

‘Completing the Jigsaw’ : Forensic Imaging

Trauma Services Conference 2016
Lindsay Batty-Smith PgDip



What is Forensic Radiography?

- Forensic radiography is the application of the science of diagnostic imaging to questions of law.
- Such evidence may be collected from either living or deceased subjects with the latter being presented as either whole cadavers or as pathological specimens.



Applications of Forensic Radiography

- Provision of evidence for litigation e.g. Assault, RTA
- Assists in diagnosis of non-accidental injury (NAI) and physical abuse of vulnerable individuals
- Confirmation of identity (living and deceased)
- Demonstration of ingested illegal substances



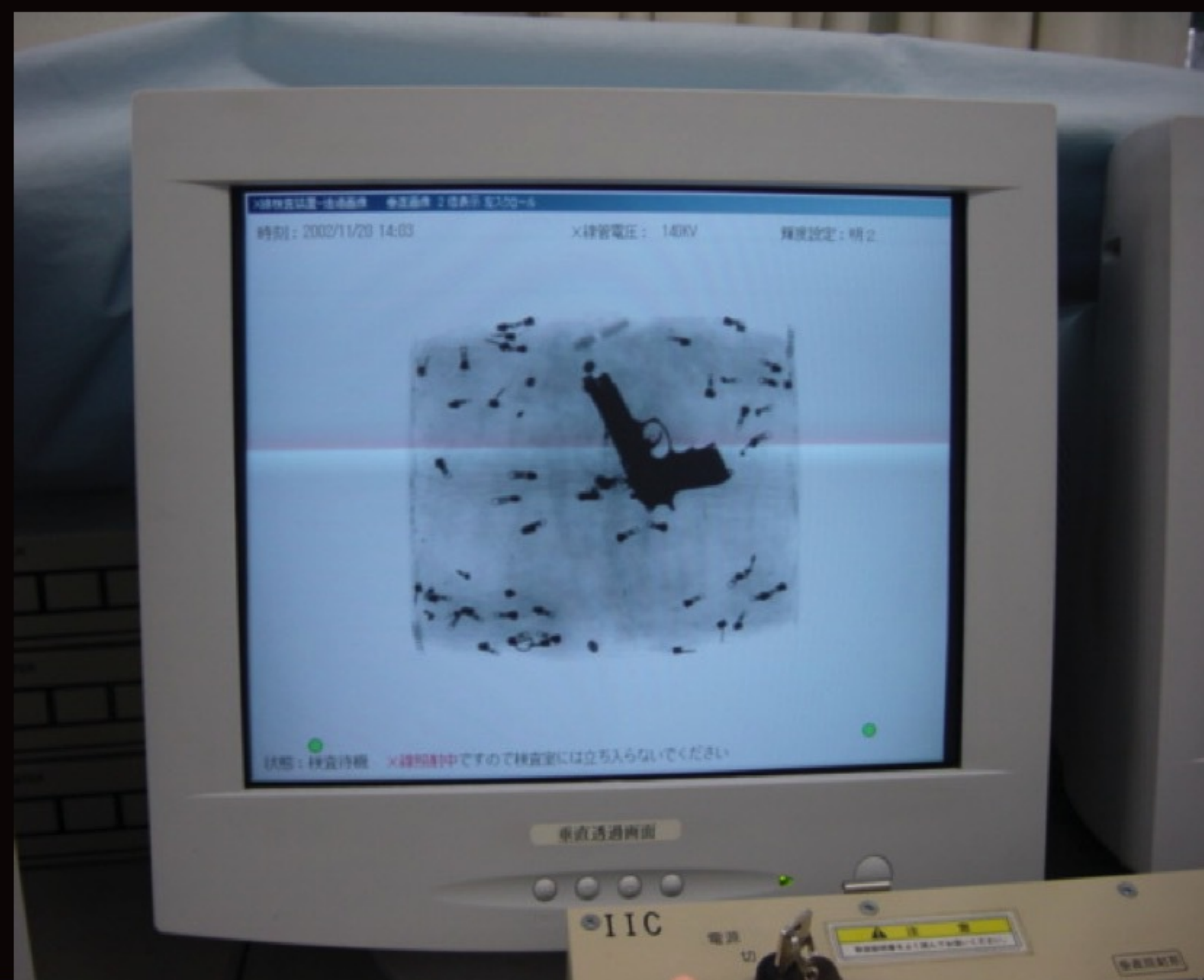
Continued...

- Assisting with, or confirmation of cause or circumstances surrounding a death
- Investigation of Sudden Infant Death (SID)
- Investigation of Genocide and Torture
- Demonstration of artefacts or persons entering or exiting the country illegally
- Demonstration of potentially hazardous foreign objects





