Single lymphovenous anastomosis for early-stage lower extremity secondary lymphedema

Clinical case presented by Christian Taeger, MD,
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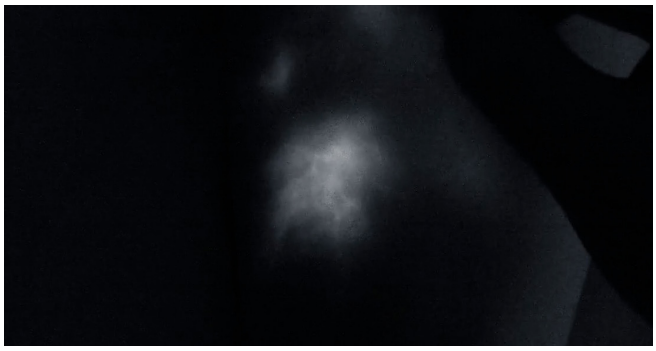
Case report

A 53-year-old woman with very early-stage secondary lymphedema following endometrial cancer was presented. Very healthy lymphatics were present. The indocyanine green (ICG) scan showed a linear pattern that ended in dermal backflow. The incision was made distally. A healthy, big lymphatic vessel, which was well stained with Patent Blue and ICG, was put to the vein. After lymphatic drainage, ICG imaging revealed no leakage, and both vessels were equally stained, indicating a patent anastomosis.

Preoperative (ICG) evaluation the day before surgery

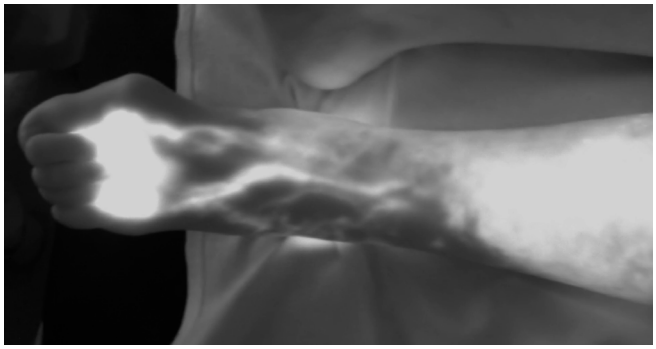
Linear flow pattern visible, vessels and crossing of the veins are marked.



The dye and the fluid run into the tissue called dermal backflow.

Augmented reality view for documentation issues and planning for the next day.

Diagnostics on the day of surgery



Repeating the ICG imaging, dermal backflow has progressed. Linear flow pattern very distally only on the foot, all dermal backflow on the leg without any linear vessels anymore.

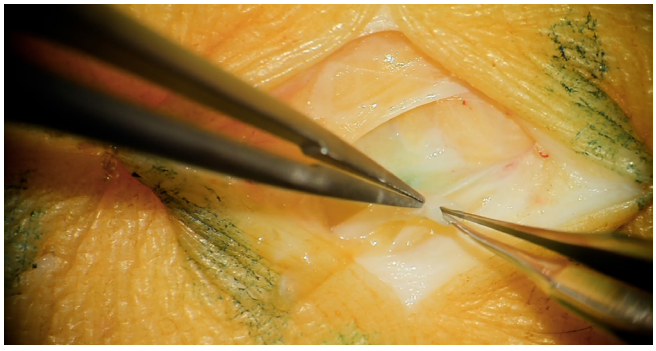
Intraoperative treatment

Identification of the vessels using medical loupes. Switching to the surgical microscope.

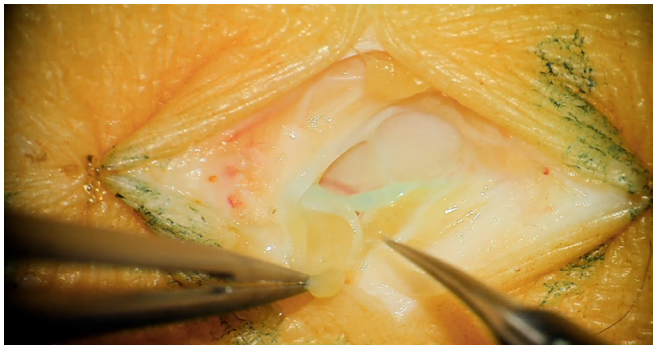
Tip for ZEISS PENTERO 800 S

Optimal positioning and adjustments of the microscope are essential to reduce tremor.

