Available online at www.sciencedirect.com

ScienceDirect

British Journal of Oral and Maxillofacial Surgery 57 (2019) 682–684

BRITISH Journal of Oral and Maxillofacial Surgery

www.bjoms.com

Short communication

Alternative suture technique for anastomosis of veins with different diameters

R. Rauso [a], G. Colella [a], L. Rugge [b,*], F. Chirico [b], G. Tartaro [a]

[a] *Maxillo-Facial Surgery Department, University of Campania "Luigi Vanvitelli", Naples, Italy*
[b] *Maxillo-Facial Surgery Department, University Federico II, Naples, Italy*

Available online 24 June 2019

Keywords: Microsurgery; Microsurgical anastomosis technique; vein diameter discrepancy

Microvascular anastomosis of vessels that differ in diameter can be technically difficult and time-consuming. Difficulties with positioning may lead to kinking or compression, and bleeding at the anastomosis can be a problem. Turbulence and sluggish flow in dilated vessels can predispose to thrombosis.[1]

End-to-side anastomosis eliminates the problem of redundancy of the vessel wall, but requires suitable anatomy to avoid kinking or compression, and provides sufficient space for movement when the posterior wall is sutured. Because of these issues an end-to-end anastomosis, together with a technique to reduce the calibre of the vessels, could provide more reliable options.[2]

Several techniques have been described and proposed for solving discrepancies in the size of the vessels in reconstructive microsurgery.[1]

Mechanical dilatation is one of the earliest procedures described and is commonly used for minimal discrepancy in the sizes of vessels, and it is sufficient when the ratio of the discrepancy is less than 1:5.[3] When the discrepancy is bigger (from 1:3 to 1:4), it should theoretically dictate an end-to-side anastomosis. The attachment of two vessels at 90°, however, will create areas of turbulence, this is why microsurgeons are often prone to an end-to-end anastomosis using a technique to reduce the calibre of the larger vessel.

When an anterolateral thigh free flap is transferred to the vessels in the neck for facial reconstruction there is a particular mismatch between the veins being anastomosed; in our practice we have some little tricks that we would like to share with you.

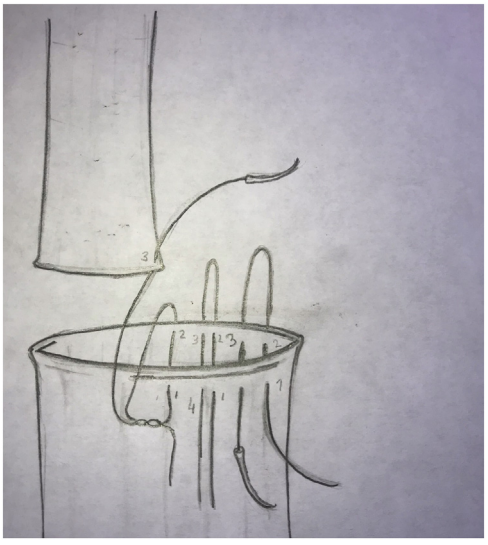

Fig. 1. Diagram of the suture technique between two veins of different calibres: step 1.

When the ratio between the two veins is 1:3 or 1:4, we reduce the larger vessel with two mattress sutures, then we apply another single suture medially. When the knot is tied, we pass the needle through the wall of the smaller vein and close it with another knot (in contact with the existing one) to reduce the calibre of the bigger vein. Finally, we place three more single sutures, one for each remaining wall, to finish the anastomosis (Figs. 1–4).

* Corresponding author at: Maxillo-Facial Surgery Department University of Campania "Luigi Vanvitelli", Piazza Miraglia 80138 Naples, Italy.
E-mail address: luigirugge@gmail.com (L. Rugge).

https://doi.org/10.1016/j.bjoms.2019.05.015

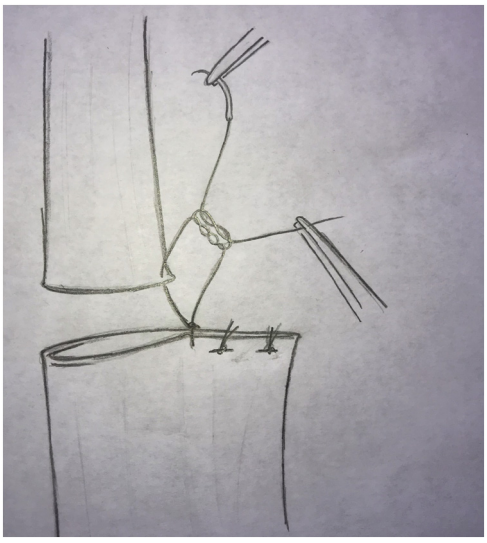

Fig. 2. Diagram of the suture technique between two veins of different calibres: step 2.

