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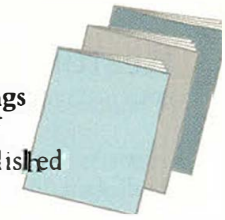
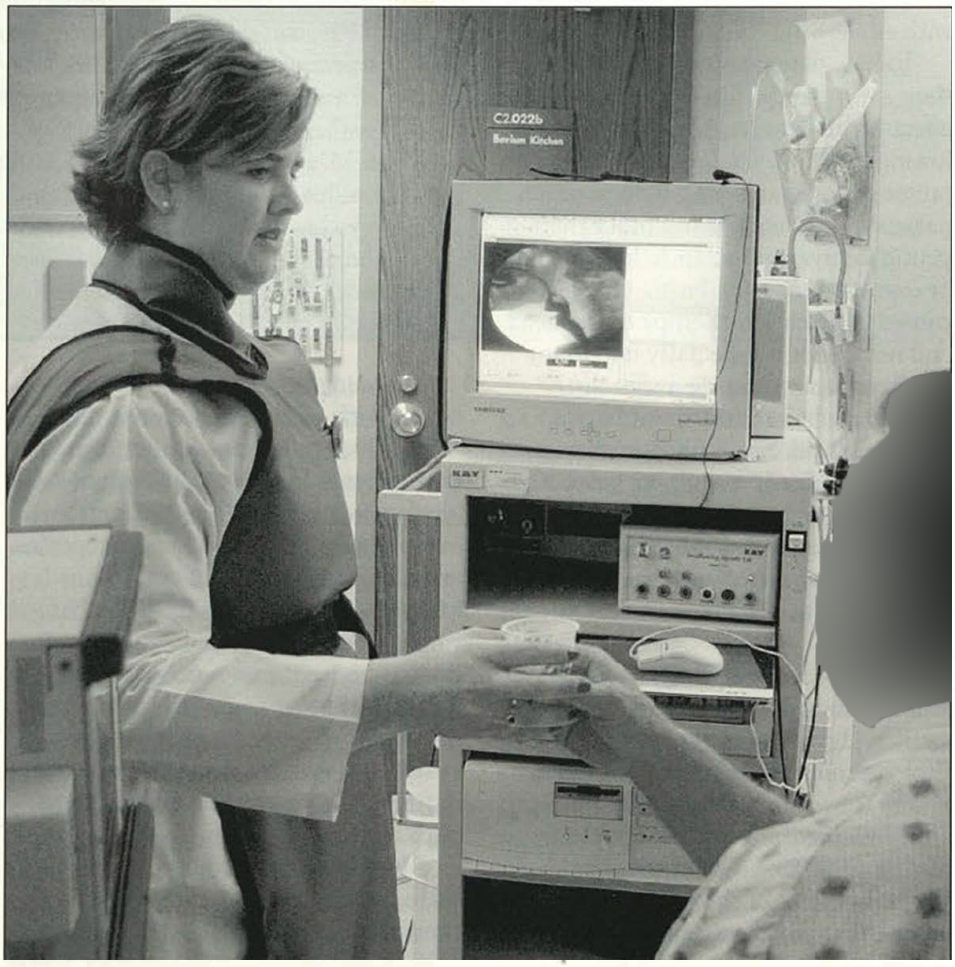


REPORT TO PHYSICIANS JANUARY 2002 Vol. 47, No. 1

OncoLog

Preserving and Restoring the Ability to Swallow in Patients with Head and Neck Cancer Requires a Team Approach



Julie Bishop-Leone, M.A., *a manager in the Section of Speech Pathology and Audiology, Department of Head and Neck Surgery, guides a patient through a modified barium swallow using food prepared in the Barium Kitchen.*

by Dawn Chalaire

When speech pathologists at The University of Texas M. D. Anderson Cancer Center counsel patients with head and neck cancer about possible side effects, the patients frequently tell them that they are worried about not being able to talk after treatment. What the patients usually do not mention, and often don't even think about, is the possibility that they may not be able to eat again.

"Patients never think about swallowing because it's a normal part of living that we take for granted," said Jan S. Lewin, Ph.D., an assistant professor and director of Speech Pathology and

(Continued on **next page***)*

THE UNIVERSITY OF TEXAS
MD ANDERSON
CANCER CENTER

Restoring the Ability to Swallow

(Continued from **page 1***)*

Audiology in the Department of Head and Neck Surgery. "Patients believe that they might not be able to swallow for a short period of time, but they really expect the problem to get better on its own. They don't realize that this may take a long time, that they may need therapy, and that they have a responsibility to participate in their own rehabilitation to be able to swallow again."

