

The total arterial myocardial revascularization using bilateral IMA and the role of post-operative sternal stabilization to reduce wound infections in a large cohort study.

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The Guidelines for Coronary Artery Bypass Grafting

Recommendations	Class ^a	Level ^b	Ref. ^c
It is recommended to perform procedures in a hospital structure and by a team specialized in cardiac surgery, using written protocols.	I	B	635,636
Endoscopic vein harvesting should be considered to reduce the incidence of leg wound complications.	IIa	A	577,578,580–582, 637,638
Routine skeletonized IMA dissection should be considered.	IIa	B	586–589
Skeletonized IMA dissection is recommended in patients with diabetes or when bilateral IMAs are harvested.	I	B	586–589
Complete myocardial revascularization is recommended.	I	B	594,598,600
Arterial grafting with IMA to the LAD system is recommended.	I	B	602,603,639
Bilateral IMA grafting should be considered in patients <70 years of age.	IIa	B	165,606–610,640, 641
Use of the radial artery is recommended only for target vessels with high-degree stenosis.	I	B	618,642
Total arterial revascularization is recommended in patients with poor vein quality independently of age.	I	C	-
Total arterial revascularization should be considered in patients with reasonable life expectancy.	IIa	B	643
Minimization of aortic manipulation is recommended.	I	B	442,644
Off-pump CABG should be considered for subgroups of high-risk patients in high-volume off-pump centres.	IIa	B	626,627,629
Off-pump CABG and/or no-touch on-pump techniques on the ascending aorta are recommended in patients with significant atherosclerotic disease of the ascending aorta in order to prevent perioperative stroke.	I	B	443
Minimally invasive CABG should be considered in patients with isolated LAD lesions.	IIa	C	
Electrocardiogram-triggered CT scans or epi-aortic scanning of the ascending aorta should be considered in patients over 70 years of age and/or with signs of extensive generalized atherosclerosis.	IIa	C	-
Routine intraoperative graft flow measurement should be considered.	IIa	C	-

General Advantages of the Total Arterial Myocardial Off-Pump Revascularization



Robert-Bosch-Krankenhaus

- Real “No Aortic Touch” technique possible
- Total arterial off-pump revascularization is associated with:
 - Lower mortality, stroke rate, perioperative myocardial infarction
 - Shorter ventilation time
 - Shorter ICU-LOS, Hospital-LOS
 - BIMA use: Best graft patency
- Standard operation in our department (94% in 2015)

Downside of Total Arterial (Bilateral IMA) Off-Pump Revascularization



Robert-Bosch-Krankenhaus

- Technically challenging
- Needs Sternotomy
- Risk of Deep Sternal Wound Infection

Especially in
patients with

Obesity or Diabetes

Standard Sternal Osteosynthesis in Patients after median Sternotomy

- 8 Sternal wires in single loop technique
- Gentamicin collagen implant 5 x 20 cm (Sulmycin® / Collatamp®, EUSA Pharma, UK)
- 3 layer skin closure: suture of fascia, subcutaneous tissue, intracutaneous suture



Gentamicin Surgical Implant

- Every patient after median sternotomy
- Fitting the vest before surgery
- Patients starting to wear vest after removal of thoracic drainage
- Patients are instructed to wear the vest for 8 weeks (Rehabilitation hospitals informed)

Why Support Vest

- Sternum instability major risk factor for wound complications
- Instability caused by
 - Mobilization, Exercise
 - Delirium
 - Respiration
- **Support vest stabilizes sternum and prevents friction between the two sternum half**
- **Lowers incidence of wound complication?**

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A newly designed thorax support vest prevents sternum instability after median sternotomy[☆]

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Reduction mediastinitis from 2.27% to 1.04%: **-54%**



SIGNIFICANT REDUCTION OF DEEP STERNAL WOUND INFECTIONS POST CARDIAC SURGERY BY THE POSTHORAX® VEST

A SINGLE CENTER OBSERVATIONAL COHORT STUDY
IN 2200 PATIENTS

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Reduction mediastinitis from 2.39% to 0.88%: **-63%**

Sternum Instability in Clinical Practice

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Reduction mediastinitis from 2.39% to 0.88%: **-72%**

The POSTHORAX® Vest



Study design

- Retrospective Study
- All patients received total-arterial revascularization using BIMA
- Vest introduced in April 2015 for all sternotomy patients
- Comparison of:
 - 515 patients July 2014 – March 2015: no vest
 - 471 patients April – December 2015: POSTHORAX® vest
- Wound infections were treated using a vacuum therapy (VacuSeal®, KCI)

Aim of this Study

Compare the incidence of wound complications after bilateral IMA grafting according to the use of the POSTHORAX[®] vest

Demographic Data

	Posthorax® vest (n=471)	No vest (n=515)	p-value
Age	68.5 ± 10.1	68.7 ± 10.0	p=0.803
Male	394 (83.5%)	435 (85%)	p=0.672
BMI [kg/m ²]	37.4 ± 4.0	28.2 ± 13.9	p=0.311
Euroscore	6.4 ± 3.3	6.4 ± 3.6	p=0.917
Insulin depended Diabetes	41 (8.7%)	45 (8.7%)	p=0.446
Dialysis	3 (0.6%)	4 (0.8%)	p=0.910
PVD	39 (8,3%)	62 (12%)	p=0.049

Intra- & postoperative Data

	Posthorax [®] vest (n=471)	No vest (n=515)	p-value
Resuscitation post-OP	7 (1.5%)	9 (1.7%)	p=0.614
Re-Thoracotomy	10 (2.1%)	12 (2.3%)	p=0.911
Dialysis (acute + chronic)	6 (1.3%)	7 (1.4%)	p=0.750
Skin-skin time [min]	192 ± 34	185 ± 35	p=0.404
No. anastomosis	3.2 ± 0.9	3.1 ± 0.9	p=0.872
Myocardial infarction	6 (1.3%)	6 (1.2%)	p=0.651
Mortality	6 (1.3%)	10 (1.9%)	p=0.471

Wound complications

	Posthorax [®] vest (n=471)	No vest (n=515)	p-value
Wound complication [No]	2 (0.4%)	9 (1.7%)	0.044
No of wound revisions per patient	5.0 ± 2.8	5.1 ± 2.4	0.955
Onset of Complication after operation [weeks]	3.0 ± 0.0	3.8 ± 2.4	0.357
Hospital length of stay w/ wound complication [d]	17.0 ± 3.4	29.6 ± 9.7	0.029

Conclusion

Significantly lower incidence for wound complications in patients after BIMA grafting with the POSTHORAX® vest

Vest is accepted by the patients as a tool for lowering incidence of wound complication → **good compliance** (if every patient wears a vest)

Rehabilitation hospitals have to be instructed about the deployment, benefits and duration of the postoperative use of a thorax stabilization vest

**Thank you for your
attention**