Angiosome-directed revascularisation of ischaemic limbs is a source of growing debate. In contrast to other recent systematic reviews, the current review suggests that, when feasible, direct revascularisation (DR) using the angiosome concept, may improve outcomes such as leg salvage and wound healing.

There are many limitations of the evidence for this novel concept, including small study numbers, predominantly retrospective data, use of historical controls, and lack of angiographic data. The heterogeneity of data, patient characteristics, and lack of standardised definitions are further confounders. One fundamental issue that Professor Biancari does not address separately is the concept of indirect revascularisation through collaterals (IRC) and its effect on outcomes. The “angiosome” was originally described as a three-dimensional network of vessels, with a unit of tissue supplied by direct source arteries, but reinforced by arterial–arterial connections between angiosomes. These collateral connections allow compensatory blood flow from a neighbouring angiosome in the event that the direct artery to the given angiosome is compromised. Therefore, the concept of IRc is important to consider, given that outcomes may be similar to those achieved with DR. However, the usefulness of IRc in a population of patients with diabetes has potential limitations. It follows that the obliteration of collaterals typical of a patient with diabetes would likely render IRc less useful than DR.

The angiosome concept was developed in healthy patients. Very little consideration has been given to the distribution of angiosomes in patients with critical limb ischaemia or diabetes. Recent evidence suggests that the traditional angiosome model may not accurately predict the distribution of blood flow in an unselected group of patients with critical ischaemia, whose pattern of perfusion is distorted by abnormalities of the vascular bed, development of collaterals (especially in patients with diabetes) and atrophy of existing microvasculature. Therefore, the topographical location of an ulcer may not actually correlate accurately with the source artery supplying that area of tissue. With standard angiography, it is impossible to ascertain the functional perfusion of a given area of tissue; in a patient with critical limb ischaemia, the source artery may have been obliterated and the major source of blood flow may, in fact, arise from a neighbouring angiosome. Therefore, direct targeting of the angiosome, which correlates with the area of tissue loss, may not be the appropriate strategy. A further area for consideration is that many foot ulcers will span multiple angiosomes.

It is also difficult to know the proportion of patients, in an unselected population, in whom DR might be possible—most comparative series published so far have used historical data and retrospectively applied criteria to determine the approach that was ultimately used. It is therefore difficult to ascertain the feasibility of using the DR approach in a prospective setting. Moreover, there is no consensus as to the standard definitions used when defining and reporting angiosomes, making comparative analyses difficult.

Overall, we remain to be convinced that angiosome-directed revascularisation offers significant advantages over the standard “best target artery approach”, although we do acknowledge its potential role in treatment, particularly in patients with diabetes, where collateral circulation is notably poor.

The key outstanding issues that remain to be determined are the ability to define angiosomes in patients with CLI and to quantify the proportion of patients in whom it may be technically possible to adopt angiosome-directed revascularisation.

REFERENCES