



**CASE REPORT**

# High-output chyle fistula treated with octreotide after neck dissection for papillary thyroid carcinoma

Felipe Toyama Aires<sup>1\*</sup>, Felipe Augusto Brasileiro Vanderlei<sup>1</sup>,  
Raquel Ajub Moyses<sup>1</sup>, Claudio Roberto Cernea<sup>1</sup>, Marcos Roberto Tavares<sup>1</sup>

## Abstract

Chyle fistula is a relatively rare complication of neck dissection occurring in about 2-3% of cases; it is associated with increased morbidity and mortality. The use of somatostatin analogs (octreotide) is well documented in cases of pancreatic and enterocutaneous fistulas. In fistulas after neck dissections, it is based on few reports and case series. The aim of this study was to report a case of conservative control of high-output fistula with octreotide. A 34-year-old female underwent total thyroidectomy with neck dissection (central compartment and left II-V levels). Postoperatively, she developed high-output lymphatic fistula (>1,600 mL/day). Fistula flow remained high in spite of conservative measures. We opted for prescription of octreotide 0.1 mg subcutaneous every 8 hours and observed complete improvement of the fistula after three days.

**Keywords:** chyle; fistula; neck dissection; octreotide.

<sup>1</sup>Universidade de São Paulo (USP), Faculdade de Medicina, Disciplina de Cirurgia de Cabeça e Pescoço, São Paulo, SP, Brasil.

**Financial support:** None.

**Conflicts of interest:** No conflicts of interest declared concerning the publication of this article.

**Submitted:** July 18, 2017.

**Accepted:** November 22, 2017.

The study was carried out at Disciplina de Cirurgia de Cabeça e Pescoço, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo (USP), São Paulo, SP, Brasil.

## Introduction

Chyle fistula is a relatively rare complication of neck dissections that occurs in approximately 2-3% of patients. It is associated with nutritional and immune system compromise, hydroelectrolytic disorders, hypoalbuminemia, lymphopenia, surgical wound infection, and increase in hospitalization time; in severe cases, it can be fatal<sup>1,2</sup>.

First-line treatment of chyle fistula is conservative – it involves diet control, compression bandaging, and negative pressure drainage. In severe cases of high-output fistulas, clinical treatment alone may not be effective; under these circumstances, reoperation is required<sup>1,2</sup>.

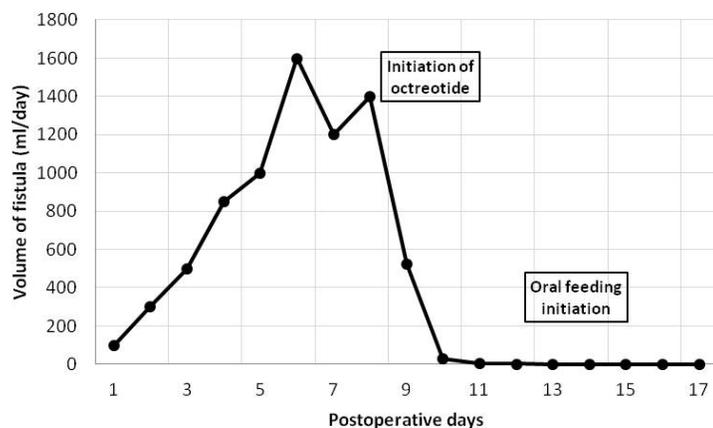
In cases of pancreatic and enterocutaneous fistulas, the use of somatostatin analogs (octreotide) is widely documented. However, in fistulas following neck dissection, reports and case series is scarce in the literature.

## Case report

Female patient, 34 years old, referred to Head and Neck Service of Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo (HCFMUSP) with complaint of lateral cervical mass persistent over 6 months. Physical

