

# PFO en Migraine

Symposium  
Vlaamse Cathlab Vereniging  
15 oktober 2005

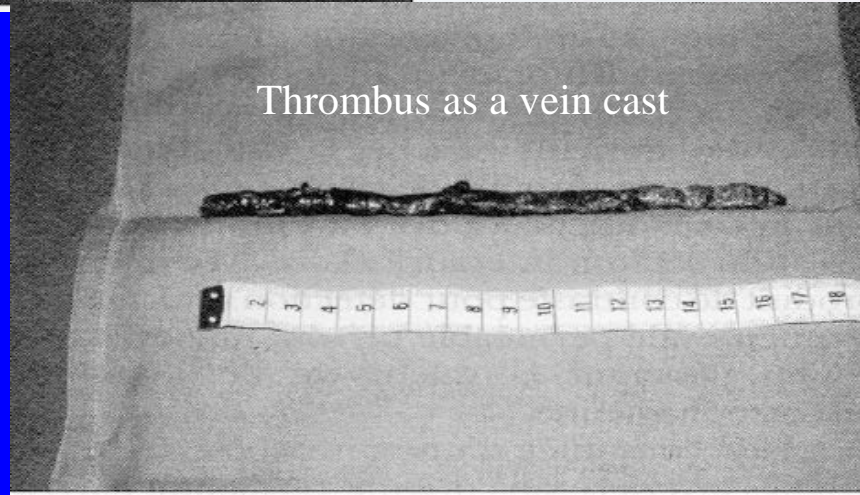
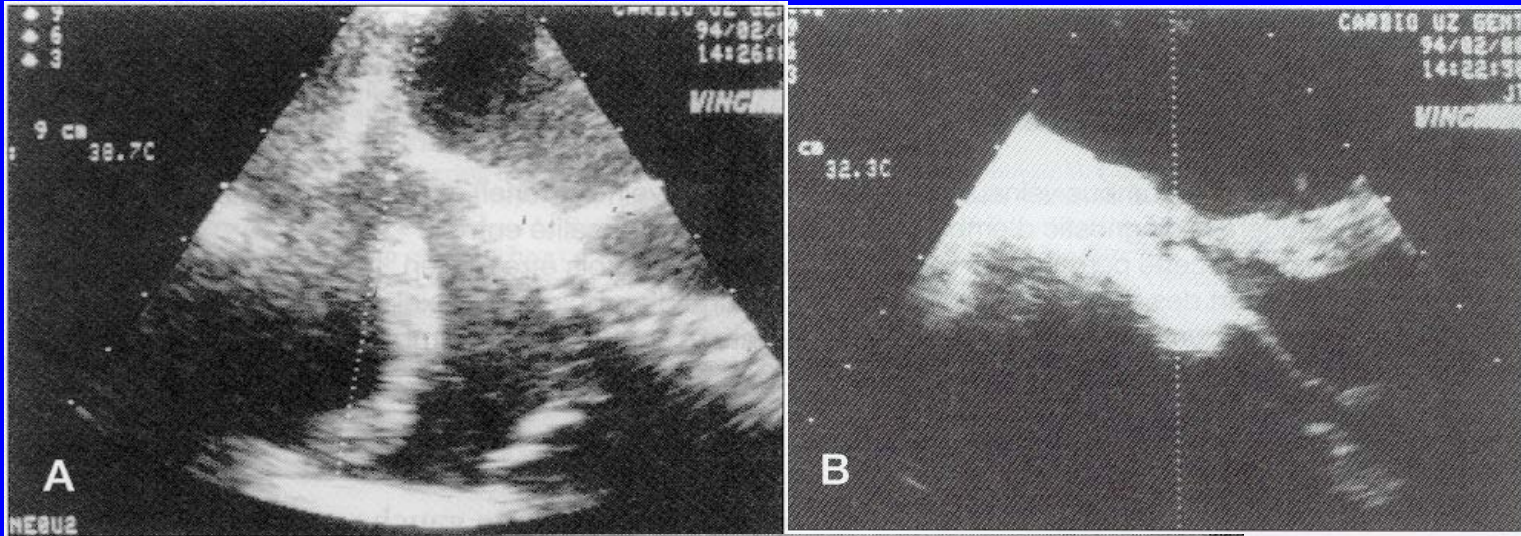


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# Trapped venous embolus in PFO causing recurrent paradoxical embolism

Missault et al., Cardiology 1995;86:86-88

Snake like thrombus extending from the ICV through a PFO into the LA



## Influence of the breathing mode on the time course and amplitude of the cyclic inter-atrial pressure reversal in postoperative coronary bypass surgery patients

