Problems in Breast Cancer Screening

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Abstract
Breast cancer in Japan is increasing. The prevalence peaks in middle age (30 to 65 years old) and declines at higher ages. In contrast, breast cancer in Western countries occurs predominantly in old age. In Japan, breast cancer has already been ranked the highest among the causes of cancer deaths in females aged between 30 and 57. The prevalence of breast cancer in Japan, albeit increasing, is less than one-third of that in Western countries, but it represents a considerable problem, since the disease affects women in the most productive age. The Ministry of Health, Labor and Welfare of Japan considered that allowing the increases in the breast cancer prevalence rate and death rate to continue would be a discredit to the country, in view of the fact that the breast cancer death rate in Western countries has been decreasing rapidly since the 1990s and the prevalence rate has been approaching a plateau. In March 2000, the Ministry issued Notification No. 65 of the Health and Welfare Bureau for the Elderly, in which conventional breast cancer screening relying on inspection and palpation was to be bolstered by the biennial MMG screening of women aged 50 and older. In the spring of 2004, the lower age limit for MMG screening was lowered to 40, considering the peak of prevalence in middle age in Japan. However, a system for MMG screening cannot be established in a day by simply issuing a notification. What we need in the meantime are the combined efforts of the national government, local governments, industries, mass media, and medical circles to educate and raise awareness of breast cancer, which should enable accurate MMG screening networks to be successively activated. For the detection of breast cancer, we need to develop a naturally acceptable route in which all women, in cooperation with all family members, perform breast cancer palpation, obtain advice from friends, and visit medical services. Although Japan lags behind Western countries in breast cancer issues, the intellect of the Japanese people is sufficiently high to support this approach. A national project like this should be realized in the timescale of a decade.

Key words  Breast cancer screening, MMG screening, Inspection and palpation, Self examination

Introduction
Articles featuring false-negative cases of breast cancer occurring in inspection-palpation screening and emphasizing the importance of mammography (MMG) screening appeared in the mass media in the fall of 2003, triggering lively discussion on MMG screening of breast cancer. Concerns had already been expressed regarding the screening depending on inspection and palpation without the use of MMG, and steady efforts had been made for improvement. There had

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also been envy over the achievements in Western countries, such as the development of the system for MMG screening since the 1990s, the high accuracy, and the insurance coverage of costs. A few attempts of MMG screening had also been reported in Japan.

However, for the physicians on the frontline conducting breast cancer screening using inspection and palpation with a combined sense of passion and despair, the plan to introduce MMG screening in a day seemed totally unrealistic. While MMG screening was regarded as a remote goal, inspection-palpation screening was continued on the premise that MMG screening was not easily attainable.

Steady efforts toward the realization of MMG screening in Japan have been made under the unspoken pressure of the fact that MMG screening was being used in every industrialized Western country and the death rate of breast cancer was decreasing in many.

To address this difficult challenge, the Ministry of Health, Labor and Welfare organized the Study Group on Cancer Screening and a draft plan for MMG screening was developed. The Accuracy Control Committee was subsequently established to ensure the accuracy of MMG as an organization formed around the core of the Japan Association of Breast Cancer Screening, the Japanese Breast Cancer Society, and the Japan Radiological Society. Based on these developments, the Ministry issued Guidelines for Health Education for Cancer Prevention and Implementation of Cancer Screening (Notification No. 65 of the Health and Welfare Bureau for the Elderly) dated March 31, 2000. The guidelines stated, “Women aged 50 and older should be examined by biennial inspection-palpation screening and mammography screening (oblique view in one direction) as a rule.” The guidelines also stipulated the standards for the use of mammography equipment, as well as the standards for training and qualification of technologists and reading physicians.

However, these guidelines were not administrative orders but recommendations. Although they declared the time had come to introduce MMG, only a few advanced medical institutions followed the recommendations.

While the progress toward MMG screening remained slow, everyone concerned was shocked by the report in the Asahi Newspaper that MMG screening was being used in only less than half of all breast cancer screening occasions. The shock came from their bewilderment, perplexity, and impatience.

