Lymphovenous anastomosis on the anteromedial lymphatic bundle in patient with primary lymphedema on the lower leg

Clinical case presented by Christian Taeger, MD,
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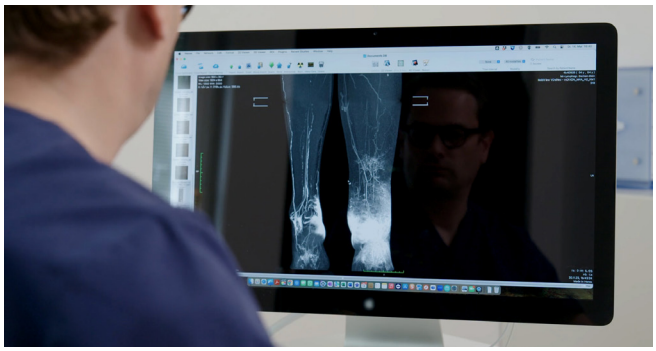
Case report

This is a case of a 64-year-old man with primary lymphedema on the lower leg. A magnetic resonance lymphangiography (MRL) prior to surgery and the preoperative ICG scan the day before surgery showed no significant lymphatics. The incision was made on the anteromedial lymphatic bundle, where large lymphatics were present, albeit misaligned in a spiral condition. Despite revision, this first anastomosis did not show patency. Subsequently, another vessel was selected, where the procedure went smoothly.

Preoperative (ICG) evaluation the day before surgery



MRL imaging prior to surgery shows many lymphatics on the right side of the thigh compared to the left side.

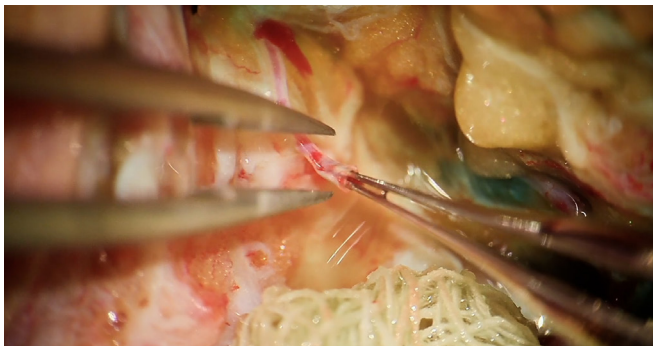
Preoperative ICG imaging shows pathologically stained lymphatics.

Intraoperative treatment

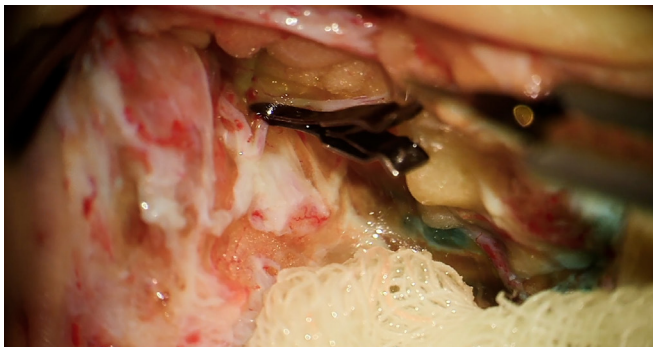
Starting the preparation with medical loupes. Then switching to the surgical microscope.

Tip for ZEISS PENTERO 800 S

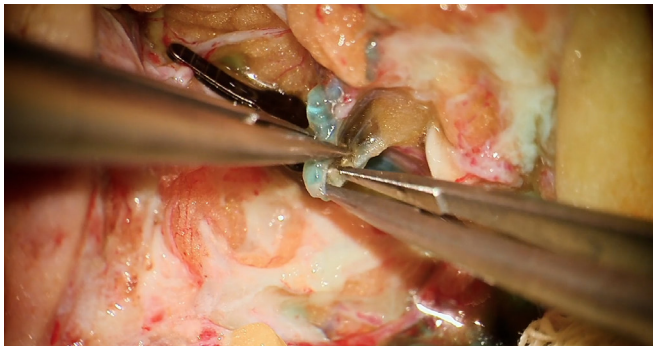
Optimal positioning and adjustments of the microscope are essential to reduce tremor.



