Bilateral chylothorax following left supraclavicular lymph node dissection for breast cancer: one case report and literature review

De-Juan Yang, Guo-Sheng Ren and Xiao-Yi Wang

Abstract

Chylothorax is a rare complication of neck dissection, and bilateral chylothorax is even rarer. However, both are potentially serious and sometimes life-threatening, especially those that are associated with left neck dissection for head and neck neoplasms. We report one case of bilateral chylothorax following left supraclavicular dissection for breast cancer. This case was treated successfully with a new conservative management approach.

Key words Bilateral chylothorax, treatment, neck dissection, supraclavicular, breast cancer

Case Report

A 43-year-old woman presented with a 3-year history of a left-sided palpable breast mass. Physical examination revealed a 15 cm × 15 cm lump, fixed, invading the skin, accompanied with left supraclavicular lymphadenectasis. Results of chest X-ray, ventral ultrasonography, radioisotope bony scanning, and nuclear magnetic resonance imaging (MRI) of the head did not show distant metastasis. The pathologic diagnosis via core biopsy was adenocarcinoma, and clinical stage was IIIC (T4N3M0). The patient underwent 4 cycles of neoadjuvant chemotherapy, and therefore the mass was reduced to 25% of its original size (partial response). Radical mastectomy and left supraclavicular lymph node dissection were then performed.

Chylous leakage is a common complication following neck dissection. However, postoperative chylothorax is uncommon, and bilateral chylothorax is even rarer. This condition may cause severe respiratory, metabolic, and immunologic dysfunctions and can even be fatal. Currently, there are no reported cases of bilateral chylothorax following neck dissection for breast cancer in the literature. Herein, we report a case of bilateral chylothorax following left supraclavicular dissection for breast cancer, which was treated successfully using a novel conservative management strategy.

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involved insertion of bilateral pigtail catheters into the thoracic cavity, total parenteral nutrition with total enteric rest, and administration of somatostatin (250 µg/h) by continuous intravenous drip on the basis of the review of literature. On the 12th day postoperation, the patient achieved complete remission of dyspnea and chest discomfort; 970 mL of chyle-like liquid was aspirated intermittently from bilateral pleural spaces. A repeated chest X-ray showed no evidence of residual effusions (Figure 1C). Thus, the drainage tubes were removed, and the patient was started on a low fat and protein diet for 3 days before resuming a regular diet. On the 15th day post-operation, the patient had recovered completely.

Discussion

Bilateral chylothorax is a rare complication that results from injury to the thoracic duct or one of its branches following neck dissection. We searched the English-language literature through PubMed and found 26 cases of bilateral chylothorax reported between 1951 and 2011[9-29]. We analyzed the primary diseases, treatment, and prognosis of bilateral chylothorax. The results showed that the majority of bilateral chylothorax cases followed neck dissection associated with head and neck cancers, such as thyroid cancer, laryngocarcinoma, and tongue cancer (Table 1). However, none of the reported cases described breast cancer as a cause for bilateral chylothorax.

The majority of injuries to the thoracic duct cause merely chylous leakage; chylothorax, especially bilateral, is rare. Milky fluid suggests a chylous effusion, but the absence of a milky appearance does not preclude chylothorax, especially if the patient is fasting or on a low-fat diet. Biochemical analysis of the fluid should be the initial diagnostic test, with a triglyceride concentration greater than 1,100 mg/L confirming the diagnosis[30]. When the triglyceride level is between 550 and 1,100 mg/L, a lipoprotein analysis is indicated to detect chylomicrons, whereas a triglyceride level less than 500 mg/L has no more than a 5% chance of being chylous[30]. Clinically, low-output chylothorax (<500 mL/day) could be treated using a conservative approach, such as drainage and a low-fat diet. High-output chylothorax (>500 mL/day) could cause a fluid and electrolyte imbalance and a loss of nutrients, and it can even be fatal. Thus, high-output chylothorax requires surgical intervention[31]. However, from the literature we reviewed, only 2 cases were treated with surgery[22,23], whereas the remaining 24 cases were treated conservatively and recovered at length.

In this case, we performed an emergency operation to ligate the fistula on the second day postoperation, when the chylous leakage reached 1,600 mL in volume. Based on our clinical experience, postoperative adhesions develop by 3 days postoperation, making surgical intervention for chylous leakage a challenge. Although the surgery ceased the neck leakage, bilateral chylothorax was confirmed 4 days after operation. To treat this condition, we prefer to follow a conservative management plan rather than perform additional surgeries, unless the conservative approach is insufficient. Here, we chose nonsurgical treatments for the patient, including drainage, total parenteral nutrition with total enteric rest, continuous intravenous infusion of somatostatin (250 µg/h), and intermittent thoracocentesis for aspirating effusion, and the patient was cured.

Our report also supports that the use of somatostatin may be a new conservative therapeutic approach. The exact mechanism of action of this neurohormonal and panacrine agent remains unknown. It may reduce gastrointestinal chyle production by decreasing splanchnic blood flow and decreasing gastric, biliary, pancreatic, and intestinal secretions[28].

Taken together, our results and the results described in the previous literature suggest that conservative management is an effective treatment for bilateral chylothorax following neck dissection. Our report shows that the use of somatostatin may be a new
conservative therapeutic approach.

References

[1] Recht A, Pierce SM, Abner A, et al. Regional nodal failure after conservative surgery and radiotherapy for early-stage breast carcinoma. J Clin Oncol, 1991;9:988–996.

