

Fig 1. Right anterior thoracotomy showing cannulation of the aorta (*small arrow*) and right atrial appendage (*large arrow*).

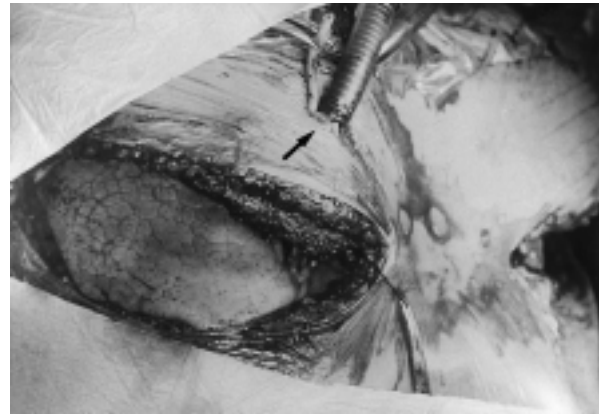


Fig 2. Transcutaneous approach for cannulation in right anterior thoracotomy (*arrow*). No sternal split is necessary.

decided to use two sequential anterolateral thoracotomies and elective CPB.

After dissection of the right hilar structures, the aortic cannula (Stöckert 5.2 mm, Munich, Germany) was introduced through the skin and right 3rd parasternal intercostal space. The cannula was later used for apical chest tube drainage (Fig 1). The single 2-stage venous cannula (Bard 46F-34F, C.R. Bard, Inc, Haverhill, Mass) was introduced through the skin and right 4th parasternal intercostal space, just in front of the right atrial appendage.

This particular case involved a long-distance procurement with an ischemic time of 4 hours 10 minutes on arrival at our institution. When CPB was instituted and right pneumonectomy followed by lung implantation was performed, the ischemic time was 6 hours 15 minutes). The left lung was transplanted sequentially, with an ischemic time of 7 hours 25 minutes. The total CPB time was 3 hours 15 minutes. The first PO_2 reading with 100% inspired oxygen fraction was 520 mm Hg. Recovery was uneventful, without ischemia-reperfusion injury.

Discussion. There is no doubt that a smaller incision produces less trauma and less pain, reduces the risk of wound complications, and facilitates recovery. On the other hand, the minimally invasive approaches have the disadvantage of producing a smaller surgical field. The majority of bilateral lung transplantations have been performed through an anterolateral thoracosternotomy known as the “clamshell” incision.³⁻⁵ The introduction of a less invasive incision, the two sequential anterolateral thoracotomies, has the challenge of performing the conventional lung transplantation through a minimally invasive approach.

When CPB is necessary, the surgeon faces the challenge of finding a way to perform cannulation with the same type of cannulas and without increasing the size of the small incision. Femoral cannulation may be an alternative but is associated with important vascular complications.

The transcutaneous extracorporeal cannulation technique herein described is very helpful in these patients. The cannu-

las are left in place away from the thoracotomy opening and provide adequate drainage of the ventricles without hampering the operation. Furthermore, exposure of the hilar structures is greatly improved, and the course of the procedure may progress smoothly without increasing the skin incision.

*Andres Varela, MD
Carlos García Montero, MD
Evaristo Castedo, MD
Jorge Roda, MD
Pablo Gámez, MD
Luis Madrigal, MD
Juan Ugarte, MD
Thoracic & Cardiovascular Surgery
Hospital Puerta de Hierro
c/ San Martín de Porres n4
Madrid 28035, Spain*

REFERENCES

1. Bryan F, Meyers R, Sudaresan S, et al. Bilateral sequential lung transplantation without sternal division eliminates posttransplantation sternal complications. *J Thorac Cardiovasc Surg* 1999;117:358-64.
2. Taghavi S, Birsa T, Seitelberger R, et al. Initial experience with two sequential anterolateral thoracotomies for bilateral lung transplantation. *Ann Thorac Surg* 1999;67:1440-3.
3. Bains MS, Ginsberg RJ, Jones WG, et al. The clamshell incision: an improved approach to bilateral pulmonary and mediastinal tumor. *Ann Thorac Surg* 1994;58:30-3.
4. Brown RP, Esmore DS, Lawson C. Improved sternal fixation in the transsternal bilateral thoracotomy incision. *J Thorac Cardiovasc Surg* 1996;112:137-41.
5. Wright C. Transverse sternothoracotomy. *Chest Surg Clin North Am* 1996;6:149-56.