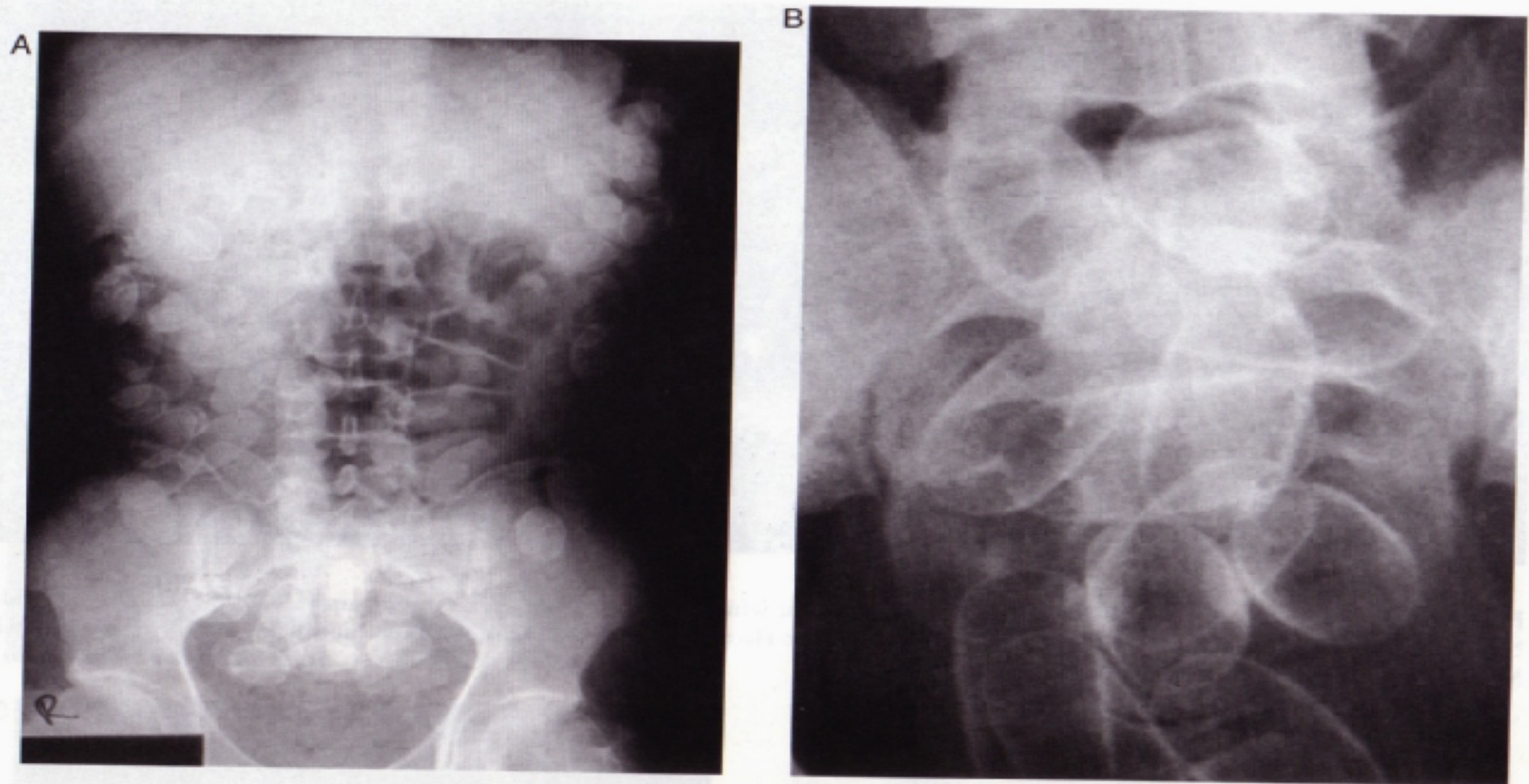
X-Ray security screening



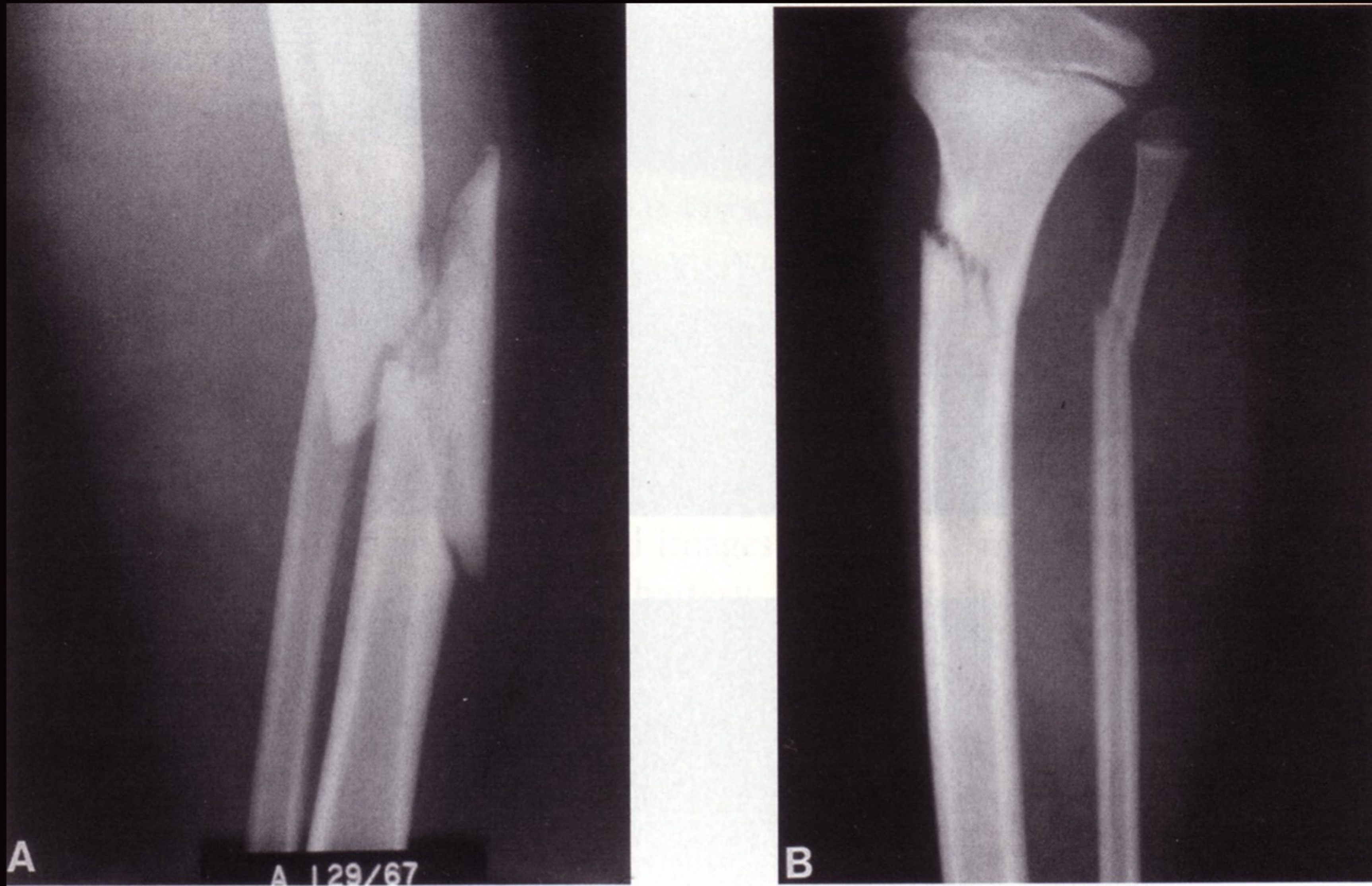
Forensic NAI



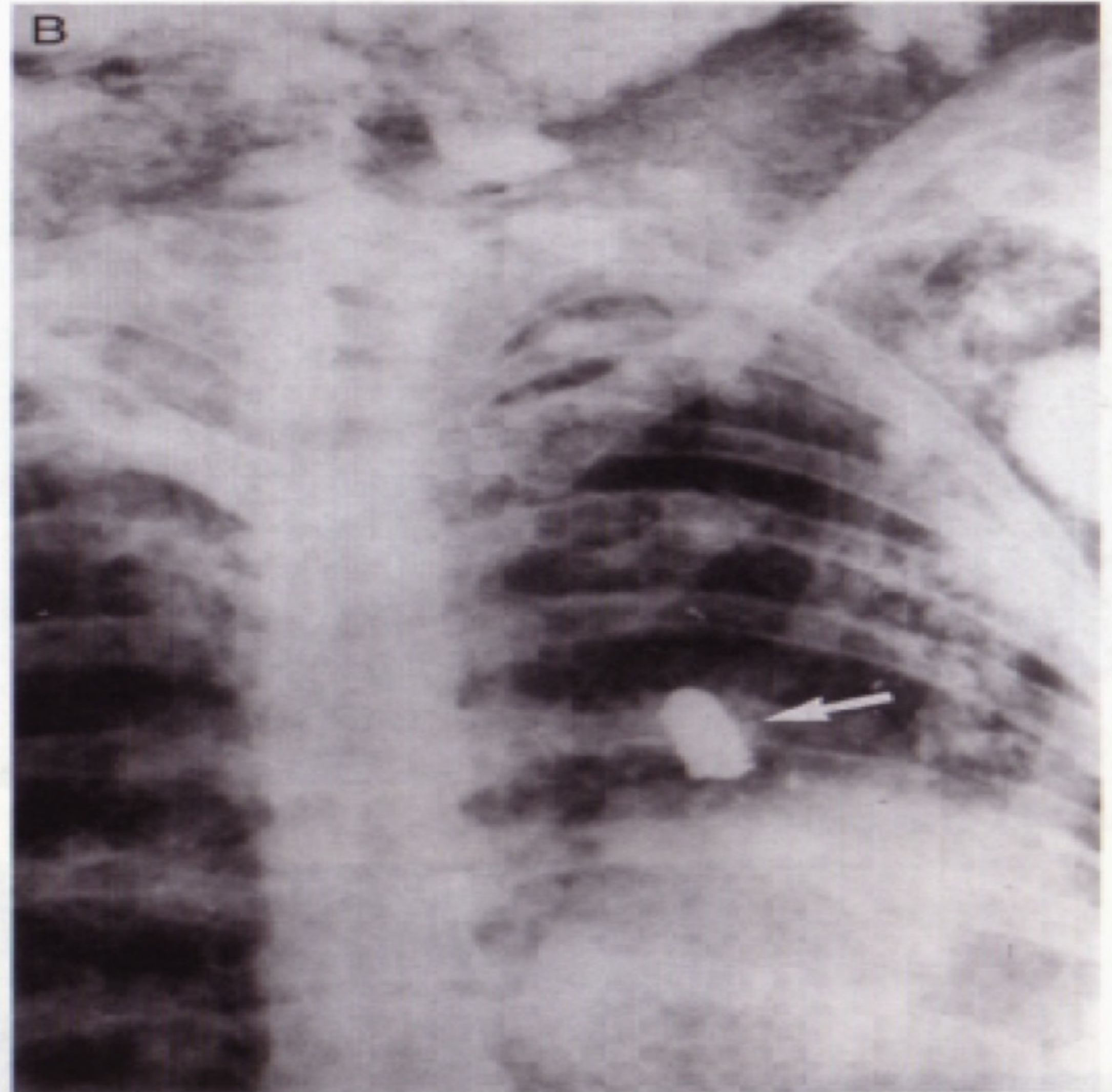
Smuggling



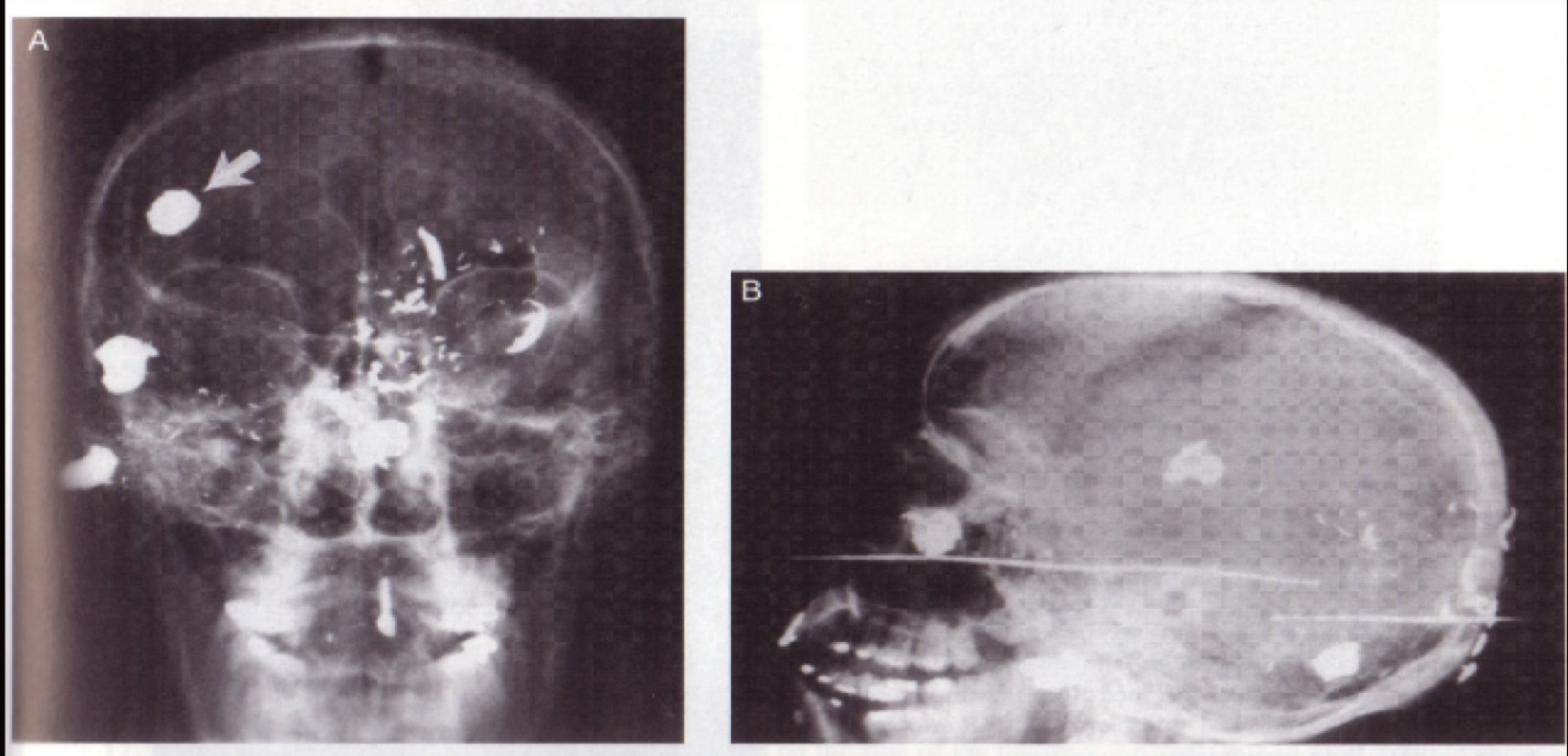
Evidence for Litigation



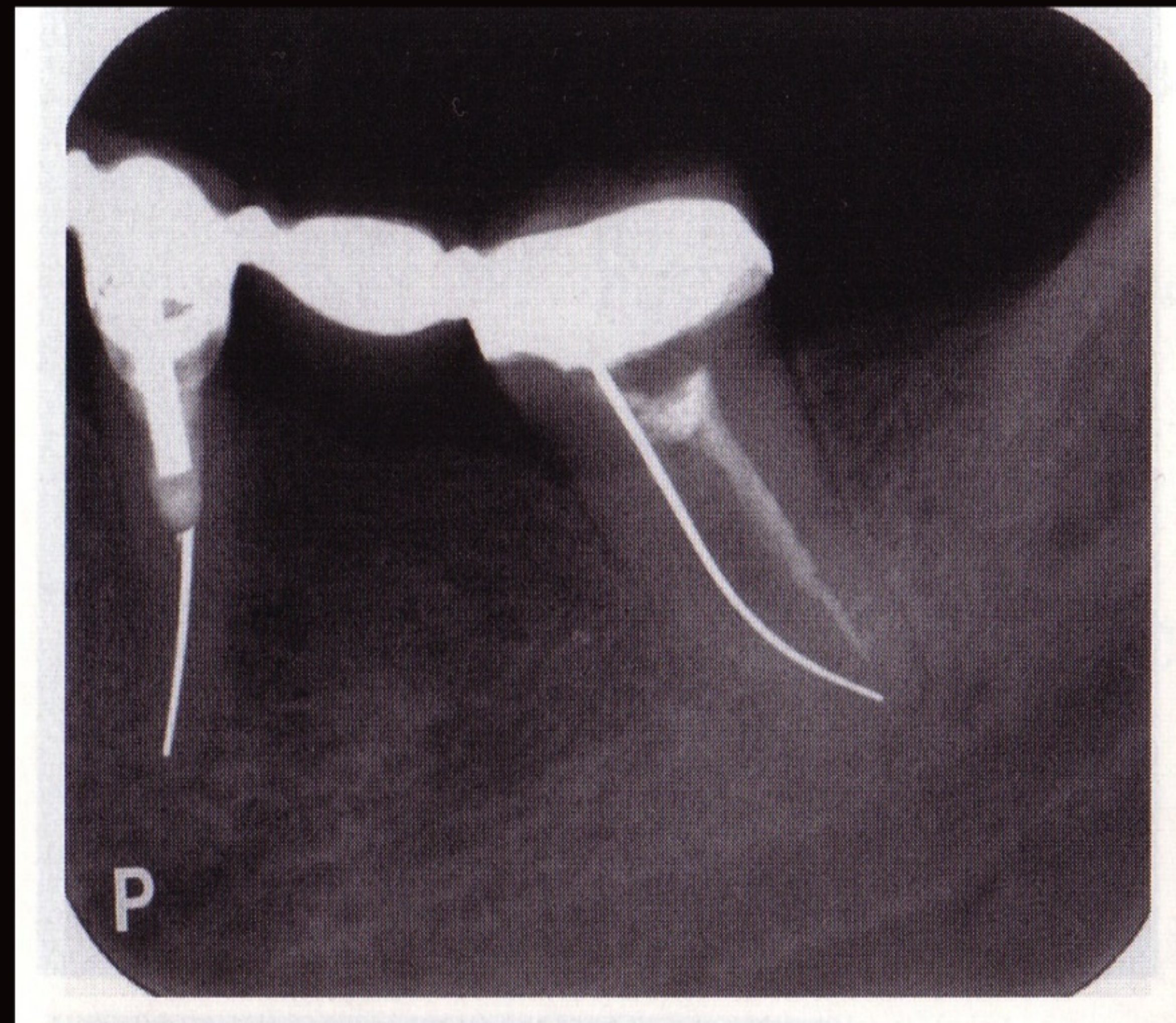
