Thoracic duct reconstruction

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OPERATIVE WOUNDS OF THE THORACIC DUCT. REPORT OF A CASE WITH SUTURE OF THE DUCT.¹

BY HARVEY W. CUSHING, M.D.,

OF BALTIMORE,

RESIDENT SURGEON OF THE JOHNS HOPKINS HOSPITAL.

Annals of Surgery 1898





THE LANCET

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A MIRROR OF HOSPITAL OF PRACTICE, BRITISH AND FOREIGN. | VOLUME 162, ISSUE 4191, P1783-1784, DECEMBER 26, 1903

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL.

A CASE OF IMPLANTATION OF THE DIVIDED THORACIC DUCT INTO THE INTERNAL JUGULAR VEIN ; RECOVERY

E. Deanesly

Published: December 26, 1903 • DOI: https://doi.org/10.1016/S0140-6736(00)69927-0

A REVIEW OF THE SURGERY OF THE THORACIC DUCT BY J. KEITH ROSS

From the Brompton Hospital, London

direct control of the fistula, suture of the leaking mediastinal pleura, and supradiaphragmatic ligation of the thoracic duct.

The best method is to find the actual point of leakage and to ligate the duct on either side of the defect. This may not be possible, particularly in infants and small children, if the mediastinal tissues are extensively soaked in chyle or when there are multiple leaks. Under these circumstances it has been proved sufficient to suture the mediastinal pleura at the point or points where the chyle is leaking (Seaman, 1954; Randolph and Gross, 1957), or to ligate the main duct below.

Either of the first two techniques may be combined with ligation of the thoracic duct low in the chest, which alone has proved entirely effective in many instances in which no attempt has been made to gain direct control of the fistula (Klepser and Berry, 1954).

Re-implantation of the divided duct into a vein (Deanesly, 1903; Hodge and Bridges, 1948) and repair of the lacerated duct (Cushing, 1898) are complicated and unnecessary.

THORACIC DUCT FISTULA AS A THERAPEUTIC MEASURE

The deliberate making of a thoracic duct fistula in the neck, or lymphaticostomy, in the management of peritonitis is of historical interest only (Costain, 1922; Cooke, 1924). More recently,







Reconstruction of occluded thoracic duct for treatment of chylopericardium: A novel surgical therapy

Rowlens M. Melduni, MD,^a Jae K. Oh, MD,^a T. Jared Bunch, MD,^a Lawrence J. Sinak, MD,^a and Peter Gloviczki, MD,^b Rochester, Minn

Chylopericardium is an uncommon disease predominantly caused by trauma. Prolonged chyle depletion may result in nutritional, metabolic, and immunologic deficiencies due to loss of essential proteins, immunoglobulins, fat, vitamins, electrolytes, and water. Medical treatment includes a low-fat diet with medium-chain triglyceride restriction, cardiac support, diuretic medications, and drainage of the pericardial effusion. Conventional surgical therapy consists of pericardial fenestration and thoracic duct ligation. We report a case of massive secondary chylous pericardial effusion successfully treated with microsurgical lymphovenous anastomosis, reconnecting the occluded thoracic duct to the internal jugular vein. This case highlights features and management strategies of this perplexing clinical condition. (J Vasc Surg 2008;48:1600-2.)



Fig 2. The completed thoracic duct reanastomosis to left internal jugular vein is shown.

Strategy for TD reconstruction

Location of obstruction ...

neck, mid-chest, lower chest, abdomen

Availability of a vein in the vicinity ... direction of the flow, end to side, end to end

Patency of innominate vein, SVC, azygous vein, PV ... Any downstream issue?

CVP, LAP... which side should we connect?











Mitaka Microscope MM51

TD obstruction in the neck



Microvascular anastomosis coupler®







TD obstruction in the chest



Thoracic duct-to-vein anastomosis for the management of thoracic duct outflow obstruction in newborns and infants: a CASE series

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Is it possible to divert the TD to a low-pressure left sided system, such as a pulmonary vein in a patient with high CVP ?

Thoracic Duct-to-Pulmonary Vein Shunt in the Treatment of Experimental Right Heart Failure

By WILLIAM R. COLE, M.D., D.Sc., F.A.C.S., MARLYS HEARST WITTE, M.D.,

STEPHEN L. KASH, MALCOLM RODGER, M.D., VIRGIL R. BLEISCH, M.D.,

AND GERHARD H. MUELHEIMS, M.D.

SUMMARY

Elevated venous pressure in right heart failure leads not only to an increase in lymph formation but also to progressive resistance in the neck to the return of lymph to the circulation via the thoracic duct. Sequestration of fluid behind the failing heart tends to protect the circulation but at the same time leads to the clinical manifestations of heart failure.

The present study was performed on 40 dogs with combined tricuspid insufficiency and pulmonary stenosis. Thoracic duct lymph flow was greatly increased. Pressure was considerably greater in the systemic veins than in the pulmonary vein beyond the right heart obstruction. Lymph flow was substantially enhanced when the thoracic duct was connected to the lower pressure pulmonary veins. Furthermore, direct anastomosis of the thoracic duct to the pulmonary vein resulted in fall in systemic venous pressure, increase in renal excretion of salt and water, and reduction in ascites. These results indicate that alterations in the flow of thoracic duct lymph have important bearing on the manifestations and treatment of right heart failure.



- Former 26 weeker, BirthWeight 1.6 kg
- Broken PIC catheter was retained with the vascular lumen.
- It resulted in sepsis, respiratory failure, multicompartment effusions and anasarca
- Chronic thrombosis of the left internal jugular and brachiocephalic vein were seen

Postoperative Course

- Her clinical status improved quickly and all effusions had resolved by the 5th operative day.
- The patient was discharged home 12 weeks after the operations, on full enteral feedings and on no respiratory support
- The patency of the TD to PV anastomosis on postoperative day 8 by injecting ultrasound contrast in the lymphatic system was confirmed.
- No symptoms 14 months after surgery

Future implications for this procedure... for Fontan patients?

Fontan patients tend to develop lymphatic issues due to high CVP.

One potential solution for lymphatic issue is to divert TD to low pressure system (left side system) without causing desaturation.

Conclusion

TD reconstruction surgery is doable and can be an option for thoracic duct obstruction

It can be anastomosed to IJ, azygous vein or,

in the setting of TD occlusion with elevated CVP, creation of an anastomosis of the TD to the PV is a viable option.