Hemodynamic monitoring for less invasive cardiovascular surgery

Academician d-r Zan Mitrev MDFETCS

Special hospital for surgery
“Fillip II” Skopje - Macedonia

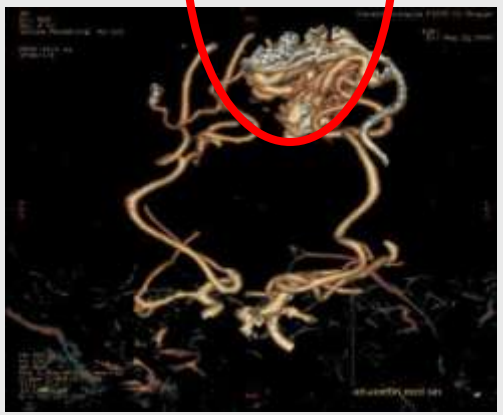
february, 2010

Needs for haemodynamic monitoring in cardiovascular surgery depends of:

1. Cardiac status
(terminal coronary artery disease, dilatative cariomyopathy, terminal valvular and congenital disease, shock status)
2. Co-morbidity

3. Anesthesia during operation

4. Type of surgery



25% cerebral A-v malformations or aneurysms

Comorbiditas – screening

Standard monitoring procedure for stabile patients (our routine procedure)

Anesthesia:

- epidural catheter –day before surgery

- CVK

- arterial line

- urine catheter

- Nasal (no rectal temperature)