To help patients with head and neck cancer maintain or recover the ability to swallow, M. D. Anderson recently opened a swallowing laboratory where clinicians can assess swallowing function. Based on test results, the speech pathologist provides counseling, strategies for prevention, and rehabilitation services. Although the laboratory is part of the Section of Speech Pathology and Audiology, the speech pathologists work with all members of the treatment team: the head and neck surgeon, the plastic surgeon, the radiologist, the radiotherapist, the dental oncologist, the medical oncologist, and the dietitian.

"What probably distinguishes the treatment of head and neck cancers at M. D. Anderson from that at other institutions is that we work as a team," said Ann Marie Gillenwater, M.D., an assistant professor in the Department of Head and Neck Surgery. "Everybody tries to do their part to keep the patients swallowing."

Julie Bishop-Leone, M.A., a manager in the Section of Speech Pathology and Audiology, said, "Surgeons talk to us before surgery to ask what they can do to help the patients retain their ability to swallow. I've never worked at an institution where there is such close collaboration among the whole team."

As an attending head and neck surgeon, Dr. Gillenwater determines which patients are referred to the swallowing laboratory based on where their tumor is located, how large the tumor is, and what type of treatment the patient needs.

"It is interesting that the two main modalities we have for treating head and neck cancers are surgery and radiation therapy, both of which have extreme potential to make patients unable to swallow," said Dr. Gillenwater. "When we do laryngeal surgery, for example, we remove a lot of the protective mechanisms that keep food going in the right direction and prevent it from going into the lungs. Radiation therapy causes less obvious but equally significant problems for the patients and their ability to swallow."

In the short term, radiation therapy can cause pain and mucositis, an inflammation and burning of the lining of the mouth and throat, said Adam Garden, M.D., an associate professor in the Department of Radiation Oncology. In the long term, it can lead to fibrosis, a scarring of the muscles that control swallowing, which can severely limit their range of motion.

"Potentially, radiation treatment to any area of the head and neck, aside from the sinuses, could cause problems with swallowing," Dr. Garden said.

To help patients understand how their cancer and its treatment could affect immediate and long-term swallowing function, Dr. Lewin recommends pretreatment counseling with a speech pathologist. Exercises and other therapeutic interventions can help lessen or even prevent the fibrotic changes caused by radiation therapy to the head and neck, so it is especially important for these patients to see a speech pathologist before treatment begins, Dr. Lewin said. Since fibrotic changes continue to occur months or years after treatment, patients who have received counseling and know what to expect will be more likely to seek help if their ability to swallow becomes impaired.

Before recommending strategies and treatments to preserve or improve swallowing function, the speech pathologist must evaluate the patient's ability to swallow. This is usually done after treatment is completed but may also be performed during treatment, when the effect of the intervention is severe. In some cases, especially for patients who will receive radiation therapy, the evaluation occurs before treatment to obtain a baseline report of the patient's functional abilities.

Modified Barium Swallow Helps Speech Pathologists Determine What Patients Are Able to Eat

by Dawn Chalaire

It is less than a week before Christmas, and [redacted] is about to undergo a modified barium swallow. He sits uncomfortably on the ledge of an X-ray table in front of a videofluoroscope, gingerly holding a small paper cup and awaiting further instructions. His face wrinkles in exaggerated disgust as he contemplates the liquid in the cup; then he looks up at the small audience assembled behind a window in the next room, shrugs his shoulders, and smiles.

Seven weeks ago, [redacted] completed a course of radiation therapy and chemotherapy at The University of Texas M. D. Anderson Cancer Center to treat his nasopharyngeal cancer. He now has a gastrostomy tube, and his throat is very sore and sometimes burns when he tries to swallow.

Assessing how a patient swallows begins with a clinical examination. "From this evaluation, you get important information about the patient's level of independent functioning, their overall perceptions and misconceptions, and the general status of oral motor function," Dr. Lewin said. "But what you can't see is what happens to the food once it passes the patient's lips. So, in many cases, it's very important that you pair the clinical evaluation with a videofluoroscopic or fiberoptic endoscopic examination of swallowing."

Many of these examinations—including evaluations of tongue function, electromyographic studies of muscle activity, and manometry—can be performed using the swallowing laboratory's mobile computerized workstation.

