was a serious concern and also demonstrated the importance of maintaining flow in the LIMA during grafting of the lateral and inferior wall of the myocardium.

When a wide retraction of the sternum is necessary, the LIMA flow may be compromised as shown in case 1 and as previously reported in a single patient operated with CPB [8]. It is important for the surgeon to be aware of this possible mechanism for the myocardial dysfunction when the myocardium is supplied by the IMA graft. If possible, a wide opening of the retractor during CABG surgery should be avoided. If the TTFM technology is available, the LIMA flow is easily measured when increasing the retractor opening. Although impairment of the IMA graft flow due to sternal retraction may be more serious in OPCAB, it may also be of importance in CABG performed with CPB. A wide opening of the sternum could reduce flow in the LIMA, which may result in ischaemia and thereby impede weaning from CPB. These mechanisms could cause similar challenges after weaning from CPB. The TTFM represents an easy and reproducible technique for the demonstration of inadequate flow in coronary grafts, and should always be considered in CABG surgery [9, 10]. The ultrasound methodology used for monitoring of the regional myocardial contractility provides a sensitive tool for detecting ischaemia. In conclusion, we believe that the TTFM, transoesophageal echocardiography [11, 12] and miniaturized ultrasonic monitors placed directly on the epicardium [3, 13] may be useful instruments in the prevention of ischaemic complications during CABG.

**Conflict of interest:** none declared.

**REFERENCES**


eComment: Extended sternal retraction and internal mammarian artery flow

**Authors:** Ahmet H. Arslan, Murat Ugurlucan, Yahya Yildiz and Sercet Cicek

**Cardiovascular Surgery Clinic, Anadolu Medical Center Hospital, Istanbul, Turkey**

doi:10.1093/icvts/ivs213

© The Author 2012. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

We read with interest the manuscript by Espinoza et al. [1], in which the authors presented two patients in whom internal mammary artery (IMA) flow was compromised with extended sternal retraction during off-pump coronary artery bypass grafting (CABG). We would like to comment on the authors’ paper with similar incidents that we have encountered in our practice.

We had 3 patients in whom the left IMA flow was decreased when we widely opened the sternum retractor during CABG. The first patient had cerebrovascular disease (left vertebral artery occlusion and insignificant left internal carotid artery stenosis) in addition to coronary lesions. We detected an accessory ascending collateral branch from the IMA after careful exploration of the proximal part of the artery. Flow reduction was overcome with clipping of this vessel and freeing of the IMA. The procedure did not affect the neurological status of the patient in the postoperative period. In the second patient, the IMA divided into two branches after the middle segment, measuring 1 mm in diameter. Left anterior descending artery was bypassed with the suitable middle portion of the IMA. Sternal over-retraction caused flow reduction, which was overcome with the approximation of the sternal edges. In both patients, we proposed that the reason for the reduction in the flow of IMA was due to distention of the graft. In the third patient, there was no identifiable cause for the decrease in IMA flow, other than sternal retraction.

Since IMA was the last anastomosed graft before the proximal anastomosis in our procedures, decrease in IMA flow was detected with simple palpation of the vessel and managed accordingly.

IMA is still the gold standard graft for myocardial revascularization. We believe, it should be kept in mind that there may be various reasons which may lead to compromised IMA flow, either of the most common distention or sometimes of an idopathic nature. Although flow compromise may be evaluated by transit-time flow measurement, simple palpation of the graft is also simple and effective method.

**Conflict of Interest:** None declared

References