Clinical Case Report

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Granulomatous lymphadenitis mimicking metastatic lymphadenopathy in the neck after lymphatic embolization of chyle leakage

A case report

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Abstract

Rationale: Lymphatic embolization is a minimally invasive treatment option for managing chyle leakage after nodal dissection in the neck. After the procedure, the embolic material may cause foreign body granulomatous lymphadenitis and can be a diagnostic challenge for radiologists because of sonographic similarity to metastatic lymph node. Herein, we describe a clinical case of granulomatous lymphadenitis due to embolic material mimicking nodal metastasis detected on ultrasonography (US) with cytologic findings in a patient with thyroid cancer who underwent lymphatic embolization to treat chyle leakage after total thyroidectomy and neck dissection. We also review the relevant literature regarding this disease with technical background of the procedure and suggest the importance of clinical suspicion in diagnosing the granulomatous lymphadenitis in patients with a history of lymphatic embolization.

Patient concerns: A 40-year-old man who underwent total thyroidectomy and bilateral modified radical neck dissection due to papillary thyroid carcinoma had suspicious cervical lymph node on US after lymphatic embolization of chyle leakage.

Diagnoses: The suspicious cervical lymph node proved to be foreign body granulomatous lymphadenitis due to embolic material by US-guided fine-needle aspiration.

Interventions: The patient did not undergone additional surgery because the pathologic cervical lymph node was confirmed to be foreign body granulomatous lymphadenitis.

Outcomes: The patient is being followed up regularly at the outpatient department.

Lessons: Clinical awareness of the technical background of lymphatic embolization and possible sonographic features of granulomatous lymphadenitis is important for an accurate diagnosis and the appropriate management in patients who underwent lymphatic embolization.

Abbreviations: LN = lymph node, US = ultrasonography.

Keywords: chyle leakage, granulomatous lymphadenitis, lymph node metastasis, lymphatic embolization

1. Introduction

Chyle leakage from iatrogenic thoracic duct injury is an infrequent but serious complication of head and neck surgery that occurs in 1% to 2% of comprehensive neck dissections.[1]

The treatment options for chyle leakage include diet modifications, lymphatic embolization, or re-exploration of the wound with repair.[1–3] Of these options, thoracic duct embolization is an effective and minimally invasive technique to treat chyle leakage that does not respond to conservative management.[1–3] Although the technical aspects of lymphatic embolization were described in many previous studies,[1,3–5] there are few reports on postprocedural radiologic findings after lymphatic embolization.

In clinical practice, abnormal nodal findings on neck ultrasonography (US) that are detected after lymphatic embolization can be a diagnostic challenge. Because lymphatic embolization after neck dissection is usually performed in oncologic patients, abnormal lymph node (LN) on imaging studies is easily misdiagnosed as metastatic LN. In the present case, we describe a clinical case of granulomatous lymphadenitis mimicking nodal metastasis with sonographic and cytologic findings in a patient with thyroid cancer who underwent lymphatic embolization due to chyle leakage after total thyroidectomy and bilateral modified radical neck dissection.

2. Case report

This was purely an observational case study, and the patient's management and outcome were unaltered. Therefore, no ethical

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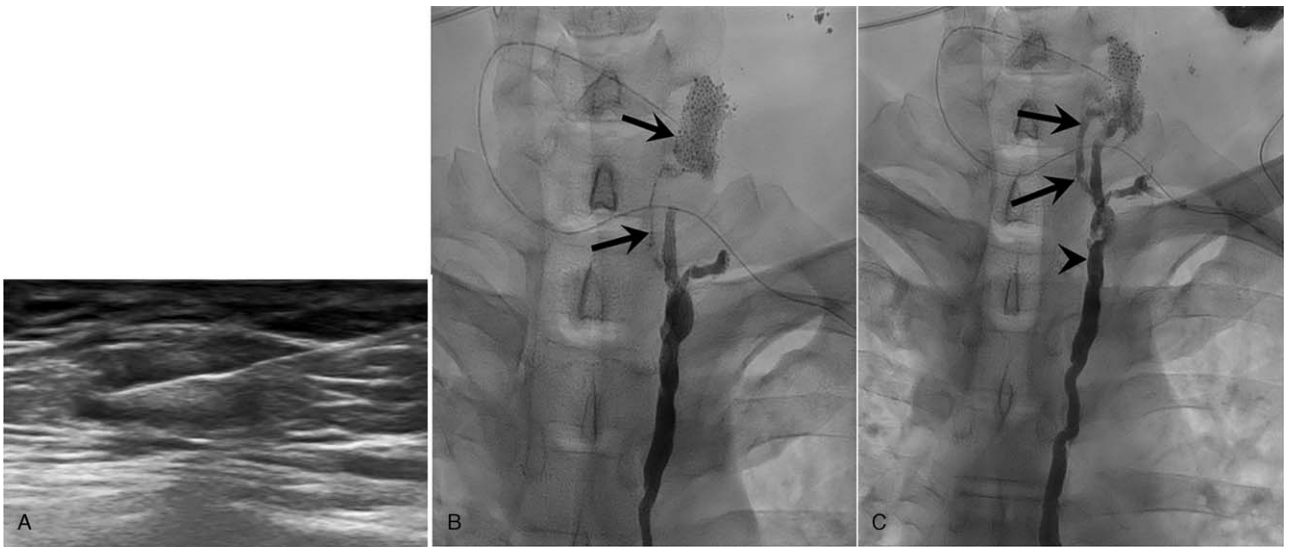

