Screening and minimally invasive treatment for gastric cancer are important challenges in elderly patients

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The aging of the population in Japan outweighs that in all other countries, with Japan having the highest proportion of elderly people. The average life expectancy of men ranks second behind that of Iceland and the average life expectancy of women is the highest in the world. In 2006, the Ministry of Health, Labour and Welfare announced that the number of elderly Japanese people over 80 years old was about 6,700,000. The ratio of people 80 years or older to the total population in Japan recently overtook the ratios in Italy and Sweden to become the highest in the world. Therefore, Japanese are among the longest-living ethnic groups in the world, but they do not live forever. Human beings die of disease but they don't die of getting old. Cancer, heart disease, cerebrovascular disease, and pneumonia are the top four causes of death in elderly people in Japan. In 2006, the Japanese Cancer Registry [1] estimated that the number of people over 80 years old affected by gastric cancer was 26,121 (Table 1). The Cancer Registry estimated that the numbers of patients affected by malignant disease in the generation of people over 80 years old were: 23,585 with large-bowel cancer, 23,423 with lung cancer, 8,689 with liver cancer, 8,191 with gallbladder and bile duct cancers, 7,679 with pancreatic cancer, 5,119 with cancer of the urinary bladder, and 4,008 with malignant lymphoma.

The Cancer Registry estimated that, of the gastric cancer patients over 80 years old, 17,753 would die of gastric cancer, with the proportion of dead patients to affected patients being 68%. Both the stomach cancer prevalence

and the death rate were markedly higher in people over 80 years old than in other age groups. The first reason for the high death rate in elderly patients with gastric cancer would be that their disease had been detected at an advanced stage compared with that in younger patients. Secondly, for elderly patients with gastric cancer, their complicated disease status and physical situation would not permit the use of some invasive treatments. Early detection and early treatment is considered a useful strategy to reduce the rate of death due to gastric cancer, even in this elderly generation. In an article in *Gastric Cancer*, Abe et al. [2] reported the minimally invasive treatment of mucosal gastric cancer in elderly patients over 80 years old. They noted that bleeding and perforation rates in endoscopic mucosal dissection (ESD) for elderly patients with gastric cancer were low, at 3.2 and 2.8%, respectively, and the cumulative observed survival in the patients with curative ESD was better than the expected survival for the general population of similar age and gender. They proved that ESD for mucosal gastric cancer was safe and feasible even in elderly patients over 80 years old.

The remaining problem would be to detect mucosal gastric cancer in asymptomatic people. In Japan, because the incidence and mortality of gastric cancer were high, population mass screening with indirect X-ray examinations was begun in 1964. More than six million individuals annually participated in the X-ray screening programs organized by the Japanese government, and about six thousand patients with gastric cancer were diagnosed via screening. A meta-analysis of three case-control studies showed that gastric cancer screening using X-ray examinations resulted in reduced mortality from gastric cancer. It was reported that gastric cancer mortality was halved in the period from 2 to 7 years after community-controlled X-ray screening following the Japanese method was performed

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Table 1 Gastric cancer incidence and death according to age in Japan (2006)

Age (years)	10–19	20–29	30–39	40–49	50–59	60–69	70–79	≥80
Number of affected patients	12	218	1,301	4,238	16,418	29,068	39,535	26,121
Number of dead patients	8	67	409	1,152	4,962	9,788	16,272	17,753
Proportion of dead patients to affected patients (%)	67	31	31	27	30	34	41	68

in Costa Rica, which has the fifth-highest incidence rate of gastric cancer in the world. Japanese guidelines were established in 2006 and recommended gastric cancer X-ray screening for population-based and opportunistic screening.

Until the early 1980s X-ray had been the first-line method of examination for patients with gastric disorders at Japanese medical facilities. After the use of forward-viewing endoscopes became common in the late 1980s, the first-line method of examination became gastric endoscopy instead of X-ray examination. A report on gastric examination at the thirty major cancer hospitals in Japan showed that endoscopy was used 10 times more commonly than X-ray examination in 2007. The use of X-ray examinations for gastric diseases has decreased in Japanese cancer hospitals because of the difficulties in teaching the complicated technique involved and in making diagnoses without the assistance of pathologists.

Another problem is that the mass X-ray screening for gastric cancer had excluded elderly people 75 years or older. They have a risk of barium aspiration and move uncertainly on X-ray inspection equipment. The government was afraid that the levels of false-negative and false-positive cases would increase in elderly participants. We can expect improvements in detecting gastric cancer if endoscopic screening is used more widely. However, the above Japanese guidelines did not recommend endoscopy as a method for population-based screening, owing to the absence of published studies that evaluated the efficacy of endoscopic screening in terms of mortality reduction. Endoscopy was rarely used in population-based screening programs for gastric cancer organized by Japanese local self-governing bodies.

On the other hand, from the late 1980s in Japan, endoscopy began to be used in opportunistic screening programs. Because the main objective of this screening was to detect disease by examining individuals, participants were able to select the screening methods for upper gastrointestinal abnormalities, especially for gastric cancer. We performed a retrospective cohort study of all asymptomatic subjects who were examined by endoscopy in opportunistic screening programs and compared the results with those of X-ray population-based screening, using the Cancer Registry data [3]. Gastric cancer was diagnosed twice as often as with endoscopic screening as with X-ray screening, and opportunistic endoscopic screening was significantly superior to organized X-ray screening in terms of a decrease in the rate of death due to gastric cancer. Endoscopy should therefore be used for gastric cancer screening, especially in the generations whose mortality is high.

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