The measurement of cardiac troponins in patients undergoing major orthopaedic surgery

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We read with interest the article of Talsnes et al. who concluded that laboratory analyses on cardiospecific troponins, namely, troponin T, provide useful information on the risk of fatal outcome in elderly patients undergoing hip fracture surgery [1]. The development and introduction into routine laboratory practice of assays for measuring cardio-specific troponins has revolutionised the diagnostic approach of patients with chest pain and suspected acute coronary syndrome (ACS). The recent advent of high-sensitivity assays has further increased the diagnostic efficiency of these markers, allowing identification of cardiac and extra-cardiac conditions where troponin value is measurable in the absence of a clear ischemic myocardial injury (e.g., severe arrhythmias, heart failure, chemotherapy toxicity, amiloidosis and sarcoidosis, pulmonary embolism,

chronic renal failure, sepsis, strenuous physical exercise) [2]. Following the findings of Talsnes and colleagues, it is interesting to express some considerations on the troponin T increases that seem to predict a fatal outcome after hip fracture surgery in the elderly. First, although the main cause of death is not clearly reported, it is conceivable that this might be mainly attributable to either venous thromboembolism or myocardial infarction. In both these clinical conditions, cardiac troponin T values are significantly increased and predict short- and long-term mortality [2, 3]. It is also interesting to analyse the kinetics of the marker, whose increase is modest overall ($< 0.20 \mu\text{g/L}$) and constantly below the traditional threshold for establishing a diagnosis of myocardial infarction (e.g., $> 1 \mu\text{g/mL}$). As such, these detectable values in blood seem to mirror increased membrane permeability and early troponin release (i.e., “leakage”) from the unbound cytosolic pool rather than an irreversible myocardial injury [4]. This information is highly significant from a pathophysiological standpoint, because it is conceivable that even a minor cardiac lesion occurring immediately after major orthopaedic surgery (which is only detectable by laboratory testing and not by ECG) should guide clinicians to establish early preventive or therapeutic interventions to limit irreversible myocardial damage. This hypothesis is consistent with our previous findings, that NT- brain natriuretic peptide (NT-proBNP) and ischemia modified albumin (IMA) values are significantly increased 72 hours after major orthopaedic surgery, thus reflecting myocardial stress and ischemia, respectively [5].

Whether routine troponin testing after major surgery should be recommended or not, can only be answered by further prospective investigations and cost-effectiveness analyses. At this point in time, however, it seems reasonable to include major orthopaedic surgery among

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the sources of troponin increase and eventually recommend troubleshooting the cause/s underlying this increase in the individual patient to rule out the presence of myocardial injury or other co-morbidities associated with increased values of troponins in blood.

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