The Study Group on Cancer Screening subsequently expanded the scope of activity. Considering the recent increase in breast cancer prevalence at ages 45 to 49, it was decided that the lower age limit for screening would be lowered from 50 to 40 years old, effective as of March 2004. The Committee’s report to the Ministry included the following: (1) screening should cover women aged 40 years or older; (2) screening should be performed using both inspection-palpation and MMG; and (3) the subjects in their 40s should be examined by MMG in two directions, because the high density of mammary glands adversely affects accuracy. These recommendations were published as a supplement to Notification No. 65 of the Health and Welfare Bureau for the Elderly. Although these recommendations were logical and reasonable, they aggravated the perplexity and impatience both among medical professionals and among the general public.

In this article, I offer a personal opinion as to how we should deal with this situation, focusing on MMG screening of breast cancer in Japan.

How Breast Cancer Is Detected in Japan

Figure 1 shows the statistics of how breast cancer was detected (why patients consulted a doctor) in the patients undergoing surgical treatment at the Department of Breast Surgery, the Cancer Institute Hospital of the Japanese Foundation for Cancer Research.1 In an overwhelming majority of cases, the
first symptom was a palpable lump (breast mass), which occurred in more than 80% of patients. After the presence of cancer was confirmed by various tests at the hospital, more than 90% of patients had palpable breast lumps. Cases detected by other means were extremely few. Women with palpable breast lumps should consult a doctor as a matter of course. They are symptomatic patients, who are not supposed to receive breast cancer screening. The cases of breast cancer detected by MMG screening or ultrasound screening in symptom-less women without breast lumps were as few as 11.7% in the years 2000–2002.

This fact clearly illustrates the incoherence of breast cancer screening in Japan. MMG screening is contributing little to the detection of breast cancer in Japanese women at present, and most of the detected cases are symptomatic patients with lumps. While women with lumps do not necessarily have cancer, most patients with breast cancer have lumps. Because many such patients are not aware of the disease, they do not consult a doctor immediately and receive inspection-palpation screening. This results in a high detection rate of breast cancer in screening. However, considering the significance in reducing the mortality rate, detection of these cases does not contribute to the effectiveness of inspection-palpation screening.

Figure 2 shows the longest diameter of a tumor in the patients with palpable lumps at
the time of surgery. The data for 1970, 1980, 1990, and 2000 do not reveal a consistent decreasing trend in tumor diameter, and the most frequent diameter remains in the range from 25 to 30 mm. T1 tumors (\(2 \leq T \leq 5\) cm) represent 35 to 40%, and T2 tumors (\(2.1 \leq T \leq 5.0\) cm) amount to nearly 50% (Fig. 3). As far as we see here, Japan is an underdeveloped country with respect to breast cancer.

Correlation between Palpation and MMG

Then, why is there a growing need for MMG screening of breast cancer now? Figure 4 compares the ability of inspection-palpation and MMG to detect lumps. As mentioned above, the size of the lumps in the new patients visiting the Department of Breast Oncology of the Cancer Institute Hospital, Tokyo is 2.5 to 3.0 cm in average. Lumps with diameters from 2.0 cm (the size of a 1 yen coin) down to about 1.5 cm are palpable. In many cases, a lump that is as small as 1.5 cm feels like an indistinct core in fatty tissues. As the size approaches 1.0 cm, lumps become much less palpable. In contrast, MMG can detect smaller lumps as well as large palpable lumps. The mean diameter of non-palpable breast cancer (Tnp; tumor not palpable) detected by MMG is about 1.0 cm. Smaller lumps down to about 5 mm can be diagnosed as cancer. Even smaller tumors can be diagnosed in the case of daughter tumors near the main tumor, but diagnosis of a solitary tumor of this size is difficult.

On the other hand, there is a splendid method for diagnosing breast cancer, namely, the depiction of calcified lesions. Calcification in the mammary gland can be cancerous or benign. In both cases, it usually occurs within mammary ducts. Calcification in cancer is localized to the tumor site and segmentally confined to one lobe. The calcification has a characteristic irregular shape, the appearance of which resembles a beer bottle that has been smashed on the pavement, and mainly consists of calcium phosphate. Sizes are distributed in the ranges of about 50 \(\mu\)m, about 500 \(\mu\)m, about 1 mm, etc. The ability of MMG in discerning this calcification is unrivaled. In view of the capability for imaging small tumors and calcification, as well as the objectivity of photographic recording, we can clearly see the advantage of MMG over inspection-palpation.

While MMG screening of breast cancer is definitely superior to inspection-palpation screening, it cannot detect all tumors. Clearly palpable masses are often missed by MMG. In many cases, masses are hidden in dense shadows of well-preserved mammary glands. False-negative cases, where masses are over-
looked due to reading errors, and false-positive cases arising from a fear of over-looking also occur frequently. Dependence on MMG may cause a problem of over-treatment. While clearly depicted masses do not involve this problem, tumors detected by microcalcification (such as those verified by the mammotome) can be treated excessively cautiously with unnecessary surgical treatment.

Although MMG screening has difficulties and detriments as mentioned above, it is the best method for breast cancer screening in Western countries, where breast cancer is much more prevalent than in Japan and women tend to have large breasts making palpation difficult. In Japan, too, MMG will clearly become the decisive means for breast cancer screening in the future.

The Japanese government is now encouraging MMG screening. The text of Notification No. 65 of the Health and Welfare Bureau for the Elderly (Table 1) imperatively states that MMG screening should be used as a rule. The supplement provided by the Study Group on Cancer Screening in March 2004 states the following:

- Traditionally, self-palpation has been recommended, because breast cancer is often detected by the patient’s awareness of a lump (mass) and it is the only cancer that can be examined by the patients themselves. However, breast cancer with a palpable lump is already in an advanced stage with a high possibility of metastasis to other organs, and the failure to detect such cancer clinically should not be allowed to occur.
- It is necessary to ensure that cancer is detected in a stage presenting no subjective symptoms before a palpable lump develops.

The wording of the above recommendations seems to lack sympathy for the actual situation and grievances of clinical professionals.

**Bewilderment of Clinical Professionals at MMG Screening Recommendations and the Mass Media Coverage Claiming MMG Screening Is the Only Effective Breast Cancer Screening**

Although breast cancer is increasing rapidly in Japan and more and more new patients are being identified, there are only a limited number of hospitals specializing in breast cancer. Because of the escalating trend for patients to choose renowned hospitals, patients with breast cancer have to wait for more than a month or even two months before admission. This is a detrimental effect of the uniformity and indiscrimination in the health insurance system of Japan. This problem will not be solved unless appropriate measures are urgently taken, such as classifying the levels of hospitals, giving preferential treatment to breast cancer specialists and authorized medical institutions, and introducing relevant competition principles. It is the uniformity of the provision of medical services that is causing the overcrowding of the breast surgery departments of famous hospitals, much to the inconvenience of patients.

However, women wanting an examination...
visit the breast surgery departments of such hospitals because they offer examination resources of the world’s highest levels. As a result, examinations for the purpose of screening drive away patients with breast cancer who are in urgent need of examination. While a small number of such cases may be acceptable, tens of such cases thwart the execution of the hospitals’ mission. Women visiting hospitals with anxiety over breast cancer usually claim that they have trouble or pain in the breasts. They assert their rights without realizing that they are doing wrong. According to the rule, such persons must receive examination at medical checkup facilities, and the cost must be self-paid. This cost is usually less than 10,000 yen (US$100), but it is much higher than the self-paid portion of the examination cost using health insurance, and hence many women choose to visit hospitals. While the mass media have been encouraging the violation of the law concerning mass screening in this form, the Ministry of Health, Labor and Welfare has not issued a statement against such media coverage. The deficit in the national health insurance system is bound to increase.

A hospital is a place for patients with known or strongly suspected diseases. On the other hand, persons without subjective symptoms who are anxious about health and who want to confirm the absence of disease should receive screening or checkup. While medical services for patients at hospitals are covered by medical insurance and patients can receive medical care at low cost, as stipulated in insurance policies, screening (checkup) is a different matter. It is outside the scope of the Health Insurance Law, and the cost must naturally be self-paid.