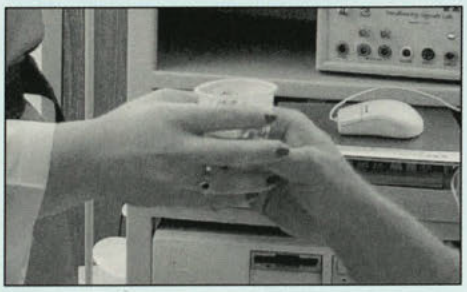
If the modified barium swallow shows that he is swallowing efficiently and not aspirating into his lungs, [redacted] could begin to eat or drink again for the first time in several weeks. According to Julie Bishop-Leone, M.A., a manager in the Section of Speech Pathology and Audiology, it is important for patients who have undergone radiation therapy to swallow as soon as possible to help prevent fibrosis.

Before [redacted] arrived in the radiology treatment room, Bishop-Leone prepared a row of cups containing water, applesauce, pudding, and fruit cocktail—each mixed with barium so that their journeys through [redacted] mouth and throat can be captured by the videofluoroscope.

"Are you ready for my wonderful cooking?" asks Bishop-Leone, and [redacted] laughs softly and jokes about his impending "Christmas feast."

At Bishop-Leone's request to swallow, [redacted] holds up the cup in a toast to those watching and puts it to his lips. He swallows then grimaces from the pain and the barium's unpleasant taste. Bishop-Leone watches on the video monitor as the liquid moves down [redacted] throat. Most of it continues on into his esophagus, but a very small amount trickles toward his vocal cords.

"A little penetration," Bishop-Leone notes to herself and to Joel Dunnington, M.D., an associate professor in the Department of Diagnostic Radiology, who is operating the fluoroscope. "Not too bad, though."



"... in many cases, it's very important that you pair the clinical evaluation with a videofluoroscopic or fiberoptic endoscopic examination of swallowing."

– Jan S. Lewin, Ph.D., assistant professor and director of Speech Pathology and Audiology, Department of Head and Neck Surgery

The test is repeated several times, with [redacted] swallowing different amounts of liquid and progressively more solid foods. Each time, Bishop-Leone watches the monitor intently to see where the food or liquid goes.

About 20 minutes later, the testing is complete, and Bishop-Leone discusses the results with [redacted]

"He did well," she tells them and begins to list the things that [redacted] can eat: mostly liquids and soft foods and, occasionally, more substantial dishes moistened with sauces, gravies, and juices. She cautions that salty, spicy, and acidic foods will burn his sensitive throat.

"Your swallow is not as efficient because things are swollen there, and you're probably not swallowing as hard because you've got some associated pain," she tells him.

Bishop-Leone instructs [redacted] to continue using the feeding tube in the same manner as before, but to keep a diary of how much he eats by mouth for a few days before his next appointment.

"When you come back," she says, "I'm going to set up an appointment for you to see our dietitian so that we can gradually wean you from the tube feedings. I'm also going to give you a set of exercises to start doing."

[redacted] jots down notes and asks questions about how to prepare some of [redacted] favorite dishes. As it turns out, he will be able to enjoy a real Christmas feast. ●

A videofluoroscopic evaluation of swallowing—commonly called a modified barium swallow—allows the speech pathologist and radiologist to assess the oral and pharyngeal stages of swallowing by viewing a functional, real-time image as the patient swallows liquid, soft, and solid foods. The speech pathologist examines the way the food is manipulated and moved in the mouth to trigger the reflex of swallowing and its subsequent transit through the pharynx, focusing on the safety and efficiency of the swallow. The modified barium swallow not only identifies the occurrence or potential for aspiration, it also allows the speech pathologist to determine why the patient is aspirating and design an individualized treatment program. If indicated, evaluation of the esophageal transit to the stomach may also be completed by the radiologist.

"After the modified barium swallow, we have a great picture of how well the patient can swallow and what the patient can safely eat," Dr. Lewin said. "The dietitian then becomes a critical resource to help us help the patient maintain their nutrition while preserving the enjoyment and pleasure associated with eating."

Patients who cannot eat enough to meet their nutritional needs require a gastrostomy or nasogastric feeding tube. In a study of combination chemotherapy and radiation therapy for patients with head and neck cancer, cited by Dr. Garden, about 80% of patients needed some kind of feeding tube. Often, however, patients are very resistant to the idea, Dr. Lewin said.

"It's critical to get these patients to us, the speech pathologists, before treatment begins, to allay the fears and eliminate the misconceptions associated with alternative methods of feeding," Dr. Lewin said. "The tube can be the patient's best friend and can actually expedite the return to oral nutrition."

