Helical MDCT Reveals Smaller Segmental Pulmonary Emboli

BY DAMIAN McNAMARA
Miami Bureau

PALM BEACH, FLA. — Helical multidetector computed tomography increases the detection of smaller segmental and subsegmental—but not central—pulmonary emboli following cancer surgery, according to the results of a database review.

In the study of almost 300 cancer surgery patients at a single center, MDCT increased the detection of PEs fourfold because of the ability to diagnose subsegmental PEs. MDCT did not increase the detection of central PEs.

"Diagnosis of pulmonary embolism in most major hospitals has changed, mostly because of the MDCT scan," said Dr. Yuman Fong, chair of the department of surgery at Memorial Sloan-Kettering Cancer Center, New York, where the study was conducted. "There is increased sensitivity and the ability to get these scans much faster—in a single breath hold."

Multidetector computed tomography has replaced ventilation/perfusion lung scans as the test of choice for detecting pulmonary emboli in most institutions.

MDCT has replaced ventilation/perfusion lung scans as the test of choice for detecting PE in most institutions, he noted at the annual meeting of the Southern Surgical Association.

Dr. Fong and his associates reviewed a prospective database of 47,601 patients who had abdominal, pelvic, thoracic, or soft-tissue major surgery at the cancer center. A total of 1,441 patients had a CT angiogram to rule out PE from January 2000 to December 2005. During this time, use of the contrast-enhanced, high-resolution MDCT scans of the chest within 30 days of surgery increased at the center from 5 per 1,000 patients in 2000 to 45 per 1,000 in 2005. The researchers sought to determine if patient outcomes changed as a result, said Dr. Fong, who is also vice chair of the technology department at the center.

They identified 311 patients who had a PE within 30 days of surgery. In all, 17 of the patients had a PE but no malignancy, and were excluded from the analysis; the remaining 294 cancer patients were assessed further.

The overall incidence of PE among cancer surgery patients increased from 2.3 per 1,000 patients in 2000 to 9.3 per 1,000 in 2005, a significant difference. This higher rate resulted from significantly greater diagnosis of subsegmental PEs, which increased from 0.1 per 1,000 patients in 2000 to 3 per 1,000 in 2005. At the same time, MDCT did not increase detection of central PEs, diagnosed in 0.7 per 1,000 patients in 2000 versus 0.6 per 1,000 in 2005.

Increased detection of subsegmental PEs with MDCT "makes sense because it's more sensitive," Dr. Fong said. "Subsegmentals are harder to find with VQ [ventilation/perfusion] scan or single-detector CT."

The researchers also looked at mortality. The annual incidence rate of fatal PE did not change during the study, remaining at 0.4 per 1,000. Not surprisingly, the 30-day mortality rate for patients with the more serious central PE was higher, at 44%, compared with 6% for patients with subsegmental PE. Those with central PE "were more likely to go to the ICU, have cardiopulmonary arrest, and die in the hospital," Dr. Fong said.

More than half of the central PE group was symptomatic, whereas "only a few of the peripheral PEs were severely symptomatic," Dr. Fong said. Shortness of breath, hypoxia, and an elevated heart rate (more than 100 beats per minute) were more common among central PE patients.

All 294 cancer patients with PE were treated with anticoagulants. Of these, 40 patients (14%) developed complications from the treatment. "Given a 14% complication rate with anticoagulation, are we putting some patients at increased risk?" asked Dr. Robert C.G. Martin, a surgical oncologist at the University of Louisville (Ky.).

"At Memorial Sloan-Kettering, when we discover a PE, whether or not it's central, we anticoagulate them," Dr. Fong replied. "Surgeons put the patients on [anticoagulants,] and then the oncologists are generally afraid to take folks off anticoagulants, so they remain on semipermanent anticoagulation." There is a balance to strike between a higher risk of complications and the lower likelihood of metastasizing cancer cells circulating in the blood "being able to stick," he added. ■

Curbing Surgical Infections

MRSA Testing *from page 1*

pital. For the 8,469 procedures performed in the 3 years prior to universal screening, patients who were at high risk for MRSA (for example, they had a history of infection or lived in a nursing home) were screened with a traditional culture and were isolated pending results.

For all 5,094 elective surgical procedures performed in the 20 months after universal screening, patients were submitted to PCR testing, which allows rapid identification of MRSA carriers, Dr. Rotondo said.

