

Elimination of wound infection in cardiac surgery

Adopted from P. Vogt

<http://www.paulvogt.com/de-wAssets/docs/Elimination-of-sternal-wound-infection-after-cardiac-surgery.pdf>

Background: sternal wound infections up to 5% in general and in 14% of patients with risk factor (obesity; diabetes; use of both IMA for CABG). In the presence of mediastinitis and sepsis 30-day mortality rate is up to 25%

Aim: sternal wound infection, blood stream infection prevention

Design: n= 4449 ; phase A - retrospective analysis of data: 2006 – 2009 (n=2697; 61%); phase B – prospective observation after new protocol implementation: 10. 2009 -12.2012 (n=1752 ;39%).

Indicators studied: incidence of wound infection; number of reoperations, changes of VAC dressing, muscle flap plasty; infection-associated mortality; costs; incidence of CVC -associated bloodstream infections per 1000 patient days (positive central venous catheter).

Results:

	<i>Klinik</i>	<i>Im Park</i>	<i>Russia</i>	
	Phase A 3 yrs	Phase B 3 yrs	Phase A 2 years	Phase B 1 year
Operations	552	560	2145	1192
Isolated CABG	32%	38%	78%	79%
BMI>30	13%	13%	18%	29%
Use of BIMA	56%	88%	21%	58%
Diabetes mellitus	22%	26%	28%	31%
Incidence of wound Infection	4.3%	0%	6.9%	0.5%
Reopening of the sternum	2.2%	-		
Number of VAC changes	38	-		
Muscle flap plasty	8 pts	-		
Infection-assoc. mortality	12.5%	-	26%	-
Positive central venous catheters	4.3/1000	1.1/1000		

Preoperatively:

- Muciporin (Bactroban[®]) starting the day before surgery and continuing **for four days after the operation**
- Men shave the face; those with a beard shave the neck
- **At the day of surgery, patients take a total body shower with Chlorhexidin 4%**
- Surgical site disinfection **twice with Chlorhexidin 2% in alcohol instead of Iodine-Povidon-solution**; again, the skin must be allowed to completely dry spontaneously
- **second-generation cephalosporin at least 30 minutes before starting surgery**
- **Second antibiotic dose iv if surgery takes more than six hours.**
- **NO intravenous antibiotic after completion of surgery**

Insertion of central venous catheters

follows a strict, aseptic protocol:

- (1) a nurse is cleaning the site of the catheter insertion with Chlorhexidin 2% in alcohol;
- (2) the anaesthesiologist performs the same skin disinfection a second and third time paying strict attention to the rules of sterility;
- (3) after disinfection, the skin must be allowed to completely dry on its own;
- (4) to avoid injection into the CVC close to the skin, extensions of 30 cm of length are added to the standard CVC;

Intraoperatively:

- Surgical technique:
- (1) no use of **electrocautery** in subcutaneous tissue;
- (2) in coronary revascularisation, preservation of the **caudal bifurcation of the left and right mammary artery at the level of the epigastrium**;
- (3) **sternal wound closure: mix of 3gr. Vancomycin with 4ml NaCl which will result in a bone wax like material being brought into the sternal spongiosa**;
- (4) use of 6 to 8 figure-of-eight sternal wires;
- (5) **after refixation of the bone, 80mg of Gentamycin is given directly on the sternum and the wires**;
- (6) **closure of the fascia over the wires with Vicryl-Rapid which will be resorbed within a few days; closure of the epigastric fascia with regular Vicryl or Maxon**;
- (7) no sutures put into the subcutaneous layer;
- (8) **80mg of Gentamycin directly given on the subcutaneous fat**;
- (9) **intracutaneous skin suture**;
- (10) no episternal drainage tubes or drains. All other perioperative measures correspond to standard treatment.

Postoperatively:

- No special precautions;
no postoperative antibiotic prophylactic medication
- Change dressing after 48 hours, or if the wound is wet
- No external thoracic stabilisation with any kind of chest jacket.

Antibiotic prescription

- Does not depend on WBC level and temperature first three days;
- NO routine antibiotic for first three days;
- Check CRP on the day 3;
- If CRP grows after day 3 – check procalcitonin and prescribe antibiotics