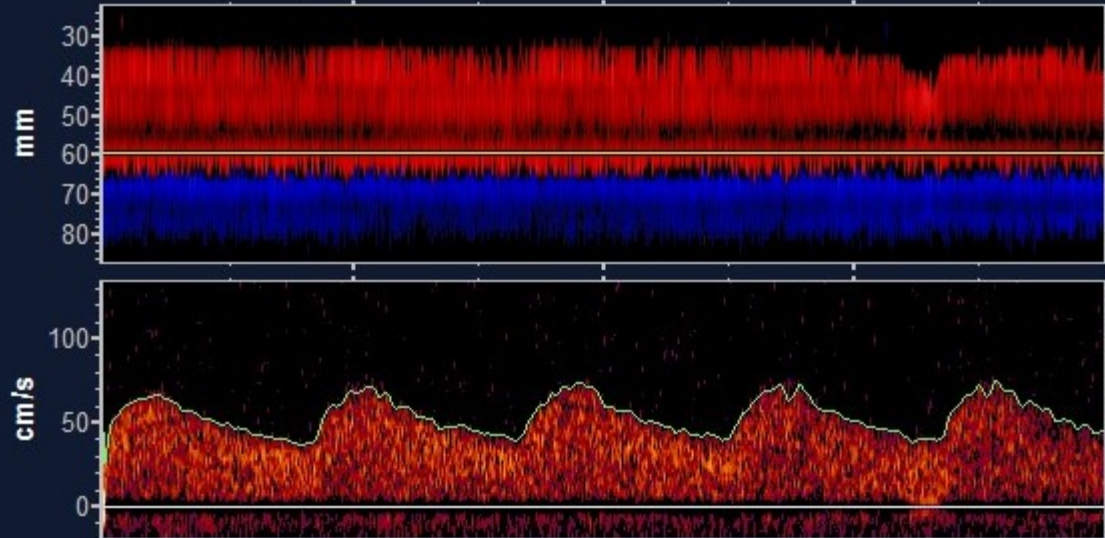
VESSEL
LMCA

DEPTH
59

POWER
100

SAMPLE
9

1



+	PEAK
	73
	MEAN
	53
	DIAS
	39
	P.I.
	0.64
	$\Delta\%$
	110

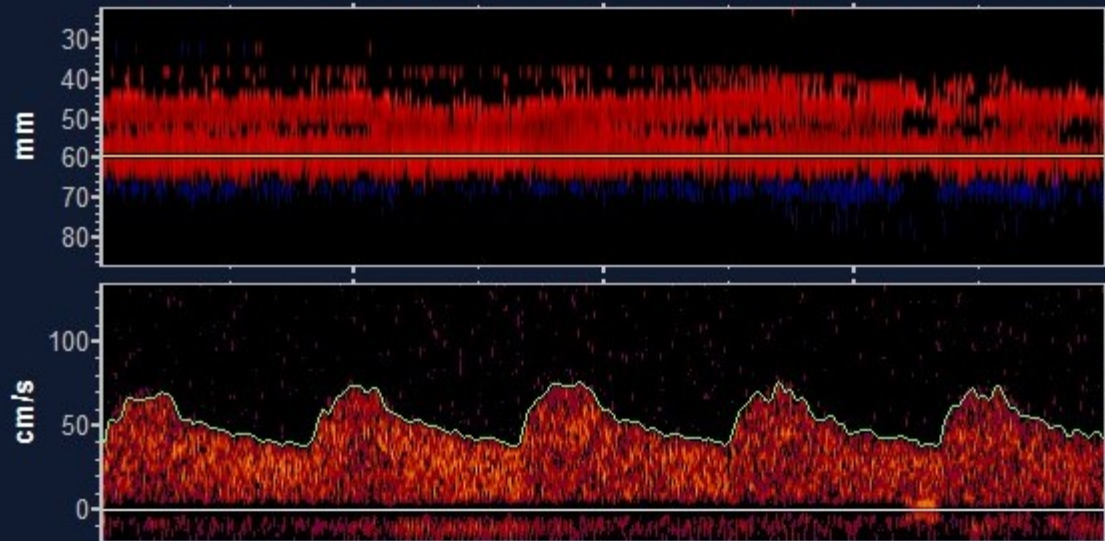
VESSEL
RMCA

DEPTH
59

POWER
100

SAMPLE
9

2



+	PEAK
	74
	MEAN
	53
	DIAS
	38
	P.I.
	0.67
	$\Delta\%$
	111

TCD-Results

- TCD signal recordings were evaluated for three stages of the procedure:

