

CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

An 86 year old man has progressive mental decline and an abnormal score on his Mini-Mental State Examination. What is the most appropriate examination?

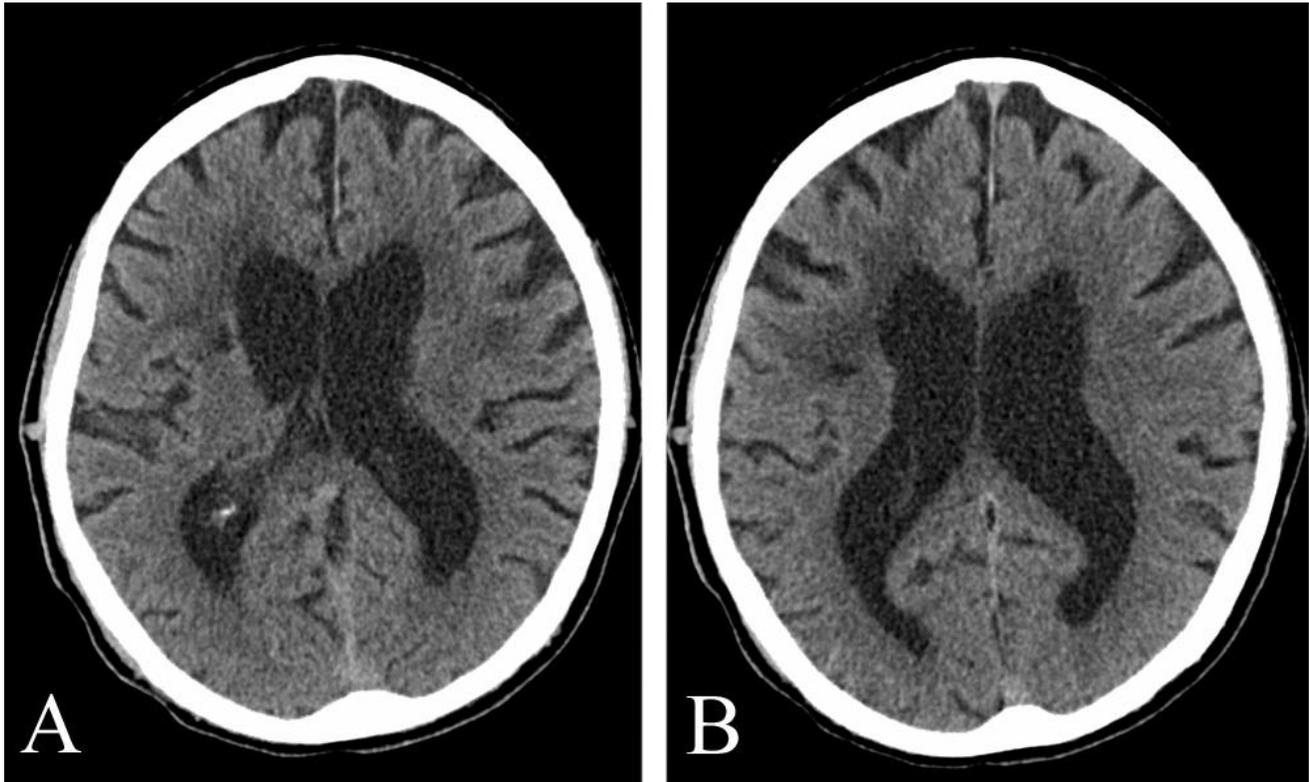
- (a) plain films of the skull
- (b) ultrasound of the carotid arteries
- (c) CT of the head
- (d) no imaging study is necessary in this case

RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION

Answer: (c), CT of the head. In patients with suspected dementia, imaging of the brain is necessary to evaluate for causes other than Alzheimer disease, which is the most common cause of dementia. Subdural hematomas, brain tumors, and multi-infarct dementia can be excluded with either CT or MR, and either study may be used in the initial evaluation of a patient with new dementia.

Plain films of the skull add no useful information in the evaluation of dementia patients, so (a) is incorrect. Ultrasound of the carotid arteries is usually undertaken to evaluate for carotid stenosis or a source of plaque in patients with known or suspected strokes, but is not the first study of choice for dementia patients, and b) is incorrect. Imaging is necessary for evaluation of new dementia to exclude subdural hematomas, brain tumors, multi-infarct dementia, and other causes of dementia, so d) is incorrect.