According to Dr. Lewin, a patient's ability to eat can often be improved by learning to use other structures of the oropharynx through guided exercises that enhance swallowing. These exercises are designed to increase the strength and range of motion of the tongue, lips, palate, and pharynx and to protect the airway from aspiration. They may include sticking out the tongue, holding the breath while swallowing, and holding the breath and clearing the throat. While it is not possible to directly manipulate the muscles of the pharynx, changes in posture such as turning the head or bending it forward

(Continued on **page 4***)*

Restoring the Ability to Swallow

(Continued from **page 3***)*

so that the food or liquid flows to one side or avoids a recess in the throat can be helpful. Some patients may also require the use of palatal prostheses to help make the critical contacts between the tongue and palate that facilitate swallowing and speech.

According to Dr. Gillenwater, surgical techniques can also help preserve swallowing function. For example, when operating on the oral cavity, head and neck surgeons often use wires or heavy sutures to pull the larynx up and forward and tuck it under the tongue to prevent food from going into the airway. The surgeons also avoid cutting nerves in the oral cavity whenever possible, and plastic surgeons often use tissue flaps to reconstruct resected portions of the tongue, pharynx, and esophagus.

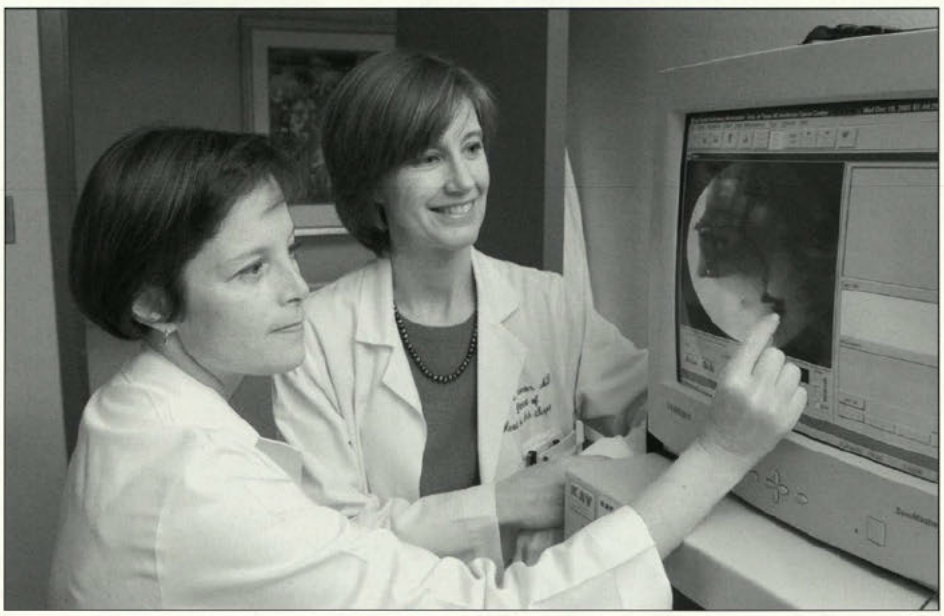
Patients who have a recurrence of their cancer or metastatic disease are also referred to the swallowing lab. "Ironically, a lot of those people come in, and when you talk to them, their biggest problem is 'I can't swallow well' or 'I can't talk well,' so they are referred to a speech pathologist," Dr. Gillenwater said. "Even in a situation where patients have incurable disease, if you can get them swallowing and off the feeding tube, you've helped them."

Even patients who have never had swallowing therapy and who come to the swallowing lab with late fibrotic changes can be helped, Dr. Lewin said. In many cases, their swallowing problems are too severe to be completely resolved, but they can be improved. For example, a patient with a gastrostomy tube may never be able to eat steak and potatoes again, Dr. Lewin said, but he or she may eventually be able to eat enough by mouth to remove the feeding tube.

Some patients never recover the ability to swallow and require permanent feeding tubes, but a more prevention-oriented, cohesive approach to treatment is making these cases less common.