[2] Fentiman IS, Lavelle MA, Caplan D, et al. The significance of supraclavicular fossa node recurrence after radical mastectomy. Cancer, 1986;57:908–910.

[3] Kiricuta IC, Willner J, Kolbl O, et al. The prognostic significance of the supraclavicular lymph node metastases in breast cancer patients. Int J Radiat Oncol Biol Phys, 1994;28:387–393.

[4] van der Sangen MJ, Coebergh JW, Roumen RM, et al. Detection, treatment, and outcome of isolated supraclavicular recurrence in 42 patients with invasive breast carcinoma. Cancer, 2003;98:11–17.

[5] Singletary SE, Allred C, Ashley P, et al. Revision of the American Joint Committee on Cancer staging system for breast cancer. J Clin Oncol, 2002;20:3628–3636.

[6] Chen SC, CHang HK, Lin YC, et al. Prognosis of breast cancer after supravacuicular lymph node metastasis: not a distant metastasis. Ann Surg Oncol, 2006;13:1457–1465.

[7] Huang EH, Tucker SL, Strom EA, et al. Predictors of locoregional recurrence in patients with locally advanced breast cancer treated with neoadjuvant chemotherapy, mastectomy, and radiotherapy. Int J Radiat Oncol Biol Phys, 2005;62:351–357.

[8] Park HJ, Shin KH, Cho KH, et al. Outcomes of positron emission tomography-staged clinical N3 breast cancer treated with neoadjuvant chemotherapy, surgery, and radiotherapy. Int J Radiat Oncol Biol Phys, 2011;81:689–695.

[9] Frazell EL, Harrold CC, Rasmussen L. Bilateral Chyalothorax: an unusual complication of radical neck dissection. J Laryngol Otol, 1976;90:967–970.

[10] Saraceno CA, Farrir RT. Bilateral chylothorax. Rare complication of neck dissection. Arch Otolaryngol, 1981;107:497–499.

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[12] Har-EI G, Segal K, Sidi J. Bilateral chylothorax complicating radical neck dissection: report of a case with no concurrent external chylous leakage. Head Neck Surg, 1985, 7:225–230.

[13] Ng RS, Kerbavaz RJ, Hilsinger RL. Bilateral chylothorax from radical neck dissection. Otolaryngol Head Neck Surg, 1985, 93:814–817.

[14] Pace-Balzan A, Moriarty B. Bilateral chylothorax following left radical neck dissection (case report). J Laryngol Otol, 1988, 102:288–290.

[15] Oi K, Haraguchi N, Machida S. Dyspnea resulting from accumulation of pleural effusion after radical neck dissection. A case report. Oral Surg Oral Med Oral Pathol, 1989, 67:258–261.

[16] Biurrun O, Sabater F, Traserra J. Bilateral chylothorax after radical neck dissection. Apropos of a case. Rev Laryngol Otol Rhinol (Bord), 1992, 113:111–113. [In French]

[17] Jabbar AS, al-Abdakareem A. Bilateral chylothorax following neck dissection. Head Neck, 1995, 17:69–72.

[18] Gregor RT. Management of chyle fistulization in association with neck dissection. Otolaryngol Head Neck Surg, 2000, 122:434–439.

[19] Al-Sebein H, Sadeghi N, Al-Dhahri. S. Bilateral chylothorax following neck dissection: a new method of treatment. Ann Otol Rhinol Laryngol, 2001, 110:381–384.

[20] Jortay A, Bisschop P. Bilateral chylothorax after left radical neck dissection. Acta Otorhinolaryngol Belg, 2001, 55:285–289.

[21] Kamasaki N, Ikeda H, Wang ZL, et al. Bilateral chylothorax following radical neck dissection. Int J Oral Maxillofac Surg, 2003, 32:91–93.

[22] Busquets JM, Rullan PJ, Trinidad-Pinedo J. Bilateral chylothorax after neck dissection. Otolaryngol Head Neck Surg, 2004, 130:492–495.

[23] Srikumar S, Newton JR, Westin TA. Bilateral chylothorax following left-sided radical neck dissection. J Laryngol Otol, 2006, 120:705–707.

[24] Tsukahara K, Kawabata K, Mitani H, et al. Three cases of bilateral chylothorax developing after neck dissection. Auris Nasus Largnx, 2007, 34:573–576.

[25] Bae JS, Song BJ, Kim MR, et al. Bilateral chylothoraces without chyle leakage after left-sided neck dissection for thyroid cancer: report of two cases. Surg Today, 2007, 37:652–655.

[26] Han C, Guo L, Wang KJ, et al. Bilateral chylothorax following neck dissection for thyroid cancer. Int J Oral Maxillofac Surg, 2009, 38:1119–1122.

[27] AL-Khudaris, Vitale L, Ghanem T, et al. Recurrent high output chyle fistula post neck dissection resolusion with conservative management. Laryngoscope, 2010, 120:S141.

[28] Rodier JF, Volkmar PP, Bodin F, et al. Thoracic duct fistula after thyroid cancer surgery: towards a new treatment? Case Rep Oncol, 2011, 4:255–259.

[29] Tian W, Li ZY, Wang P, et al. Chylothorax after neck dissection for thyroid carcinomas: report of three cases. Surg Today, 2012, 42:89–92.

[30] Valentine VG, Raffin TA. The management of chylothorax. Chest, 1992, 102:586–591.

[31] Binkert CA, Yucel EK, Davison BD, et al. Percutaneous treatment of high-output chylothorax with embolization or needle disruption technique. J Vasc Interv Radiol, 2005, 16:1257–1262.
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