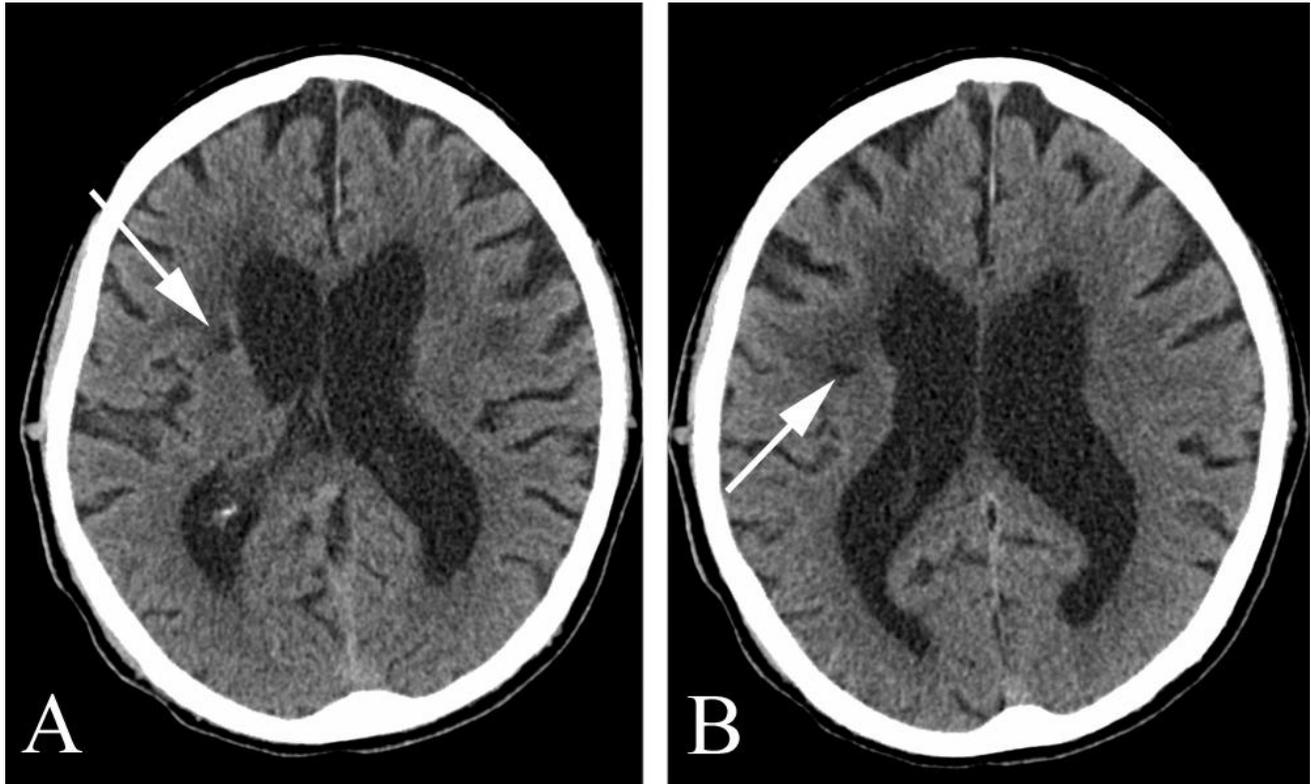
IMAGING STUDY AND QUESTIONS



Imaging questions:

- 1) What type of study is shown in the figure?
- 2) Are there any abnormalities?
- 3) What is the most likely diagnosis?
- 4) What is the next step in management?

IMAGING STUDY QUESTIONS AND ANSWERS



Imaging questions:

- 1) What type of study is shown in the figure? Unenhanced head CT.
- 2) Are there any abnormalities? There is bilateral, symmetric distension of the lateral ventricles and there is also proportionate, bilateral prominence of the subarachnoid spaces. In addition, there are at least two separate foci of decreased attenuation in the right cerebral hemisphere (at the arrows).
- 3) What is the most likely diagnosis? The bilateral distended ventricles and prominent sulci are compatible with diffuse cerebral atrophy. The focal areas of abnormality (at the white arrows) are compatible with old lacunar infarctions, raising the possibility of multi-infarct dementia.
- 4) What is the next step in management? Evaluation and management of possible causes of multi-infarct dementia. Management for dementia.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP

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Further history indicated that this gentleman also had diabetes and hypertension. Because he was not an operative candidate for vascular intervention, no imaging of the vascular tree was performed. Caretaker arrangements were made and the patient's hypertension and diabetes were managed.

SUMMARY

Presenting symptom: Neurologic symptoms generally need to be placed in one of several categories to plan imaging. Progressive mental decline in an elderly patient suggests dementia, defined by fourth edition of the American Psychiatric Association Diagnostic and Statistical Manual (also known as “DSM-IV”) as a disorder characterized by impairment of memory and at least one other cognitive domain (aphasia, apraxia, agnosia, or executive function) which represents a decline from a prior level of function severe enough to interfere with daily function and independence.

Imaging work-up: The American Association of Neurology recommends imaging with either CT or MRI in the routine initial evaluation of all patients with dementia.

Establishing the diagnosis: The diagnosis typically rests on a clinical history, supplemented by cognitive tests such as the Mini-Mental State Examination, Clinical Dementia Rating, the “mini-cog” test or formal neuropsychologic testing. Imaging is performed to exclude reversible causes of dementia.

Take-home message: Patients with dementia need initial imaging evaluation with either a head CT or a brain MR to evaluate for reversible causes of their condition.

FURTHER READING

Knopman DS, DeKosky ST, Cummings JL et al. Practice parameter: diagnosis of dementia (an evidence-based review). Report of the Quality Standards Subcommittee of the American Academy of Neurology. *Neurology* 2001;56:1143-1153.

Morris JC. The Clinical Dementia Rating (CDR): current version and scoring rules. *Neurology* 1993;43:2412-2414

Psychiatric Association Diagnostic and Statistical Manual, 4th Edition, APA Press, Washington DC, 1994.

Renfrew, DL. Stroke, seizure, multiple sclerosis, and dementia. Chapter 4 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.

Shadlen MF, Larson EB. Evaluation of cognitive impairment and dementia. UpToDate, accessed 10/10/09.

Tangalos EG, Smith GE, Ivnik RJ et al. The Mini-Mental State Examination in general medical practice: clinical utility and acceptance. *Mayo Clin Proc* 1996;71:829-837.