

CASE REPORT

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The Use of Mammographic Equipment in Mass Disaster Identification

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ABSTRACT: Because of its suitability for fine detail radiography, mammographic X-ray film and equipment was found to be well suited to identifying human remains through dental radiography.

KEYWORDS: pathology and biology, human identification, mammographic equipment

Forensic pathologists use a variety of methods in establishing the identification of decomposed or mutilated human remains. Fingerprints or dental X-rays are established and effective methods of identification, but the former may not be possible if decomposition is advanced. A recent report by Murphy et al [1] emphasizes the value and ease of comparing postmortem radiographs in establishing identification. There have been scattered reports of this in the radiographic literature [2,3] but this simple and readily available method is not routinely used by most radiologists. This report illustrates how routine radiographic equipment used for mammography was used in quickly and effectively obtaining diagnostic quality dental radiographs of eight aircraft accident victims.

Cases

In May 1980 a helicopter crash occurred in Molokai, HI, killing eight military personnel. The ensuing fire caused considerable damage to several of the bodies. Identification was not a critical issue because the accident occurred during a take-off and because of the small number of passengers. However, as part of the routine pathological investigation, odontologic verification was considered necessary for completion of the report. Antemortem dental records of all eight individuals were available.

In order to facilitate the dental radiography, the forensic dentist disarticulated the mandibles of the eight victims. These mandibles were appropriately labeled and brought to the department of radiology. Using standard mammographic X-ray equipment and film, lateral views of both sides of the mandibles were taken. Diagnostic quality radiographs of all eight mandibles were obtained in less than an hour.

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Discussion

Film mammography is available in most hospitals. Mammographic film is designed for fine detail radiography because of the small size of the abnormalities looked for by the radiologist. In recent years there have been a number of advancements that have further improved the quality and resolution of this film. The X-ray tube used for mammographic equipment is different than the standard radiographic X-ray tube in that molybdenum rather than tungsten is used as the anode source. This results in a low kilovoltage X-ray beam that is ideal for radiographing thin bony structures and soft tissues. By positioning the disarticulated mandible, as demonstrated in Fig. 1, both sides of the mandible were easily radiographed. An appropriate radiographic technique was determined by brief experimentation; once a technique was derived, it was used for all the specimens with diagnostic results. Because of the wide variety of currently available film and equipment, such experimentation would be necessary whenever this method was used. Figure 2 compares a routine antemortem dental radiograph and a postmortem film.

This technique proved extremely quick and effective and could obviously be used in a larger mass identification. Diagnostic quality radiographs of disarticulated mandibles can be obtained using virtually any piece of diagnostic radiographic equipment because of the recent advances in film quality and film-screen combinations. Unfortunately few radiologists possess the necessary interest in working on mass disasters and few pathologists are familiar with the capabilities of radiographic equipment. If necessary, mandibles could be disarticulated at the site of the disaster, properly tagged, and subsequently radiographed elsewhere. It becomes incumbent on the pathologist to use the radiologist as a consultant in exploring the various ways that he or she can be of assistance in the difficult task of identifying human remains.

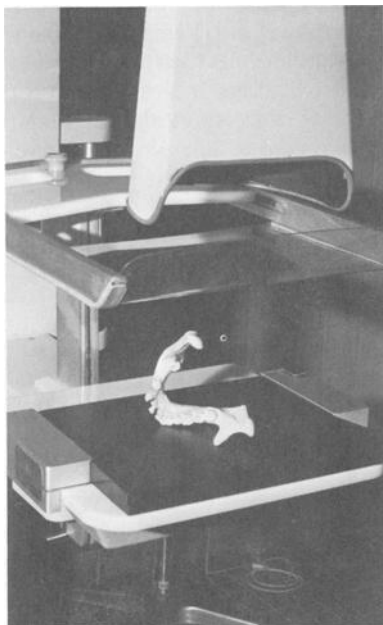


FIG. 1—A model of a mandible is placed directly on the film cassette. The disarticulated mandible may require slight positioning and bracing with towels to obtain a lateral view.

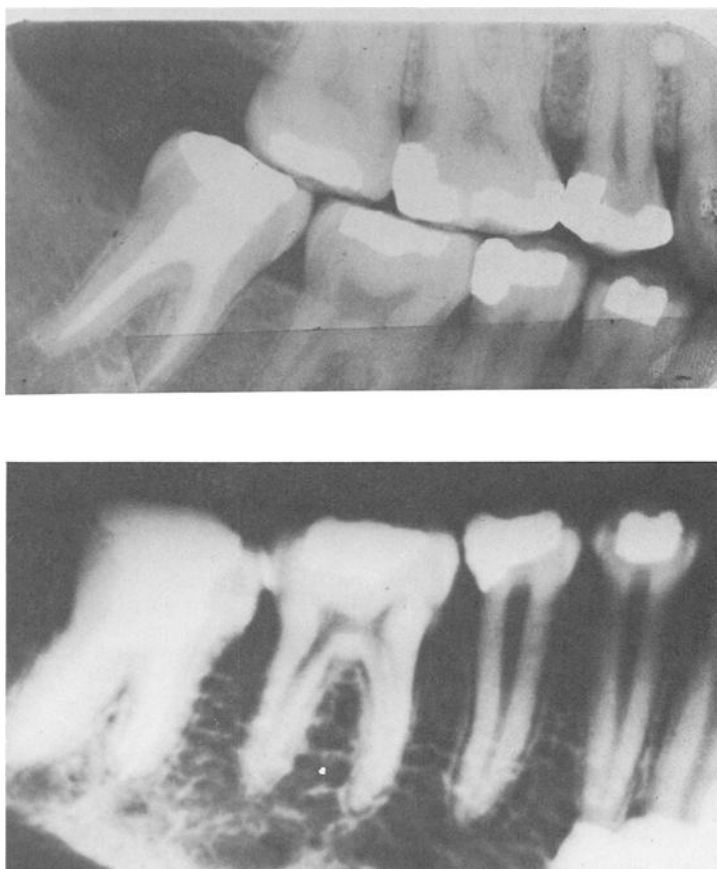


FIG. 2—The antemortem dental radiograph (top) is easily compared to the postmortem film (bottom).

References

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