

Conservative Management of Postoperative Chylothorax Using Somatostatin

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Chylothorax is a rare but serious postoperative complication of thoracic surgical procedures. We report the case of a 77-year-old man who underwent a coronary artery bypass procedure using a left internal mammary artery pedicle graft. A permanent pacemaker was required postoperatively. A persistent postoperative chylothorax developed necessitating continuous drainage and conservative management. Somatostatin was instituted when after 1 week this management failed to resolve the chylothorax. This led to rapid cessation of chyle production. Enteral feeding was reinstated without complication and surgical intervention was avoided.

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Chylothorax is a rare but well-recognized complication of general thoracic and cardiac procedures [1, 2]. Conservative therapy currently includes the use of a low-fat diet with medium chain triglycerides, or keeping the patient NPO with total parenteral nutrition. Both are combined with pleural drainage. Operation may be necessary if drainage persists despite conservative management. Often, by 1 week of conservative management it becomes evident whether or not surgery will be needed [1]. Timing of the operation depends on the amount and duration of drainage, but typically is recommended by 1 to 2 weeks if output remains greater than 1,000 mL/day [3]. The surgical approach needed will depend on the probable injury incurred at the time of the original operation.

In February 1999, a 77-year-old man underwent a triple coronary artery bypass procedure with a left internal mammary artery placed to the left anterior descending, a reversed saphenous vein graft to the posterior descending artery, and a reversed saphenous vein graft to an obtuse marginal branch. The operation was uneventful. The patient resumed a diabetic diet on postoperative day 2 at which time the mediastinal and left pleural chest tubes were removed. There was no chylous drainage noted at that time. He did have a preoperative diagnosis of sick sinus syndrome with persistent sinus bradycardia postoperatively. A permanent pacemaker was placed

postoperatively via the left subclavian vein on postoperative day 4. Chest x-ray at that time was unremarkable. He was discharged on postoperative day 8 to a transitional care facility for physical therapy and postoperative rehabilitation.

On postoperative day 18, the patient returned to clinic with complaints of progressive shortness of breath, anorexia, and fatigue. A chest x-ray revealed a large left pleural effusion. A thoracentesis was performed and the fluid was serosanguinous. A pigtail catheter was then placed to completely drain the effusion. After the lung fully expanded, the patient's respiratory symptoms improved markedly. He slowly resumed a diabetic diet with the pigtail catheter in place. At first, the chest tube drainage remained low after the initial effusion was drained. However on hospital day four, after tolerating a diet, the fluid character became milky with an increase in production to 900 mL per day for 2 days. The triglyceride level was 835 mg/dL. When the character of the fluid changed to chylous, the patient was made NPO and started on total parenteral nutrition on hospital day 5. After 24 hours of this therapy, the drainage fell to 300 to 400 mL per day and stabilized at this level for 6 days. This amount of drainage was felt to be too great to reabsorb if the chest tube was removed or diet resumed. As the patient appeared to be failing conservative therapy, the addition of somatostatin was considered. Somatostatin injections of 50 μ g subcutaneous every 8 hours was instituted on hospital day 12. This dose was based on the minimum dosing recommendations for treatment of a pancreatic fistula. As the patient is a diabetic, the decision was made to start at a low dose and monitor the drainage response as any effect on blood sugar levels. He required no change in his insulin regimen. Due to the immediate decrease in drainage, the dose was not increased. By hospital day 13, the drainage was at 140 mL/day, then zero by hospital day 14. The total parenteral nutrition was discontinued, and a diabetic diet resumed on hospital day 15. There was no increase in chylous drainage and after 4 days of no output, despite resuming a complete diet, the somatostatin was discontinued. The time course of somatostatin use was based on the patient's response and concern that, as he resumed a full diet, the drainage may recur. The catheter was then removed and a follow-up chest x-ray confirmed no reaccumulation of fluid. The patient was discharged home on hospital day 19 without surgical intervention. The timetable for resorting to surgical intervention for failed conservative management is after 7 to 10 days. After this time, the likelihood of resolution without surgery is low [1].

Comment

Chylothorax after myocardial revascularization procedures is rare, but does occur particularly when a left internal mammary artery graft is used [2]. It is due most often to branch avulsion rather than complete transection of the thoracic duct. This is also true of duct injuries following central line placement. In a review of case

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reports documented in the literature, half were successfully managed by conservative treatment and half required reoperation [2]. The occurrence of thoracic duct injury after central line placement is also rare but does occur [4]. In our patient, given that the drainage was only moderate in amount and the rather late presentation of the effusion, the likely injury was of a branch of the thoracic duct rather than complete transection at the time of left internal mammary artery harvest or placement of the pacemaker leads. The time course appears most consistent with injury at the time of the subclavian access for the pacemaker lead, as this was performed later in his hospital stay. The late presentation to clinic may be due to the fact that as he became more dyspneic, he also became anorexic and slowed the fluid accumulation. The drainage then increased and became chylous as he felt better and resumed a complete diet.

Traditionally, the initial management of chylothorax is conservative. Surgical treatment is considered only when the output remains high (> 1,000 cc/day) despite this management or if drainage or lung expansion is incomplete. The most effective surgical approach is mass ligation of the thoracic duct at the level of the diaphragm, but at best this has an 80% success rate [1].

The addition of somatostatin to the conservative management created a dramatic response. Somatostatin is a peptide that acts as a neurohormone as well as a paracrine agent. It inhibits the pituitary's secretion of thyroid-stimulating hormone and growth hormone. It inhibits vasoactive intestinal peptide, gastrin, and motilin in the gastrointestinal tract. It also inhibits secretion of insulin, glucagon, and somatostatin from the pancreas. Yet, somatostatin's effectiveness may be due to its ability to reduce gastric, intestinal, and pancreatic secretions, decrease hepatic venous pressure, and reduce splanchnic blood flow [5]. For our patient, there was a marked decrease in chyle production within 24 hours of starting therapy. This permitted resumption of a diet without restriction within days of instituting the somatostatin. There are only two other case reports of using somatostatin in the treatment of postoperative chylothorax [6, 7]. In these patients, the somatostatin had a similar effect within 24 hours. There was no increase in drainage when diet was resumed. No reoperation was required even though each case was showing signs of failing conservative management due to persistent drainage.

The use of somatostatin as an adjunct to the conservative management of chylothorax is a relatively new concept. It may be of particular benefit in borderline situations of moderate drainage. It may not change the clinical course if the drainage remains greater than 1,000 cc/day, and these patients may still require surgical intervention. However, as there are no apparent complications noted with the use of somatostatin, it is a worthwhile adjunct to conservative management. The rapid response in our patient and the previous case reports make this an appealing therapeutic addition. Although further studies are indicated to confirm this observation, the immediate use of somatostatin in conjunction with keeping patients NPO and on total

parenteral nutrition is recommended. The combination should increase the effectiveness of conservative management, and more clearly delineate those patients who will require surgical intervention due to persistent high output.

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Staged Repair of Acute Type I Aortic Dissection and Coarctation in Pregnancy

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A 29-year-old gravid female presented at 22 weeks gestation with an acute Type I aortic dissection and coarctation of the aorta. She underwent emergent repair of her aortic dissection using cardiopulmonary bypass and hypothermia. At 25 weeks gestation, she underwent repair of her coarctation of the aorta. The patient had a cesarean delivery of a viable, normal male infant at 39 weeks gestation.

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Acute aortic dissection in pregnant women is often associated with severe hypertension and pre-eclampsia. In addition, congenital abnormalities, such as

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