"I'm very pleased to say that, especially here at M. D. Anderson, with the quality of our services and the expertise of our medical specialists, permanent dysfunction is far less common than it was in the past," Dr. Lewin said. ●

For more information, *contact Dr. Lewin at (713) 745-2309, Dr. Gillenwater at (713) 792-8841, Bishop-Leone at (713) 745-5846, or Dr. Garden at (713) 792-3400.*



Dr. Jan S. Lewin *(left), an assistant professor and director of Speech Pathology and Audiology in the Department of Head and Neck Surgery, points to the transit of food through a patient's pharynx as she and* **Dr. Ann Marie Gillenwater**, *an assistant professor in the Department of Head and Neck Surgery, review a videofluoroscopic image.*

Portal Vein Em
Offers More Pa
Opportunity for
Curative Hepat

by Mariann Crapanzano

Researchers long ago recognized that the liver has the remarkable ability to regenerate, making hepatic resection possible for many patients with cancers such as hepatocellular carcinoma or hepatic metastases from primary cancers such as colorectal cancer. Extended hepatic resection in which 25% or less of the liver remains after surgery, however, was for many years not an option owing to the high risk of complications and even death associated with the surgery. Now, a procedure known as portal vein embolization (PVE) allows physicians to preoperatively stimulate hypertrophy of the future liver remnant (FLR), the portion that remains after liver resection.

During PVE, selected branches of the portal vein are embolized by a physician, who strategically inserts into the vessels material that causes the blood to clot at those sites.

"PVE induces growth of the contralateral liver [the side that is not embolized] by diverting blood flow and hepatotrophic factors such as insulin and glucagon to that side," said Jean-Nicolas Vauthey, M.D., associate professor in the Department of Surgical Oncology and chief of the Liver Service at The University of Texas M. D. Anderson Cancer Center. The sections

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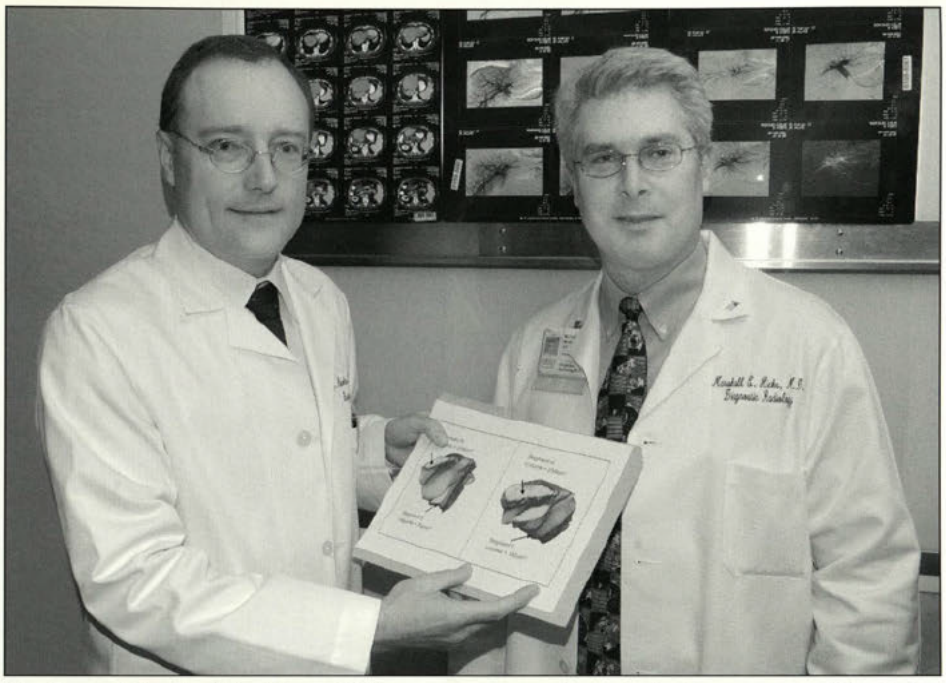


Dr. Jean-Nicolas Vauthey *(left), an associate professor in the Department of Surgical Oncology, collaborates with* **Dr. Marshall Hicks**, *a professor in the Department of Diagnostic Radiology. "We have established a method of standardized measurement before surgery, so surgery can be performed with volumetric expectations of the future liver remnant, which is very important in terms of patient outcome," said Dr. Vauthey.*

of the liver that are supplied by the embolized portal branches atrophy and are later excised—along with the cancer—during surgery.

A larger functional liver remnant better equips the patient to adjust to the physiologic insult that results from the extensive surgery.

"If you resect 75% or more of the total liver, there is a sudden increase in portal pressure because you have amputated the vascular bed," said Dr. Vauthey. In such cases, a patient who has not undergone preoperative PVE is left with a very small liver remnant, which must then regenerate to compensate for the functional liver that was lost. This puts the patient at higher risk for a cascade of adverse events.

