Chyle leak following an axillary sentinel lymph node biopsy for breast cancer in a patient with superior vena caval thrombosis – a case report and review of the literature

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ABSTRACT

Chyle leak is a very rare complication following an axillary lymph node dissection. We report a case of chyle leak following sentinel lymph node biopsy in a patient with breast cancer with superior vena caval thrombosis. To our knowledge, this is the first case report of chyle leakage following axillary sentinel lymph node biopsy. We describe the aetiology, prevention and treatment strategy that can be adopted in these patients.

KEYWORDS

Chyle – Breast cancer – Sentinel lymph node biopsy – Superior vena cava thrombosis

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Introduction

Chyle fistula is a very rare complication following an axillary lymph node dissection; the reported incidence ranges from 0.36% to 0.84% of axillary lymph node dissections.¹ We report a case of chyle leak that occurred following axillary sentinel lymph node biopsy for breast cancer in a patient with superior vena caval (SVC) thrombosis.

Case history

A 41-year-old woman presented with a painful left breast lump with no sign of overlying skin inflammation. The breast ultrasound showed a 6-cm × 5.5-cm solid mass in the upper outer quadrant of left breast with an enlarged left axillary lymph node. Patient declined to have a mammogram as her breast was quite painful. The ultrasound-guided biopsy of the left breast mass showed grade 2 invasive ductal cancer while core biopsy of the enlarged axillary lymph node showed reactive changes. The cancer was estrogen receptor, progesterone receptor and human epidermal growth factor receptor negative. The patient was advised neoadjuvant chemotherapy followed by surgery. The chemotherapy included four cycles of fluorouracil, epirubicin, and cyclophosphamide and four cycles of taxotere.

Three weeks following chemotherapy and just before surgery, the patient developed swelling of both the upper limbs and face. Computed tomography (CT) of the neck and thorax showed deep vein thrombosis in the superior vena cava (SVC) and both brachiocephalic veins (Fig 1). She was commenced on anticoagulation with a therapeutic dose of low molecular weight heparin 100 mg daily. CT of the thorax was repeated after one month. This showed resolution of the thrombus in both brachiocephalic veins with minimal change in SVC thrombosis.

We decided to proceed with surgery, namely left mastectomy and sentinel lymph node biopsy using a dual technique of radioisotope and patent blue dye injection. The intraoperative course was uneventful. The postoperative drainage output was initially serosanguinous but on the second postoperative day it became milky in colour (Fig 2). The laboratory analysis of the fluid showed a triglyceride level of 10.9 mmol/l, which confirmed the diagnosis of chyle in the drain. We discussed the diagnosis with the patient and opted to treat this conservatively.

The volume of chyle in the drain gradually came down over the next four weeks from 180 ml/day to 100 ml/day. However, during week five, the drain inadvertently came out. As there was no sign of infection or metabolic disturbance, we continued with conservative management. Two

Figure 1 Computed tomography of the neck and thorax; the red arrow shows a thrombus in the superior vena cava and both brachiocephalic veins

Figure 2 Postoperative day 2; the milk-like fluid in the drain is clinically consistent with chyle

percutaneous aspirations were performed for the subcutaneous chyle collection at five-day intervals, yielding 100 ml and 50 ml respectively. After the sixth week, no more collection was observed.

Postoperative histology showed a good partial response from chemotherapy; grade 3 invasive cancer with high grade ductal carcinoma in situ measuring 20 mm, with clear margins and no vascular invasion. All four sentinel lymph nodes were negative.

Discussion

Chyle leak following axillary dissection is an unexpected postoperative complication occurring in 0.36–0.84% of patients. On reviewing the literature, most of the reported cases were on the left side, with only three cases reported

from the right side.¹ The majority of patients presented within the first three postoperative days.¹ According to some authors, the left axillary chyle leak can be due to injury to the aberrant branches of thoracic duct that drains the left axilla.¹ Sing *et al.*² suggested that axillary chyle leak can also occur due to reflux of chyle from injured branches of subclavian lymphatic trunk that has to drain its valveless termination into the thoracic duct. In our patient, we believe that the presence of SVC thrombosis caused impedance of drainage of chyle into the venous system resulting in development of high pressure in the thoracic duct, leading to the retrograde flow of chyle and dilatation of the normally tiny lymphatics associated with the sentinel lymph nodes (Fig 3). Division of these dilated lymphatics at the time of sentinel lymph node biopsy, coupled with retrograde flow, resulted in leakage of the chyle.

Chyle leak can be suspected clinically from the milky appearance of the drain output and can be confirmed by a biochemical assay of the fluid. A triglyceride level of more than 1.24 mmol/l or the presence of chylomicrons in the drained fluid is diagnostic of chyle.^{1,5} In the published cases, chyle leak occurred mainly following level 2 axillary clearance,¹ possibly due to the close relation of subclavian lymphatic duct and its tributaries to Berg's level II lymph node dissection.⁴ To the best of our knowledge, this is the first reported case of chyle leak following an axillary sentinel lymph node biopsy.

As there are no definite risk factors to predict injury to the lymphatic trunks during axillary surgery preoperatively or ways to identify injury intraoperatively, Chan *et al.*⁵ has recommended that in patients with massively enlarged axillary nodes, careful dissection and ligation of the tissue during axillary clearance might prevent this complication. We suggest that in a patient with SVC thrombosis or obstruction requiring sentinel lymph node biopsy or axillary clearance, careful diathermy dissection to completely obliterate the lymphatics should be performed to prevent this complication. Consideration should also be given to ligating the lymphatic tissue near the hilum of the node if the blue lymphatic channels are clearly visible during sentinel lymph node biopsy.

Chyle leak can be treated conservatively with dietary advice and monitoring of the drain output. However, Nakajima *et al.*⁶ successfully treated four patients with no dietary restrictions and removal of the drain by seventh day with percutaneous aspiration if there was any development of collection of chyle.⁵ Surgical exploration is recommended in extremely high output fistula (more than 2 litres/day) or failure of several days of conservative treatment with high fistula output (more than 500–600 ml/24 hours) or to avoid delay in adjuvant treatment like chemotherapy or radiotherapy.⁴

The volume of chyle in the drain of our patient gradually came down over four weeks from 180 ml/day to 100 ml/day. The drain inadvertently came out in the fifth week. After five days, we aspirated 100 ml of chyle. A second aspiration was required five days later obtaining another 50 ml of chyle. After the sixth week, no further collection was observed. This supports the view of Nakajima *et al.*⁶ who removed

drains by the seventh day, followed by percutaneous aspiration if necessary. The tamponade effect of the collected chyle could have also contributed to the obliteration of the lymphatics.

Octreotide has been documented to be beneficial in patients with neck and thoracic chyle fistula.³ Some authors have reported promising results regarding its role in chyle leakage following axillary surgery but at present, the evidence is very limited.^{1,4,5}

Conclusion

Chyle leak can occur after sentinel lymph node biopsy in a patient with SVC thrombosis. Careful diathermy dissection and obliteration of the lymphatics should be performed to prevent this complication. Most patients can be managed conservatively. Surgical intervention should only be considered if conservative treatment fails or to avoid delay in adjuvant oncological treatments.

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