

Malpractice Issues in Radiology

The Missed Breast Cancer: Perceptions and Realities

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The Cases

In Illinois, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 52-year-old woman was delayed for 1 year because the carcinoma was missed on mammography was settled for \$900,000.

In Texas, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 43-year-old woman was delayed for 7 months because the carcinoma was missed on mammography was resolved at trial, with a jury awarding \$1.25 million to the woman's family.

In Hawaii, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 57-year-old woman was delayed for 17 months because the carcinoma was missed on mammography was resolved at trial, with a jury awarding \$1.32 million to the plaintiff.

In Tennessee, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 36-year-old woman was delayed for 10 months because the carcinoma was missed on mammography was resolved at trial, with a jury awarding \$1.7 million to the plaintiff.

In South Carolina, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 55-year-old woman was delayed for 2 years, in part because the carcinoma was missed on mammography, was resolved at trial, with a jury awarding \$1.8 million to the plaintiff.

In Massachusetts, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 45-year-old woman was delayed for 15 months, in part because the carcinoma was missed on mammography, was settled for \$1.9 million.

In California, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 38-year-old woman was delayed for 2.5 years, in part because the carcinoma was missed on mammography, was settled for \$2 million.

In Delaware, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 64-year-old woman was delayed for 21 months, in part because the carcinoma was missed on mammography, was resolved at trial, with a jury awarding \$2 million to the plaintiff.

In New York, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 37-year-old woman was delayed for 7 months because the carcinoma was missed on mammography was resolved at trial, with a jury awarding \$2.5 million to the plaintiff.

In Arizona, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 47-year-old woman was delayed for 13 months because the carcinoma was missed on mammography was settled for \$3 million.

In Kentucky, a medical malpractice lawsuit alleging that the diagnosis of breast cancer in a 33-year-old woman was delayed for 4 months because the carcinoma was missed on

mammography was resolved at trial, with a jury awarding \$3.1 million to the plaintiff.

In Florida, two medical malpractice lawsuits, one alleging that the diagnosis of breast cancer in a 33-year-old woman was delayed for 4 months, the other that the diagnosis of breast cancer in a 56-year-old woman was delayed for 6 months, both because the carcinomas were missed on mammography, were resolved at trial, with juries awarding \$3.1 million and \$3.35 million to the respective plaintiffs.

Medical-Legal Issues

These summarized cases constitute but a small sampling of the multitude of medical malpractice lawsuits filed in the United States that share the common denominator of claiming that a radiologist committed malpractice by failing to diagnose breast carcinoma on mammography, thereby resulting in the payment of substantial monies, through either a jury verdict or a pretrial settlement, to the woman or her family. These cases illustrate in personal terms the otherwise dry statistical data compiled by professional liability insurance companies that disclose that the number of medical malpractice lawsuits alleging injury due to missing or delaying the diagnosis of breast cancer has increased so rapidly that such lawsuits have now reached epidemic proportions. Radiologists have become the

Received March 11, 1999; accepted after revision March 26, 1999.

Case summaries are based on actual events and lawsuits, although certain facts have been omitted or modified by the author. All opinions expressed herein are those of the author and do not necessarily reflect those of the *American Journal of Roentgenology* or the American Roentgen Ray Society.

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AJR 1999;173:1161-1167 0361-803X/99/1735-1161 © American Roentgen Ray Society

specialists most frequently sued in malpractice lawsuits involving breast cancer; likewise, mammography has become the most prevalent procedure involved in medical malpractice lawsuits filed against radiologists [1]. Indeed, the allegation that an error in the diagnosis of breast cancer has occurred is now the most prevalent condition precipitating medical malpractice lawsuits against all physicians [2]. Furthermore, as can be seen in the cited cases, monetary awards in the multimillion dollar range made to women in whom the diagnosis of breast cancer has been delayed have now become commonplace. This article will explore some of the reasons behind this sharp surge in breast cancer malpractice litigation.

Perceptions and Realities

In a previous article in this series [3], I discussed perceptual issues in the context of radiologists failing to see on a radiograph an abnormality that later is plainly evident. Here, however, I shall discuss perceptual issues from a different perspective—from the failure of the lay public to see certain medical realities about the diagnosis and prognosis of breast cancer that to the scientific community are plainly evident.