Complications associated with resection of 75% or more of the liver include fluid retention caused by the increased portal pressure, transient jaundice resulting from insufficient excretory function of the remaining liver, and abnormal coagulation—which may lead to bleeding—due to decreased synthesis of clotting factors in the liver.

"PVE and the [hepatic] growth that occurs before resection improve perioperative function and reduce the risks associated with extensive resections," Dr. Vauthey said.

In a recent study, Dr. Vauthey and others at M. D. Anderson evaluated operative factors and results of extended right hepatectomy in 42 patients at M. D. Anderson and the University of Florida. PVE had been performed in 18 of those patients to preoperatively increase the size of the FLR, which otherwise would likely have been too small for such a resection to be performed safely. PVE significantly increased the median size of the FLR from 18% to 25% of the total liver volume. The FLR in the remaining 24 patients had been determined to be adequate, with a median size of 23% of the total liver volume, allowing resection without PVE. The rate of major postoperative complications, length of hospital stay, duration of the operation, and amount of blood lost did not differ significantly between the two groups.

The study also showed that the median survival duration did not differ significantly between the two groups—a favorable finding, since many of the patients who had undergone PVE would not otherwise have been candidates for extended resection. Eddie K. Abdalla, M.D., a clinical specialist in the Department of Surgical Oncology and co-investigator in the study, said the benefit of PVE may be better appreciated by comparing the median survival time of patients who undergo PVE (in this study, 40 months) with that of patients who have unresectable disease (reported to be about 12 months for those with hepatic metastases from colorectal cancer and about 11 months for those with cholangiocarcinoma).

Researchers do not fully understand the molecular signals that initiate hepatic regeneration or the mechanisms involved in the process. It is known that hepatocyte growth factor, which induces the proliferation of hepatocytes, is produced immediately upon physiologic insult such as a partial hepatectomy or blockage of the blood flow to the liver. Hepatocytes are very specialized cells, said Dr. Vauthey. These cells dedifferentiate into a quasi-fetal state, divide, and then differentiate back into a mature phenotype, so that the hepatic regeneration results from an increase in the number as well as the mass of the cells.

Even without PVE, said Dr. Vauthey, the liver regenerates with stunning speed after partial resection. Once the hepatic resection is performed, the stimuli for regeneration are immediately engaged, he said, with DNA synthesis and actual regeneration beginning 24 to 72 hours after surgery.

"But if you prime the regeneration, 30% to 40% of the regeneration occurs before the surgery," said Dr. Vauthey. "This staggers the physiologic insult so that you are probably less likely to induce a cascade of fatal events, and that gives the patient a buffer."

Marshall E. Hicks, M.D., a professor in the Department of Diagnostic Radiology and chief of the Section of Angiography and Interventional Radiology at M. D. Anderson, performs PVEs in a single three- to four-hour session. Dr. Hicks uses sonography to

(Continued on **page 6***)*

Portal Vein Embolization

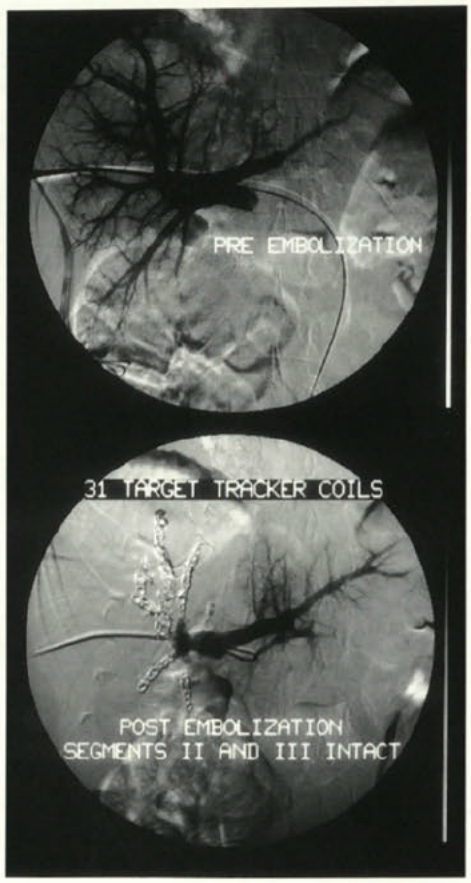
(*Continued from* **page 5**)

identify the portal vein and, in some cases, to guide the administration of a contrast agent that helps to visualize the liver's vascular anatomy. Using fluoroscopic guidance, he inserts into the vein a tube through which a catheter is placed. He then injects polyvinyl alcohol particles and tiny metal coils (just one of several effective clotting combinations or substances) through the catheter into the vessel. The blood clots around the polyvinyl alcohol and metal coils, occluding blood flow to the liver segments that will be resected.