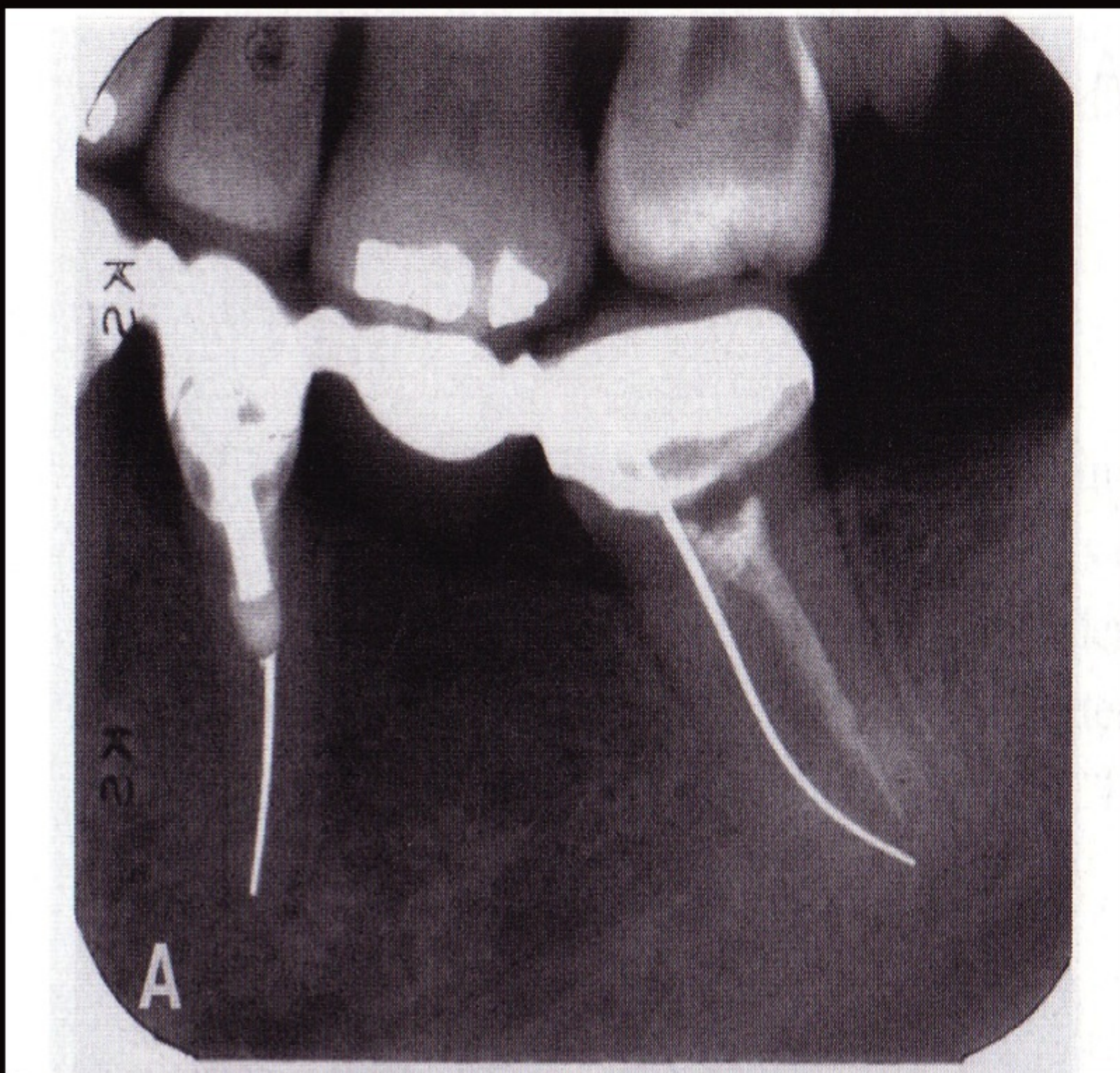
Determine cause of suspicious death



Number of bullets



Identification of the deceased



Objectives

- Who Died? (Disaster Victim Identification)
- Why did they die? (Cause of Death)
- How did they Die? (Circumstances of Death)



Pan American Flight 103, Lockerbie

21 December 1988



- 259 + 11 fatalities
- All remains imaged
- Major review of UK practice

World Trade Centre, New York

11 September 2001



- 19,934 Remains Recovered
- All remains Imaged
- Imaging confirmed ID in 14% cases
- Imaging assisted ID in 77% cases (Office of Chief Med Ex. NY.2003)



MAJOR DISASTER



Tsunami December 2004

Investigation of Genocide and Torture



Victim of Srebrenica Massacre 1995

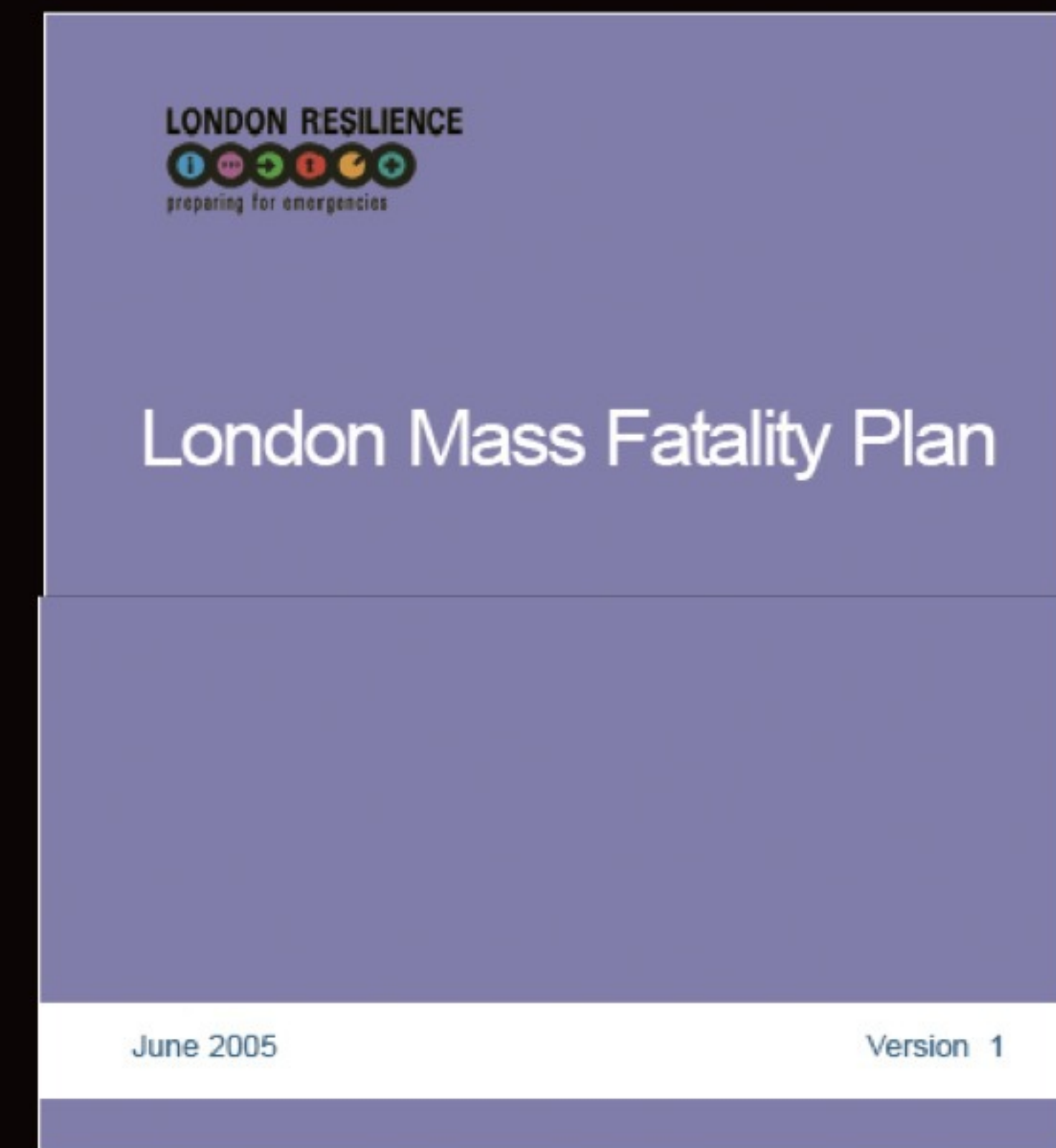


We are seeking the truth so justice can be served



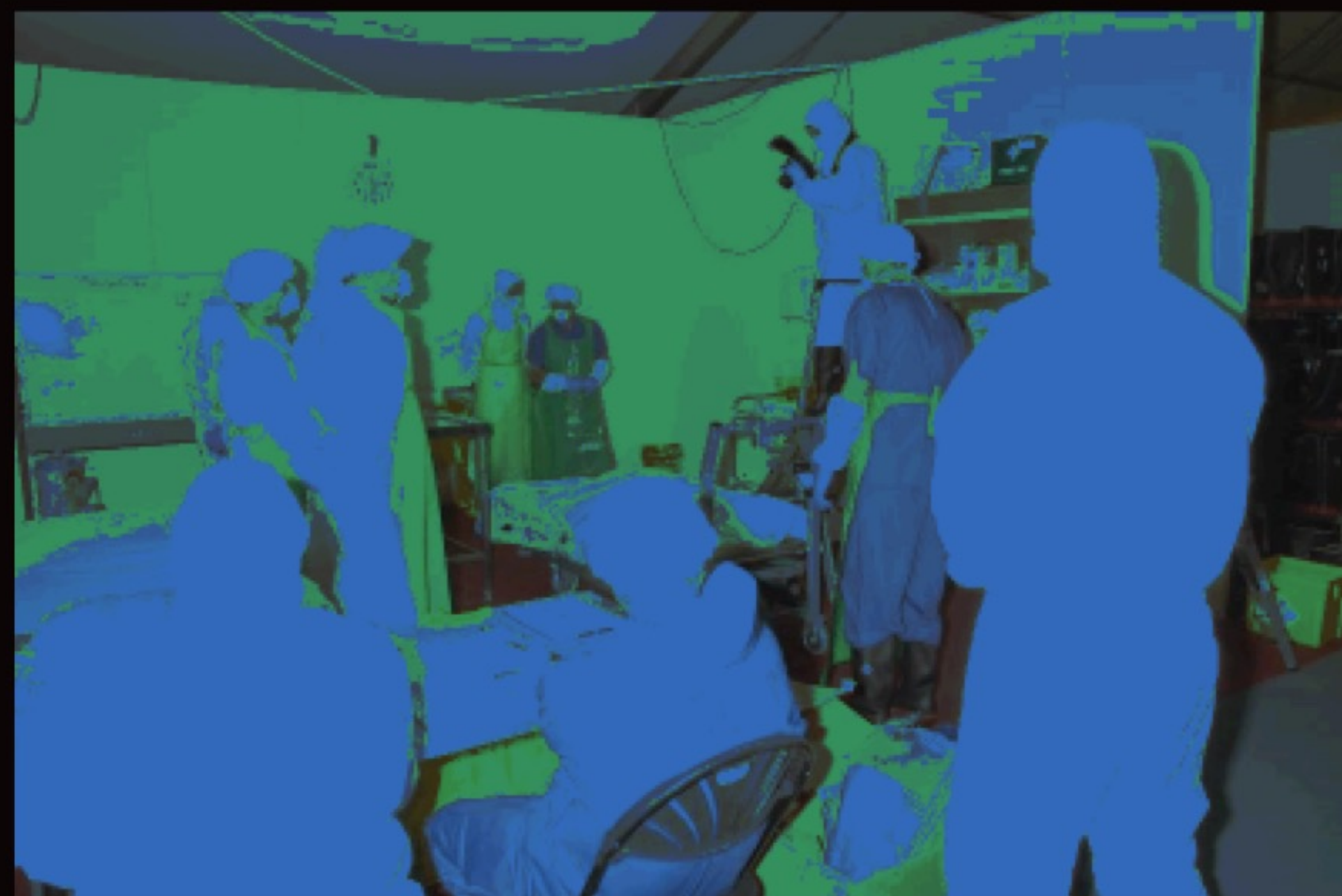
2004 - 2005

- Association of Forensic Radiographers asked to assist the Home Office National Mass Fatalities Working Group