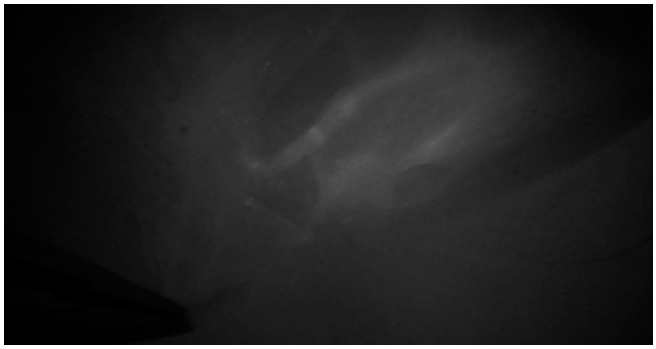
Incision right over the marked lymphatic vessel, a small venule is exposed, with good size match.



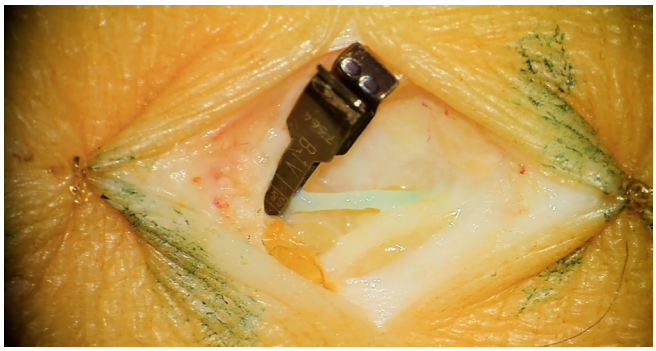
After putting a clip on the distal part of the venule, a clear cut is made and the dilator used to widen the venule.



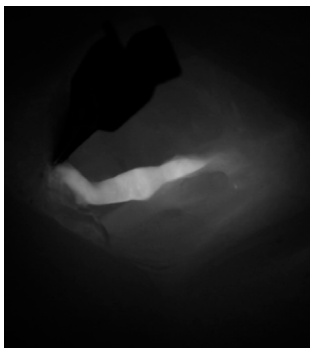
One vessel is stained with Patent Blue and also with indocyanine green, the other not.



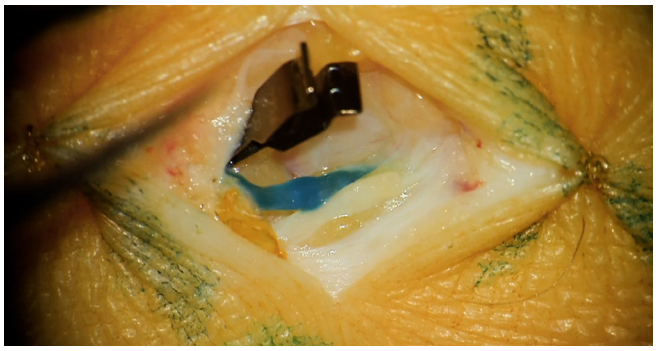
ICG imaging shows the bigger vessel is well stained with ICG.



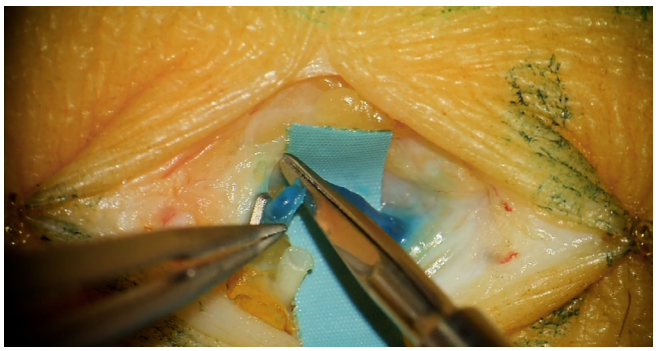
ACLAND® clamp is put on the proximal part of the vessel and ICG imaging is performed.