At the end of *Damages* [4], a book that describes in fine detail and with great poignancy the natural history of a medical malpractice lawsuit, author Barry Werth observes that almost all malpractice cases are decided “not on the basis of fact but on the *perception* of what a jury is likely to think is fact” (italics are mine). Perhaps nowhere else in the medical field today does perception—or misperception—play as great a role as it does in breast cancer litigation. The public’s perceptions—or misperceptions—related to breast cancer fall into three categories: the perception that women are at extraordinarily high risk of developing and dying from breast cancer, the perception that mammography is 100% accurate in detecting breast cancer, and the perception that the capability of mammography to diagnose breast cancer in early stages guarantees a cure. Let us take a closer look at these perceptions—or misperceptions—by examining the bases for them and then attempt to determine to what extent the perceptions—or misperceptions—reflect reality.

The Perception of High Risk of Developing and Dying from Breast Cancer

In 1995, researchers at Dartmouth Medical School published the results of a survey regarding women’s perceptions of breast cancer

[5]. The survey found that women overestimated their probability of dying of breast cancer by more than 20-fold and the value of screening mammography in reducing that risk by 100-fold. The researchers attributed these misperceptions to widespread efforts to promote screening mammography. The researchers acknowledged that these efforts have been successful in encouraging more and more women to undergo mammography, but at the same time the researchers expressed concern that this has been accomplished at the cost of creating unnecessary public anxiety through manipulation of data.

One of the more obvious examples of manipulation of data is the familiar “one in eight” statistic, which refers to the cumulative lifetime risk of developing breast cancer for women who live past the age of 85 years. According to a senior fellow at the Hudson Institute in Washington, DC, the American Cancer Society “concocted” this figure and it “quickly became a staple of any story on breast cancer and of government advice” [6]. As pointed out in a recent article in the *New England Journal of Medicine* [7], it is true that breast cancer is the most common cancer among North American women, and the incidence of breast cancer has been steadily rising; however, the risk of breast cancer occurring in a woman in any decade of her life never approaches one in eight. A woman entering her 30s has a 1-in-250 chance of developing breast cancer in the next 10 years, and a woman entering her 40s has a 1-in-77 chance of developing the disease in the following decade. Although breast cancer is more common in older women, the risk of breast cancer developing in any decade of life never exceeds 1 in 34. As far as mortality rates are concerned, the cause of death among women at any age is always more likely to be something other than breast cancer, and in fact, the proportion of deaths due to breast cancer never exceeds 20%. Furthermore, most women in whom breast cancer is diagnosed do not die of the disease, a fact that statistics that focus merely on the incidence of breast cancer do not convey [7].

A recent article in the *New York Times* highlights the controversy surrounding the one-in-eight statistic [8]. The article points out that when women are asked to identify the greatest threat to their health, most name breast cancer—an obvious misperception. One researcher quoted in the article attributes this incorrect perception to “well-meaning public health campaigns” that have made women’s fears “even worse than they should be.” Other cancer specialists quoted in the article label the

one-in-eight figure “one of the most alarming statistics ever promoted by the National Cancer Institute and the American Cancer Society,” and express concern that the publicity surrounding this statistic causes “anxiety” and “panic.” Elsewhere, other researchers refer to women’s misperceptions concerning breast cancer as a “fear frenzy” and blame the misperceptions on media sensationalism and “awesomely successful efforts” to get more research money for the disease [6].

The Perception of Perfection

The basis for the second misperception held by the public—that radiologists achieve 100% perfection and accuracy in their interpretation of mammography—is not difficult to identify. American newspapers and magazines regularly publish advertisements that extol the virtues of screening mammography and have been doing so for years. The advertisements, usually prepared by the American Cancer Society and printed as a public service for the purpose of encouraging women to undergo mammography, are extraordinarily generous in their assessment of the accuracy of mammography. For example, one ad in its left upper corner shows a small dot measuring 1 mm in diameter. Referring to the dot, the ad declares, “You’ve just missed the first sign of breast cancer if you didn’t see that small dot...Even though you may have missed the first sign of breast cancer, a mammogram won’t.” A similar advertisement in a local magazine placed by a hospital in Atlanta (paid advertisement, Saint Joseph’s Hospital of Atlanta, Atlanta, GA) (Fig. 1) shows a dot that is 2 mm in diameter alongside a message that states, in part:

We’re making a big deal out of something this small...Detecting breast cancer in its earliest stages can make a big difference. And chances are it’s time for you to get a mammogram...[We have] radiologists specially trained in mammography.

There is little doubt that these advertisements have succeeded in convincing many women who otherwise would not have done so to undergo screening mammography. There is also little doubt, however, that by implying that mammography is 100% accurate, these advertisements have at the same time succeeded in creating among the public the perception that mammography is perfect. Is the public perception of perfection realistic? Scientific literature suggests that the answer is no, for numerous studies indicate that the

level of accuracy achieved in mammography is considerably less than perfect.

Published articles that document the accuracy of mammography in revealing breast carcinoma generally fall into two groups: those articles that specifically deal with radiologists' missing lesions on mammograms that are apparent on retrospective review (errors), and those articles that document the numbers and types of breast cancers that are simply not seen on mammography, even in retrospect (false-negatives). The distinction between the two is not always clearly delineated. A Canadian national breast screening study [9] revealed that interpreters of screening mammograms missed 17% of breast cancers and 35% of interval cancers that occurred within 1 year of screening. A study published in 1992 by Bird et al. [10] revealed that 24% of cancers are missed on mammography. A 1993 study by Harvey et al. [11] at the University of Arizona disclosed that, for women who develop cancer, 75% of mammograms initially interpreted as having normal findings are in retrospect found to show cancer by at least one of three radiologist-reviewers. A study published in 1994 by researchers at Yale University [12] revealed a miss rate for breast carcinomas on mammography ranging from 15% to 63%.

Subsequent articles commenting on the Yale study listed reasons for the lack of accuracy. These included differences in visual perception ("I just didn't see it"), differences in diagnostic criteria (one interpreting radiologist saying, "Any calcification may be malignant"; another saying, "If punctate, calcifications may be benign"), and varying thresholds of concern (one interpreting radiologist saying, "I recommend biopsy whenever my suspicion of cancer is 2%"; another saying, "My threshold of concern is 6%") [13]. Referring to the same Yale study in a *New York Times* article [14], Daniel B. Kopans pointed out that "mammography is not an accurate diagnostic test because there is considerable overlap in the appearances of benign and malignant lesions on mammograms," and he emphasized that "even the most expert doctor will occasionally overlook an important abnormality" on a mammogram.

A 1996 study of a large group of patients revealed a 40% disparity among American radiologists regarding the rate with which they recommend biopsy on the basis of mammography of women in whom cancer was later proven. The study concluded that there is indeed a "wide variability in the accuracy of mammogram interpretation within the population of U. S. radiologists" [15]. A similar review by researchers at the University of

California, San Francisco, found differing sensitivities for screening mammography that depended on the age of patients: 70% for women 30–39 years old, 87% for women 40–49 years old, and more than 90% for all women older than 50 years [16]. An Australian study described an overall miss rate of 25% [17]. An article recently published in the *American College of Radiology Bulletin* reiterated that 30–70% of breast cancers detected at follow-up mammography are visible in retrospect on initial mammograms that had been interpreted as having normal findings [18]. A meta-analysis of published literature also found that from 5% to 17% of breast cancers are missed on mammography, and emphasized that much variability exists in mammographic interpretation by American radiologists [19]. The analysis concluded that diagnostic accuracy of mammography has not changed substantially over time. This conclusion was echoed by researchers at the University of California, San Francisco, who also found that 25% of cancers were missed on mammography [20]. In his recently published book, Kopans [21] also reports that 5–15% of palpable breast cancers are not revealed on mammograms, and when carcinomas that reach clinical detectability within 1 year of mammography are included, the number increases by 20%. This kind of miss rate, concludes Kopans, is "a reality that must be acknowledged."

The Perception that Early Detection by Mammography Will Cure Breast Cancer

An advertisement (paid advertisement, American Cancer Society, Atlanta, GA) that has appeared frequently in medical journals and magazines states:

If all women over 50 had regular mammograms, their death rate from breast cancer would drop by a third....No matter what your specialty, the American Cancer Society needs you to recommend an annual mammogram for every woman over 50—it is her only true protection.

Is this advertisement accurate? Is the statement that mammography reduces breast cancer deaths by one third based on reality, or is it a misperception? The answers to these questions are far from clear.

A review of data to determine the efficacy of breast cancer screening that was published in 1989 did indeed corroborate a 30% reduction in breast cancer mortality over a 10-year period after screening mammography was be-

gun [22]. A report of a Canadian national breast screening study published in 1990 reached similar conclusions and then added that when detection of breast cancer is delayed, "concern arises that the benefits of screening will suffer and there will be an increased likelihood of death from breast cancer" [9]. Of more recent note, Feig [23, 24] at least twice has confirmed that screening mammography has led to a "statistically significant" reduction in breast cancer mortality of 29–45% for women 40–49 years old and of 34% for women more than 50 years old.

Other researchers, however, have reached different conclusions, and thus a controversy has been created. Sox [25] reviewed a meta-analysis of 13 randomized clinical trials conducted on women 50–74 years old and agreed that, in this age group, mammography reduces the risk of dying of breast cancer by 26%. However, Sox concluded that it is "not possible to claim that screening premenopausal women alters mortality from breast cancer." Chu et al. [26] also voiced skepticism about the efficacy of mammography in reducing breast cancer deaths. These researchers stated that the recent drop in breast cancer mortality has been too rapid to be explained only by the increased use of mammography, and suggested that the apparent decrease in mortality is the result of both improved therapy and better early detection methods. Harris et al. [27] also acknowledged that screening mammography appears to reduce the overall mortality from breast cancer by approximately 25%, and that in patients who are 50–70 years old, reduction in breast cancer mortality may approach 30–40%. However, these same researchers admonished that the ability to detect cancers at a very early stage does not ensure that mortality will be reduced. Harris et al. further emphasized that "there is no firm evidence that screening either reduces or increases mortality from breast cancer in women between the ages of 40 and 49."

One researcher stated at a 1997 meeting of the National Institutes of Health that mammography fails to markedly prolong the lives of women in their 40s and "offers only limited benefit to older women because the medical prognosis for most cancers that it finds is not altered by early detection" [28]. Another researcher reported that mammography "has not slashed breast cancer death rates for women in their 40s....There is a tiny benefit, if any, for women over 50—only a small proportion of those who have regular mammograms live longer as a result." Concluded another researcher at the same meeting, "Better and bet-

ter mammograms cannot magically turn the breast cancer statistics around" [28].

Adding to the controversy, Black and Welch [29], writing in the *New England Journal of Medicine*, have raised serious questions about the efficacy of mammography in reducing deaths from breast cancer in women of any age. These researchers argue that mammography has lowered the detection threshold for breast cancer, a phenomenon that can explain the increase in carcinomas found. The lower detection threshold has led to an increase in the number of carcinomas in situ, an entity that may never be life-threatening to many women. These researchers point to studies that show that small foci of breast cancer are found at autopsy in 39% of women between 40 and 50 years old who died of other causes. Most of these cancers never become clinically apparent, much less fatal. These researchers proceed to point out the difficulty in evaluating the validity of mortality data. Statistics regarding mortality are distorted by lead-time bias (pushing back the date of first diagnosis, thereby increasing the interval between diagnosis and death, resulting in apparent lengthening of survival), length bias (the more aggressive fast-growing tumors tend not to be diagnosed mammographically; thus, the tumors that are discovered by mammograms are often less dangerous), and selection bias (women who participate in medical research are often not the general population—they may be more affluent, more worried about their health, and thus not reflective of the population at large). These three biases, added to the fact that the total number of carcinomas detected by mammography now includes an increasing percentage of cases of ductal carcinoma in situ—a tumor that has an extremely good prognosis, for which there is no consensus regarding treatment [30], and that in many cases may never become invasive [31]—along with certain carcinomas that otherwise would have remained silent throughout the woman's life, can create what Black and Welch call the "spurious effect—a conversion of an apparent effect into an active effect of zero or negative."

In a provocative article in *The Atlantic Monthly*, Plotkin [32] echoed these sentiments and added that many or most in situ cancers never grow big enough to be detected by palpation, let alone to pose a threat to life. Plotkin, too, believes that the efficacy of mammography in decreasing mortality from breast cancer can be more apparent than real. Mammography reveals smaller tumors, many of which are slow-growing and might otherwise

never be discovered, concluded Plotkin. Detecting such tumors will thus manufacture an apparent excess of "cures."

Adding even more fuel to the controversy regarding the efficacy of mammography, a study of breast cancer among Swedish women 50–70 years old who underwent mammography, as reported by the *Wall Street Journal* in February 1999 [33], determined that widespread screening by mammography

...hasn't significantly reduced breast cancer mortality in Sweden...Those results sharply contrast forecasts that mammography screening would decrease breast-cancer mortality in Sweden by at least 28%.