However, there is a gray zone between medical care and screening (checkup), where the two overlap each other and cannot be discriminated clearly (Fig. 5). From the physician’s perspective, it can very roughly be said that an examination falls under medical care if there is a lump and screening (checkup) if there is none, because a palpable lump is the main sign of a breast tumor, whether benign or malignant. However, how do we classify a woman receiving an examination because she has pain, because something is wrong with a part of the breasts, or because her mother and sister had breast cancer? We cannot discriminate these cases and any methods of discrimination would cause problems. In fact, public facilities such as cancer screening centers offer examinations on a self-paid basis in principle, but users are told at the time of making a telephone appointment that part of the cost will be covered by insurance if they have some specific medical problems and the cost must be self-paid if they have none. Given this explanation, users would choose either of the two options if there were some difference in examination procedures. If there is no difference, users can pay less by stating that they feel that there is something wrong with their breasts. In this logic, cancer screening centers are no different from the outpatient departments of hospitals. However, the Ministry has not taken any action to correct this situation. This attitude is contrary to the policies to reduce deficits, such as to limit the medical services for people lacking major symptoms by raising the percentage of the self-pay portion from 20% to 30% and raising the follow-up consultation fee.
Every citizen should recognize that screening (checkup) with higher accuracy costs more and the maintenance of their own health requires investment. In making this investment, citizens should seriously evaluate the accuracy of screening. As discussed above, although the discrimination between medical care and screening (checkup) must be made, this discrimination is very difficult. People with no reason to suspect a disease should never try to save on the cost for screening (checkup) by receiving it in the form of medical care covered by medical insurance. As stated in the public brochures, if you know you have a lump in the breast, do not wait until municipalities offer free screening but see a doctor; you do not want to throw your health away. Every person should understand the need for paying properly defined charges to secure their own health.

Where to Look for Accurate Screening

At present, facilities performing MMG screening in Japan include the following:

1. Screening centers, cancer screening centers, etc. attached to hospitals (in separate buildings);
2. Public and semi-public facilities entrusted by local governments, such as screening centers, cancer screening (checkup) centers, Health Service Associations, and Public Health Service Associations;
3. Privately operated health screening facilities and screening centers operated by companies for their employees; and
4. Privately operated breast cancer screening clinics.

The facilities under (1), (2), and (3) are reasonably well equipped, but equipment renovation to replace aged units with the newest models is rarely possible. Difficulties also lie in the recruitment of specialist technologists and physicians, as well as the capability to double check mammograms. These facilities are inferior to hospitals in terms of equipment, human resources, and accuracy, and upgrading these factors would require considerable investment of money and manpower. It seems that dumping is taking place among some of these facilities. Category (4) includes a small number of facilities offering self-pay screening services, where experienced physicians recognizing the value of MMG are providing highly accurate screening for a price. Facilities in this category are gradually increasing in number. While their services compare favorably with those of top-ranking hospitals, the shortage of human resources is a major problem.

As discussed above, the realization of MMG screening is not easy. The development of screening networks may not be completed in a short time, as there will be constraints in various aspects, such as location, fund, specialist technologists, specialist physicians, accuracy, proficiency, and experience. It will probably take 10 years.

Education and Raising Awareness about Breast Cancer

As discussed in the above sections, the announcement to start MMG screening alerted the nation to the urgency of need, and it exerted a strong impact in concert with the thrust from the mass media. Local governments and other relevant parties are now implicitly but inevitably forced to make further efforts to take long, difficult steps. Women and their family members are waiting in expectation.

However, from the perspective of frontline medical institutions, the present situation in Japan is far from the goal of promoting MMG screening. Although the prevalence of breast cancer is much lower in Japan than in Western countries and the relatively small size of the breasts of Japanese women means easier examination as compared with Western women, nearly 50% of breast cancer cases in Japan are detected at stage II.

