Endoscopic Saphenous Vein Harvest: Severe Hypercarbia

To the Editor,

Although arterial conduits are favoured during coronary artery bypass grafting (CABG), a variable number of venous grafts are used in all patients undergoing the procedure. Endoscopic vein harvesting of the great saphenous vein has multiple advantages over the traditional open vein harvesting technique.

A 40-year-old male patient with critical left main involvement and triple vessel disease was uneventfully anaesthetised for CABG surgery using standard anaesthetic techniques. A baseline arterial blood gas before surgical incision revealed normal values as follows: pH 7.34; partial pressure of carbon dioxide (PaCO2) 40 mmHg; partial pressure of oxygen (PaO2) 152 mmHg (fraction of inspired oxygen (FiO2) 0.35); bicarbonate level 23.7 mmol/L; potassium 4.3 mmol/L.

Endoscopic vessel harvesting (EVH) (Vasoview 7xB, Wayne, NJ, USA) was done through a transverse incision on the medial aspect of the left knee. CO2 insufflation was initiated at a flow of 2 L/min, resulting in constant pressure of 10 mmHg. The physician-assistant who was harvesting the vein incidentally noted increased bleeding in the field. Ten minutes after the EVH incision, the end tidal CO2 (ETCO2) began to rise progressively and peaked at 88 mmol/L [Figure 1]. Immediate response included checking the ventilation and suctioning the patient. An arterial blood gas (ABG) demonstrated severe respiratory acidosis without impairment of oxygenation (pH 7.13; PaCO2 87.9; PaO2 201 (FiO21); single breath counting (SBC) 29.2 mmol/L). The temperature of the patient remained normal. Transesophageal echocardiogram (TEE) depicted no evidence of air in the right atrium (RA) or in the inferior vena cava. Similarly, there was no evidence of rebreathing or hypermetabolic state such as malignant hyperthermia. A repeat arterial blood gas after 30 minutes exhibited a similar picture. Hand ventilation did not result in any significant change in the PaCO2 levels. The heart rate increased by 12 beats/min. Body temperature, heart rhythm, and blood pressure remained unchanged.

At this point, there was a suspicion that the CO2 being used for the EVH could contribute to the high ETCO2. Immediately after the cessation of CO2 insufflation, there was a remarkable improvement in the ETCO2. The surgeons abandoned EVH and an open technique was used to harvest the remaining vein. Soon, the ETCO2 concentration decreased to pre-insufflation levels, and normal ventilation could be resumed. The patient then underwent 3-vessel coronary artery bypass graft surgery without further complications.

A sudden rise in ETCO2 during surgery can have catastrophic consequences on the patient. Routine causes like ventilation, hyperthermia, or any hyper metabolic state and airway issues are to be immediately ruled out. Hypercarbia during EVH is not well known although there are a few reported cases in the literature.1–3 Liu et al.3 in a study of 405 patients undergoing EVH for CABG or
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Carbon dioxide can enter the systemic veins either by venous absorption of the gas or by the entry of CO2 through the open end of injured or cut veins. In moderate and massive CO2 embolism, the later mechanism has a predominant role. Hypercarbia is also influenced by the tunnel pressure or the type of system being used for EVH. Higher tunnel pressures and closed EVH systems (which were used in this case) are associated with a higher incidence of hypercarbia.

In summary, we described a case of significant hypercarbia resulting from increased absorption of CO2 during EVH. Close monitoring of ETCO2 levels during this process is encouraged for early detection and management of hypercarbia.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Paradoxical Interatrial Shunt During Cardiopulmonary Bypass ‑ Transesophageal Echocardiography to the Rescue

To the Editor,

Left atrial (LA) vent may cause an unexpected paradoxical shunt during cardiopulmonary bypass (CPB) with serious hemodynamic consequences. Its timely detection is crucial which often requires comprehensive echocardiography and surgical evaluation. We report a case of transient hypoxemia due to LA vent where the intraoperative transesophageal echocardiography (TEE) was instrumental in the identification of the problem and its successful management. The patient gave written informed consent for the publication of this case.

A 39‑year‑old male, weighing 58 kg (body surface area 1.71 m²) with severe rheumatic aortic stenosis and left...