7th July 2005





Mortuary Procedure for Mass Fatality Incidents

- | | |
|---|----------------------------|
| ■ Primary Survey-
Fluoroscopy (triage) | Odontology
Anthropology |
| ■ Secondary Survey-dental | Finger Printing |
| ■ Tertiary Examination- | Reconstruction |



Radiography Examination

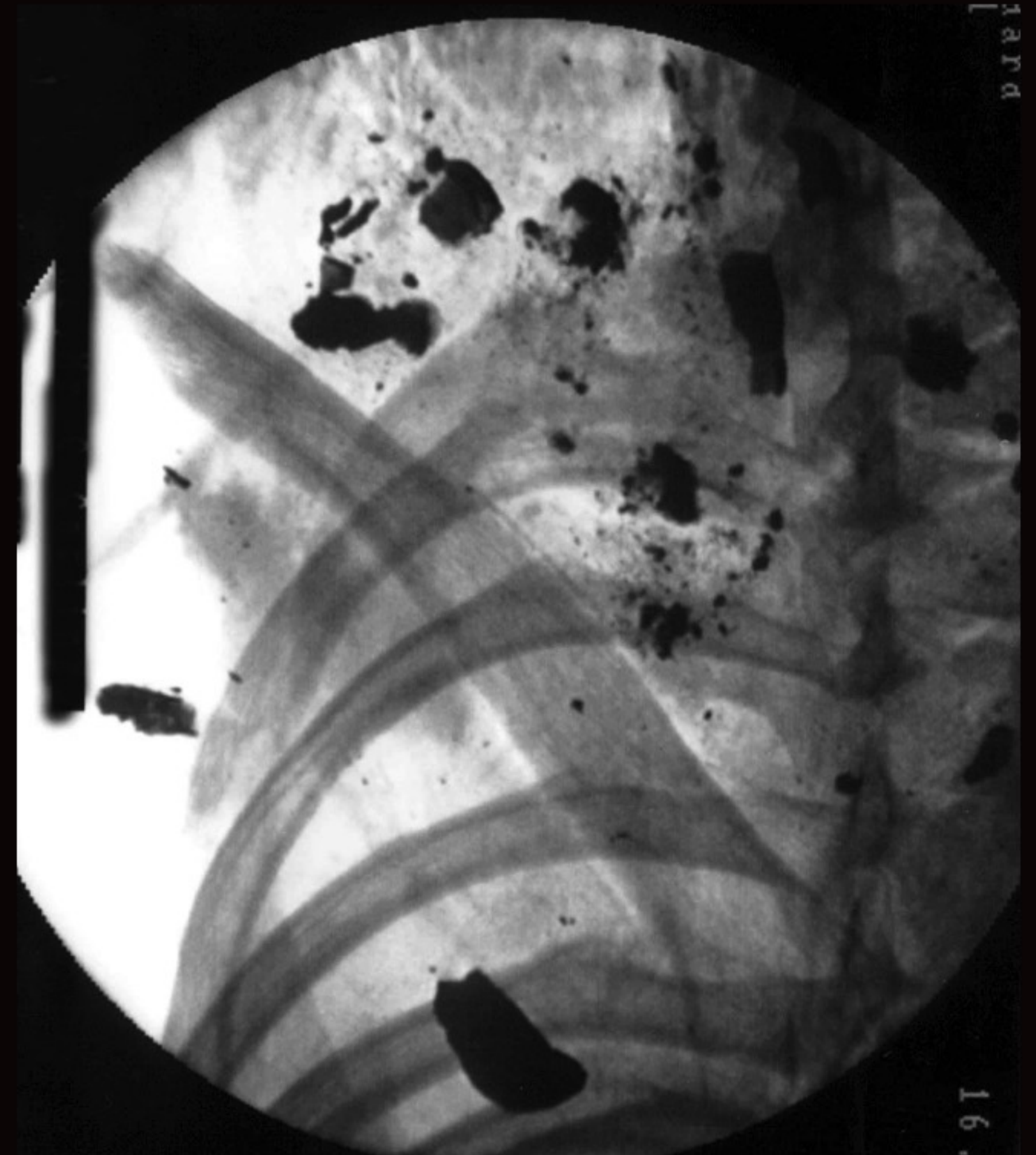
Skeletal Survey

- Any identifying pathology
- Healed trauma
- Uncommon anatomical variants
- Degenerative changes
- Determination of anthropological parameters; age, sex etc



Fluoroscopic Survey

- Fluoroscopy
 - Documentation of previous injuries or skeletal abnormalities
 - Location of small body parts, eg: teeth
 - Location & retrieval of projectile fragments and other items of evidence



Tertiary Radiographic Exam

Plain Imaging specific to the particular investigation:



Identification:
Skeletal
anomalies,
previous injuries
or surgery



7/7 Summary

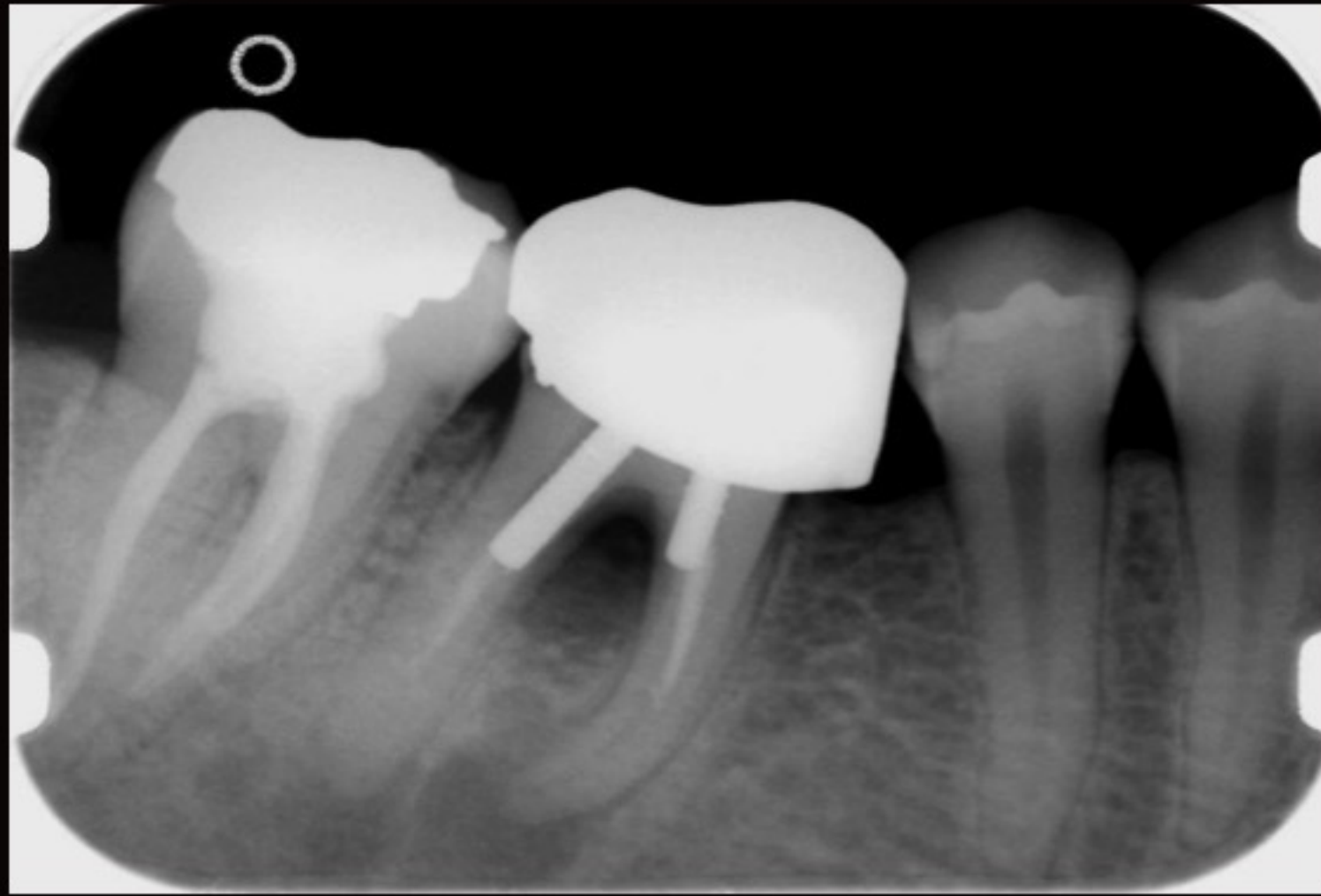
- 24 Radiographers involved over 17 days
- 52 victims, 4 perpetrators and 1162 body parts examined
- All individuals identified within approx. 8 days
- First time application of digital radiography



