Postoperative serum Troponin I elevation after thoracotomy versus video-assisted thoracoscopic lung resection

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Background and Goal of Study: Troponin elevation after non-cardiac surgery has been related to an increased risk of postoperative mortality (1). Troponin elevation is frequent after open lung surgery, ranging from 8,8% (1) up to 20% (2). It is believed that minimally invasive approach through video-assisted thoracoscopic surgery (VATS) is associated with a lower incidence of major cardiopulmonary complications and mortality compared to open thoracotomy (3), but there is a lack of information were it might be related with a less troponin elevation. The aims of this study were to determine the frequency of postoperative TnI elevation following thoracotomy or VATS lung resection in high-risk patients and its correlation with 30-day mortality.

Patients and methods: As part of routine postoperative care for high cardiac risk patients (≥ 65 years or < 65 years with known cardiovascular pathology), we measured serum high-sensitivity Troponin I (TnI) levels (Siemens ADVIA Centaur) during the first two postoperative days in 96 consecutive patients that underwent lobectomy (n=70) or lung wedge resection (n=26). The TnI cut off used to define troponin elevation was the 99th percentile provided by our laboratory (TnI ≥ 0.04 ng/ml). Patients were divided in two groups depending upon surgical approach (open thoracotomy or VATS). Baseline clinical characteristics, perioperative parameters, and 30-day mortality was assessed in both groups.

Results: Of the 96 patients screened, 44 underwent open thoracotomy (TH group) and 52 VATS (VATS group). Baseline clinical characteristics and perioperative parameters were similar in both groups. Overall 30-day mortality was of 3/96 patients (3.1%). 30-day mortality was of 2/44 patients (4.5%) in the TH group and 1/52 patient (1.9%) in the VATS group (P-value chi-squared 0.825) (Table 1)

The overall frequency of TnI elevation was of 32.3%. TnI elevation was detected in 14/44 patients (31.8%) in the TH group and in 17/52 patients (32.7%) in the VATS group (P-value chi-squared 0.927). (Table 2)

TABLE 1. Demographic and surgical parameters

	VATS (n=52)	THORACOTOMY (n=44)	TOTAL (n=96)	p value Chi-squared
Sex (Male/female)	39 (54.17%)/ 13 (54.17%)	33 (45.83%)/ 11 (45.83%)	72 (75%)/ 24 (25%)	1.000
Age >65 years	51 (54.84%)	42 (45.16%)	93 (96.88%)	0.462
Smoker	10 (43.48%)	13 (56.52%)	23 (23.96%)	0.376
Coronary artery disease	9 (69.23%)	4 (30.77%)	13 (13.54%)	0.241
Peripheral vascular disease	9 (47.37%)	10 (52.63%)	19 (19.79%)	0.507
Renal chronic disease	4 (66.67%)	2 (33.33%)	6 (6.25%)	0.526
Side (righ / left)	33 (62.26%) / 18 (42.86%)	20 (37.74%) / 24 (57.14%)	53 (55.21%) / 42 (43.75%)	0.110
Intraoperative blood transfusion	1 (100%)	0 (0%)	1 (1.04%)	0.355
30-day mortality	1 (33.33%)	2 (66.67%)	3 (3.13%)	0.825

TABLE 2. Troponin elevation upon surgical approach

N (%) [IC 95%]	VATS (n=52)	Thoracotomy (n=44)	Total (n=96)	p-value Chi-squared
TnI Elevation				
$\geq 0,04\text{ng/ml}$	17 (54.84%) [39.08% ; 72.68%]	14 (45.16%) [30.15% ; 63.97%]	31 (32.29%) [23.1% ; 42.61%]	
$< 0,04\text{ng/ml}$	35 (53.85%) [42.53% ; 66.3%]	30 (46.15%) [35.15% ; 58.97%]	65 (67.71%) [57.39% ; 76.9%]	0.927
Total	52 (54.17%) [43.69% ; 64.38%]	44 (45.83%) [35.62% ; 56.31%]	96 (100%)	

Conclusions: In high risk patients undergoing major thoracic surgery, the incidence of postoperative TnI elevation was higher than reported in non high risk patients. Although less invasive, patients undergoing VATS showed similar troponin elevation than patients operated through open thoracotomy. No differences in 30 day mortality were observed.

References:
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