Operating theatre: LAP

ICU

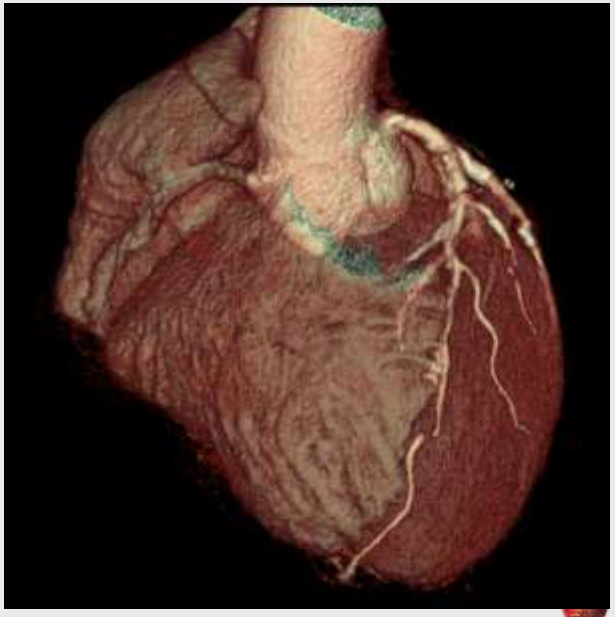
- early extubation

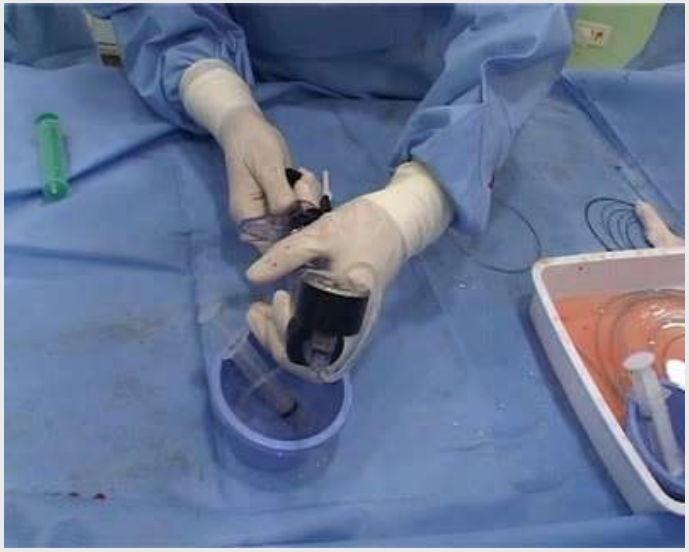
- early mobilization

- home discharging 3/4th day

Treatment of hemodynamically non stabile patents

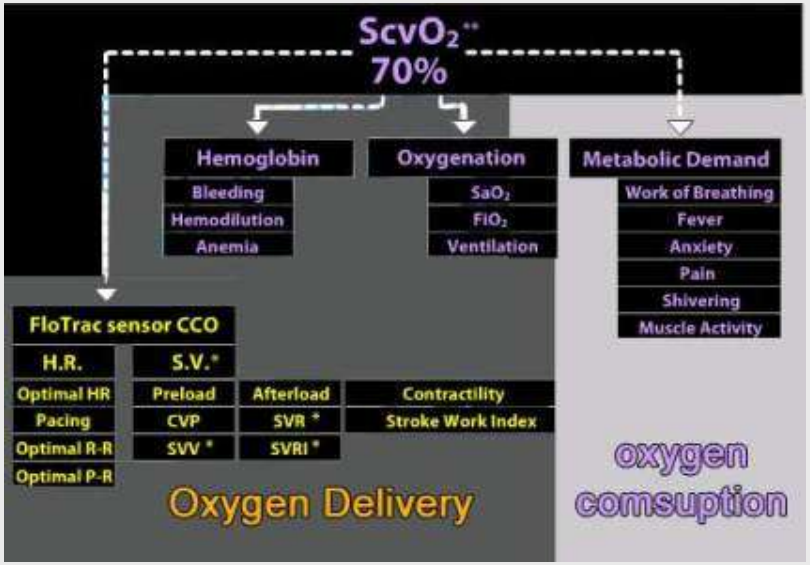
- Hemodynamic stabilization
- IABP
- Electrolyte and metabolic stabilization
- Urgent diagnostic
- Angio (PTCA or stent)
- Urgent surgery





Continuous haemodynamic monitoring

Vigileo:



Advantages :

-Contiuous measurment of CO
-No need for manual callibration
- Time spearing
- Continuous measurment of ScvO2
- Practical for every ICU
- Less possibility for infection

Treatment in haemodynamically instabile and shocked patients

IABP and invasive lines

Stabilisation

Urgent operation

Idications

Non stabile angina

Acute myocardial infarction with haemodynamic instability

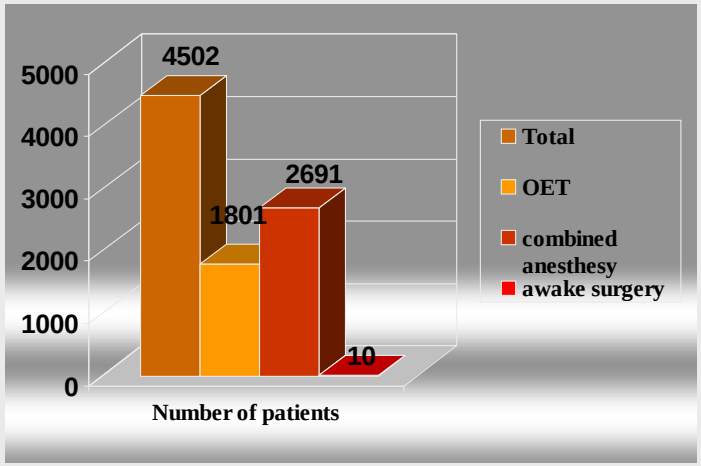
Acute left chamber failure

Chronic left chamber failure

High left main stenosis with haemodynamic instability

Less invasive anesthesia

1. Spinal anesthesia L3/4
2. Cervical blockage – processus transversus C2/3/4
3. High thoracic epidural anesthesia is (HTEA) C7/Th1/2



Mixture for analgesia: Bupivacaine 20ml + Fentanyl 2ml + NaCl 0,9%- perfusor

Peripherial vascular surgery- N=697pts

Pre-operative 64MSCT

Spinal anesthesia

Operative technique

Awake-spinal anesthesia L2/3

L3/4

Patient – discharge after 1st postoperative day

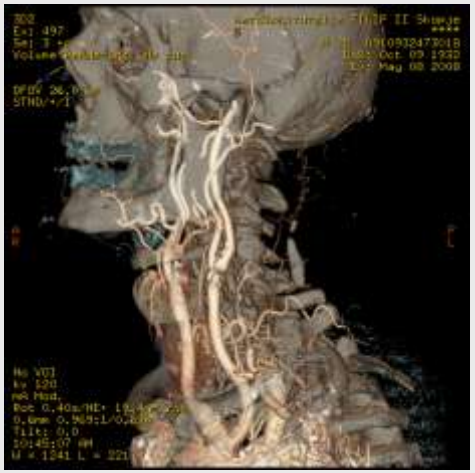
Post-operative

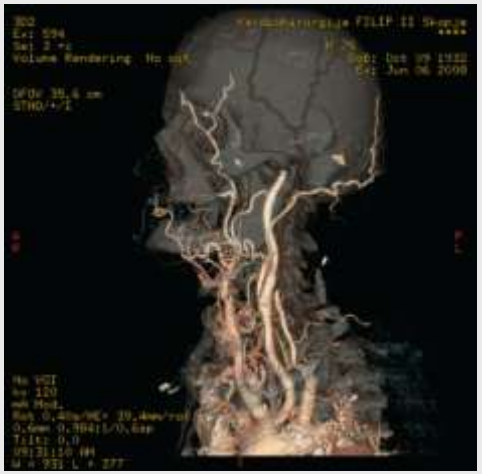
64 MSCT

Less invasive vascular surgery

Anesthesia: immediately before surgery,
3 level infiltrations at C2, C3 and C4,
(blocking the deep and superficial cervical plexus)

