

Massive Chylorrhea following Total Thyroidectomy and Neck Dissection

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ABSTRACT

Chylorrhea, following thyroid surgery, is a known complication mentioned in the literature, but massive chylorrhea is uncommonly encountered. Here, we report two such cases of thyroid malignancy (papillary carcinoma) where the patient developed massive chylorrhea following total thyroidectomy and neck dissection, one of whom underwent tracheal resection and anastomosis in addition. The patient, in whom only total thyroidectomy and neck dissection was done, developed encysted chyloma postoperatively which was managed surgically. The other patient who underwent neck exploration twice for his chylorrhea but later developed septicemia and succumbed to it. Development of chyloma following neck surgery is not a common entity, very few cases have been reported.

Keywords: Chyloma, Chylorrhea, Total thyroidectomy, Neck dissection.

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INTRODUCTION

Cervical chyloma is a rare clinical entity, which is a cyst or pseudocyst that arises from the thoracic duct and their tributaries. They are usually seen on the left supraclavicular region following thoracic surgery, radical neck dissection, blunt or penetrating trauma, or tumor erosion, or they can occur secondary to subclavian vein line placement (acquired chyloma).¹⁻³ Rarely, they may be congenital as well. Here, we report a case of left cervical chyloma and another case of massive chylorrhea, subsequent to total thyroidectomy and neck dissection, which was managed surgically after failure of conservative management.

CASE REPORT

A 65-year-old male patient visited our OPD with complaint of swelling in the left side of the neck for 6 months duration, with no other complaints or comorbidities. On examination, a swelling on the left side of the neck, at level III and IV, measuring about 6 × 6 cm, which was firm to hard in consistency and mobile, was noted. Thyroid gland was palpable with a nodule in the left lobe which was also hard in consistency. Indirect laryngoscopy revealed bilateral mobile vocal cords, with rest of the examination being

within normal limits. USG of neck showed a hypoechoic nodule in the left lobe of the thyroid. FNAC of the neck swelling and thyroid nodule was reported as papillary carcinoma. His preoperative serum thyroglobulin was 617 ng/dl and thyroid profile (T3, T4, TSH) was within normal limits. With the above clinical picture, patient was taken up for total thyroidectomy and neck dissection (MRND, vein and nerve sparing) under general anesthesia. Perioperatively, patient had a chyle leak which was identified and sealed using 5.0 prolene suture material with a portion of muscle harvested from sternocleidomastoid. Postoperatively patient recovered well, drains were removed by 6th postoperative day. On the 8th postoperative day, patient developed a swelling in the left supraclavicular area, which was fluctuant. About 40 ml of fluid was aspirated, which was milky and odorless, later confirmed as chyle, followed by pressure dressing. Patient was managed conservatively with medium-chain fatty acids in diet and avoiding the long-chain fatty acids, along with aspiration and pressure dressing. The histopathologic report (3 × 3 × 2 cm nodule in left lobe, the right lobe and isthmus were normal) was given as follicular variant of papillary cancer with infiltration into the capsule and metastatic neck nodes at level II (5 of 5 nodes) and level III (1 of 9 nodes). Patient later received 100 mCi of radioactive iodine ablation after withdrawal of T4 for 6 weeks. During this intervening period, patient was treated conservatively for chyle collection in the left supraclavicular region (6 × 7 cm fluctuant swelling) (Fig. 1). In spite of 2 months of conservative management, the chyle leak did not subside. A CT scan done subsequently showed a well-circumscribed cystic swelling measuring 5.7 × 6.3 × 7.5 cm in the left supraclavicular region (Figs 2 and 3), with minimal postcontrast enhancement, posteriorly it was seen abutting the left common carotid artery. He was taken up for exploration of the neck to close the chyle leak. The neck was opened through the previous surgical scar, after which the cyst was entered, about 150 ml of chyle was cleared. An internal chyle duct draining into the cyst was identified on the posterior aspect of the cyst wall lateral to the left recurrent laryngeal nerve and common carotid artery (Fig. 4). The cyst wall was scraped and the opening sutured with muscle and fat pad with nonabsorbable suture and wound closed. Patient recovered well in the postoperative period and is on follow-up with TSH suppression.



