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Case report

A conservative approach to a thoracic duct injury caused by left subclavian vein catheterization

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ABSTRACT

Thoracic duct injury is a rare complication of left subclavian vein catheterization. A significant injury could lead to chylothorax, a condition with high mortality rate if not treated. It is diagnosed with lymphography or by laboratory tests of pleural fluid aspirate. A 51 year old Caucasian male with a history of unregulated hypertension presented to our Emergency department (ED) with anginous symptoms and increased serum creatinine level. After the placement of a temporary central venous catheter for hemodialysis in left subclavian vein, he developed lymph leakage on puncture site beside the catheter, at drainage rate of 75 ml/h. In the absence of more serious clinical symptoms, conservative treatment with close patient monitoring and diet changes was chosen, rather than more invasive treatment options.

1. Introduction

Thoracic duct injury is a rare complication of left subclavian vein catheterization. This complication is more often in case of left jugular vein catheterization [1]. A significant injury could lead to chylothorax, a condition with high mortality rate if not treated. Thoracic duct injury is very rare, but incidence increases with variations of duct anatomy seen in more than one third of general population [2]. A surgical ligation of a thoracic duct with developed chylothorax below the site of fistula has been reported as a solution [3]. Embolization of the thoracic duct or fluoroscopic percutaneous interventional technique has been shown to be a much safer method [4,5].

A basic conservative treatment is adequate fluid and electrolyte replacement together with appropriate nutrition. Patient is monitored for two or three weeks especially when chylothorax is absent. It is diagnosed with lymphography or by laboratory tests of pleural fluid aspirate [6].

2. Case presentation

A 51 year old Caucasian male with failing transplanted kidney presented to the Emergency department (ED) with anginous symptoms. He was on hemodialysis from 1982 due to of vesicourethral nephropathy, had cadaveric kidney transplantation twice, in 1984 and 2006. In 2011 an arterio-venous fistula on the right arm was created and on his left arm in 2013, both subsequently failed. After admission anginous symptoms progressed and he underwent diagnostic coronarography and a temporary central venous catheter was placed in left subclavian vein for hemodialysis. Central venous catheter was placed by an experienced practitioner using ultrasound guidance. The subclavian vein was cannulated and guidewire and catheter were inserted without any difficulties while the patient was in the supine position. Chest pain were treated conservatively because acute myocardial infarction was out ruled due to non-significant findings on coronarography and myocardial hypocontractility of probably earlier date with normal cardiac enzymes. On the second day after the introduction of central venous catheter, a thick yellowish fluid started to drain from the puncture site along the catheter, at drainage rate of 75 ml/h. The yellowish fluid was collected by the drainage bag with the anti-reflux chamber. Chest X-ray and computed tomography were performed immediately after catheter insertion and three days later, with signs of mild left pleural effusion, which was not seen on X-ray performed on admission day. Computed tomography venography was performed, but showed no communication between venous lumen and adjacent structures with normal position of the catheter tip in superior vena cava and with mild left pleural effusion so analysis of the pleural fluid has not been performed. The fluid from the puncture site was taken for analysis twice and identified as lymph in both cases. Unfortunately, lymphangiography could not be performed in the Radiology department. Perma-

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nent dialysis catheter was placed in right femoral vein. We chose conservative treatment with adequate fluid and electrolyte replacement and low fat diet for 7 days. After first 10 days with significant drainage along the catheter, the amount of fluid spontaneously started decreasing and at the 21st day, when the secretion completely stopped, catheter was removed. The chest X-rays were completely normal in the following days and the former catheter puncture site was now clean with no secretion whatsoever.

Given his complete recovery and no presence of lymph secretion after three weeks, the diagnosis of thoracic duct injury due to left subclavian vein catheter insertion was confirmed, with conservative spontaneous recovery.