12/8/104343

Cardiac aspergillosis

To the Editor:

Although nosocomial infection is decreasing in Spanish hospitals,¹ a relative increase in infections caused by fungi is

being noticed, which is similar to the tendencies found in other developed countries,² and which implies a high rate of morbidity and mortality among immunodeficient patients.³

Fungal endocarditis after cardiac surgery is rare, but when it occurs it is almost always fatal.^{4,5} As a truly effective treatment does not exist, prevention is vital. So that aerial infection in the operating room can be prevented while regulations for asepsis and epidemiologic controls are being fulfilled, it is recommended that the operating theater be acclimatized with a high degree of ambient biosecurity.⁶

We report the case of a 54-year-old woman who was operated on in October 1998 in our specifically air conditioned cardiac operating room. The diagnosis was severe aortic stenosis and ascending aortic aneurysm (6 cm). She underwent prosthetic valve replacement with a St Jude Medical 21 HP prosthesis (St Jude Medical, Inc, St Paul, Minn) and replacement of the supracoronary ascending aorta with a 26-mm Dacron graft. Five days later, a VDD pacemaker was implanted because of episodes of complete atrioventricular block. Postoperative recovery was uneventful and she was discharged on the 10th postoperative day.

The operating theater was equipped with high-efficiency particulate air filter terminals and hyper-pressure with 25 air renewals per hour. All technical tests regarding both acclimatization and periodic ambient microbiological samples had been negative.

In January 1999, the patient came to the hospital with dyspnea, orthopnea, and a dry cough. On examination, bilateral jugular distention and facial edema were apparent. Transthoracic echocardiography, computed tomographic scanning, and aortography were performed, showing a huge mediastinal pseudoaneurysm around the aortic graft, with clots inside. There was no prosthetic leak. Because an infectious pseudoaneurysm was suspected, the patient was operated under deep hypothermic circulatory arrest and the aortic graft was replaced with another Dacron graft. Same-day microscopic examination of the explanted graft confirmed a fungal infection. Intravenous amphotericin was started, but the patient died of multiorgan failure. Cultures of the graft yielded *Aspergillus flavus*.

After diagnosis of endovascular aspergillosis, we started a follow-up of all the patients operated in this theater in the previous 3 months, but fortunately, there were no other cases. An epidemiologic survey was carried out to try to detect the source of the fungal infection: microbiologic samples from air (volumetric method), hardware, and filters were collected. All the cultures were negative except two samples collected in the dual reservoir cooler/heater (HemoTherm; Cincinnati Sub-Zero Medical Division, Cincinnati, Ohio), from which *A*

flavus was isolated. Molecular typing of both strains from the exchanger and the strain from the graft was performed. The technique used was Random Amplified Polymorphic DNA (RAPD) against 8 control strains from other sources. All the strains (11) were analyzed with 3 different primers, AP12h, R-151, and R-108, to confirm the results. The strains from the heat exchanger (2) and the one from the graft showed 100% concordance whichever primer we used, thus allowing us to assert that we were dealing with the same strain of *A flavus*.⁷

These results allow us to confirm the vent of the heat exchanger as the source of the aortic graft infection. Consequently, the heat exchanger should be considered as a possible source for fungal infection and should be taken into account in the control of ambient biosecurity in the cardiac surgery operating theater.

J. I. Villate, MD
G. Aldamiz-Echevarria, MD
L. Gaztelurrutia, MD
J. I. Barrenechea, MD
P. González de Zárate, MD
Servicio de Medicina Preventiva
Gurutzetako Ospitalea
Hospital de Cruces
Vizcaya, Spain

REFERENCES

1. Vaqué J. Evolución de la prevalencia de las infecciones nosocomiales en los hospitales españoles. Epine 1990-1997. Sociedad Española de Medicina Preventiva. Salud Pública e Higiene. Madrid, 1998.
2. Fridkin SK, Jarvis VR. Epidemiology of nosocomial fungal infections. Clin Microbiol Rev 1996;9:499-511.
3. Torres-Rodríguez JM. Infecciones fúngicas invasivas. Med Clin (Barc) 1998;110:416-8.
4. Rubinstein E, Noriega ER, Simberkoff MS, et al. Fungal endocarditis: analysis of 24 cases and review of the literature. Medicine 1975;54:331-4.
5. Durack DT. Infective and non-infective endocarditis. In: Hurst JW, editor. The heart: arteries and veins. New York: McGraw-Hill; 1986. p. 1130-52.
6. Nichols RL. The operating-room. In: Bennet JV, Brachman PS, editors. Hospital infections. 4th ed. Philadelphia: Lippincott-Raven; 1998. p. 421-9.
7. Díaz Guerra TM, Mellado E, Cuenca-Estrella M, Gaztelurrutia L, Villate JI, Rodríguez-Tudela SL. Molecular typing of *Aspergillus flavus* isolates obtained from patient who underwent heart surgery and from surgical ward. Interscience Conference on Antimicrobial Agents and Chemotherapy. 39th ICAAC, San Francisco: September 26-29, 1999;

12/8/104342