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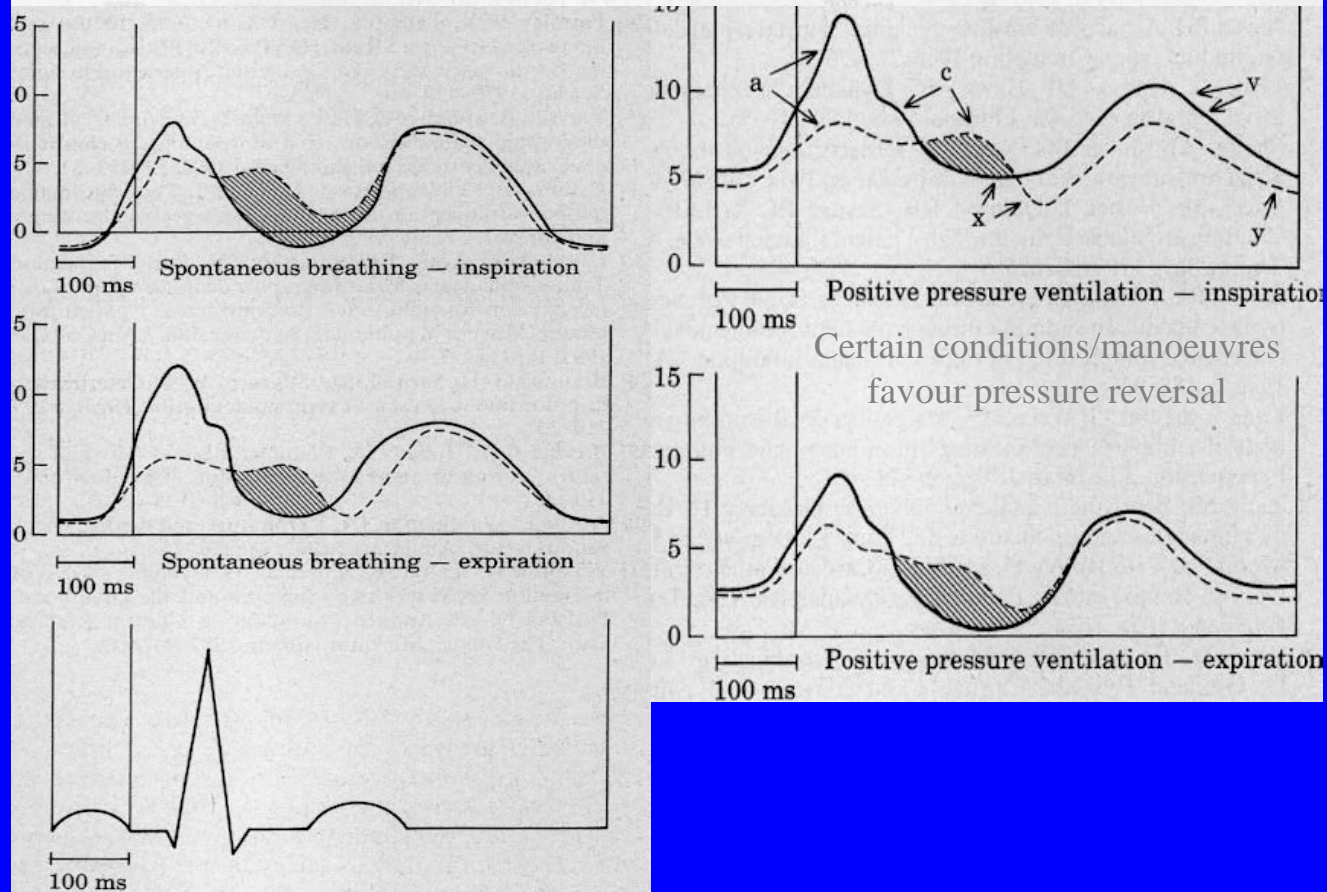


Figure 2 Schematic illustration of both atrial pressure pulses

# “High Risk PFO”

- Atrial Septal Aneurysm  
(10 mm sway in either direction or 15 mm total)
- Spontaneous intracardiac passage of contrast without provocative manoeuvres indicating large shunt
- (Prominent Eustachian valve ?)