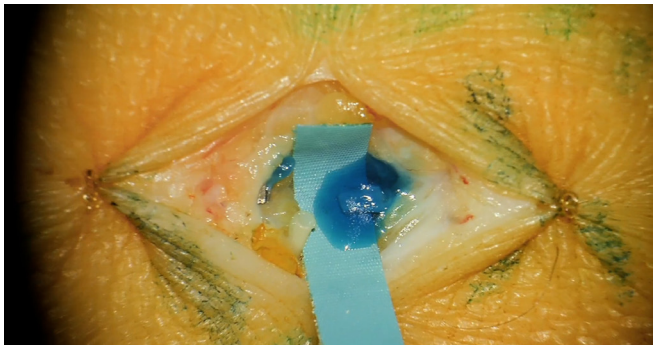
Lymphatic drainage widens the vessel and more dye is administered.



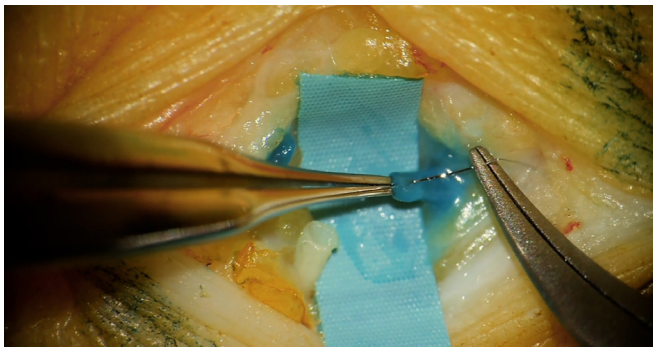
The vessel has a much greater diameter and also the Patent Blue is now much more in the vessel.



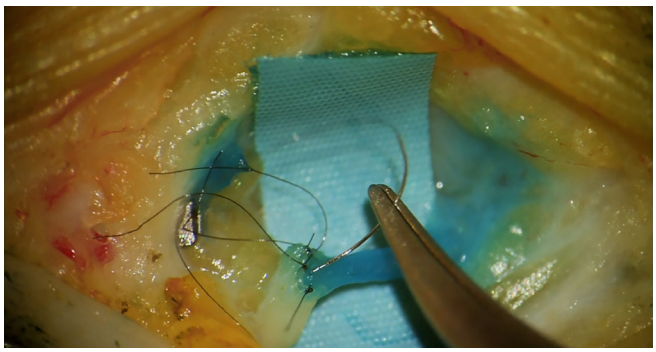
ACLAND clamp is removed and clip is put on the proximal part of the vessel, background is inserted and the vessels are shortened to avoid kinking.



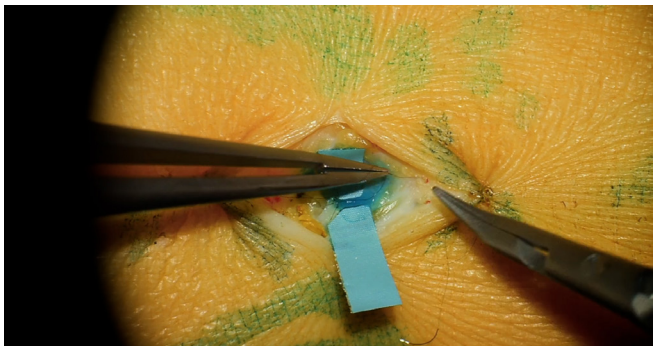
After lymphatic drainage, the caliber of the vessel is much bigger compared to the beginning of the operation. Some lymphatic fluid is running out of the vessel.



Due to very well-prepared vessels, it is very straightforward to do the anastomosis using the 11.0 stitch.



Even very small gaps are closed by adding more knots. The suture is cut under high magnification.



