

Dental Identification of Human Remains

If you are unable to establish the identification of an individual by visual means, fingerprints or other identifying data, then a dental examination should be done. Due to the medicolegal ramifications, this should be carried out by a qualified forensic odontologist. Human remains will usually be burned, mutilated, decomposed or skeletonized. There have been numerous times when dental examinations have been done on victims who are visually identifiable.

If a body is recovered and cannot be identified, the dental records should be submitted to the National Crime Information Center (NCIC) after a very thorough postmortem dental examination (see Chapter 26, *Identification of Unknown Deceased*). It is also appropriate to place the dental records of people who have been missing for a period of time (30-90 days) into the NCIC Missing Person database.

Forensic Postmortem Dental Examination

Examination of the Oral Tissues

- A.** In certain circumstances, the examination can begin at the site where the body was found or a return trip may be warranted. A forensic odontologist may be able to help locate and identify dental remains that are decomposed, charred or traumatically mutilated. Some of the fragments may appear to be burned pieces of wood or other debris.
- B.** A single tooth, jaw fragment or even a portion of a tooth may be vital to the identification.
- C.** As easily as teeth break down throughout life, they will outlast all other body tissues after death.
- D.** Postmortem head and neck x-rays (or full body x-rays) may locate dislodged teeth or fragments. X-ray examination of dirt or charred debris may also reveal fragmentary evidence.

- E. Conditions of the bodies that may be examined.
 - 1. Normal condition or visually identifiable.
 - a. A dental examination should be conducted if there are:
 - (1) No reports of a missing person or clues to the identity.
 - (2) No personal effects are found.
 - (3) No fingerprints are on file.
 - b. Dental examination should proceed with **no** disfigurement to the face (no resection or removal of the jaws). Body may be viewed by relatives.
 - c. Dental examination would consist of photographs of the teeth, a dental chart, a full mouth series of standard dental x-rays with a portable dental x-ray machine and impressions of the teeth.
 - 2. Completely decomposed or skeletonized.
 - a. Easiest to work on.
 - b. Some of the teeth will dislodge from the jaw since the periodontal ligaments (tissue that attached the teeth to the bone) have been destroyed in the decomposition process. All loose teeth should be recovered and replaced in their sockets.
 - 3. Partially decomposed.
 - a. