INTRODUCTION

Thoracic endovascular aortic repair (TEVAR) has been accepted as an alternative to open surgical repair in certain groups of patients (1). A potential complication caused by persistent or recurrent flow into the aneurysm sac is known as endoleak which can be classified to four types (2). Complex type II endoleaks occur due to persistent reverse blood flow through branch vessels (3). Common sites of type II endoleaks are the left subclavian artery and intercostal arteries with occasionally bronchial arteries (4). Arterial pressure in type II endoleaks is transmitted to the aneurysm sac, causing sac expansion. In this situation, patients remain at risk of aneurysm rupture (3). Various methods are introduced to manage type II endoleaks, such as the use of coils, plugs, or liquid embolic agents (histoacryl, thrombin, onyx, etc.) through a transarterial approach or a direct puncture of the aneurysmal sac. We herein report a case of a type II endoleak caused by reverse blood flow through intercostal artery after TEVAR which was successfully treated with n-butyl cyanoacrylate (histoacryl)-lipiodol mixture by a squeeze technique to reach the aneurismal sac using a microcatheter.

CASE REPORT

A 77-year-old woman who was admitted to our hospital due to coronary artery occlusive disease presented diffused abdominal and chest pain. A 6.5-cm saccular aneurysm with discontinuous wall of the descending thoracic aorta was confirmed. The patient had been scheduled for TEVAR (Endologix, Irvine, CA, USA) for the aneurysm. Furthermore, the patient complained of mild dyspnea and anxiety. Computed tomography and contrast MRI revealed a type II endoleak with a fistulous communication between the main pulmonary artery and the left intercostal artery. The endoleak caused the sac to expand gradually. Therefore, we decided to perform TEVAR with a squeeze technique to reach the aneurysmal sac using a microcatheter.
Endoleak is a significant predictive factor for outcome of thoracic aortic aneurysms treated by TEVAR (5). The incidence of endoleak after TEVAR ranges from 5% to 20%, which is similar to that after endovascular abdominal aortic aneurysm repair (EVAR) (1). Type II endoleaks are most commonly seen after EVAR. Type I and II endoleaks occur at similar rates after TEVAR (6). An accepted management method is aggressive endovascular repair of type I and III endoleaks along with observation for type II endoleaks (7). Collateral circulation in the chest involving the thoracic aorta is not so well developed compared to collateral vessels in the abdomen, making transarterial embolization of thoracic endoleaks quite difficult (6). To our knowledge, there is no consensus treatment option for type II endoleaks. There have been some reports on embolization of intercostal artery caused type II endoleaks by percutaneous sac puncture through lung parenchyma. However, a direct thoracic approach may involve transgression of the pleura and lung, which has a high risk of complications (6). In our case, embolization with a...
A mixture of histoacryl (3 mL) and lipiodol (9 mL) was successfully performed with a transarterial approach in type II endoleak caused by reverse blood flow from the left seventh intercostal artery. The aneurysmal sac and intercostal arteries were embolized with a mixture of histoacryl (3 mL) and lipiodol (9 mL). Postembolization angiography showed a complete resolution of the endoleak. A unchanged saccular aneurysm and a complete resolution of the endoleak are seen on noncontrast (F) and contrast-enhanced (G) CT scans.

Fig. 2. Type II endoleak after thoracic endovascular aortic repair treated by histoacryl embolization. A. Thoracic angiogram shows a type II endoleak due to retrograde filling of the aneurysmal sac with blood flow from the left seventh intercostal artery.
B, C. Cavitogram shows opacification of the aneurysmal sac and an efferent intercostal artery (black arrows).
D. The aneurysmal sac and intercostal arteries were embolized with a mixture of histoacryl (3 mL) and lipiodol (9 mL).
E. Postembolization angiography shows a complete resoultion of the endoleak.
F, G. An unchanged saccular aneurysm and a complete resolution of the endoleak are seen on noncontrast (F) and contrast-enhanced (G) CT scans.
may be challenging but highly effective because the durability of endoleak embolization using the approach can be increased by selecting an actual endoleak with a microcathether.

In conclusion, this is a report on successful transarterial embolization with histoacryl in type II endoleak caused by reverse blood flow from the intercostal artery after TEVAR. Since there is no definite guideline for treating type II endoleaks after TEVAR, close and regular follow-up is needed for optimal treatment and good clinical outcome.

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