Fig. 1: Left supraclavicular chyloma

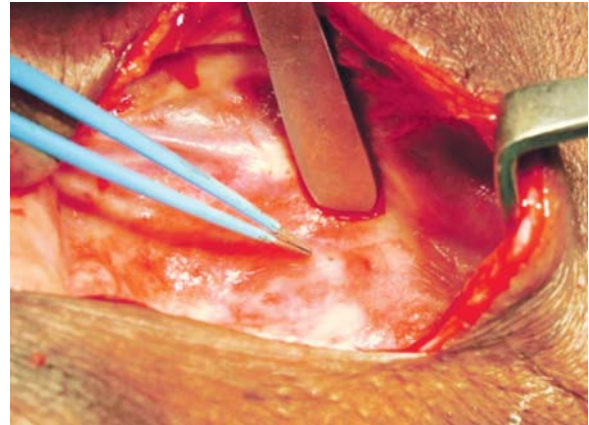


Fig. 4: Chyle duct opening seen in the cavity (pointer)



Fig. 2: CT scan image of chyloma-coronal view



Fig. 3: CT scan image of chyloma-axial view

In another case, a 62-year-old male patient diagnosed to have papillary thyroid carcinoma with tracheal infiltration, underwent total thyroidectomy, functional neck dissection on left side with tracheal resection and anastomosis. Postoperatively, patient developed massive chyle leak

(750 ml/day) from the 4th postoperative day, for which neck exploration was done on the 7th postoperative day. But the chyle leak persisted hence, he was taken up for reexploration on the 14th day once again. Subsequently, patient developed septicemia and succumbed to it.

DISCUSSION

Thoracic duct was discovered in a horse by Eustachio in 1565 and it was discovered in human beings by Veslingus in 1634.² In 1948, Lampson performed the first successful ligation of the thoracic duct, until this period thoracic duct ligation was considered fatal.² Thoracic duct begins as cistern chyli, at the level of the second lumbar vertebral body near the aortic bifurcation, it ascends up through the aortic opening and to the right of the aorta. It continues superiorly, posterior to the esophagus in the posterior mediastinum between the aorta and the azygos vein. At vertebral level T4, it turns to the left before exiting the thoracic inlet. It then ends between left subclavian vein and left internal jugular vein.⁴ It is here that the duct system is at risk of trauma or injury during neck surgery. The thoracic duct drains lymph from most of the body, the exceptions being the right hemithorax, the right upper limb and the right head and neck. The right lymphatic duct drains the right side of the head, neck and chest wall. Termination of the thoracic duct is extremely variable and it can have multiple end points opening separately in 10 to 40.6% of subjects.⁵ It has been reported to terminate on the left side in 75 to 92% of patients and on the right side in fewer than 5%. A further 5% of cases see the duct divide into a left and right branches each draining in their respective hemithoraces.⁵ The thoracic duct drains chyle from most of the body (and the entire intestinal tract) and is essential in maintaining fluid balance. The lymphatic system serves to collect and transport large molecules, such as extravasated plasma proteins, absorbed lipids and excess tissue fluids