The very premise that early diagnosis by any technique reduces breast cancer mortality remains clouded by uncertainty. A recent study does indeed lend credence to the theory that women are more likely to survive breast cancer when detected early (Michaelson JS et al., presented at the Radiological Society of North America meeting, November 1998). Long-term survival exceeds 95% in women whose breast cancer is found before it metastasizes, report the researchers. On the other hand, according to a recent *New York Times* article, the question of whether early diagnosis reduces mortality from breast cancer "remains one of the most disputed issues in preventive medicine" and, despite being "so intuitively obvious," remains "so remarkably resistant to scientific validation" [34]. This article also pointed out that finding breast tumors a few months earlier "may make very little difference in their response to treatment," and

If tumors are aggressive enough to spread out of the breast, markedly reducing chances of survival, they are likely to have done so already...In fact, early detection of these tumors may only increase the length of time a woman has to live with a diagnosis of cancer without actually changing her prognosis.

The director of health policy studies at Dartmouth College's Center for Evaluative Clinical Sciences agrees, and, in referring to the public's "incredible fear of cancer" and its belief that "early cancer detection will save your life," concludes that those "assumptions are not always true" [31].

In *The Lancet*, Skrabanek [35] has asserted that claims of "cure" in studies with a short

follow-up time—less than 30–40 years—are unjustified. Skrabanek went on to say that early detection does not guarantee cure, although it does lead to longer survival times because of lead-time bias, and that this is often confused with better prognosis or lower mortality. He also wrote that screening programs, with the accompanying "propaganda" from cancer societies and media, heighten the level of "cancer phobia," with little to show in return. Adherence to these myths and avoidance of reality "undermines the credibility of the medical profession with the public," concluded Skrabanek.

Defending Malpractice Lawsuits

After reviewing the medical records of patients who filed medical malpractice lawsuits over a 14-year period in New York State, Brennan et al. [36] found that the question of whether a physician has been negligent bears little relation to the outcome of the claims. The severity of the patient's injury, not the physician's negligence, is predictive of payment to the patient. "If the permanence of a disability, not the fact of negligence, is the reason for compensation," concluded these researchers, "the determination of negligence may be an expensive sideshow." If medical malpractice litigation is indeed a sideshow, as Brennan et al. suggest, then breast cancer cases have taken center stage position.

An analysis by Zylstra et al. [37] of breast cancer malpractice lawsuits found that the major difficulty in defending physicians successfully against allegations of failure to diagnose breast cancer in a timely manner is the public's perception of the seriousness of the adverse consequences that arise from even a short delay in diagnosis. The American Cancer Society and other agencies tell the public that earlier detection increases the likelihood of a complete cure, wrote these researchers, but "medical evidence does not support this premise." These researchers reasoned that any alleged delay associated with a noncurative outcome leads to a disillusioned patient and a physician's being sued, and a good likelihood that the physician will be held liable. Although the premise that early detection improves breast cancer outcome remains controversial from a scientific perspective, a delay in either detection or treatment will likely be viewed as inappropriate by the patient and the legal system, speculated Zylstra et al. This "loss of chance" permits compensation to the plaintiff if, in the court's opinion, the physician's negligence reduces the patient's life expectancy.

The news media also contribute to the formulation of many public misperceptions regarding breast cancer. As ABC News medical reporter Timothy Johnson pointed out recently in the *New England Journal of Medicine* [38], whereas science traditionally emphasized collective data over individual anecdotes and getting it right over getting it first, medical scientists today often feel pressured to release prematurely to the public early clinical research. And whereas journalists traditionally used multiple sources to confirm new information and obtained opposing viewpoints to balance any story, journalists are now "all too willing to let doctors and scientists of the revered medical establishment state their hypotheses unopposed whenever and however they wished." A national poll of 2300 adults disclosed that 75% of those surveyed said they pay either a "moderate amount" or a "great deal" of attention to medical and health news reported by the media, stated Johnson. The primary sources of health news listed by respondents were television (40%), doctors (36%), magazines or journals (35%), and newspapers (16%).