Dental Radiography

- Recommended for all dental remains
- Open Incident/Closed Incident
- Disaster Victim Identification (92% accurate)







Radiography and Terrorism

- **Boston Marathon-Head & Neck injuries** Emergency Radiology 2015; 22; 5:527-532
- **Radiographic spectroscopy of materials used in anti terrorist activities**
https://www.researchgate.net/publication/2172835_Multi-Energy_Radiography_Against_Terrorism_Theory_and_Experiments
- **Emergency imaging after a mass casualty incident: role of the radiology department during training for and activation of a disaster management plan** (BJR Vol 89 issue 1061)
- **Forensic radiology: An emerging tool in identification** Kumar R, Athota A, Rastogi T, Karumuri SK. Forensic radiology: An emerging tool in identification. J Indian Acad Oral Med Radiol 2015;27:416-22



Future developments - PMCT

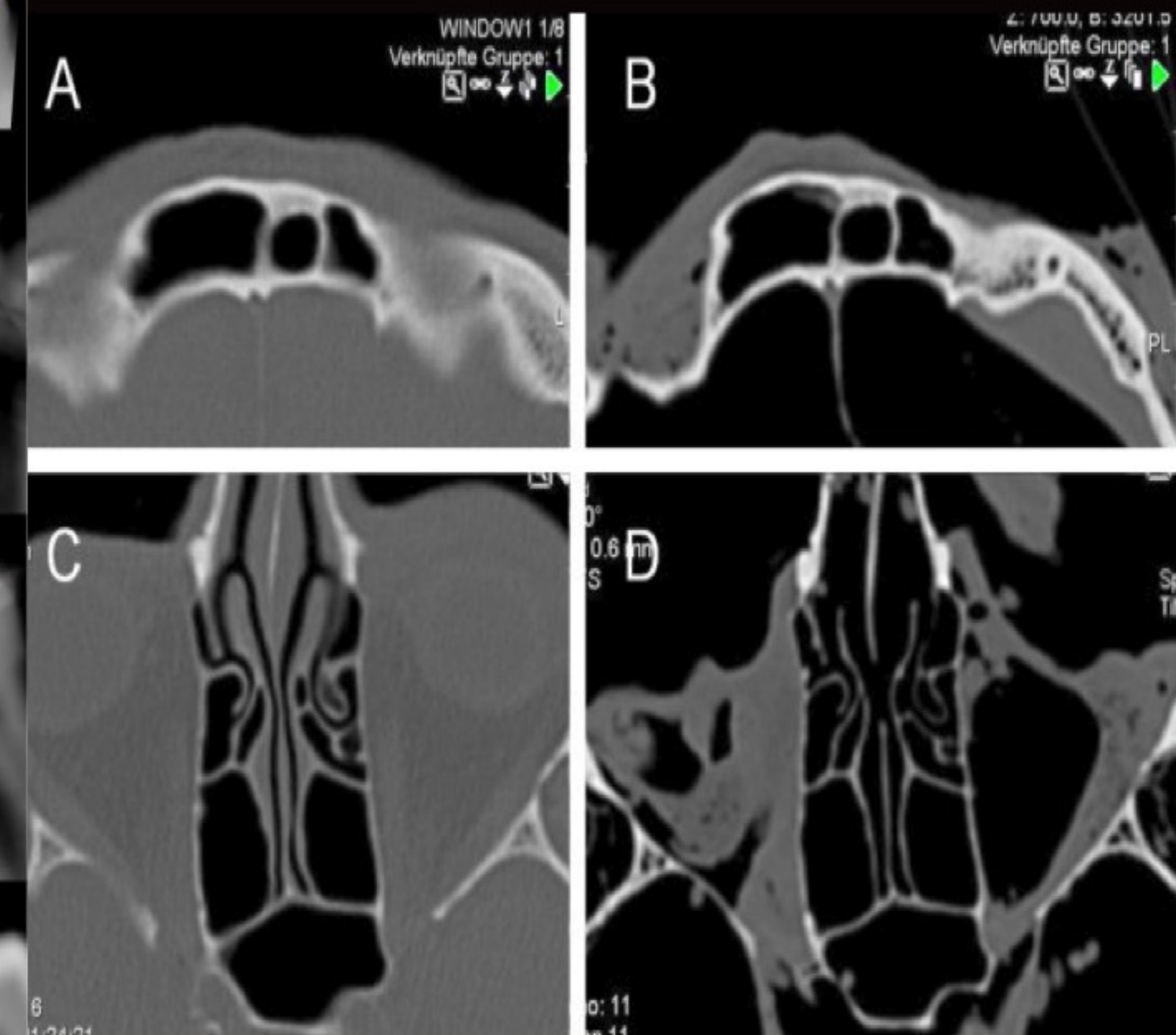
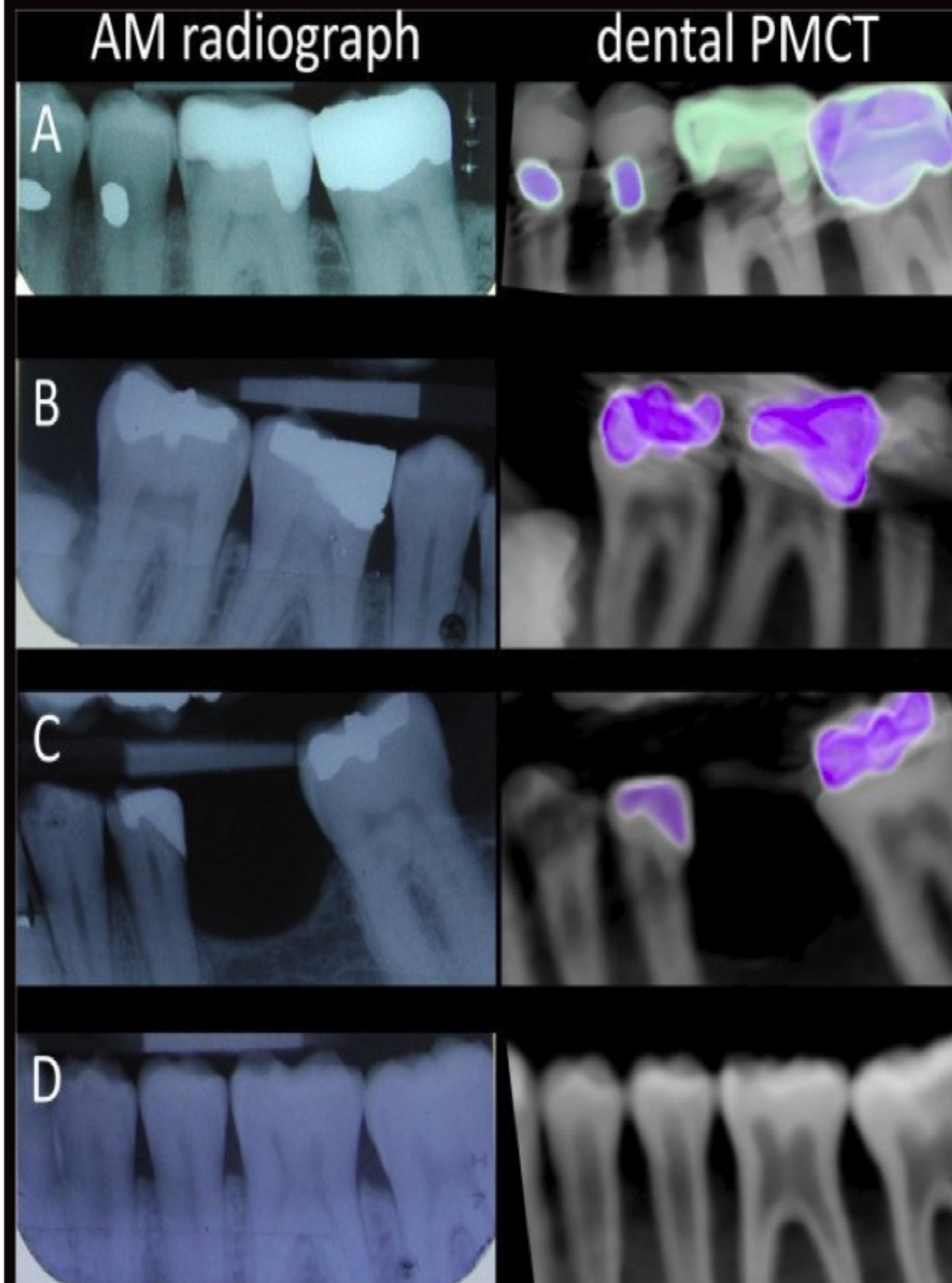
Post Mortem CT



