

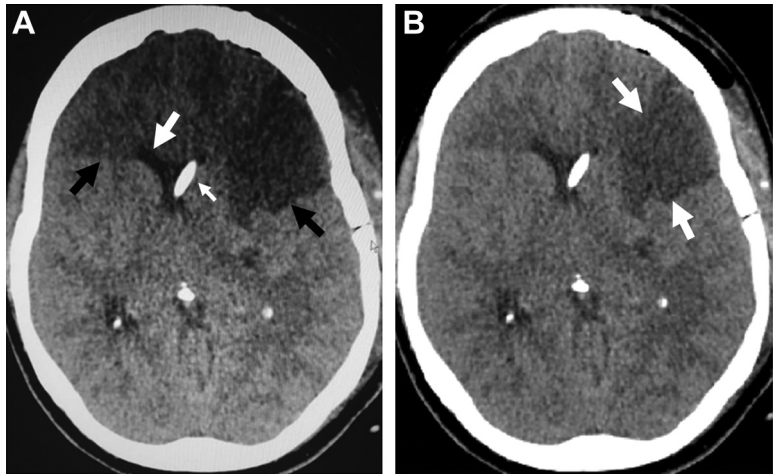
Pitfalls in photographing radiological images from computer screens

Using mobile phones to acquire images in clinical practice enables rapid, collaborative decision making¹ and is increasingly common. However, the practice is not completely foolproof, as a recent “near miss” at our institution demonstrates.

A 45-year-old woman presented with spontaneous subarachnoid haemorrhage secondary to a ruptured anterior communicating artery aneurysm. The anterior communicating artery aneurysm and an unruptured left middle cerebral artery aneurysm were clipped via craniotomy and a ventricular drain was inserted. Serial post-operative computed tomography (CT) brain scans showed an evolving infarction in the left middle cerebral artery territory, presumed to be secondary to temporary clipping at surgery, which became fully established after 28 hours. All cerebral vessels were patent, visualised on a post-operative CT angiogram. Elevated intracranial pressure (> 40 mmHg) and neurological fluctuation prompted a repeat CT scan, a photograph of which was taken from a computer screen using a mobile phone (Box, A). This image was sent by the intensive care unit consultant to the mobile phone of the on-call neurosurgeon, who noted apparent extensive bifrontal infarction. The patient was urgently transported to the operating room for decompressive craniectomy; however, on reviewing the scans at a radiology workstation before surgery (Box, B), the neurosurgeon noted the discrepancy and the procedure was cancelled. The patient recovered well and was neurologically intact and independent 6 months after discharge.

Although others report success using mobile phones to photograph CT brain scans displayed on computer monitors,² our case

Mobile phone photograph of the cranial computed tomography (CT) scan compared with the original image



A: Photograph of axial CT image sent via a mobile phone, showing apparent hypodense frontal lobes suggestive of infarction (black arrows). Note however the anterior horns of the lateral ventricles are not distorted or effaced, as would be expected with such an extensive infarct (large white arrow). A ventricular catheter is located in the right lateral ventricle (small white arrow). **B:** The original axial CT image showing only a wedge-shaped, left middle cerebral artery infarct (white arrows). ♦

highlights the need for doctors to appreciate the limitations of display technology. For example, many computer monitors exhibit viewing angle-dependent reductions in luminance and contrast ratio,³ which render images susceptible to artefact, particularly when viewed at close range.⁴ Moreover, mobile phone screens do not meet the technical requirements of a medical imaging display device.⁵

“spatial variations in image brightness can dramatically affect image interpretation, with potentially disastrous results”

We confirmed that viewing angle-dependent reductions in luminance were responsible for the spurious frontal lobe darkening evident in the mobile phone image. Clearly, spatial

variations in image brightness can dramatically affect image interpretation, with potentially disastrous results.

Guidelines on mobile device photography in the health care setting address privacy concerns but not technical aspects.¹ Therefore, we offer some suggestions on preventing similar cases from occurring:

- Use original images wherever possible.
- Compare the photo with the original before sending.
- When photographing computer screens, position the camera perpendicularly to, and at arm’s length from the screen, enlarging the image with digital zoom as required.
- Before making clinical decisions, review the original imaging, including confirming the correct patient details with an observer or peer.

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- After photographing, ensure that images are deleted from the phone and any online data storage accounts, and record in writing the image use in the case notes.
- Teach undergraduates as well as practising clinicians the technical

aspects of the use of mobile phone images.

We hope this case serves to remind doctors of the need for caution when reviewing photographs of digital images, and that our suggestions will be helpful in

preventing similar situations from occurring.

Competing interests: No relevant disclosures. ■

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References are available online at www.mja.com.au.

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