BRIEF COMMUNICATIONS

EXTRAPLEURAL APPROACH IN THE MANAGEMENT OF THE DESCENDING THORACIC AORTIC ANEURYSM WITH DENSE LUNG ADHESION

Yukinori Moriyama, MD, Riichiro Toda, MD, Koichi Hisatomi, MD, Hitoshi Matsumoto, MD, and Akira Taira, MD,
Kagoshima City, Japan

Recent advances in surgical techniques for various aortic diseases have resulted in improved operative results. Whatever technique is used, however, reentry into the chest cavity for redo aortic surgery poses a formidable task.¹⁻³ This is particularly true for patients with previous aortic or lung operations. Our experience with aortic repairs through an extrapleural approach on such patients is described.

Patients. In the past 5 years, 38 patients underwent aneurysm repairs in the descending thoracic or thoracoabdominal aorta at our institution. All patients had placement of a double-lumen endotracheal tube and were supported by cardiopulmonary bypass (CPB). Three of them had an extrapleural approach to the descending thoracic aorta because of dense lung adhesion to the parietal pleura.

CASE 1. A 72-year-old man had a sudden onset of chest pain with massive hemoptysis. Two years earlier, he had undergone a patch repair of an aneurysm in the descending thoracic aorta at T5-T7 via a left thoracotomy. Computed tomographic scan showed a recurrent aneurysm with massive mural thrombus. Although a transpleural approach was attempted at reoperation, the dense adhesion of the left lung to the parietal pleura prevented us from entering the chest cavity. Hence an extrapleural approach was applied. The presence of thickened, slightly edematous pleura made it possible to proceed with dissection within the extrapleural space. After liberation of the parietal pleura from the proximal descending thoracic aorta, the collapsed left lung was gently retracted anteroinferiorly to minimize injury. The skin incision was extended down to the left pararectal line across the costal arch. The diaphragm was incised circumferentially and the supraceliac abdominal aorta was exposed in the extraperitoneal space. After establishment of femoro-femoral CPB, the descending thoracic aorta was replaced with a 10-cm long woven Dacron prosthesis. The

suture line of the previous patch repair was found to be disrupted. The amount of blood loss after repair was 380 mL. The patient was discharged from the hospital with no complications and was doing well 3 years after the operation.

CASE 2. A 68-year-old man had an aneurysm in the descending thoracic aorta repaired 7 years earlier. At that time a temporary bypass from the descending thoracic aorta (at the T5 level) to the femoral artery was used to avoid lower body ischemia during the repair. During the 3 months before this admission, he had had occasional hemoptysis. Computed tomographic scan showed a contained rupture at the mid descending thoracic aorta. At reoperation a massive dense lung adhesion to the parietal pleura was encountered. Hence the ruptured aorta was reached by an extrapleural approach as used in case 1. The descending thoracic aorta was replaced with a 10-cm long woven Dacron prosthesis under femoro-femoral CPB. The proximal cannulation site for an aortic bypass used in the first operation was found to be disrupted. The amount of postoperative blood loss was 450 mL. The patient remained well 1 year after the repair.

CASE 3. A 55-year-old man was in unstable hemodynamic condition after the sudden onset of massive hemoptysis. Emergency repair was performed for a fusiform aneurysm in the proximal descending thoracic aorta through a left thoracotomy under femoro-femoral CPB with deep hypothermic circulatory arrest. Despite no history of chest surgery or lung disease, dense lung adhesion to the pleura made it difficult to enter the chest cavity without risk of a pulmonary tear. Hence the ruptured aneurysm was exposed extrapleurally and was replaced with a 15-cm long woven Dacron graft. The amount of postoperative blood loss was 250 mL. He was extubated the following day and had an uncomplicated recovery.

Comment. The optimal treatment for patients with recurrent aortic disease after prior operations remains controversial. Despite its many limitations, endovascular stent graft repair seems to be a reasonable approach for management of recurrent aneurysms of the descending thoracic aorta.⁴ However, in case of aortic rupture, open surgical repair is still considered the treatment of choice at this stage.

For redo aortic surgery there are some circumstances in which access to the aorta is dangerous or impossible. Liberation of dense lung adhesions, in particular, can provoke tremendous difficulties such as perforation of the aneurysm or trauma of lung parenchyma leading to massive hemorrhage. Hence it is advisable in such cases for these adhesions to be

From the Second Department of Surgery, Kagoshima University, Faculty of Medicine, Kagoshima City, Japan.

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Address for reprints: Y. Moriyama, MD, Second Department of Surgery, Kagoshima University, Faculty of Medicine, Sakuragaoka 8-35-1, Kagoshima City 890, Japan (E-mail: moriyama@medb.kufm.kagoshima-u.ac.jp).

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left untouched. Kwaan, Humphrey, and Connolly⁵ reported using an extrapleural approach to repair a thoracic pseudo-aneurysm. In our 3 cases as well, because of the presence of dense lung adhesions, dissection into the thickened scarred tissue around ruptured aneurysms seemed to be technically demanding. Hence the extrapleural approach was used with no complication related to lung injury despite the use of full heparinization for CPB. In view of our favorable experience, we recommend this approach to reduce the risk of pulmonary tears and open rupture of aneurysms in selected patients with dense lung adhesions.

REFERENCES

1. Moreno-Cabral CE, Miller DC, Mitchell RS, Stinson EB, Oyer PE, Jamieson SW, et al. Degenerative and atherosclerotic aneurysms of the thoracic aorta: determinants of early and late surgical outcome. *J Thorac Cardiovasc Surg* 1984;88:1020-32.
2. Carrel T, Pasic M, Jenni R, Tkebuchava T, Turina MI. Re-operations after operation on the thoracic aorta: etiology, surgical techniques, and prevention. *Ann Thorac Surg* 1993;56:259-69.
3. Crawford ES, Crawford JL, Safi HJ, Coselli JS. Redo operations for recurrent aneurysmal disease of the ascending aorta and transverse aortic arch. *Ann Thorac Surg* 1985;40:439-55.
4. Dake MD, Miller DC, Mitchell RS, Semba CP, Moore KA, Sakai T. The "first generation" of endovascular stent-grafts for patients with aneurysms of the descending thoracic aorta. *J Thorac Cardiovasc Surg* 1998;116:689-704.
5. Kwaan JHM, Humphrey R, Connolly JE. Extrapleural and extraperitoneal staged technique in successful management of complicated thoracic anastomotic aneurysm. *Surgery* 1981;90:554-8.