

Chyle Leak Following Axillary Lymph Node Clearance – a Benign Complication: Review of the Literature

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Keywords

Breast cancer · Complication · Lymph node dissection · Parenteral nutrition · Breast neoplasm · Axillary clearance

Summary

Case Report: An 82-year-old patient underwent a mastectomy and axillary lymph node clearance for a large multicentric lobular cancer of the left breast. On day 11 after her operation, white viscous fluid was noted in her axillary drain. **Methods:** We analysed case reports in the literature, noting the interval between surgery and diagnosis of chyle, the duration of the chyle leak, the volume of chyle during the first 24 h, the median volume and the administered treatment. **Results:** 25 cases were reported in 13 publications. Our case was unusual in that chyle was noted 11 days after surgery. In most cases, chyle leakage subsides spontaneously by simply leaving the drain in situ. **Conclusions:** A conservative observant approach appears appropriate in most cases. Only for persistent and large-volume leaks, dietary intervention (medium-chain lipid diet, nil by mouth, total parenteral nutrition) is justified. Surgery with re-exploration of the axilla and oversewing of the chyle duct can be used as the last reserve for persistent chyle leaks.

Schlüsselwörter

Brustkrebs · Komplikation · Lymphknotenausräumung · Ernährung, parenterale · Lymphknotenausräumung, axilläre · Chylusfistel

Zusammenfassung

Fallbericht: Eine 82-jährige Frau unterzog sich einer Mastektomie und axillären Lymphknotenausräumung wegen eines fortgeschrittenen lobulären Karzinoms der linken Brust. Am 11. postoperativen Tag wurde eine weiße visköse Flüssigkeit in der axillären Drainage festgestellt. **Methoden:** Wir analysierten Fallberichte in der Literatur im Hinblick auf den Zeitraum zwischen Operation und Diagnose des Chylus, der Dauer der Chylusfistel, des Chylusvolumens während der ersten 24 h, des durchschnittlichen Chylusvolumens und der Behandlung. **Ergebnisse:** 25 Fälle wurden in 13 Veröffentlichungen beschrieben. Unser Fall war ungewöhnlich, da Chylus erst am 11. postoperativen Tag festgestellt wurde. In den meisten Fällen geht die Chylusfistel bei kontinuierlicher axillärer Drainage spontan zurück. **Schlussfolgerungen:** In den meisten Fällen ist konservatives Zuwarten angebracht. Ein diätetischer Eingriff (mittelkettige Lipid-Diät, komplette parenterale Ernährung) ist nur bei hohem, persistierendem Fistelvolumen angebracht. Eine Operation mit erneuter Exploration der Axilla und Übernähen des Chylusgefäßes ist ein letztes Reservemittel bei persistierender Chylusfistel.

Introduction

Seroma formation and leakage of lymphatic fluid are expected side effects following an axillary lymph node clearance. Change of the drain fluid to a viscous white fluid promp-

ted testing for triglyceride levels in fluid and serum and led to the diagnosis of a chyle leak. We compare our case with the literature and outline management options.



Fig. 1. Day 11 after left mastectomy and axillary node clearance. White viscous drain fluid with elevated triglyceride levels establishing the diagnosis of chyle.

Case Report

An 82-year-old lady underwent a mastectomy and axillary lymph node clearance for a large multicentric lobular cancer of the left breast. On day 11 after her operation, white viscous fluid was noted in her axillary drain (fig. 1). Until then, drainage had consisted of 90–250 ml/24 h of typical serous fluid. Fluid sent for microscopy revealed a moderate amount of white blood cells. Gram stain and culture did not reveal any organisms. Triglyceride levels of the fluid measured 3.9 mmol/l, i.e. 3 times the serum level (1.3 mmol/l), which established the diagnosis of chyle. Initially, 120 ml drained during 24 h. Suction was released, output reduced to 20 ml over the following 24-h period and the drain was removed. The patient was well and did not experience any noticeable fluid collection in her axilla after removal of the drain.

Methods

This unusual complication prompted us to search MEDLINE and EMBASE using the medical subject headings (MeSH) ‘axillary clearance’ and ‘chyle’ and handsearching the references. We analysed the case reports, noting the interval between surgery and diagnosis of chyle, the duration of the chyle leak, the volume of chyle during the first 24 h, the median volume and the administered treatment.

Results

We identified 13 publications reporting on 25 cases including our own (table 1). Our case was unusual in that chyle was noted 11 days after surgery. The majority of chyle leaks occur during the first days after the operation (8 of 19 recorded cases on the first post-operative day, 5 on the second, 5 between the third and fifth post-operative day (table 1)). The median duration of chyle leak is 7 days. Of 11 patients where the level of axillary dissection was recorded, 4 patients had a level III and 7 patients had a level II clearance. In most cases,

chyle leakage subsided spontaneously by simply leaving the drain in situ [1–3]. Treatment of the chyle leakage required surgery in 2 cases [4, 5]. In our case, chyle leakage subsided spontaneously by simply leaving the drain.