N=490pts carotid vascular surgery
n=27pts (25m/2f; 63 ± 8 years)
AWAKE - cervical plexus block
1st postoperative day –discharging





surgery for carotidal aneurysm

High epidural anesthesia

- **- Respiratory and hemodynamic stability**
- **- Excellent intra-operative and postoperative analgesia**
- **- Less stress**
- **- Awake surgery**
- **- Ex-tubation in the operating theatre**
- **- Early mobilization and effective improvement**
- **- Better health economy**

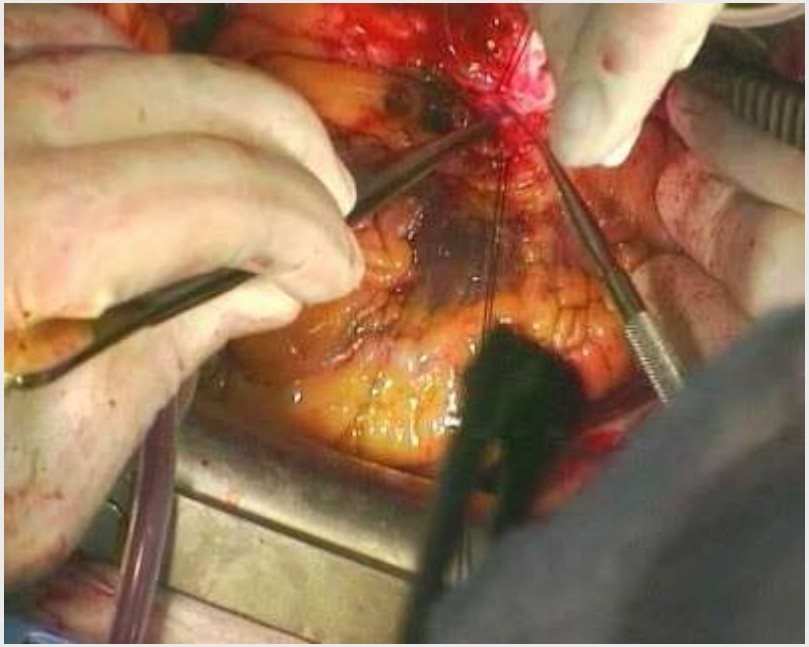
Minimal invasive surgery

- **8pts with mitral valv. reconstruction**
- **22pts with ASD closure**

Aorto-coronary by-pass n = 5019 pts

-Preoperative invasive lines and monitoring
-Vigileo monitoring
-Intraoperative LAP

CABG	**5019**	**71.7%**
OPCAB	*682*	14,5%
Total arerial revasc.	*2826*	56.3%
CABG+aneurysmetoy	*722*	14.4%
CABG + valv surgery	*768*	15.3%



CABG + IABP pre -op. 89pts
CABG + IABP intra-op. 82pts
CABG + IABP post-op. 45pts

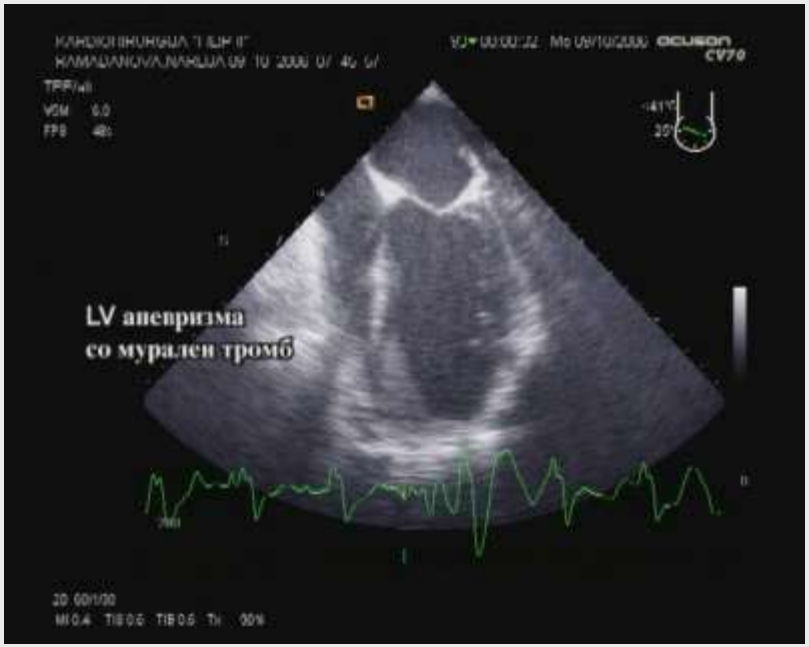
120 pts with haemodynamis instability- acute coronary syndrom