 Copyright Aires et al. This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

examination indicated multiple hard palpable nodules in both lobes, whereas the biggest one was approximately 2 cm in size, as well as level II-III cystic cervical mass of approximately 4 cm on the left side. Thyroid function was normal, and neck ultrasound revealed three hypoechoic nodules with microcalcifications, as well as a level VI lymph node conglomerate and a level II cystic formation on the left side, with hypervascular solid component. By means of a cytological evaluation by fine needle aspiration of thyroid nodules, the level VI lymph nodes and lateral cystic mass revealed a papillary carcinoma of the thyroid with central and left lateral metastases. The patient underwent total thyroidectomy with left (levels II-V) and bilateral (levels VI-VII) neck dissection. The surgical outcomes corroborated the physical examination and imaging of the thyroid with multiple hard nodules and lymph nodes of suspected secondary involvement at levels II, III, IV, and VI. During surgery, lymphatic leakage and level IV trauma of lymphatic vessels were observed; the latter was immediately identified and controlled with polypropylene yarn. Lymphatic fistula was not observed until the end of the procedure. A suction drain was placed at the thyroid cavity and neck dissection location. From the second postoperative day, a white milky secretion – approximately 300 mL within 24 hours – was observed as drained output. On subsequent days, the drain output increased, reaching values of up to 1,600 mL (Figure 1). In face of the high-output lymphatic fistula diagnosis, conservative measures – such as fasting, total parenteral feeding, compression bandages and strict control of hydration and electrolytic disorders – were put in place. However, in spite of these conservative measures, the fistula output remained high. On the 8<sup>th</sup> postoperative day, 0.1 mg subcutaneous octreotide every 8 hours was prescribed. Within a day of the prescription, the fistula output reduced to 500 mL; on subsequent days, it dropped further to 35 and 5 mL. The medication was administered until the 14<sup>th</sup> postoperative day (6 days). Oral diet was reintroduced on the 13<sup>th</sup> postoperative day. The patient was released from hospital on the 17<sup>th</sup> postoperative day, clinically stable and free of chyle fistula symptoms. The patient is on routine follow-up (for approximately 18 months at the moment of writing of this report) and has not presented signs of complications related to chyle fistula.



**Figure 1.** Evolution of chyle fistula during hospitalization.

## Discussion

Lymphatic fistula occurs following neck dissection in approximately 2-3% of cases. Its incidence is highly correlated with the anatomical aspects of lymphatic vessels at the cervicothoracic junction, in particular on the left side of the neck, where the thoracic duct empties between the junction of the subclavian and internal jugular veins<sup>2</sup>. Handling of this venous angle during neck dissection represents the main risk factor for chyle fistula, especially in cases of metastatic lymph nodes<sup>3</sup>.

The incidence of lymphatic fistula is alarming, as it exposes patients to several complications, significantly increases their time in hospital and the probability of reoperation – in severe cases, it may lead to death. Upon identification of lymphatic fistula, patients must be carefully watched due to the risk of nutritional and immune compromise, hydroelectrolytic disorders, hypoalbuminemia, lymphopenia, surgical wound infection, and pleural effusion – with or without chylothorax<sup>1,2</sup>.

Lymphatic fistula is usually detected on the first days following surgery by an increase in output of white milky secretion through the drain. Diagnosis may be based on biochemical analysis of the secretion, which indicates an increase in triglyceride levels (>100 mg/dL) and lymphocyte count above 50%. Although there is no consensus in the literature, most authors classify fistulas as high- or low-output based on a threshold of 500 mL.

Management of fistulas, in most cases, is done as conservative treatment, especially in low-output cases. Initial measures include diet change upon reduction of fat intake – where medium-chain triglycerides are more highly recommended –, compression bandages, and suction drainage. In some cases, it is necessary initiate patients on oral fasting and parenteral feeding in order to further reduce flow in lymphatic vessels. When conservative treatment does not effectively control the fistula, reoperation is usually recommended, especially in high-output cases. There is no consensus as to the ideal time for reoperation. In general, a more aggressive conduct is recommended in cases of high-output (>1 L) and persistent (>7 days) fistulas with no perspective of improvement. However, this conduct is associated with a considerable increase in morbidity and mortality<sup>1,2,4</sup>.

Somatostatin is a peptide that acts on the neurohormonal axis in a paracrine manner. Octreotide, a synthetic somatostatin analog, performs a similar function, although it is more selective in the gastrointestinal system. Its biological actions include inhibiting the thyroid stimulating hormone (TSH), the growth hormone (GH), the vasoactive intestinal peptide, gastrin, intestinal secretions, and biliary flow. The precise mechanism of action of octreotide in the management of lymphatic fistulas is still unknown. However, it is believed that intestinal absorption of fat and triglycerides reduces the thoracic duct flow, which would help cicatrization of the vessel wall. In most cases, octreotide is administered subcutaneously at 100mcg every 8 hours. The main adverse events are nausea and vomit, pain and/or bruise at the site of injection, headache, abdominal discomfort, and hyper- or hypoglycemia.