In an environment in which the public holds the widespread perception that we are in the midst of an epidemic of breast cancer that has a high likelihood of being fatal, that accuracy of mammography is 100% perfect, and that early diagnosis is the only and best key to survival, we can easily understand why it is so difficult to successfully defend before a jury any radiologist accused of delaying the diagnosis of breast cancer by having missed a lesion on mammography. Another national poll released in October 1998 indicated that 75% of Americans eligible to serve on a jury say that they would act on their own beliefs, regardless of legal instructions from a judge [39].

How juries can be influenced by public perceptions and attitudes is illustrated by a personal injury case in Chicago that was highly publicized in the local television and print news media. A young woman, an accomplished violinist, sustained severe injuries, including amputation of one leg, as a result of an accident that occurred while she was exiting a commuter train. Even before the trial ended, a newspaper columnist wrote that although the injury was not "an obvious case of negligence," nonetheless the columnist would be "stunned" if the jury failed to rule in favor of the woman. Wrote the columnist [40]:

The defendant attorneys are faced with the enormous task of convincing

twelve human beings that the brave, sweet, emotional, gifted and permanently disabled young woman in front of them should not receive any financial compensation for what she has endured and will have to endure for the rest of her life....Jurors are supposed to consider only the facts and put their emotions aside.... You can do that, but you better also hope the jurors are robots.

Several days later, the jury awarded the woman \$29.6 million. Clearly, sympathy for the injured woman played a major role in the jury's action. It is no stretch of our imagination to accept the likelihood that a jury could display the same degree of sympathy for a woman who has undergone mastectomy or whose chance for survival from breast cancer has been diminished because of an alleged mammographic misinterpretation. Sentiments such as those expressed by the columnist and apparently shared by the Chicago jury may well lead jurors in courtrooms around the United States to finding radiologists liable for misinterpreting mammograms, thus awarding monetary compensation to women in whom the diagnosis of breast cancer was thereby delayed.

The degree to which public perceptions influence the outcome of a malpractice lawsuit involving breast cancer is exemplified by a case in Chicago in which a radiologist was accused of missing a carcinoma on a mammogram, causing a 14-month delay in diagnosis. Once the tumor had been found, excisional biopsy was performed and lymph nodes were negative for tumor. It was now 4 years after the initial mammography, and the woman was free of detectable disease. Three weeks before the trial was scheduled to begin, the defense attorney wrote a letter to the radiologist's insurance company, stating:

Even though our consulting oncologist in this case is prepared to testify that the 14-month delay in diagnosis had no effect whatsoever in either the treatment or prognosis of the patient, I recommend that the case be settled because given the public perception that a woman can be cured of breast cancer only through early detection by screening mammography, I believe it will be very hard to convince a jury to rule in favor of the radiologist.

The case was settled for \$350,000.

Summary and Risk Management

No doubt the public, and to a large degree a sizable portion of the medical community, harbor perceptions that the incidence of breast cancer has reached epidemic proportions, that mammography is 100% accurate, and that screening mammography markedly reduces mortality from breast cancer. To be sure, considerable scientific data support these perceptions. It is not my purpose in this article to contradict these impressions or to advocate an opposing view, but I have presented data culled from the scientific literature that call into question the validity of these perceptions. I would not hazard a guess as to which set of data is more correct, but I do believe that a legitimate controversy surrounding these perceptions exists. The radiology community is virtually unanimous in its recognition that the accuracy of mammography is considerably less than 100% and, in fact, radiologists acknowledge that review of mammograms interpreted initially as normal in women who later develop breast cancer discloses that many of the cancers can be seen retrospectively. Breast cancer is a common and a deadly disease, but much of the radiology community realizes that its prevalence is nowhere near the one in eight figure that the American Cancer Society and associated organizations lead us to believe. Furthermore, although the bulk of the radiology community readily accepts the premise that early diagnosis of breast cancer by screening mammography reduces the mortality rate of the disease, nonetheless, a "respectable minority" remains unconvinced.

I have made a point in this article to differentiate between perceptions and realities with regard to breast cancer, but from a practical perspective, the distinction is murky. An adage well known in the marketing field states that "perception is reality." The patriarch of a prominent American political family is said to have advised his sons, "What is important is not what you are, but rather, what people think you are." In the courtrooms of America, what ultimately determines the outcome of malpractice litigation is what the public, in the form of a jury, believes to be true, not necessarily what is true. In pretrial settlement discussions among plaintiff attorneys, defense attorneys, and claims managers for professional liability companies, what determines the final resolution of lawsuits is what the parties think—that is, perceive—a jury will decide.