Figure 1. (A) Ultrasonographic-guided inguinal node puncture for lymphatic embolization. Ultrasonographic image shows the access of the inguinal lymph node with a needle. (B) Thoracic duct lymphangiogram before lymphatic embolization. Contrast leakage was demonstrated in the left lower neck (arrows). (C) Thoracic duct lymphangiogram after lymphatic embolization. Lymphatic embolization was performed using a mixture of glue and Lipiodol in the leakage site (arrows) and distal thoracic duct (arrowhead).

approval was required for this case report. Written informed consent was obtained from the patient for publication of this case report and accompanying images.

A 40-year-old man underwent total thyroidectomy and bilateral modified radical neck dissection due to papillary thyroid carcinoma and bilateral cervical LN metastases. His postoperative course was complicated by chyle leakage in the left lower neck from the operative bed. Because conservative management with a low-fat diet did not lead to any improvement in lymphatic leakage, he underwent lymphatic embolization on postoperative day 11. Under ultrasonographic guidance, an inguinal LN was punctured (Fig. 1A) and intranodal lymphangiography was obtained via an injection of Lipiodol. An opacified thoracic duct injection demonstrated contrast leakage from the transected duct in the left lower neck, and embolization was performed using a mixture of glue and Lipiodol (Fig. 1B, C). After the lymphatic embolization, the chyle leakage markedly decreased via the surgical drainage catheter.

Six months after the lymphatic embolization, the patient returned to the hospital for the postoperative US surveillance of his thyroid cancer. There was a newly developed enlarged LN in the left level IV (Fig. 2A). The LN showed relatively homogenous hyperechogenicity with loss of fatty hilum, suggesting suspicious LN. With the suspicion of LN metastasis, US-guided fine-needle aspiration was performed. On cytologic examination, there were several clusters of foreign substances that were engulfed by multinucleated giant cells, and no malignant cells (Fig. 2B, C). Finally, this pathologic LN was cytologically proven as a foreign body granulomatous lymphadenitis containing embolic materials. A chest computed tomography (CT) for the evaluation of the lung metastasis revealed multiple strongly hyperattenuating foci with beam hardening artifacts by the embolic materials in the left lower neck (Fig. 2D).

3. Discussion

Lymphatic embolization is a minimally invasive treatment option for managing chyle leakage that does not respond to conservative management after neck dissection,[1–3] and this procedure is usually performed in oncologic patients. Oncologic patients with a history of lymphatic embolization undergo regular imaging studies including US, CT, or magnetic resonance imaging for the postoperative surveillance of known malignancy. However, there are few reports regarding the postprocedural image findings mimicking a pathologic condition after lymphatic embolization. As the present clinical case demonstrates, it is important to recognize foreign body lymphadenitis simulating nodal metastasis with technical background in patients who have undergone lymphatic embolization.

Through a literature review, we found previous studies on sonographic findings of foreign body lymphadenitis as follows[6,7]: facial filler-induced pathologic LNs demonstrated hyperechogenicity with posterior hyperechoic trails and multiple hyperechoic foci within the LNs, and pathologic LNs derived from the rupture of silicone breast implants revealed an increased nodal echogenicity with incoherent posterior shadowing.

However, to the best of our knowledge, there are no previous reports on the ultrasonographic findings of granulomatous lymphadenitis due to embolic materials from lymphatic embolization. In addition, the US findings of our case differ from those in the previous reports on foreign body lymphadenitis.[6,7] The characteristic feature of foreign body lymphadenitis in the present case was a homogeneous hyperechogenicity and a ground glass appearance without posterior acoustic shadowing or enhancement despite the complete alteration of nodal echogenicity. There was no additional nodal change. These findings differ from the appearance of metastatic LN of papillary thyroid carcinoma showing heterogeneous echogenicity, multifocal cystic change, and microcalcifications. Further research involving a large number of cases may be necessary to prove the sonographic findings of embolic material-induced granulomatous lymphadenitis after lymphatic embolization.

In conclusion, we present a clinical case of embolic material-induced granulomatous cervical lymphadenitis mimicking a metastatic LN with radiologic and cytologic findings in a patient with thyroid cancer. On the basis of this report, we suggest that granulomatous lymphadenitis should be considered for a differential diagnosis in patients with lymphatic embolization.