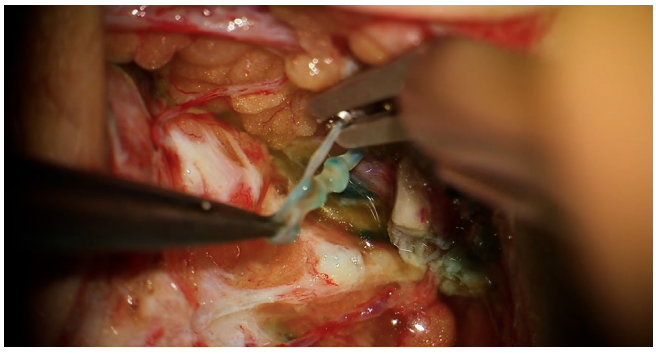
Exposing and preparing a very small venule. Removal of remaining blood using diluted heparin solution.



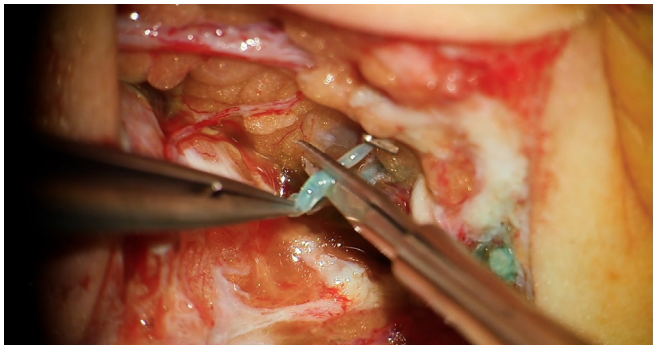
Temporary closing the vessel with an ACLAND® clamp.



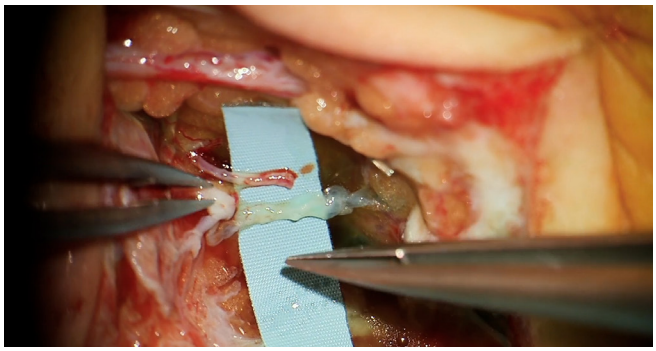
Preparing a lymphatic vessel. In this case of primary lymphedema, the vessel, well stained with Patent Blue, is pathological in a spiral shape. Removal of all surrounding tissue.



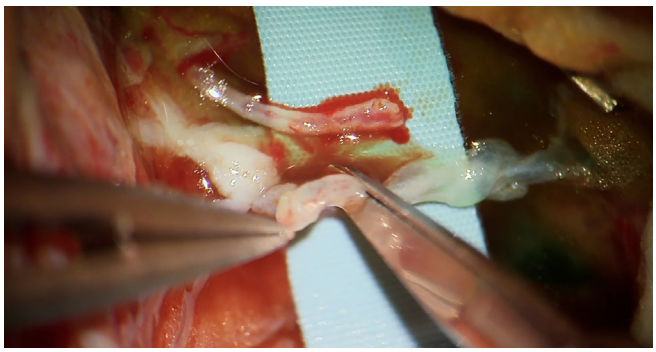
ACLAND clamp is removed and a clip is put on the vessel.



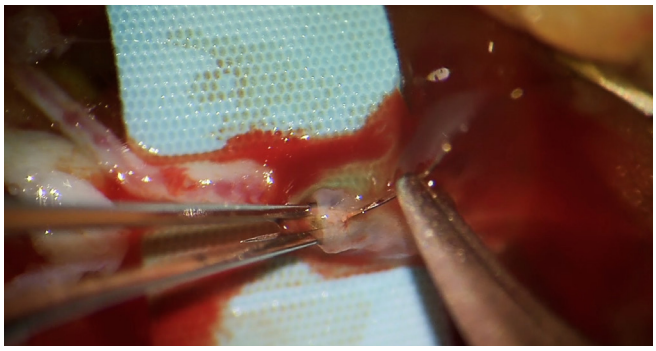
Cutting through the vessel with a sharp incision.



