

Special considerations for the radiologist managing old and very old patients

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Abstract

Life expectancy in developed countries has almost doubled in the past century. As a result, this ageing population needs greater medical and supportive care, a change which is affecting imaging departments. Elderly patients create logistic problems due to their special needs in transportation and poor mental status which causes longer room occupancy.

Diagnostic imaging interpretation in the elderly is affected by the difficulty in obtaining adequate clinical information due to poor mental status and paucity of symptoms. Radiographic patterns of disease are usually masked in the elderly by alterations related to ageing. As a result, it is common to use high-technology examination techniques (e.g. CT and MRI). Although they are expensive procedures, their use may save time and expense by establishing accurate diagnoses and avoiding intermediate, inconclusive examinations.

Introduction

Life expectancy in the Western world has increased markedly over the past century. At the beginning of the 20th century, the life expectancy in males was around 46 years and only slightly higher in females. At the end of the century, it had risen to 76 years in males and 82 years in females. Thus, during this short time, the life expectancy of the population in developed countries has almost doubled.

What is the current definition of elderly? Given the good health of the general population, the current retirement age (65 years) is not considered as old age. Nowadays, it is suggested that old age begins at 75, with the term 'young old' being applied to people between 70 and 75 years of age; those over 85 years of age are referred to as 'oldest old'.

As a result of increasing wealth and better medical attention, the population is getting older and, as such, needs greater medical and supportive care.' Hospital

imaging departments are being influenced by this change. Older patients create new problems and challenges, which should be addressed by radiologists.

The imaging of the elderly affects imaging departments in two ways: logistics and diagnosis.

Logistics

Elderly patients usually need transportation to and from the imaging department, which increases the need for auxiliary personnel. Once in the department, they often have special needs (e.g. oxygen, nursing care) and they should be placed in a separate room with an attending nurse and facilities to give specialized care. Because of their age, some of these patients will have hip or knee prostheses, or pacemakers, which can result in imaging artefacts or contraindicate a CT or MRI examination.

Another consequence of old age is slowness in getting dressed and undressed, which means that patients will need longer room time in comparison with younger patients. In addition, many elderly patients have difficulties in understanding instructions because of diminished hearing or poor mental status. (About 18 million people in the world have dementia and this number is expected to nearly double in the next 25 years.)

Diagnostic problems in imaging

In elderly patients, the diagnostic imaging process is influenced in different ways:

- *Insufficient clinical information:* It is recognized that clinical information is essential in the diagnostic imaging process. Studies have shown that it may be ten times more difficult to obtain useful clinical information in elderly patients than in younger ones. This is probably due to a combination of communication problems and the paucity of symptoms in the elderly. They are more likely than younger patients to present with vague symptoms and have nonspecific findings on

examination. Many of them have a diminished sensorium,⁷ allowing pathology to advance prior to symptom development. In addition, their pain is likely to be less severe than expected for a particular disease.

- *Definition of standards:* A further problem for the radiologist is the lack of standards establishing normality in the elderly.³⁻⁶ For example, coronary calcifications are given a different significance in a middle-aged versus an elderly patient. It is very important to define normal standards in this population in order to separate real pathologies from findings that are merely manifestations of old age (Figure 1).



Figure 1. Calcification in the annulus fibrosus of the mitral valve in a 79-year-old patient.

- *Changes in disease patterns:* The characteristic patterns of many disease processes change in the elderly and may be masked by alterations related to ageing.⁷⁻⁸ For example, pneumonia appears as a segmental air-space opacity in young patients, whereas in the elderly it appears as a patchy infiltrate, due to the accompanying emphysema (Figure 2). To better identify the imaging features in this population, it is common to use high-technology examination techniques, such as CT and MRI.⁹⁻¹² Although these are expensive procedures, their use may save costs by establishing accurate diagnoses and avoiding intermediate, inconclusive



Figure 2. 'Swiss-cheese' pattern of pneumonia in an old patient.

examinations. Computed tomography plays a very important role in the evaluation of abdominal pain in elderly patients, especially when the diagnosis is unclear (Figure 3).

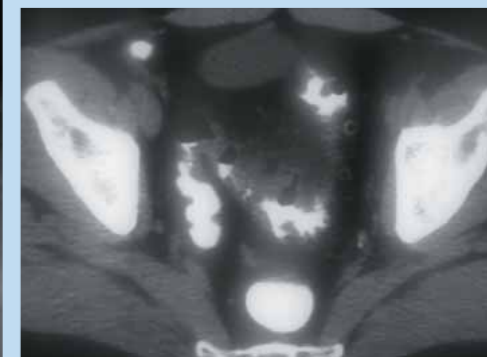


Figure 3. Diverticulitis in a 76-year-old patient with vague abdominal symptoms.

The emergence of multi-detector-row CT (MDCT) promises great advances in this field. MDCT is a fast and noninvasive technique and, among other capabilities, allows virtual endoscopy of the hollow viscera. For an elderly patient, it is probably more appropriate to undergo virtual colonoscopy with this technique than to have a barium enema.^{13,14}

With the current ageing of the population, it can be seen that diagnostic imaging faces new problems which will need to be addressed with new approaches, especially in patients with diminished cognitive functions.

Special considerations for the radiologist managing old and very old patients *continued*

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Key Learning

- Life expectancy in developed countries has almost doubled in the past century
- Elderly patients create logistic problems in imaging departments due to their special needs in transportation and poor mental status
- Radiographic patterns of disease may be masked in the elderly by alterations related to ageing
- It is difficult to obtain adequate clinical information in the elderly due to poor mental status and paucity of symptoms
- High-technology examinations (CT and MRI) may save time and expenses in the elderly, if used wisely

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