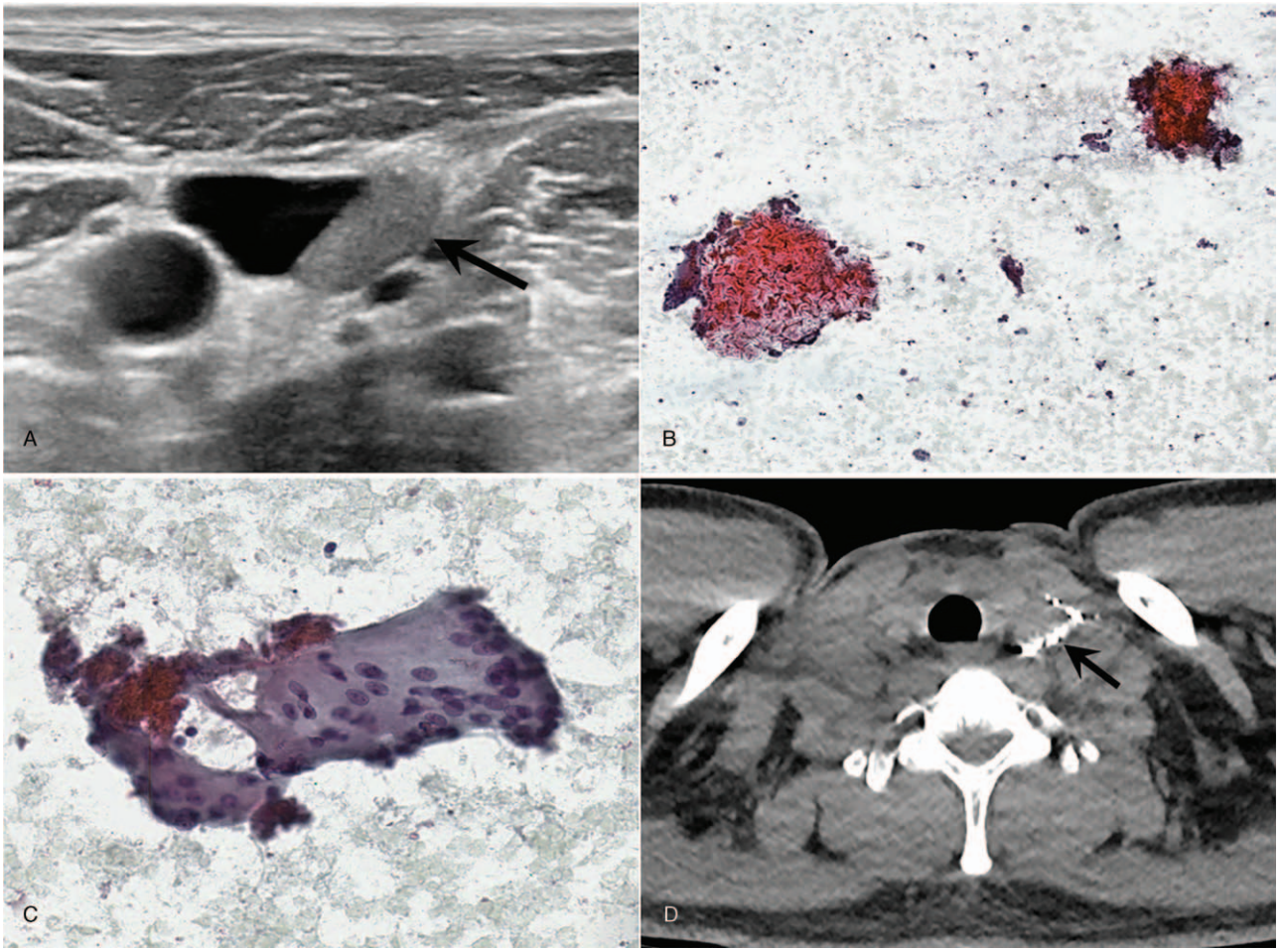

Figure 2. (A) Neck ultrasonography for the surveillance of thyroid cancer. There is a suspicious lymph node in the left level IV. The lymph node shows homogeneous hyperechogenicity with loss of fatty hilum. (B) Cytology of the left level IV lymph node (×100). There are several clusters of eosinophilic, glistening foreign substances mixed with some giant cells. (C) Cytology of the left level IV lymph node (×400). At a higher magnification, multinucleated giant cells are engulfing the eosinophilic granular materials. (D) Chest computed tomography obtained after the procedure. There are multiple strongly hyperattenuating foci with beam hardening artifacts by the embolic materials (arrow) in the left lower neck.

Therefore, clinical awareness of the technical background of lymphatic embolization and possible sonographic features of this disease entity is important for an accurate diagnosis and the appropriate management in clinical practice.

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