Images in cardiovascular medicine

Anatomical anomalies following coronary artery bypass surgery

A middle-aged man underwent cardiac catheterisation for evaluation of recurrent angina several years after two-vessel coronary artery bypass grafting (left internal mammary arterial (LIMA) graft to left anterior descending artery (LAD) and saphenous vein graft to intermediate artery). Angiography demonstrated that both grafts had occluded, with proximal LIMA occlusion. His native coronary arteries were severely diseased and a redo coronary artery bypass grafting was performed. The right internal mammary artery was grafted to the intermediate artery but intraoperatively the surgeon noted flow in the LAD. Consequently, the LAD was not grafted.

The patient's angina persisted and repeat angiography revealed a patent right internal mammary artery graft but once again the LIMA was blocked proximally. CT coronary angiography confirmed proximal LIMA occlusion but the distal portion was shown to receive collateral flow from the inferior thyroid arteries, explaining the intraoperative finding of flow in the LAD. Figure 1 shows volume-rendered CT images demonstrating the occluded LIMA (1), collaterals from the inferior thyroid arteries (2) and final reconstitution of the LIMA (3). Stress myocardial perfusion imaging demonstrated a large area of inducible ischaemia and the patient underwent a third bypass operation, receiving a radial artery graft to his LAD.

To the authors' knowledge, anastomoses to a LIMA graft from the inferior thyroid arteries have not been reported. This case presented significant diagnostic challenges and ultimately resulted in the patient requiring an additional operation. CT coronary angiography enables imaging of extracardiac vessels and may have pre-empted this finding, allowing necessary preoperative investigation to take place.

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Figure 1 Volume-rendered CT images demonstrating the occluded left internal mammary artery (LIMA) (1), collaterals from the inferior thyroid arteries (2) and final reconstitution of the LIMA (3).