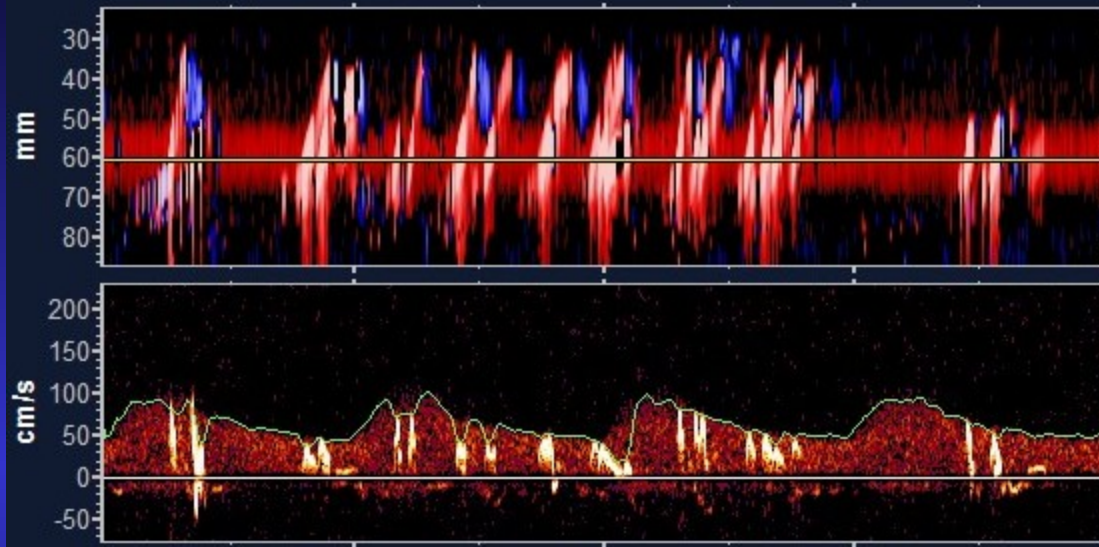
Phase I - protection device deployment (PD)

Phase II - stent delivery including pre- and post dilatation (SD)

Phase III - protection device removal (PR)