The most important areas in which Japan is lagging behind are education and raising
awareness about all aspects of breast cancer. The enviable fact that MMG screening has reached 70 to 80% in Western countries is supported not only by the development of MMG screening networks, but also by the breast cancer education and awareness efforts targeted at both women and men. Although the above-mentioned statistics show no progress in the early detection of breast cancer cases since 1970, my impression in practice at the Department of Breast Surgery, the Cancer Institute Hospital of JFCR suggests that breast cancer detected by screening has increased since the Asahi Newspaper coverage of breast cancer issues. The intellect of the Japanese people is sufficiently high to improve the underdeveloped situation regarding breast cancer. We should all take measures to educate and raise awareness so that we can create an environment in which women react without fear to breast cancer and all people seriously work toward the early detection.

To this end, it will be necessary to provide education in breast cancer in general, facts about the increase in breast cancer, practice of self-examination, basic knowledge of MMG, significance of receiving MMG, screening networks, etc. Physicians, hospitals, industries, mass media, local government, and the state should collaborate enthusiastically to repeat educational efforts concerning all aspects of breast cancer. Education and awareness projects will require much less funds as compared with the development of MMG screening networks, and the effect will be considerable, if conducted repeatedly. As I frequently leave the operating room and participate in various education and awareness activities, I feel that the effects of such activities are expanding year by year. The Susan G. Komen Breast Care Foundation, headquartered in Dallas, U.S., raises $100 million every year from various enterprises through marathon events held for breast cancer campaigns at various locations throughout the world. Their scale, enthusiasm, and performance are astonishing. The Foundation’s efforts to fight breast cancer are gaining people’s sympathy nationwide, and we cannot help but applaud them.

As education and awareness activities are continued in Japan, women will be more cautious about breast cancer, self-examination will be practiced widely, and the size of breast cancer at the time of detection will diminish. Meanwhile, MMG screening networks will be developed step by step, and hopefully we will be able to respond to the recommendation of the Study Group on Cancer Screening. This is the rough road map that should be presented before the announcement of MMG screening.

Personal Opinion on the Development of MMG Screening in Japan

1. The above discussion should provide a glimpse of the direction of the development of the MMG screening network in the future. The proposals of the Study Group on Cancer Screening contained the following remarks concerning the development of the system for implementation of the screening:
   ● Prompt introduction of MMG screening should be planned.
   ● The state, prefectures, municipalities, and related organizations should cooperatively take necessary measures so that screening can be provided in all municipalities starting from fiscal 2005.
   ● The state, prefectures, municipalities, and related organizations should cooperate in developing training courses for radiation technologists and physicians performing screening, recruiting human resources, and ensuring sufficient accuracy control.
   ● It is also important to ensure accuracy at medical institutions that perform detailed examination after screening.

The Ministry of Health, Labor and Welfare issued the Health and Medical Service Law for the Aged based on these proposals. From the text of the Law, we can expect that screening (checkup) conducted by local governments will naturally be subsidized
from the national budget. In fact, when Ms. Yoriko Madoka, Member of the House of Councilors, asked about the measures for improving MMG screening before the House of Councilors Standing Committee on Audit in the presence of the Prime Minister, her question was answered by Mr. Sakaguchi, Minister of Health, Labor and Welfare, as follows: Buying MMG equipment is no easy matter because it costs as much as 20 million yen US$0.2 million per unit, but it is a means to save human life. Therefore, the government is attempting to promote the use of MMG across Japan while reducing the lower age limit for screening from 50 to 40. His answer implicitly suggests future subsidizing from the national budget.

2. Semi-public screening facilities are unable to perform highly accurate screening as long as they are being operated separately from each other. We should seek a means to promote cooperation and unification among them.

3. Self-paid MMG screening provided by private physicians may be improved further, if a larger number of experienced physicians come to operate such screening facilities and work in friendly rivalry. The general public should make efforts to entrust their own health to better medical services and actively evaluate the quality of screening to improve accuracy.

4. The facilities providing the most accurate MMG examination in Japan are top-level hospitals that are performing breast cancer surgery in clinical practice. Using these facilities may be the fastest way to success. This will require several conditions. In the U.S., such examination is covered by Medicare, Medicaid, and insurance policies for wealthy people. In Japan, cancer centers and specialized hospitals should be devoted to treatment, and some other hospitals, as long as they have reserve capacity, should cover MMG screening that is recommended under health insurance.

While items 1 and 4 above require discussion and decision at the National Diet, these seem to be the most feasible solutions.

References