Future developments - PMCT



INTERPOL Disaster Victim Identification Guide



DVI Guide: INTERPOL 2014 (Proposed Amendments: March 2014)

1 of 127




Future developments - Further Education

- ERASMUS Forensic Radiography Exchange Module, Lausanne <http://www.hesav.ch>
- MSc in Forensic Radiography, Teesside University, Online, Virtual learning environment, International student base, www.tees.ac.uk/postgraduate_courses/health_social_care/msc_forensic_radiography
- Annual Virtopsy course, Zurich, <http://www.virtopsy.com>
- Victorian Institute of Forensic Medicine PMCT Interpretation <http://www.vifm.org/>




MSc Forensic Radiography

This course is the only course of its kind in the UK. Throughout this master's degree you learn about forensic imaging practice relevant to your department and the mass fatalities environment.



Forensic Short Course

Postmortem CT Interpretation

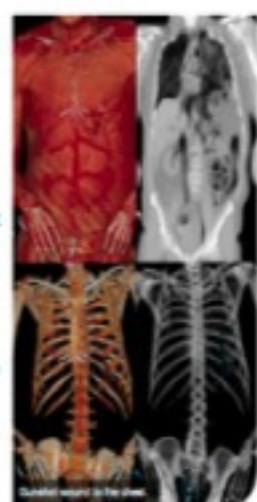
3 Day Course: WED 7, THU 8 and FRI 9 September 2016

Course Description
This intensive short course is designed for forensic pathologists and radiologists with an interest in forensic imaging, including registrars in training, as well as radiographers and anatomical pathologists. The course will consist of didactic lectures on the principles and practice of post-mortem CT and the application of CT techniques to forensic pathology. There will be an interactive session on the use of CT in imaging forensic cases as applied to the preliminary examination of 10PM and a session on reviewing radiological/pathological correlations. Participants will also have the opportunity to perform image manipulation on this-client workstations and to tour the CT facility at 10PM.

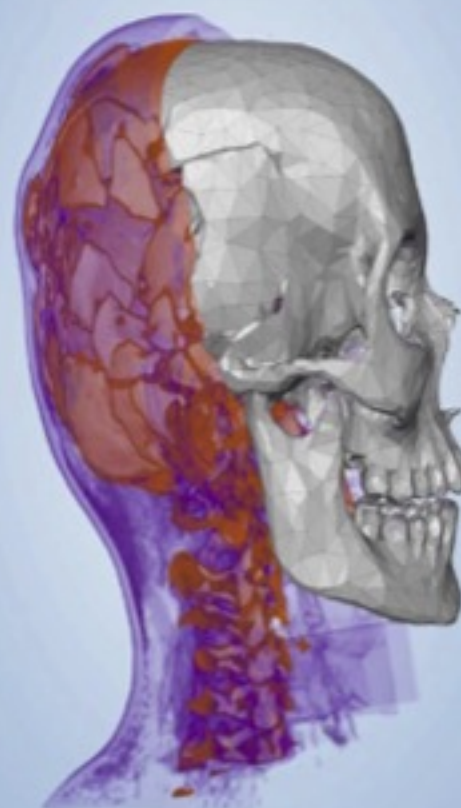
How to Register
For more information and to register, please contact:
Nicola Clements
nicola.clements@monash.edu
Tel: +61 3 9594 4322
Registrations are strictly limited to 25.

Cost
Registration fee: \$1,750 inclusive of GST. Includes course materials, lunch, refreshments and certificate of completion.

Location
Victorian Institute of Forensic Medicine
Planchette Lecture Theatre
45 Kewington Street, Southbank
VIC 3006, Australia.
CPE points will be available from MONASH.



14th Virtopsy Course ZÜRICH SWITZERLAND
March 20th – 24th 2017



Experience the Future of Forensic Sciences
www.virtopsy.com



HESAV International Module
Exchange in Forensic Radiography



Centre Universitaire Romand de Médecine Légale | CHUV | Centre hospitalier universitaire vaudois | Université de Lausanne | HESAV



Contacts of Interest

- The International Association of Forensic radiographers-
<http://www.afr.org.uk>
- British Association of Human Identification-BAHID-
<http://www.bahid.org>