Particular care must be taken to embolize all branches that supply segments of the liver that contain tumor, Drs. Hicks and Vauthey said. Otherwise, the embolization of selected vessels will suddenly increase the blood flow to and induce the growth of the tumor in liver supplied by veins that are not embolized.

PVE is performed while the patient is under conscious sedation and is well tolerated by patients, said Dr. Hicks. In fact, according to Drs. Hicks and Vauthey, the most common complaint by patients is the discomfort associated with lying on the hard table in the radiology suite while PVE is performed. Also, the needle entry into the liver requires local anesthetic. "The capsule of the liver is fairly sensitive," said Dr. Hicks, "but once you get through that and put the sheath into the vein, there's no pain associated with it."

The complication rates associated with PVE have been reported to be between 3% and 10%. Dr. Hicks said that in a recent M. D. Anderson study of 26 patients, the two complications encountered did not preclude successful surgery. Also, unlike hepatic artery embolization—which is used to block the blood supply to large, unresectable tumors—PVE typically does not cause postembolization syndrome, which consists of high fever, nausea and vomiting, substantial pain in the right upper quadrant, and malaise, Drs. Hicks and Vauthey said. This is because hepatic artery embolization induces necrosis, whereas PVE causes the embolized segments of the liver to shrink by apoptosis, or programmed cell death, which is not associated with such severe side effects.



Before (top) and after (bottom) portal vein embolization: The coils outlining branches of the portal vein can be seen in the lower view. (Abdalla EK, Hicks ME, Vauthey JN. Portal vein embolization: rationale, technique, and future prospects. Br J Surg *88:165-175, 2001. Figure reprinted with permission from Blackwell Science Ltd., London.)*

Dr. Vauthey selects patients for PVE before resection on the basis of the volumetric measurement, determined using computed tomography, of the FLR.

Although the selection of patients for PVE is individualized, Dr. Vauthey said, a patient may be a candidate for the procedure if the patient does not have underlying liver disease and the FLR is estimated to be only 25% or less of the total liver volume; if the patient's liver is compromised by underlying chronic liver disease, such as cirrhosis or fibrosis, and the FLR is estimated to be 40% or less of the total liver volume; or if the patient is scheduled for a partial hepatic resection plus resection of the common bile duct, which increases the need to optimize the patient's hepatic reserve. PVE is unnecessary in patients with tumors that block the portal vein because obstruction by the tumor stimulates growth of the contralateral liver without the procedure.

PVE does not substantially delay surgery, said Dr. Vauthey. The regeneration occurs in about three weeks in patients without underlying liver disease, although it may take six to eight weeks in patients with chronic liver disease or diabetes. During this time, preoperative chemotherapy may be administered if necessary.

"The advantage of PVE is that it may be performed in association with preoperative chemotherapy [in cases of metastatic colorectal cancer or for primary liver cancer, for example]," Dr. Vauthey said. "The side effects of PVE are so minimal, patients usually receive one to two cycles of chemotherapy, and then ... before the third cycle of chemotherapy, they can undergo the PVE."

Blocking the portal vein also does not interfere with subsequent chemotherapy, said Dr. Vauthey. "The chemotherapy works mainly through the hepatic artery and is preserved because the blood supply to the metastases is through the hepatic artery."

Although it is not yet the standard of care in the United States, the efficacy of PVE has been proven, and researchers are reluctant to evaluate the procedure in a prospective randomized trial that would deny some patients its benefit, said Dr. Abdalla. Future trials of PVE will likely focus on minimizing the size of the liver remnant that can retain hepatic function after resection without PVE in patients with and without impaired liver function, he said.

PVE is not an option for patients with diffuse hepatic metastases or with metastases that are not confined to the liver, Dr. Vauthey said. Also, some patients who undergo PVE are determined at the time of surgery to have unresectable disease.

For patients whose FLR is too small without preoperative embolization for an extended hepatic resection to be safely performed but whose disease is otherwise resectable, however, PVE offers both the option of resection and the chance for longer survival. ●

FOR MORE INFORMATION, *contact Dr. Vauthey at (713) 792-2022, Dr. Hicks at (713) 792-5765, or Dr. Abdalla at (713) 792-7952.*

HOUSE•CALL

Common Cancers, Common Symptoms

A healthy lifestyle (one that includes proper nutrition and exercise and excludes smoking) and regular visits to your doctor for check-ups and cancer screening tests are the best defenses against cancer. It is also important, however, to be alert for the common symptoms of cancer.