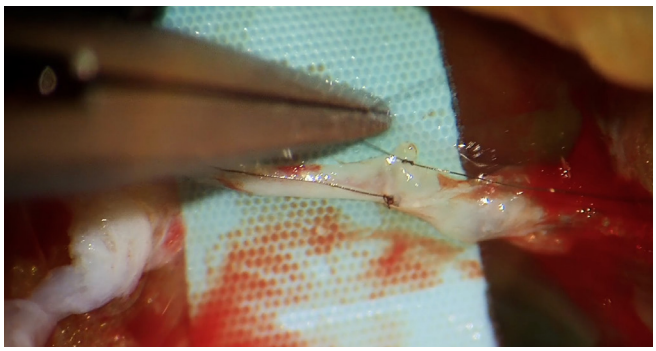
The background is inserted. The vessel still has the shape of a spiral, although all the surrounding tissue has been removed.



The vessels are shortened to avoid kinking. To get a clear cut, very sharp scissors are required.



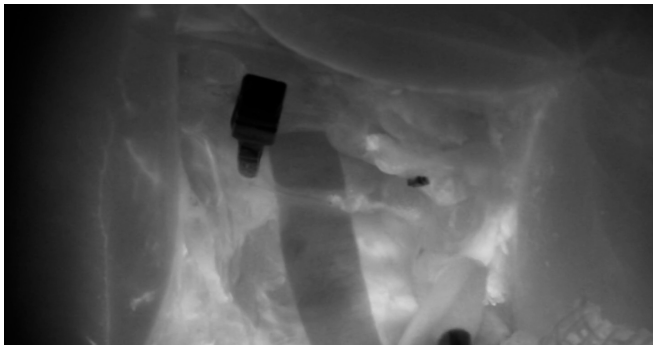
Using the dilator in order not to stitch the back wall of the vessel.



Suturing using high magnification. It seems that the size of both vessels matches very well.

Tip for ZEISS PENTERO 800 S

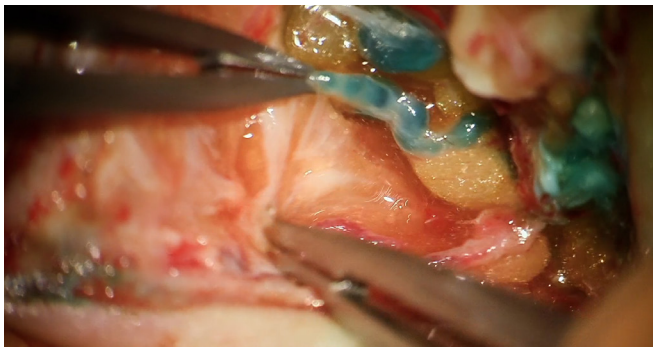
Use the Resolution Enhancer for magnification levels of more than 40×.



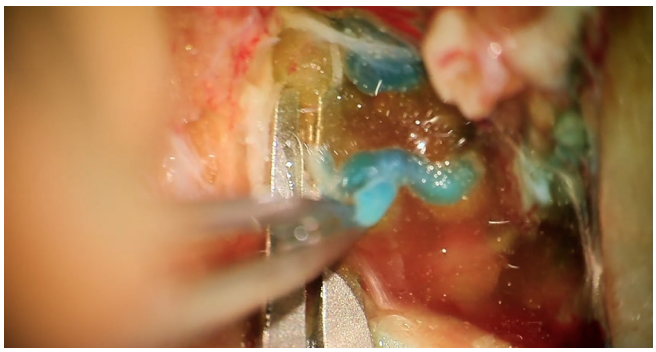
Intraoperative ICG check shows that the dye is not running into the venule, which means that this anastomosis is not patent – even after revision.

Tip for ZEISS PENTERO 800 S

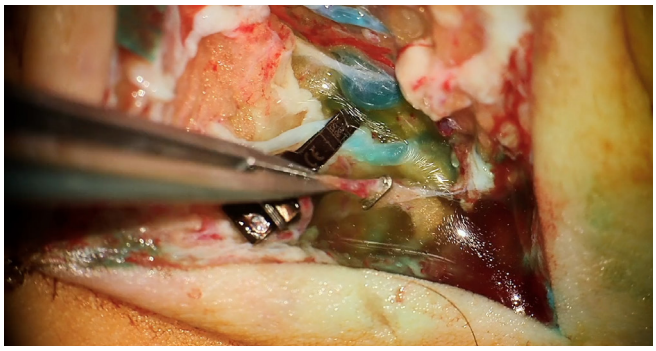
Use the microscope-integrated ICG imaging technology ZEISS INFRARED 800 to check vessels.