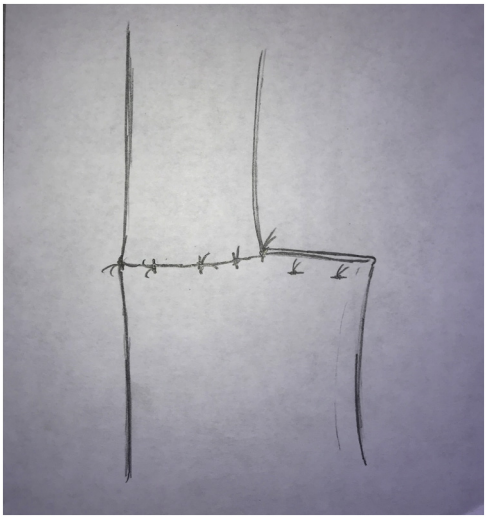

Fig. 3. Diagram of the suture technique between two veins of different calibres: step 3.

In microvascular surgery, there have been several techniques described to address the discrepancies in vessels to be anastomosed. One is similar to our technique, but the first difference is that the end-to-end anastomosis is completed beforehand, to narrow the large vessel. However, the interesting issue is not related to which part of the anastomosis is done first but on the "double" knot between the discrepant vessel and the anastomosis itself. [4]

When asymmetries between vessels have to be faced, the stitches used to close the larger vessel are usually separated from the ones placed to complete the anastomosis itself. We have devised a strategy to avoid a "bleeding point" between the closure of the vessel and the anastomosis and, at the same time, the medial point of the closure of the larger vessel also becomes the fixing point of the side of the anastomosis. The other one on the opposite side, is a typical end-to-end anastomosis and will easily help the surgeon to complete suturing of the vessels.

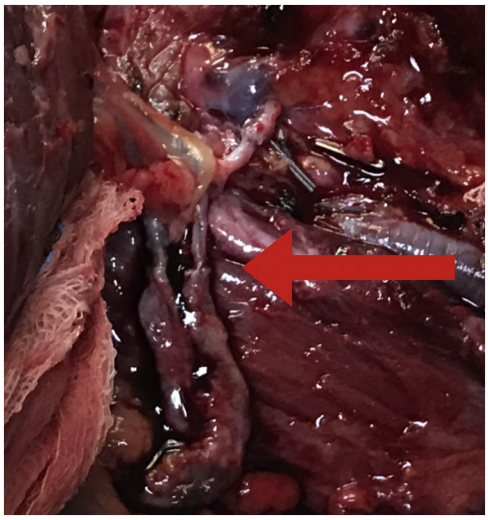

Fig. 4. Red arrow points to a suture placed between veins in the pedicle of the anterolateral thigh flap and the external jugular vein after the bifurcation in two branches.

We have used this technique in five patients who needed anastomoses between veins (three flaps all survived without complications: two vastus lateralis and one forearm free flap that had been used for head and neck reconstruction) and in all instances the larger vessel was the recipient. We think that in venous anastomoses, it is always better to have larger recipient vessels to avoid turbulence in the venous flow. We realise that there may be some concern regarding the double knot that is placed between the anastomosis and the closure of the larger vessel, but this does not cause any turbulence to the venous flow because the second knot is placed outside the anastomosis. Placing two single sutures laterally to the last stitch used to narrow the vessel would have a similar result, but the real advantage is to reduce the typical "bleeding point" between the anastomosis and the narrowing of the larger vessel. The "double knot" indicates the fixing point of the side of the end-to-end anastomosis, and avoids placement of two stitches, one on each side, next to the last stitch placed to narrow the discrepancy.

We found this suture to be really useful, particularly when the knot is placed medially between the reduced vessel and the smaller one. This area is typically the one that used to bleed during anastomoses when the calibres of the veins were reduced. Although a larger number of cases are required to confirm the effectiveness of the technique, we think that these little tricks could be useful in current microsurgical practice.

Ethics statement/confirmation of patients' permission

We have obtained the patients' permission for publication.

Disclosures

None.

Funding

None.

Conflict of interest

We have no conflicts of interest.

References

1. Bakhach J, Dibo S, Zgheib ER, et al. The v-plasty: a novel microsurgical technique for anastomosis of vessels with marked size discrepancy. *J Reconstr Microsurg* 2016;**32**:128–36.
2. Akan M, Cakir B, Aköz T. "Open Y" technique in vessel diameter discrepancy. *Microsurgery* 2006;**26**:506–14.
3. de la Peña-Salcedo JA, Cuesy C, López-Monjardin H. Experimental microvascular sleeve anastomosis in size discrepancy vessels. *Microsurgery* 2000;**20**:173–5.
4. Sabapathy SR. Vessels. In: Wei FC, Mardini S, editors. *Flap and reconstructive surgery*. 2nd ed. Elsevier; 2017. p. 319.