Curbing chyle leaks

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In this issue of the *Journal*, a report by Delany and colleagues¹ describes the use of tissue plasminogen activator (tPA) to reestablish the patency of a clogged pericardial drain in a 16-month-old patient with chronic chylous drainage after cardiac surgery. Their patient underwent a repair of double-outlet right ventricle and had persistent chylous drainage. The chylous pericardial effusion increased in size in the presence of a 19F Blake drain and despite the institution of a low-fat diet. She then underwent a pericardial window procedure with placement of a 15F Jackson-Pratt drain (CardinalHealth, Dublin, Ohio) on postoperative day 25, but the pericardial effusion continued to increase while the drain output decreased. Therefore, tPA was instilled into the drain on postoperative day 30, which subsequently resulted in an increase in drainage with resolution of the pericardial effusion. The pericardial drain was removed 6 days later after tPA instillation.

Although there are several decades of experience in using tPA (or other serine proteases) for clogged pleural tubes and loculated pleural effusions, the instillation of tPA into a clogged pericardial drain for chylous effusion as described by Delany and colleagues is novel.¹⁻⁴ Chyle leaks after cardiac surgery in neonates and infants occur in up to 9% of cases.⁵ The exact incidence of clogged pericardial tubes secondary to chylous drainage after pediatric cardiac surgery is not known. The observation at our center is that the incidence of clogged pericardial drains secondary is low, occurring mostly in percutaneously placed small-bore pigtail catheters. Nevertheless, the use of tPA to reestablish the patency of clogged drains in the setting of chyle leak is important to eliminate fluid-filled spaces and promote apposition of mediastinal tissue planes important for healing (or scarring) that presumably leads to the cessation of the chyle leak.

This case also highlights the variability in approach to managing chyle leaks after pediatric cardiac surgery. At our center, we follow a clinical practice guideline that involves a medium-chain triglyceride (and low long-chain fatty acid) diet for low-volume chylothorax (<20 mL/kg/d) and a regimen of non per os (NPO), total parenteral nutrition, and possible thoracic duct ligation for high-volume

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Central Message

Treatment of chyle leaks after pediatric cardiac surgery is in need of innovation and standardization.

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chylothorax.⁶ Perhaps a trial of NPO would have benefitted this patient with persistent and enlarging pericardial effusion; one can speculate that a regimen of NPO in patients eliminates the chylous component of the drainage, decreases viscosity, and decreases the probability of drain clogging. Treating persistent, high-volume chyle leak with thoracic duct ligation also is effective, but the long-term effects of this procedure are unknown. Recently, we have undertaken an even more targeted approach to these patients by selective embolization of chyle performed by our interventional radiologists, thereby avoiding prolonged periods of NPO. The rate and durability of success of this approach remain to be seen. Yet another approach that one can postulate is the prophylactic application of fibrin glue laden with lymphangiogenesis-promoting agents (eg, recombinant vascular endothelial growth factor-C or sphingosine-1-phosphate^{7,8}) to areas of surgical dissection to aid in lymphatic repair and regeneration in patients at high risk of developing chyle leak after pediatric cardiac surgery.

Postoperative chyle leak is a well-recognized complication of pediatric cardiac surgery and carries significant morbidity and public health cost.⁹ The novel description supplied by Delany and colleagues¹ will assist in addressing one particular piece of the postoperative chyle leak problem. However, to make even a further impact in these affected patients, significantly more effort is needed from our field to formulate innovative and effective strategies for curbing chyle leaks.

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