

## **Medicolegal X-Ray and CT of standard size mobile phone cards (SIM card).**

### **Abstract**

Background. Foreign body ingestion typically affects children or adults with mental conditions. SIM (subscriber identity module) card ingestion is extremely rare. As their particularly X-Ray dense metal parts are sized about  $9 \times 12 \text{ mm} \times 50\text{--}80 \mu$ , they can be difficult to capture on plain radiographs. We were asked by investigative authorities to point out the best method to document intentionally swallowed SIM cards. Method and material. A case of a 23 year old female who had swallowed a SIM card when she was arrested for murder was followed up with four abdomen radiographs and CT (computed tomography) of the abdomen. Experimentally, SIM cards were examined in CT. SIM card object contrast against surrounding background was quantified through CNR (contrast-to-noise ratio). Results. SIM card orientation perpendicular to plain film X-Ray beams resulted in relatively low CNR values of 1.6-2.5. SIM cards in CT scans yielded considerably better CNR values exceeding 9. Discussion. While plain abdomen radiographs have a lower X-Ray dose than abdomen CT scans, more frequent possibly negative results may lead to repetitive exposure. We recommend to consider drug trafficking as possible problem in conjunction with any observed SIM card swallowing, particularly in context of police arrests or a suspect's detention. We recommend to consider CT of the abdomen, if possible with a low dose, rather than plain abdomen radiographs.

**Keyword:** Airport detention; CT scanning; Ingestion; Radiography; SIM card; Suspect