

Strategies In Surgery

Innovations in Prevention, Diagnosis and Treatment of Breast Cancer

- New Breast Cancer Data
- Risk Assessment
- Peri-Operative Innovations
- Surgical Treatment

By William C. Dooley, M.D.,
G. Rainey Williams Chair in
Breast Oncology and
Professor, Department of Surgery

Breast cancer is rising in incidence quickly in the U.S. Current projections from the National Cancer Institute (NCI) are that by 2015, more than 480,000 women a year may be diagnosed with this disease.

Treatments for breast cancer are undergoing a rapid evolution since the introduction of breast conservation and sentinel node biopsy. Unfortunately, our diagnostic improvements have lagged behind somewhat.

The American Cancer Society stopped endorsement of self breast exam this past summer, since no scientific studies could show that it reduced breast cancer deaths. Mammography has reduced the average size of cancer at diagnosis and improved survival among American women significantly in the last five to seven years.

Even with these successes, it is humbling to realize that by the time mammography detects a 6mm breast cancer – the size of a pencil eraser- it has already been an invasive cancer for more than five to seven years. Other imaging modalities such as MRI, 3-D ultrasound and PET scans can find some cancers missed by mammography but face a similar problem of finding them years after the initial invasion and process of systemic spread begins.



Figure A. High Grade DCIS through a 0.6mm endoscope

During the last decade, we have begun to learn much about breast carcinogenesis and have had our first successful chemoprevention studies. Until recently, we have not been able to screen for the atypical hyperplasias which are best reversed by our current chemoprevention drugs.

Facing these challenges, we have completely re-organized our breast cancer programs at OU. We began offering the latest in non-surgical biopsy and imaging technology. We now have branched out to include a full range of services from genetic/risk assessment and prevention to complete integrated, multi-disciplinary treatment offering - not just the standard options - but a full array of experimental options equivalent to many of the comprehensive cancer centers.

More patients are enrolled in clinical trials during their surgical treatment at OU than at almost all of the major comprehensive cancer centers. Our collaborative efforts have joined OU breast cancer researchers with those from centers in Kansas, Texas, Alabama, California, Illinois, Oregon, Florida, Britain, Scotland, Japan, Korea, Israel, Germany and Italy to develop better prevention and detection for breast cancer. Now, Oklahomans have an opportunity to participate in changing the course of this breast cancer epidemic.

New Breast Cancer Data

- Survival is better when both the surgeon and hospital are high volume.
- Unfortunately, the majority of patients in U.S have an operation by a surgeon treating less than two new breast cancers a month.
- Rapid changes in new technologies and multi-disciplinary care require extensive CME.
- Survival is better when the surgeon has specific surgical oncology training.
- Most patients will require multi-modal treatment with subtle complexities in decision-making producing large differences in survival.
- Anti-estrogen hormonal approaches may reverse as much as 85 percent of atypical hyperplasia and pre-malignant breast disease.
- New studies show that these same benefits may

also come from Cox – 2 inhibitors, statins and certain dietary supplements in pre-clinical trials.

- “Minimally invasive” now defines many approaches.
- More than 97 percent of breast cancer can be diagnosed without surgical biopsy.
- More than 85 percent of patients are candidates for breast conservation.
- Sentinel node approaches dramatically spare uninvolved lymph nodes and may dramatically decrease complications such as lymphedema.
- Almost half of breast cancer patients may not need the full breast radiated after breast conservation surgery, allowing duration of radiation treatments to shrink from six weeks down to less than one week.

Risk Assessment

Family history tells only part of the story about breast cancer risk. Most of the history tools we were taught in medical school only help to predict a patient’s lifetime risk of breast cancer. As clinicians, we need to know when in life the patient is at greatest risk of developing breast cancer. Some of our pioneering research has indicated that women with a family history of breast cancer and who produce fluid at the nipple – either spontaneously or expressed on clinical exam – may be approaching the decade in their lives when the risk for pre-malignant disease is highest.

These women can greatly benefit from some of our new evaluation tools, such as ductal lavage and endoscopy. If pre-malignant disease is found, chemo-prevention drugs or dietary research studies are options. With lavage and endoscopy, we have now the ability to follow these patients and determine potential efficacy without having to wait until frank cancer formation. Our collaborative efforts allow us to test new approaches quickly at multiple centers and hopefully improve our attempts to lessen the numbers of new breast cancer patients diagnosed each year.

Peri-Operative Innovations

- Ductal lavage has been shown to be an effective method of finding ADH – the pre-malignant disease

most susceptible to current chemoprevention approaches.

- Surgical breast endoscopy with a 0.6mm endoscope has allowed better treatment of nipple discharge – often without external incisions.
- Surgical breast endoscopy has identified more multi-focal breast cancers and pre-malignant disease in new breast cancer patients than the combination of any other imaging modalities such as mammography, ultrasound, MRI and PET scans.
- Improvements in local anesthesia, sedation and operative technique have allowed almost all breast cancer patients to have operations completed in 50 to 90 minutes and to return home the same day.
- These changes have dramatically decreased overall costs, infection rates and complication rates.
- Use of ductal lavage in the contra-lateral breast of newly-diagnosed breast cancer patients has identified radiographic and clinically unsuspected pre-malignant disease in 25 percent of cases.
- These patients go on to get aggressive chemoprevention to reduce their chances of a second or third cancer a few years later.
- Surgical technique improvements now allow autologous tissue reconstruction immediately and safely, in most cases – even for those who may need radiation in the future.
- Discussion of all cases before, during and after treatment in a weekly multi-disciplinary forum assures consensus about treatment plans and conformity to the latest proven approaches.

Surgical Treatment

Routine operative breast endoscopy has identified that more than 41 percent of patients with small breast cancers actually have extensive malignant and pre-malignant disease that goes undetected by

traditional imaging. Being able to image this in the operating room dramatically increases the number of these women who can have successful breast conservation, since the endoscopic information can be used to design the best position and extent of lumpectomy. The endoscope allows us to see growths in the wall of the ducts of the breast as small as 0.01mm - 100 times smaller than MRI.

We believe that the accuracy of this new imaging technology will allow us to safely perform some sort of minimal access lumpectomy in the future. Can you imagine breast conserving surgery performed through a needle hole? Our research program incorporates a number of these new “ablation” technologies and offers patients tumor reducing treatments pre-operatively as we define how we might use these new techniques to replace traditional surgery.

Not only are we interested in shrinking the incisions needed for breast conservation, but we are also anxious to decrease the stress and trauma of the whole treatment process. Innovations in the technical aspects of surgery and anesthesia have allowed more than 99 percent of patients to avoid nausea and significant pain or anesthetic hangover post-operatively.

Extensive pre-operative education and customized post-operative supplies and exercises have relieved anxiety in patients and families. Most patients choose to return home the same day as their surgeries and return back to work and daily living activities almost immediately. Interestingly, our research has found that these same-day surgery patients have higher patient satisfaction, score much lower on stress surveys and experience fewer complications later in chemotherapy and radiation therapy.

A team of OU physicians, survivors, dieticians and others are now working on a series of projects to try to improve the quality of life for breast cancer survivors. Most patients gain over 20 percent in body weight within the first year after treatment and suffer a number of non-breast cancer problems, such as an increased incidence of heart disease and colon cancer. We hope to address many of these issues in our expanding clinical research program.

Already, we offer the largest enrolling American clinical trial studying the effects of soy on menopausal symptom control.

Summary

Join us to become a part of the solution to breast cancer. Whether it is a situation dealing with prevention, detection, treatment or survivorship, we are ready to help you and your patients. We certainly don't know all the answers yet, but we have a great team that knows how to ask questions, design clinical trials and get the answers we so desperately need as breast cancer becomes even more common.

References:

1. Dooley WC. Endoscopic visualization of breast tumors. JAMA 2000 Sep 27;284(12):1518.
2. Dooley WC; Ljung BM; Veronesi U; Cazzaniga M; Elledge RM; O'Shaughnessy JA; Kuerer HM; Hung DT; Khan SA; Phillips RF; Ganz PA; Euhus DM; Esserman LJ; Haffty BG; King BL; Kelley MC; Anderson MM. Ductal lavage for detection of cellular atypia in women at high risk for breast cancer. J Natl Cancer Inst 2001 Nov 7;93(21):1624-32.
3. O'Shaughnessy JA; Ljung BM; Dooley WC; Chang J; Kuerer HM; Hung DT; Grant MD; Khan SA; Phillips RF; Duvall K; Euhus DM; King BL; Anderson BO; Troyan SL; Kim J; Veronesi U; Cazzaniga M. Ductal lavage and the clinical management of women at high risk for breast carcinoma: a commentary. Cancer 2002 Jan 15;94(2):292-8.
4. Vargas HI; Dooley WC; Gardner RA; Gonzalez KD; Heywang-Kobrunner SH; Fenn AJ. Success of sentinel lymph node mapping after breast cancer ablation with focused microwave phased array thermotherapy. Am J Surg 2003 Oct;186(4):330-2.
5. Dooley WC. Routine operative breast endoscopy during lumpectomy. Ann Surg Oncol 2003 Jan-Feb;10(1):38-42.
6. Dooley WC. Ambulatory mastectomy. Am J Surg 2002 Dec;184(6):545-8; discussion 548-9.
7. Dooley WC. Routine operative breast endoscopy for bloody nipple discharge. Ann Surg Oncol 2002 Nov;9(9):920-3.
8. Dooley WC. Breast cancer-have we been chasing the wrong target? J Surg Oncol 2003 Jun;83(2):57-60.



Physicians

SURGERY

www.ouhsc.edu/surgery

For Patient Appointments
and Physician Consultation, call
405-271-0000
or statewide 888-271-6989