Discussion

Discovery of chyle following an axillary dissection is unusual as the thoracic duct is remote from the site of dissection. Nonetheless, in 3 series, a chyle leak occurred in 0.47% (4/851), 0.68% (6/882) and 0.84% (5/591) of axillary clearances [6–8]. Discovery of chyle drainage following axillary dissection is surprising as the thoracic duct is not thought to be related to the axilla. There is, however, considerable anatomical variation of the thoracic duct. Usually, it drains into the internal jugular or subclavian vein, but it can also join the external jugular or innominate vein. 30% of thoracic ducts branch along the course [9]. In 4% of cases, the duct anastomoses to the venous system via multiple terminations [10]. In 2 of 344 lymphoscintigraphies (0.6%) drainage into the left axilla was noted [11]. Injury to an aberrant branch of the thoracic duct during axillary dissection could therefore lead to a chyloous leak.

Four patients had a level III and 7 patients had a level II clearance. Purkayastha et al. [5] observed chyle leakage at the time of its surgical repair at level I. A more aggressive dissection may not necessarily put the patient at an increased risk of this complication.

Despite the anatomic variation, one would expect a chyle leak to occur after a left-sided axillary dissection. However, 2 cases have been noted on the right side [7].

Conclusions

Due to the small number of reported cases, evidence for the optimal management of chyle leakage after axillary dissection is limited and anecdotal. As in most cases the chyle leak subsides spontaneously, a conservative observant approach appears to be appropriate. Only for persistent and large-volume leaks, dietary intervention (medium-chain lipid diet, nil by mouth, total parenteral nutrition) is justified. Surgery with re-exploration of the axilla and oversewing of the chyle duct can be used as the last reserve for persistent chyle leaks. There does not appear to be any added advantage for pre-operative imaging with lymphoscintigraphy, but it may give further information of any anatomic variation of the thoracic duct [12].

Disclosure Statement

The authors declare no conflict of interest.

Table 1. Chyle leak after axillary lymph node dissection

Reference	Patients	Level of axillary clearance	Chyle occurrence	Duration	Volume		Treatment	Other
					First 24 h	Median (range)		
Present study		III	day 11	2 days	120 ml		continuation of drainage	stopping suction on drain reduced output
Curcio et al. 2009 [13]		not recorded	day 1	13 days	500 ml	300 ml (20–700)	TPN	
Cong et al. 2008 [7]	n = 6	III	day 2	5 days (3–7)	170 ml (120–250)		low-fat diet compression bandage	6/882 clearances 2 patients with right-sided chyle leak
Sales et al. 2007 [1]		not recorded	day 2	6 days		341 ml/day (265–370)		stopping suction on drain reduced output
Sakman et al. 2007 [14]		II	day 1	4 days	350 ml		compression bandage; TPN	
Donkervoort et al. 2006 [2]			unknown	7 days			continuation of drainage	
Haraguchi et al. 2006 [4]		II	day 5		318 ml	200–800 ml	re-operation on day 25	chyle leakage at level I oversewn + sprayed with fibrin glue
Abdelrazeq 2005 [15]		II	day 3	5 weeks	450 ml	100 ml/day	repeated aspirations; MCT diet; compression bandage	scintigraphy scan
Nakajima et al. 2004 [6]	n = 4	III	day 3	1 day	60 ml		continuation of drainage	4/851 patients 3/4 had re-aspiration after drain removal
		II	day 3	4 days	90 ml	90 ml/day (70–100)		
		II	day 2	3 days	70 ml	50 ml/day (40–70)		
Purkayastha et al. 2004 [5]		II	day 2	3 days	90 ml	60 ml/day (20–90)	TPN; re-operation on day 14	leak at level I oversewn, covered with lateral part of pectoralis major
		III	day 1	14 days		1000 ml/day		
Caluwe and Christiaens 2003 [3]		II	day 1	4 weeks			continuation of drainage	
Rijken et al. 1999 [8]	n = 5	not recorded	day 1	8 days		120 ml/day (30–960)	vacuum drain	5/591 left axillary clearances
			day 4	11 days		270 ml/day (30–2970)		
			day 1	8 days		175 ml/day (30–1400)		
			day 2	12 days		– (30–260)		
Rice et al. 1993 [16]	not recorded	not recorded	day 1	13 days		88 ml/day (30–240)	diet – nil by mouth	chyle leakage disappeared when nil by mouth, recurred with oral intake
			–	2 months		400 ml/day		

TPN = Total parenteral nutrition, MCT = medium-chain triglycerides.

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