that have leaked from the interstitial spaces back into the bloodstream, it also enables the return of proteins and T-lymphocytes to venous circulation. Chyle is a turbid, milky fluid, composed of emulsified fat, triglycerides, proteins, glucose, electrolytes, antithrombin globulin, prothrombin and fibrinogen, as well as cellular components such as lymphocytes and erythrocytes. Daily lymph flow varies between 2 and 4 liters depending on the intake of long-chain triglycerides. When the thoracic duct is injured, two complications can arise: Chylous leaks and cervical chylomas. Chylous leaks are associated with metabolic derangements secondary to severe fluid, electrolyte and protein loss, a loss of lymphocytes that results in lymphocytopenia, fistula formation, skin-flap necrosis and carotid artery blowout. The incidence of chyle leaks following neck dissection has been estimated to range from 1 to 5.8%. The lower the neck nodes in the neck, the higher the incidence of this complications. So far it has been described mostly as an undesirable outcome following neck dissections. However, it stands to reason that any obstruction of the lymphatics/chyle tributaries in the tracheoesophageal groove and in the retrotracheal area in central compartment clearance and tracheal resection will disrupt orderly flow of the chyle and cause lymphatic stasis. If this is overt and is in the vicinity of a suction drain, it will manifest as chylorrhea in the suction drains, may cause compressive symptoms as well as massive loss of nutrients and negative nitrogen balance.

Establishing the diagnosis of a cervical chyloma requires a determination that the cyst fluid is of chylous origin and that the cyst is in the region of the thoracic duct. All reported cases, including ours, have been associated with either trauma or surgery.^{6,7} Fluid analysis can be obtained by fine needle aspiration of the mass. In order to classify a cyst as a chyloma, the fluid analysis should identify an elevated triglyceride level (> 100 mg/dl) or an elevated chylomicron level (> 4%). Elevation of either of these levels indicates a high likelihood of chyle leakage. CT and ultrasound can help determine the location and extent of the mass. Lymphangiography or lymphoscintigraphy can also be useful in making the diagnosis and in making an intraoperative identification of the mass.

Conservative management of a chyloma includes aspiration or drainage of the mass and the application of compressive dressings. Dietary management should include instituting a medium-chain triglyceride diet or delaying the feeding of the patient.^{8,9} Total parenteral nutrition is generally considered not to be beneficial in the management of thoracic duct damage, although some authors have found it to be useful. An agent, such as povidone-iodine, a fibrin

sealant, or tetracycline can be instilled into the cyst to sclerose the leak.^{10,11}

The size of the lesion, a failure of conservative management, persistence of chylorrhea >500 ml/day and the presence of compressive symptoms are indications for surgical excision of a chyloma. Ligation of the thoracic duct can be accomplished with a minimum of significant morbidity. However, formal identification of a leak and its successful seal in a reexploration is often unsuccessful because of the diffuse nature of the thin-walled multiple lymph capillaries. Most chyle leaks need to be conservatively addressed by frequent pressure dressings to promote healing by secondary intention over a period of time. Prevention is the best option. Whenever there is significant nodal disease in tracheoesophageal groove (level VI) and level IV, after dissection in these area it should be a mandatory practice to instruct the anesthetist to perform forced positive pressure hand ventilation so as the raise intrathoracic pressure and 'milk' the lymph to become more evident in areas where the capillaries have been disrupted. Such areas need to be underrun with 3-0' prolene sutures with some mashed muscle mass, harvested from the nearby neck. This should be done until there is no evidence of any leak of chyle during the above anesthetic maneuver. Care should be taken not to traumatize the recurrent laryngeal nerve in the tracheoesophageal groove or the vagus and phrenic nerve in the proximity of jugulosubclavian vein. Finally, suction drains should not be placed in the vicinity of the repair.

In this case, our patient developed a left cervical chyloma subsequent to total thyroidectomy and neck dissection for papillary thyroid cancer. In spite of conservative management with repeated aspiration, diet modification and pressure dressing the chyloma did not respond to the treatment, hence, surgical exploration and closure of the leak was done successfully. In the second case, though the massive chyle leak was attempted to be identified and surgically corrected, he subsequently developed septicemia and eventually succumbed to it.

CONCLUSION

Massive chylorrhea, following thyroidectomy and neck dissection, is a known complication documented in literature. We have shared our experience with two such cases of which one developed a chyloma of the left supraclavicular region which was managed successfully, very few cases of chyloma have been reported in literature, especially following surgery for thyroid cancer. The other case with massive chylorrhea was attempted for surgical

correction twice but the patient developed septicemia and succumbed subsequently.

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