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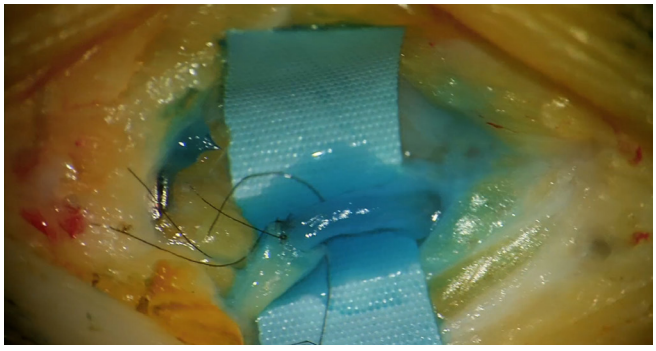
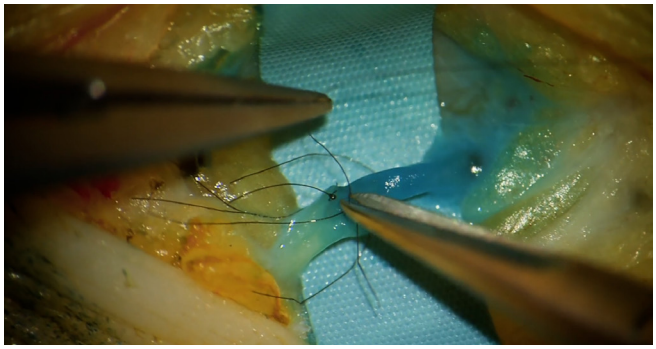
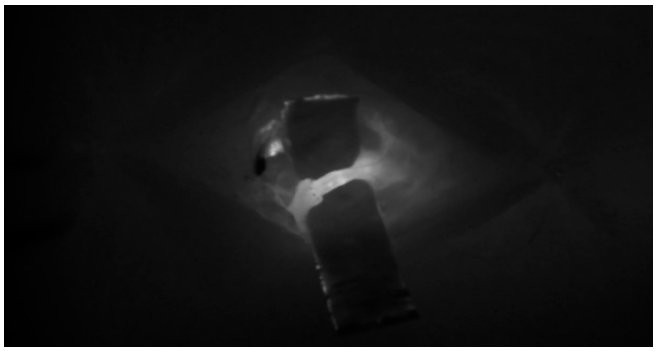
Zoom out to make the knot easier, as you have more overview, and zoom in to control your knot with ZoomMemory.



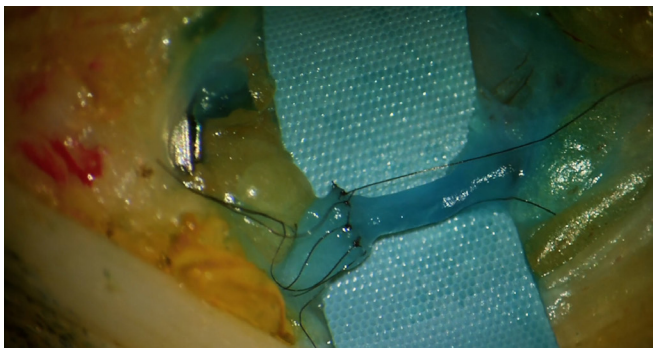
Lymphatic drainage is performed to check for leakage and there is a big gap.



More stitches are added to complete the anastomosis.

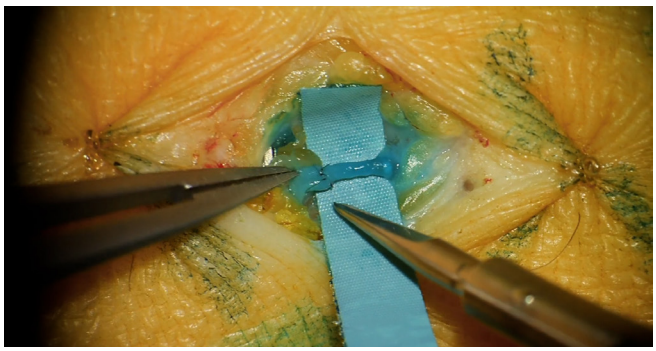


After lymphatic drainage, there is no leakage and both vessels are stained equally – a sign that the anastomosis is patent.



Double check for any gaps and there is a small gap. More stitches are added.

Performing lymphatic drainage under ICG imaging shows no leakage. Both vessels are stained equally. A clinical check is done to determine if there is a refill: After evacuating the fluid in the vein and mild lymphatic drainage, the vein becomes dilated again. This is a sign that the anastomosis is patent.



Remove all the stitches, which is very important as they are non-resolvable and can make some problems in the situs.

It takes several stitches to get an anastomosis that is patent and has no leakage, although the vessels are not too big.

Clinical case report

Further information

"I think precision is the key to an anastomosis that lasts not only for some days, but for years.

Christian Taeger, MD
Specialist for Plastic and Hand Surgery Munich, Germany

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