All positive PCR tests were confirmed by traditional culture. Affected patients were treated with 2% mupirocin nasal ointment and chlorhexidine soap before hospital admission.

The universal screening and eradication protocol reduced the overall MRSA-associated surgical site infection rate from 0.23% to 0.09%. This was not a statistically significant difference, Dr. Rotondo said.

"It's significant if you are the one who gets infected," said study discussant Dr. Martin A. Croce, professor of general surgery and trauma at the University of Tennessee, Memphis.

One subgroup of patients, those undergoing orthopedic surgery, did experience a statistically significant decrease. Their MRSA surgical site infections dropped from 3% to 0%.

Although the screening and treatment protocol is simple, it is not without its challenges. For example, screening must be done more than 10 days prior to elective surgery so there is sufficient time to treat carriers, Dr. Pofahl noted.

"Compliance has been the hardest part, because there are several other portals of entry into the system, such as through private physician groups. We have worked with them to make sure they are compliant," he said.

A meeting attendee asked if increased screening costs were offset by fewer infections. Dr. Pofahl replied that assays cost $24 each, and patients are charged $70. "Overall, it is probably about a break-even. We get patients out of isolation earlier. This is part of a change of the culture at our institution in terms of patient safety and quality improvement, and … that is immeasurable." ■

Reliance on Checklist Cuts Surgical Deaths

BY MARY ANN MOON
Contributing Writer

The use of a simple safety checklist dramatically reduced mortality and morbidity in a study of more than 7,600 consecutive surgery patients in diverse clinical settings around the world.

The 19-item checklist, which was based on the 2008 World Health Organization guidelines for improving the safety of surgical patients, cut the rate of postoperative complications by 36% on average, "and death rates fell by a similar amount," said Dr. Alex B. Haynes of the Harvard School of Public Health, Boston, and his associates in the Safe Surgery Saves Lives study.

The overall complication rate decreased from 11% at baseline to 7% after introduction of the checklist, and in-hospital mortality decreased from 1.5% to 0.8%. Overall rates of surgical site infection and unplanned reoperation also markedly declined.

"Applied on a global basis, this checklist program has the potential to prevent large numbers of deaths and disabling complications," the investigators noted.

The medical literature suggests that at least half of all surgical complications are avoidable. The investigators designed the checklist and assessed its use in a prospective study at eight hospitals in North America, Europe, Asia, the Middle East, and Africa.

Each hospital identified one to four operating rooms to serve as study rooms. Consecutive inpatients undergoing noncardiac surgery in those rooms were enrolled. The 3,733 patients who underwent surgery during a baseline period served as a comparison group for the 3,955 patients who underwent surgery after implementation of the checklist.

"The checklist consists of oral confirmation by surgical teams of the completion of the basic steps for ensuring safe delivery of anesthesia, prophylaxis against infection, effective teamwork, and other essential practices in surgery," and is used before anesthesia is administered, immediately before incision, and before the patient is removed from the operating room, according to the investigators.

They evaluated adherence to a subgroup of six key safety measures as a gauge of overall adherence: objective assessment of the patient's airway status; use of pulse oximetry at initiation of anesthesia; presence of at least two peripheral IV lines or a central venous line before incision in cases where blood loss was expected to be 500 mL or more; administration of prophylactic antibiotics within 1 hour before incision; oral confirmation of the patient's identity, the operative site, and the procedure to be performed, before commencing; and completion of a sponge count at the end of the operation.

After the intervention was implemented, it was still commonplace for some of the 19 individual steps in the checklist to be omitted. However, adherence to the key safety indicators increased by two-thirds. Appropriate use of prophylactic antibiotics, for example, rose from 56% to 83%, a single change that could reduce the rate of surgical site infection by as much as 88%, Dr. Haynes and his associates noted.

These "substantial and robust" improvements were seen at every study site, at high-income as well as low-income locations, the investigators said (doi:10.1056/NEJMsa0810119).

Implementation of the checklist should be very feasible, since it was "neither costly nor lengthy. All sites were able to introduce the checklist over a period of 1 week to 1 month." Moreover, only two items on the checklist were potentially expensive: the use of pulse oximetry and the use of prophylactic antibiotics. Both of these were available at all the study sites before the intervention but had not been used consistently, Dr. Haynes and his colleagues said. ■