Mortality rate 5,8% (7 pts)

Standard haemodynamic monitoring – non-stabile patients

Left ventricle filling pressure (LAP)

Transoesophagial echocardiography (TEE)



Intra-operative monitoring

LAP placement after heart-lung machine weaning

Surgery for patients with terminal ishemic heart- ventriculoplasty &by-pass surgery N-722 (14,4%)

Direct circular repair for anterior left ventricle aneurysm N=524pts

Haemodinamic parameters:

EDV=345 ± 33.4ml EF=27 ± 6.2%

ESV= 259 ± 26.5ml Mortality rate -5,6% (21 pts)

Surgery- ventriculoplasty with posterior cuneate or separate posterior linear reconstruction N=96 pts

Haemodinamic parameters:

EDV=367 ± 23.5ml EF=25 ± 5.6%

ESV= 299 ± 22.4ml Mortality rate 5,6% (4 pts)

Transventricular mitral valve reconstruction for pts with LV aneurysm and mitral valve insuff N=56pts

EDV=387 ± 29.5ml EF=20 ± 7.6%

ESV= 309 ± 32.8ml Mortality rate 8,6 % (4pts)

Surgery for patients in cardiogenic shock and postinarction VSD N= 5pts

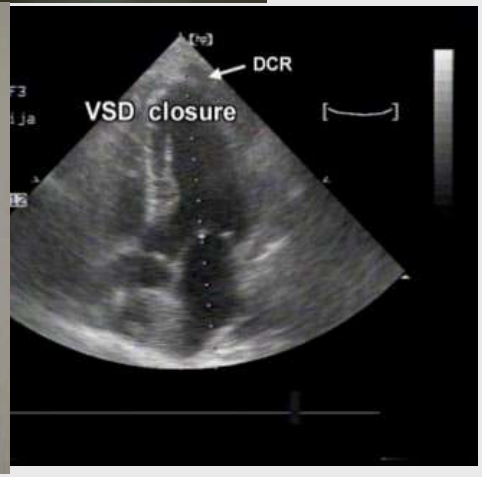
Haemodinamic stabilisation

Pre-operative IABP 5

Cathecholemines if necessery

Strategy - IABP,

- **haemodynamic stabilisation**
- **operation**



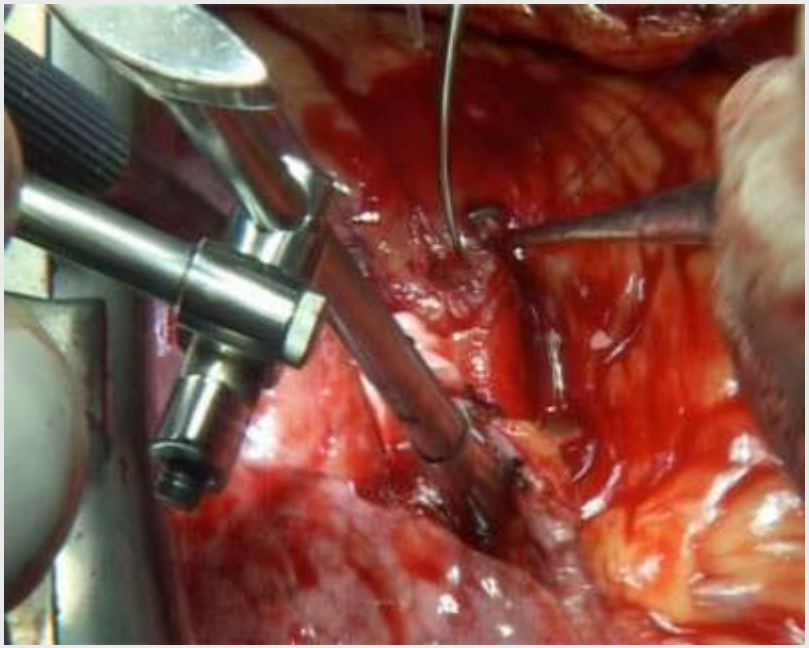
Haemodynamic parameters:

EDV=232 ± 30.4ml EF=25 ± 4.2%

ESV= 189 ± 28.5ml

One pts died 3 months after surgery severe heart failure

Surgery – off-pump left ventricle aneurysmectomy (n=37pts)



52 ± 6.4y Sex f/m 20/17

Heamodinamic instability 2 (6%) pts

Pre-operative IABP 4(12%) pts

Post-operative IABP 0

Haemodinamic parameters:

EDV=250 ± 13.7ml EF=30 ± 4.8%

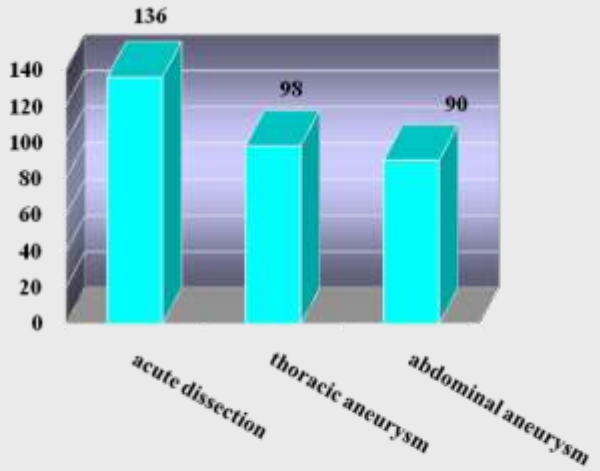
ESV= 169 ± 19.4ml

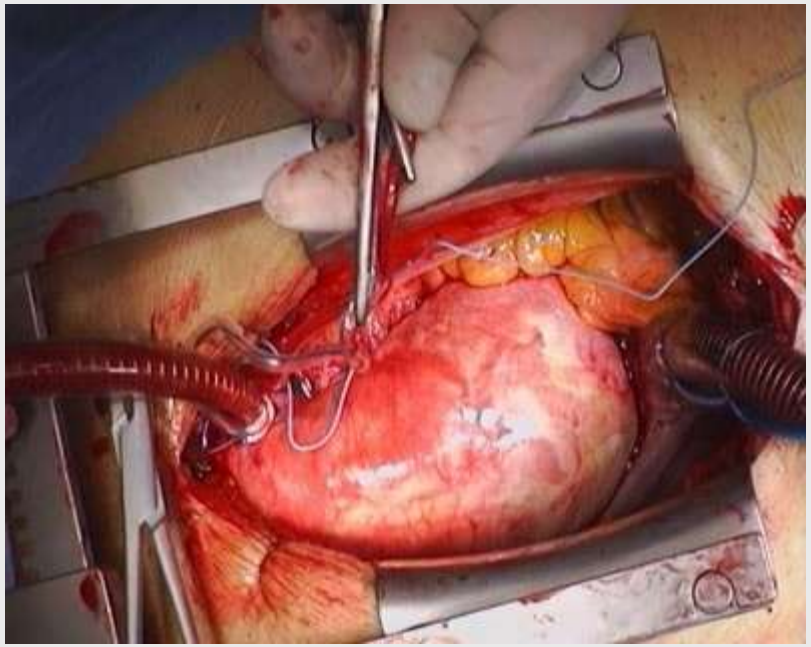
Prezented on X Jubillee congress

CTT/ Mayami 03/2004 year

Aortic dissections- less invassive procedures

- Mild hypothermia
- Right subclabian cannulation
- Cerebral antegrade protection





Less invasive thoracoabdominal aneurysm repair

Pre-operative

Operative technique N=7pts

M.Z. 47god, 2004 - first op. replacement of ascendens with Albograft 28mm – due to acute dissection
2009- thorako-abdominal aortic aneurysm

Postoperative

3D reconstruction

European Journal of Cardio-thoracic Surgery 35 (2009) 905
Images in cardio-thoracic surgery
DeBekay repair for type III thoracoabdominal aortic aneurysm
Zan Mitrev, Vladimir Belostotski, Lidija Veljanovska, Nikola Hristov *
Special Hospital for Surgery ''Filip Vtori'', Skopje, Macedonia
Available online 9 March 2009

Conclussion:

The hemodynamic monitoring influents on the clinical results especially in cardiovascular surgery
Hemodynamic monitoring depends of:

- **on time diagnostic**
- **less invasive anesthesiology**
- **less invasive surgery**

Adequate monitoring ensures good survival results even in end-stage patients

AWAKE patient is the best monitoring

Awarded on 6th annual meeting - ISMICS San Francisco (06/2003)as the best aodio and oral presentation