# Clinical Problems related to PFO

- Stroke - Paradoxical embolism
  - cryptogenic stroke 31 % (8%- 44%)
  - USA: 70.000 cryptogenic stroke + PFO (10 % coronary angioplasty)
- + Paradoxical embolic risk in perioperative period
- Decompression illness in divers
- Migraine: ↓ 2/3 after PFO closure (serotonin ?)
- Platypnea orthodexia (R-L shunt while sitting up due to eustachian valve or RV compliance or pulmonary HTA)
- Potential role of PFO in high altitude diseases

# Possible Management of PFO

## no consensus guidelines !

**Abstinence** *Nendaz et al. Am Heart J 1998;135:532-41*

*If recurrence CVA > 0.8% / year - treatment required*

## **Medical**

**Antiaggregants:** - recurrence ↓ 50 %

**Anticoagulation:** - bleeding risk 1-2 %/year  
- recurrence ↓ 50 %

## **Closure**

**Surgical:** *risk, cost, scar, recovery,...*

**Transcatheter/Percutaneous:**

*Bridges et al. Circulation 1992;86:1902-1908*

*Windecker et al. Circulation 2000;101:893-898*

*Wahl et al. Neurology 2001;57:1330-1332*

# Closure vs medical

(systematic review of case-control studies :  
10 on percutaneous closure and 6 on medical therapy)

%	closure	medical	RR (95% CI)	p	NNT
stroke	0.42	3.09	0.14 (0.06- 0.37)	<0.0001	37
TIA	1.43	2.58	0.56 (0.30- 1.06)	0.07	87
<u>Both</u>	<u>1.86</u>	<u>5.80</u>	<u>0.33</u> <u>(0.20- 0.54)</u>	<u>≤0.0001</u>	<u>25</u>

# Effect of PFO closure on migraine

Study	No. migraine/ no. closed (%)	% migraine improved or cured	Length of follow up (months)
Wilmshurst 2000	21/37 (57%)	86%	up to 30
Morandi 2003	17/62 (27%)	88%	all 6
Schwerzmann 2004	48/215 (22%)	81%	all 12
Post 2004	26/66 (39%)	65% cured	all 6
Reisman 2004	50/120 (42%)	90%	mean 4
Azarbal, 2005	37/89 (42%)	76%	all 3
Reisman 2005	57/162 (35%)	70%	all 12



# The MIST Trial

Prospective, randomised, multicentre, double-blinded, placebo controlled trial to evaluate the effectiveness of patent foramen ovale closure with the STARFlex® septal repair implant to prevent migraine headache

MIST compares the effect of transcatheter closure of PFO vs sham intervention on migraine headache

Final results will be available by late 2005/early 2006

Preliminary results on type of shunts in MIST available

## Prevalence and size of shunts in population studies

- 27.3% of population have a PFO.  
(Mayo Clin Proc 1984;59:17-20)
- Transthoracic contrast echocardiography shows that 27.6% of controls have a shunt but only 7.3% are large - 4.9% at rest and 2.4% only with Valsalva. (Clinical Science 2000;99:65-75)

## MIST: Shunts found in migraine patients

Size of shunt	RBH		RSH		Both centres	
<b>No shunt</b>	73	(40.6%)	77	(40.5%)	150	(40.5%)
<b>Small shunt</b>	28	(15.6%)	33	(17.4%)	61	(16.5%)
<b>Large pulmonary</b>	6	(3.3%)	12	(6.3%)	18	(4.9%)
<b>ASD</b>	2	(1.1%)	0		2	(0.5%)
<b>Large PFO</b>	71	(39.4%)	68	(35.8%)	139	(37.6%)
<b>Total studied</b>	180		190		370	

# MIST: Prospective findings in Migraine Patients

the prevalence of large shunts  
six times greater than in the general population !!!

<b>Result</b>	<b>Total #</b>	<b>%</b>
<b>Total studied</b>	370	100.0%
<b>Small shunts (atrial and pulmonary)</b>	61	16.5%
<b>Large pulmonary shunt</b>	18	4.9%
<b>ASD</b>	2	0.5%
<b>Large PFO</b>	139	37.6%
<b>Large shunts (all types)</b>	159	43.0%
<b>Total Shunts</b>	<b>220</b>	<b>59.5%</b>

# Transcatheter PFO Closure

**Feasible and safe (need for operator experience)**

**Superior to surgical closure (recurrence rate 4 to 20 %)**

(Dearami et al, Circulation 1999; Homma et al, Stroke 1997)

**Actual accepted/unequivocal indication for PFO closure** (Landzberg, Heart 2004)

**Cryptogenic stroke < 55 y + PFO**

**Stroke + PFO + atrial aneurysm**

**even more so if hypercoagulable state or large shunt at rest**

**Efficacy - no residual shunt: 90%**

**- disappearance of septal aneurysm : 100%**

**- most important criterion « no/less recurrence of stroke/TIA »...**

**! Need for randomized trials !**

**- PEPSIS; CLOSURE I; RESPECT; PC trial**

**- MIST in migraine patients**