A search on the MEDLINE database (via Pubmed) with search words and operators (*chyle fistula OR chyle leak OR chylous fistula OR Thoracic duct*

*fistula) AND (neck dissection) AND (octreotide OR somatostatin OR somatostatin analog) resulted in twelve articles about the subject, with 43 cases altogether (Table 1). Synthesis of these case reports shows a success rate of lymphatic fistula conservative treatment with octreotide around 95%. Nevertheless, it is necessary to take the publication bias and the limited number of cases into consideration when categorically concluding that somatostatin and its analogs are efficient, especially in high-output fistulas.*

**Table 1.** Review of chyle fistulas using somatostatin/octreotide following neck dissection.

Reference	Local	n	Fistula output	Somatostatin/ Octreotide		Efficacy	Time of Hospitalization (days)	Observation
				Dosage	days			
Ahn et al. <sup>3</sup>	South Korea	4	High	0.1Mg SC 3x/day	-	75%	-	One patient treated with surgery
Alzaman et al. <sup>5</sup>	USA	1	Low	0.1Mg SC 3x/day	10	100%	-	-
Cascales Campos et al. <sup>6</sup>	Spain	1	Low	0.1Mg SC 3x/day	7	100%	-	-
Coşkun and Yildirim <sup>7</sup>	Turkey	1	Low	3 mg/day IV	5	100%	19	-
Harlak et al. <sup>8</sup>	Turkey	1	Low	0.1Mg SC 3x/day	11	0	-	Patient treated with surgery (sternocleidomastoid muscle flap + fibrin sealant)
Jain et al. <sup>9</sup>	India	19	Low/High	0.1 mg SC 3x/day	5-7	100%	14 (11-17)	-
Priego Jiménez et al. <sup>10</sup>	Spain	1	High	0.1Mg SC, 3x/day 6 mg IV, for 1 day	63	100%	69	Although the fistula was resolved, the authors indicate that the use of octreotide yielded no benefit
López Otero et al. <sup>11</sup>	Spain	1	Low	-	-	100%	-	-
Prabhu and Thomas <sup>12</sup>	India	1	High	0.1 mg SC 3x/day	6	100%	40	Octreotide initiated following reoperation on the 22 <sup>nd</sup> postoperative day
Rodier et al. <sup>13</sup>	France	1	High	0.1 mg SC 3x/day	6	100%	16	-
Swanson et al. <sup>14</sup>	USA	11	Low/High	0.1 mg SC 3x/day	9 (2-20)	100%	8 (3-18)	Three patients used IV; Six patients were kept on the medication five days after hospital release
Valentine et al. <sup>15</sup>	USA	1	High	0.1 mg SC, 3x/day 0.05 mg IV, 3x/day	24	100%	16	-

This study aimed at reporting a case of conservative control of high-output fistula with the use of octreotide in a safe and surprisingly fast manner.

Chyle fistula is a severe complication following neck dissection. However, there is no therapeutic algorithm in place to improve its management. Use of octreotide as a supplement to established clinical measures appears to be promising in the scope of conservative management of lymphatic fistulas.

