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CORRESPONDENCE AND COMMUNICATION

Deep inferior epigastric perforators do not correlate between sides of the body: The role for preoperative imaging

The deep inferior epigastric artery (DIEA) perforator (DIEP) flap has been widely described as a safe flap with reliable vascular anatomy. One of its limitations is potentially lengthy operating times during flap harvest, and many techniques have been reported to reduce operating times.^{1,2} One such technique is the preoperative selection of perforators with imaging, which has been shown to substantially reduce operating times.^{3–5} In the past, a technique utilised for perforator selection was to raise one hemi-abdominal wall purely for perforator identification, and to use the location of perforators as a predictor for the contralateral hemiabdominal wall. However, anatomical studies have highlighted substantial variability between DIEA perforators both within and between individuals,^{6–8} and the anatomical basis for such a technique has not been demonstrated in any anatomical studies. The current study thus sought to compare the abdominal wall perforators of each side of the body to confirm whether such a correlation between sides exists.

Methods

A clinical study comprising 300 consecutive patients (600 hemiabdominal walls) undergoing preoperative computed tomographic angiography (CTA) was undertaken. In each case, the size and location of the largest perforator of each hemiabdominal wall was recorded and compared to the contralateral side. The same was done for the branching pattern of each DIEA. Measurements of perforator diameter comprised the contrast-filled, internal diameters of arterial perforators made using computer software (Siemens InSpace, Siemens, Erlangen, Germany). Patients were all female, aged between 48 and 90, and had a range of body habitus. Results were recorded descriptively, through

a range of degrees of correlation for perforator size, location and branching pattern of the DIEA (see Table 1).

Results

In assessing the correlation between perforator size of the largest perforator of each contralateral hemiabdominal wall, only 2% of cases showed a similar size (within 0.1 mm) between sides, and less than 50% of cases demonstrated perforators within 0.3 mm of each other. There was thus no trend towards correlation between sides for the diameter of the largest perforator of each hemiabdominal wall.

For the correlation between perforator location of the largest perforator between contralateral hemiabdominal walls, only 6% of cases showed a similar location (within 1 cm) between sides, and less than 50% of cases demonstrated perforators within 3 cm of each other. There was thus no trend towards correlation between sides for the location of the largest perforator of each hemiabdominal wall.

There was similarly no correlation between branching patterns of the DIEA, with only a 46% correlation between sides.

Discussion

Previous descriptions of DIEA perforators have discussed substantial variability in perforator size, location and course between individual perforators,^{6–8} however differences between hemiabdominal sides have not been specifically explored. This is of clinical pertinence, as selection of the side of choice with preoperative imaging can aid selection of the side of choice, and indeed the perforator of choice for dissection. This has already been shown to reduce operative times.^{3–5}

The current study has shown that there is no concordance in perforator anatomy between hemiabdominal walls, supporting the role for preoperative imaging in DIEA perforator flap surgery.

DIEA perforators do not correlate between sides of the body, with preoperative imaging able to aid selection of the optimal hemiabdominal for flap harvest.

Table 1 Correlation of vascular anatomy between hemiabdominal walls.

Ipsilateral Side (<i>n</i> = 300)	Correlation with Contralateral Side (<i>n</i> = 300)
Diameter of largest perforator	% cases with diameter within 0.1 mm = 2% (<i>n</i> = 7) % cases with diameter within 0.2 mm = 12% (<i>n</i> = 36) % cases with diameter within 0.3 mm = 49% (<i>n</i> = 148) % cases with diameter within 0.4 mm = 78% (<i>n</i> = 233) % cases with diameter within 0.5 mm = 93% (<i>n</i> = 280)
Location of largest perforator	% cases with location within 1 cm radius = 6% (<i>n</i> = 19) % cases with location within 2 cm radius = 24% (<i>n</i> = 72) % cases with location within 3 cm radius = 47% (<i>n</i> = 141) % cases with location within 4 cm radius = 74% (<i>n</i> = 222) % cases with location within 5 cm radius = 89% (<i>n</i> = 268)
Branching pattern of its source deep inferior epigastric artery (DIEA)	% cases with same branching pattern = 46% (<i>n</i> = 139)

Conflicts of interest

None.

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