3. Discussion

Thoracic duct, wide only 2–6 mm, transports lymph from the lower part of the body and mixing with fluids from intestines form a mixture called chyle and pours into venous circulation by sometimes multiple branches. Its variations are seen in more than one third of the population. Cisterna chyli is present in only 50% of humans, when absent, there are 2 or more lymph ducts. Clouse relationship with other structures leads of injury during operations, a main cause of traumatic duct injury. Other causes as malignancies and coronary artery bypass are not so common, especially injuries during catheter insertions (<1% of cases). Periprocedural central venous catheter complications are mostly related to pneumo or hematothorax, vascular injury and the catheter tip malposition and very rarely thoracic duct injury which is similar with our experiences. The rate of these complications is higher in patients with prior temporary or permanent central venous catheters on hemodialysis. Patients with chylothorax manifest with onsets of pleuritic pain or dyspnea caused by pleural effusions which can also be absent in cases with low flow chylothorax and manifest only as unspecific pleural effusions on chest X-rays [7].

The fluid analysis is characterized as increased triglycerides level and normal cholesterol. The management of chyle fistulas or drainage could be either conservative or operative. Decision of treatment solely depends on the drainage volume and patients symptoms [8]. Conservative treatment is suggested in cases of low flow drainage for a couple of weeks which includes parenteral nutrition or oral feeding on special diets with low fat and replacement of fluids and electrolytes [9]. Surgical intervention is needed in cases with high flow drainage or inefficiency of conservative treatment for a couple of weeks. Open thoracothomy or video assisted thoracoscopic surgery are largely used with high incidence of post ligation complications and sometimes inability to indentify thoracic duct or leak. Pleurodesis and usage of fibrin glue during thoracoscopy are described as useful second options [10]. Other available alternative is percutaneous thoracic duct embolization by interventional radiologists [11].

The presented case is interesting for two reasons: unusual presentation without chylothorax and with significant lymph drainage only along catheter puncture site and spontaneous recovery within two weeks.

The events that led to the lymph leakage only along catheter and without chylothorax formation remains unclear. Fortunately, lymph leakage decreased during next few weeks and there was no need for any invasive treatment.

4. Conclusion

Conservative treatment of lymph leakage, in absence of serious clinical symptoms, with patient monitoring and diet changes has been shown more preferable than the invasive approach, although current data are insufficient to definitely confirm this theory.

Conflict of interest statement

There are no conflict of interest.

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References

[1] Kwon SS, Falk A, Mitty HA, et al. Thoracic duct injury associated with left vein catheterization: anatomic considerations. J Vasc Interv Radiol 2002;13:337–9.
[2] Skandalakis JE, Skandalakis LJ, Skandalakis PN. Anatomy of the lymphatics. Surg Oncol Clin N Am 2007;16:1–16.
[3] Maldonado F, Cartin-Ceba R, Hawkins FJ, Ryu JH. Medical and surgical management of chylothorax and associated outcomes. Am J Med Sci 2010;339:314–8.
[4] Cope C, Kaiser L. Management of unremitting chylothorax by percutaneous embolization and blockage of retroperitoneal lymphatic vessels in 42 patients. J Vasc Interv Radiol 2002;13:1139–48.
[5] Anestis N, Farazi-Chongouki C, Pougouras I, et al. Thoracic duct injury due to left subclavicular vein catheterization: a new conservative approach to a chyle fistula using biological glue. Int J Surg Case Rep 2012;3:330–2.
[6] McGrath EE, Blades Z, Anderson PB. Chylothorax: aetiology, diagnosis and therapeutic options. Respir Med 2010;105:1–8.
[7] Ryu JH, Tomassetti S, Maldonado F. Update on uncommon pleural effusions. Respirology 2011;16:238–43.
[8] Schild HH, Strassburg CP, Welz A, Kalff J. Treatment options in patients with chylothorax. Dtsch Arztebl Int 2013;110(48):819–26.
[9] Nair SK, Petko M, Hayward MP. Aetiology and management of chylothorax in adults. Eur J Cardiothorac Surg 2007;32:362–9.
[10] Inderbitzi R, Krebs T, Stirneman T. Treatment of postoperative chylothorax by fibrin glue application under thoracoscopic view with the use of a local anesthetic. J Thorac Cardiovasc Surg 1994;104:209–10.
[11] Cope C. Management of chylothorax via percutaneous embolisation. Curr Opin Pulm Med 2004;10:311–4.