## References

1. Campisi CC, Boccardo F, Piazza C, Campisi C. Evolution of chylous fistula management after neck dissection. *Curr Opin Otolaryngol Head Neck Surg*. 2013;21(2):150-6. <http://dx.doi.org/10.1097/MOO.0b013e32835e9d97>. PMID:23449286.
2. Smoke A, Delegge MH. Chyle leaks: consensus on management? *Nutr Clin Pract*. 2008;23(5):529-32. <http://dx.doi.org/10.1177/0884533608323424>. PMID:18849558.
3. Ahn D, Sohn JH, Jeong JY. Chyle fistula after neck dissection: an 8-year, single-center, prospective study of incidence, clinical features, and treatment. *Ann Surg Oncol*. 2015;22(Suppl 3):S1000-6. <http://dx.doi.org/10.1245/s10434-015-4822-7>. PMID:26286200.
4. Santaolalla F, Anta JA, Zabala A, Del Rey Sanchez A, Martinez A, Sanchez JM. Management of chylous fistula as a complication of neck dissection: a 10-year retrospective review. *Eur J Cancer Care*. 2010;19(4):510-5. <http://dx.doi.org/10.1111/j.1365-2354.2009.01086.x>. PMID:20030699.
5. Alzaman N, Pittas AG, O'Leary M, Ceglia L. Post-thyroidectomy hypocalcemia exacerbated by chyle leak. *Endocrinol Diabetes Metab Case Rep*. 2015;2015:140110. PMID:25861451.
6. Cascales Campos PA, Ríos Zambudio A, Rodríguez González JM, Parrilla Paricio P. Cervical chylous fistula after lymphadenectomy for papillary thyroid carcinoma treated with somatostatin analogs. *Endocrinol Nutr*. 2011;58(3):150-1. <http://dx.doi.org/10.1016/j.endonu.2010.10.007>. PMID:21353652.
7. Coşkun A, Yildirim M. Somatostatin in medical management of chyle fistula after neck dissection for papillary thyroid carcinoma. *Am J Otolaryngol*. 2010;31(5):395-6. <http://dx.doi.org/10.1016/j.amjoto.2009.05.002>. PMID:20015785.
8. Harlak A, Karahatay S, Onguru O, Menten O, Gerek M, Tufan T. Chyle fistula after neck dissection for an unusual breast cancer recurrence. *Breast Care*. 2008;3(4):274-6. <http://dx.doi.org/10.1159/000144491>. PMID:21076608.
9. Jain A, Singh SN, Singhal P, Sharma MP, Grover M. A prospective study on the role of octreotide in management of chyle fistula neck. *Laryngoscope*. 2015;125(7):1624-7. <http://dx.doi.org/10.1002/lary.25171>. PMID:25639346.
10. Priego Jiménez P, Collado Guirao MV, Rojo Blanco R, Grajal Marino R, Rodríguez Velasco G, García Villanueva A. Chyle fistula in right cervical area after thyroid surgery. *Clin Transl Oncol*. 2008;10(9):593-6. <http://dx.doi.org/10.1007/s12094-008-0257-4>. PMID:18796379.

**\*Correspondence**

Felipe Toyama Aires  
Universidade de São Paulo, Faculdade de Medicina, Hospital das Clínicas, Disciplina de Cirurgia de Cabeça e Pescoço  
Av. Dr. Enéas de Carvalho Aguiar, 255, 8º andar, sala 8174, Cerqueira Cesar CEP 05403-000, São Paulo (SP), Brasil  
E-mail: toyama.aires@gmail.com

**Authors information**

FTA, FABV and RAM - Assistents, Department of Head and Neck Surgery of HCFMUSP. CRC and MRT - Full Professors, Head of Department of Head and Neck Surgery of HCFMUSP.

11. López Otero MJ, Fernández López MT, Outeiriño Blanco E, Álvarez Vázquez P, Pinal Osorio I, Iglesias Diz D. Neck chylous fistula: conservative treatment. *Nutr Hosp*. 2010;25(6):1041-4. PMID:21519779.
12. Prabhu S, Thomas S. Octreotide for conservative management of intractable high output post operative chylous fistula: a case report. *J Maxillofac Oral Surg*. 2015;14(Suppl 1):21-4. <http://dx.doi.org/10.1007/s12663-011-0269-y>. PMID:25838666.
13. Rodier JF, Volkmar PP, Bodin F, Frigo S, Ciftci S, Dahlet C. Thoracic duct fistula after thyroid cancer surgery: towards a new treatment? *Case Rep Oncol*. 2011;4(2):255-9. <http://dx.doi.org/10.1159/000328801>. PMID:21734879.
14. Swanson MS, Hudson RL, Bhandari N, Sinha UK, Maceri DR, Kokot N. Use of octreotide for the management of chyle fistula following neck dissection. *JAMA Otolaryngol Head Neck Surg*. 2015;141(8):723-7. <http://dx.doi.org/10.1001/jamaoto.2015.1176>. PMID:26135979.
15. Valentine CN, Barresi R, Prinz RA. Somatostatin analog treatment of a cervical thoracic duct fistula. *Head Neck*. 2002;24(8):810-3. <http://dx.doi.org/10.1002/hed.10103>. PMID:12203809.