It is exactly because perceptions and realities blend that the number of medical malpractice lawsuits alleging a delay in the

diagnosis of breast cancer due to a radiologist's misinterpretation of mammograms is increasing, as are indemnifications paid in these lawsuits. What, if anything, can be done to stem this rising tide of breast cancer litigation? Perhaps no more than little of a substantial nature, but, nonetheless, the pointers that follow can assist in the effort.

- Radiologists who interpret mammograms should constantly strive to increase their expertise. Linver et al. [41] have shown that attendance at continuing medical education seminars on breast cancer and other educational endeavors related to mammography increase the accuracy of mammographic interpretations, as does comparing current mammograms with previous ones [42, 43]. In many radiology facilities, mammograms are interpreted by radiologists who spend either all or most of their time interpreting mammography. Although such dedication is not the standard of care, nonetheless, intuitively it would appear that such a practice would result in improved accuracy of mammographic interpretation [44].

- Every effort should be made to optimize mammographic examinations technically. Radiology facilities and personnel, including technologists and radiologists, should adhere to all rules promulgated by the Mammography Quality Standards Act and *Standards* issued by the American College of Radiology [45] relative to the performance of mammography.

- If it is true that the American Cancer Society and other similar organizations have overemphasized the incidence of breast cancer and have created unfounded fear of the disease in the minds of the public, as some believe, perhaps efforts should be made to convince these organizations to modify their public positions and advertising campaigns to present a more realistic portrayal of breast cancer risks.

- Radiology organizations such as the American College of Radiology and the American Roentgen Ray Society might consider the possibility of undertaking efforts that would educate the public about the actual rates of sensitivity and accuracy of mammography and about the reality that early diagnosis of breast cancer does not necessarily guarantee a cure.

- Radiologists who find themselves defendants in malpractice lawsuits alleging the missing of breast cancer should acquaint their defense attorneys with scientific literature that objectively discusses the accuracy of mammography and the relationship between early detection on mammography and breast cancer prognosis in hopes of achieving a settlement among the parties or a verdict from the jury favorable to the defendant radiologist. However,

whether acquaintance with the literature will be effective in altering the outcome of most medical malpractice litigation involving a delay in breast cancer diagnosis, remains problematic.

References

1. Physician Insurers Association of America. *Breast cancer study*. Rockville, MD: Physician Insurers Association of America, 1995
2. Physician Insurers Association of America and American College of Radiology. *Practice standards claims survey*. Rockville, MD: Physician Insurers Association of America, 1997
3. Berlin L. Malpractice issues in radiology: perceptual errors. *AJR* 1996;167:587-590
4. Werth B. *Damages*. New York: Simon & Schuster, 1998:370
5. Black WC, Nease RF Jr, Tosteson ANA. Perceptions of breast cancer risk and screening effectiveness in women younger than 50 years of age. *J Natl Cancer Inst* 1995;87:720-731
6. Fumento M. Happy acceptance of a horrific procedure: preventative mastectomy. *Chicago Tribune*, February 2, 1999:11
7. Phillips KA, Glendon G, Knight JA. Putting the risk of breast cancer in perspective. *N Engl J Med* 1999;340:141-144
8. Grady D. In breast cancer data, hope, fear and confusion. *New York Times*, January 26, 1999:D1
9. Baines CJ, McFarlane DV, Miller AB. Role of the reference radiologist: estimates of inter-observer agreement and potential delay in cancer detection in the National Breast Screening Study. *Invest Radiol* 1990;25:971-976
10. Bird RE, Wallace TW, Yankaskas BC. Analysis of cancers missed at screening mammography. *Radiology* 1992;184:613-617
11. Harvey JA, Fajardo LL, Innis CA. Previous mammograms in patients with impalpable breast carcinoma: retrospective vs blinded interpretation. *AJR* 1993;161:1167-1172
12. Elmore JG, Wells CK, Lee CH, Howard DH, Feinstein AR. Variability in radiologists' interpretations of mammograms. *N Engl J Med* 1994;331:1493-1499
13. Randall T. Varied mammogram readings worry researchers. *JAMA* 1993;269:2616
14. Brody JE. Mammogram interpretations are questioned in a report. *New York Times*, December 2, 1994:B1
15. Beam CA, Layde PM, Sullivan DC. Variability in the interpretation of screening mammograms by US radiologists. *Arch Intern Med* 1996;156:209-213
16. Kerlikowske K, Grady D, Rubin S, Sandrock C, Ernster V. Efficacy of screening mammography: a meta-analysis. *JAMA* 1995;273:149-154
17. Goergen SK, Evans J, Cohen, GBP, MacMillan JH. Characteristics of breast carcinomas missed by screening radiologists. *Radiology* 1997;204:131-135
18. Can false positives be reduced without endangering patients? *ACR Bulletin* 1998;54(6):15-17, 28
19. Mushlin AI, Kouides RW, Shapiro DE. Estimating the accuracy of screening mammography: a meta-analysis. *Am J Prev Med* 1998;14:143-153
20. Kerlikowske K, Grady D, Barclay J, et al. Variability and accuracy in mammography interpretation using the American College of Radiology breast imaging reporting and data system. *J Natl Cancer Inst* 1998;90:1801-1809