All of the symptoms listed below can—and usually do—indicate a less serious condition than cancer, so don't let fear (or embarrassment) keep you from talking to your doctor. Also, *don't* put off screening tests and regular check-ups. Sometimes symptoms may not occur until after the cancer has been growing for a while.

Don't wait until you feel pain; early cancers usually are not painful. Listen to your body. If you detect a problem, see your health-care provider.

Breast cancer

Breast cancer is one of the diseases that women dread most, but when caught and treated early, breast cancer can often be cured. The symptoms of breast cancer include the following:

- A recent change in the size of one breast
- A lump or mass in a breast, or skin puckering
- Enlarged lymph nodes in the armpit
- Changes in the nipple: bleeding or a discharge, a retraction (pulled-in area) or elevation (raised area), or eczema (red, itchy, or oozing spot)
- Dimpling, redness, edema (swelling), or sores (ulcers) on the skin of the breast
- Changes in color or in the way the breast feels to the touch

Although the vast majority of breast cancers occur in women, the disease occurs in—and kills—hundreds of men each year, too.

Colorectal cancer

Cancers of the colon and rectum can usually be successfully cured when detected early enough. Don't be shy about telling your doctor if you have any of the following symptoms:

- Bleeding from the rectum
- A change in bowel movement pattern that continues over time
- General discomfort in the abdomen (frequent gas pains, cramping pain, feeling of bloating or fullness)
- Vomiting
- Constant fatigue
- Chronic constipation

Lung cancer

Lung cancer is often associated with smoking and now occurs almost as often in women as in men. Lung cancers can be very difficult to successfully treat, but early detection can still help save lives. Symptoms may include one or more of these:

- A nagging cough, especially one that gets worse over time
- Coughing up blood
- Repeated attacks of pneumonia or bronchitis
- Pain in the chest and arm
- Loss of appetite or unexplained weight loss
- Shortness of breath, wheezing, or hoarseness
- An increased amount of sputum or sputum streaked with blood
- Swelling of the face and arms

Prostate cancer

Prostate cancer is the most common cancer in men. It is usually diagnosed before symptoms appear, and screening and early detection are critical to finding the disease at an early stage when it can be treated more effectively and potentially cured. Men with this cancer may have one or more of these symptoms:

- Painful or burning urination
- Inability to urinate or difficulty in starting to urinate
- Frequent or urgent need to urinate
- Trouble emptying the bladder completely

WARNING SIGNS OF CANCER

According to the National Cancer Institute, the following are common symptoms of a number of cancers:

- Thickening or lump in the breast or any other part of the body
- Obvious change in a wart or mole
- A sore that does not heal
- Nagging cough or hoarseness
- Changes in bowel or bladder habits
- Indigestion or difficulty swallowing
- Unexplained changes in weight
- Unusual bleeding or discharge

- Blood in the urine or semen
- Continual pain in the lower back, pelvis, or thighs

Prostate cancer is uncommon in men younger than 40. However, such symptoms in younger men may indicate other health problems that need attention.

Remember: Doctors are not mind readers! If you have a symptom that might indicate a problem, if something about your state of health feels different or wrong, or even if you just have a nagging question about your health, talk to your health-care provider. If you do have cancer, early treatment may improve the chances for a cure. ●

For more information, contact your physician or contact the M. D. Anderson Information Line:

(800) 392-1611 *within the United States, or*

(713) 792-6161 *in Houston and outside the United States.*

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Staff Publications in January

Below is a partial list of staff publications appearing this month.

Ahmad SA, Patel SR, Ballo MT, Baker TP, Yasko AW, Wang X, Feig BW, Hunt KK, Lin PP, Weber KL, Chen LL, Zagars GK, Pollock RE, Benjamin RS, Pisters PW. Extraosseous osteosarcoma: response to treatment and long-term outcome. *J Clin Oncol* 2002;20(2):521-7.

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Ellerhorst JA, Stephens LC, Nguyen T, Xu XC. Effects of galectin-3 expression on growth and tumorigenicity of the prostate cancer cell line LNCaP. *Prostate* 2002;50(1):64-70.

Gwyn K, Sinicrope FA. Chemoprevention of colorectal cancer. *Am J Gastroenterol* 2002;97(1):13-21.

Kim ES, Hong WK, Khuri FR. Chemoprevention of aerodigestive tract cancers. *Annu Rev Med* 2002;53:223-43.

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