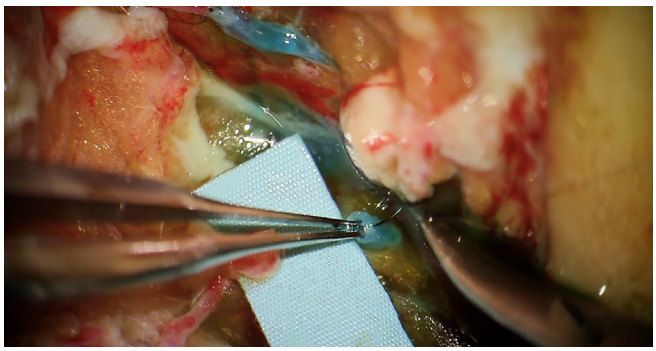
Selecting another vessel, that is also in a spiral shape. Then trying to remove all adhering tissue and widen the diameter of the vessel.



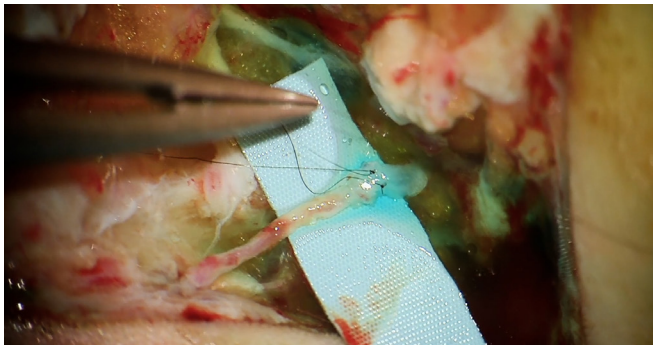
Attaching a clip.



Cutting the vessel and placing an ACLAND clamp. Lymphatic drainage is performed against resistance in order to expand the diameter of the vessel. Attachment of a clip on the distal part of the venule.



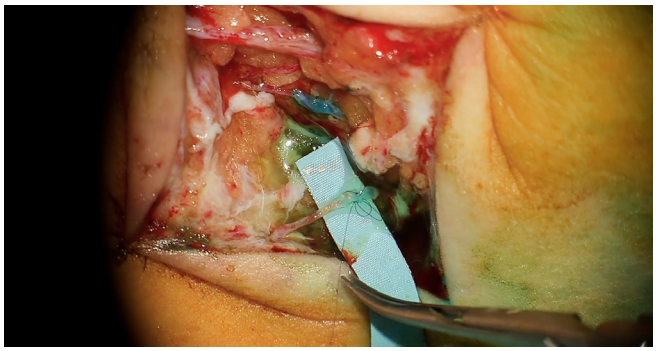
Positioning a background and using the dilator to avoid stitching the back wall prior to suturing vessels with good size match.



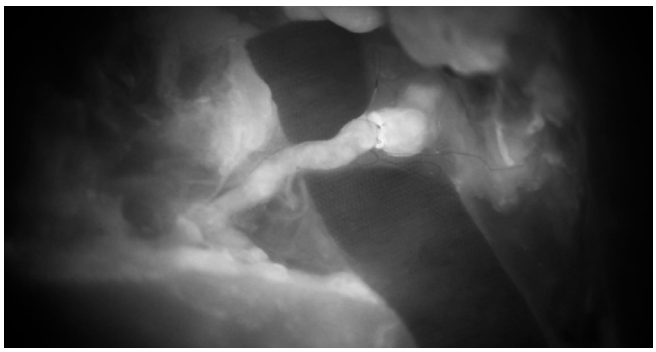
Switching between high and low zoom levels using the foot control panel helps to save time during suturing.

Tip for ZEISS PENTERO 800 S

Use the foot pedal to activate the ZoomMemory function hands-free.



Even very small gaps are closed by adding more knots to prevent leakage. Visual check of anastomosis shows Patent Blue is running from the vessel into the vein.



Flow and patency of the anastomosis are confirmed in the intraoperative ICG view.

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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