21. Kopans DB. *Breast imaging*, 2nd ed. Philadelphia: Lippincott-Raven, 1998:797-803
22. Shapiro S. Determining the efficacy of breast cancer screening. *Cancer* 1989;63:1873-1880
23. Feig SA. Strategies for improving sensitivity of screening mammography for women aged 40 to 49 years. *JAMA* 1996;276:73-74
24. Feig SA. A perspective on false positive screening mammograms. *ACR Bulletin* 1998;54(6):8.13
25. Sox HC. Benefit and harm associated with screening for breast cancer. *N Engl J Med* 1998;338:1145-1146
26. Chu KC, Tarone RE, Kessler LG, et al. Recent trends in U. S. breast cancer incidence, survival and mortality rates. *J Natl Cancer Inst* 1996;88:1571-1579
27. Harris JR, Lippman ME, Veronesi U, Willett W. Medical progress: breast cancer. *N Engl J Med* 1992;327:319-328
28. Kolata G. New view sees breast cancer as 3 diseases. *New York Times*, April 1, 1997:B9-B10
29. Black WC, Welch HG. Advances in diagnostic imaging and overestimations of disease prevalence and the benefits of therapy. *N Engl J Med* 1993;328:1237-1243
30. Ernster VL, Barclay J, Kerlikowske K, Grady D, Henderson IC. Incidence of and treatment for ductal carcinoma in situ of the breast. *JAMA* 1996;275:913-918
31. Kolata G. Ability to find a tiny tumor poses dilemma. *New York Times*, March 27, 1996:A1, B8
32. Plotkin D. Good news and bad news about breast cancer. *The Atlantic Monthly*, June 1996:53-82
33. Breast-cancer study casts doubts on mammography. *Wall Street Journal*, February 23, 1999:B5
34. Zuger A. Do breast self-exams save lives? Science still doesn't have answer. *New York Times*, January 6, 1998:B9, B15
35. Skrabanek P. Screening for disease: false premises and false promises of breast cancer screening. *Lancet* 1985;2:316-319
36. Brennan TA, Sox CM, Burstin HR. Relation between negligent adverse events and the outcomes of medical-malpractice litigation. *N Engl J Med* 1996;335:1963-1967
37. Zylstra S, Bors-Koefoed R, Mondor M, Anti D, Giordano K, Resseque LJ. A statistical model for predicting the outcome in breast cancer malpractice lawsuits. *Obstet Gynecol* 1994;84:392-398
38. Johnson T. Shattuck lecture: medicine and the media. *N Engl J Med* 1998;339:87-92
39. Lester W. Jurors say they follow beliefs, not instructions. *Chicago Sun-Times*, October 24, 1998:37
40. Roeper R. A case that tears at the heartstrings. *Chicago Tribune*, February 25, 1999:11
41. Linver MN, Paster SB, Rosenberg RD, Key CR, Stidley CA, King WV. Improvement in mammography interpretation skills in a community radiology practice after dedicated teaching courses: 2-year medical audit of 38,633 cases. *Radiology* 1992;184:39-43
42. Sickles EA. False positive rate of screening mammography (letter). *N Engl J Med* 1998;339:561-562
43. Berlin L. Malpractice issues in radiology: comparing new radiographs with those obtained previously. *AJR* 1999;172:3-6
44. Roux S, Markle L, Diamond A. False positive rate of screening mammography (letter). *N Engl J Med* 1998;339:561
45. American College of Radiology. *Standards*. Reston, VA: American College of Radiology, 1997

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