FILTER CASE – Phase II

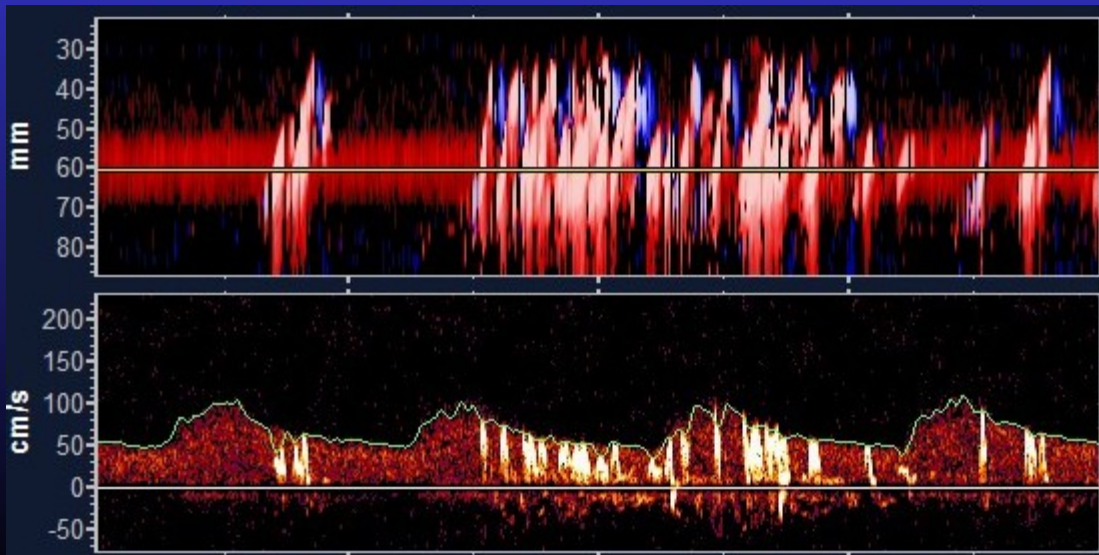
Stent
deployment



13:40:08

+	PEAK
	95
	MEAN
	65
	DIAS
	40
	P.I.
	0.85
	Δ%
	0

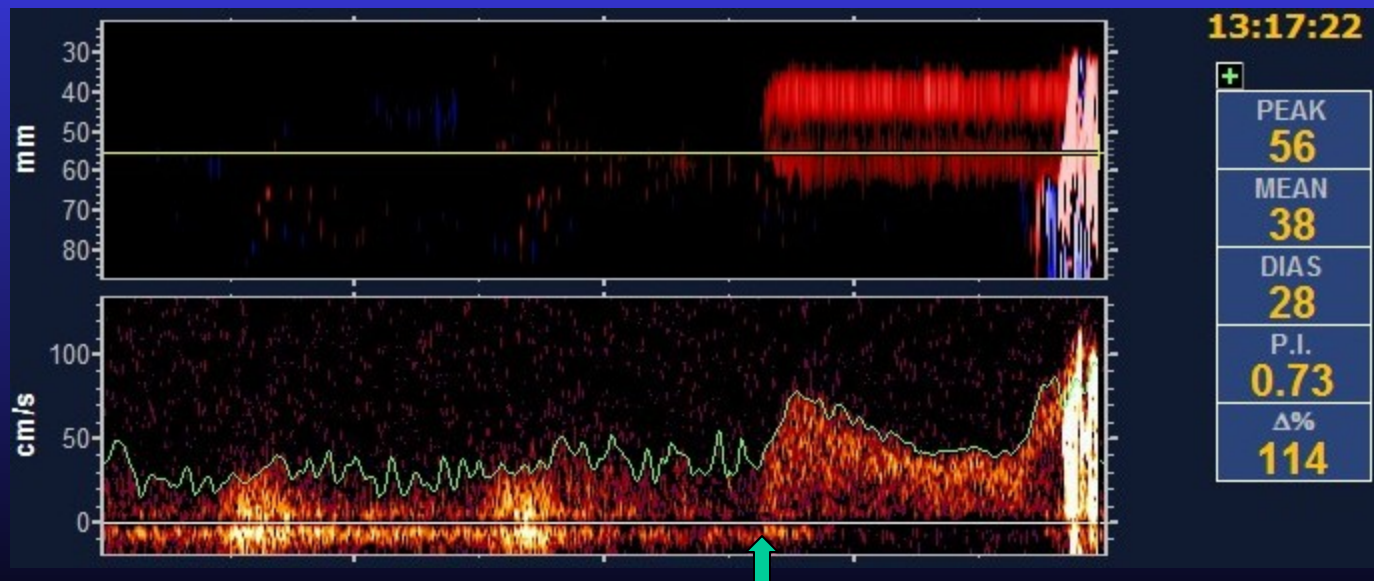
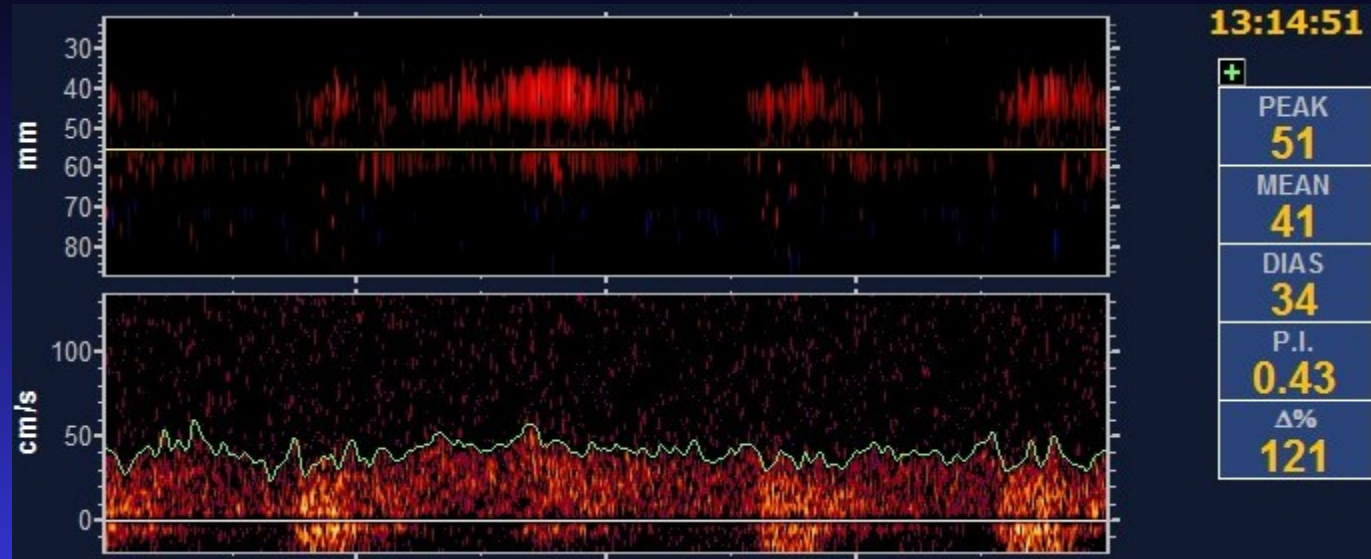
Post-stent
PTA



13:40:21

+	PEAK
	101
	MEAN
	67
	DIAS
	45
	P.I.
	0.83
	Δ%
	0

Flow reversal Case – Phase II - III



Antegrade flow
restoration

TCD-Results (n=14)

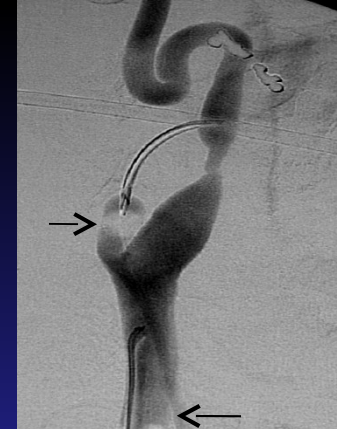
Patients undergoing CAS with flow reversal demonstrated significantly less average total MES compared to procedures using filter devices:

CAS 431.3 ± 65.4

FRS 116.3 ± 20.8 ($p < 0.001$)



MES



CAS

FRS

I	102.3 ± 28.4	73.7 ± 19.6	NS
II	294.7 ± 56.2	6.0 ± 1.03	<.001
III	34.3 ± 24.4	36.7 ± 8.9	NS

CONCLUSIONS

- Preliminary analysis of the study data suggests that patients undergoing CAS under reversal of flow have significantly less MES than patients protected with filter devices.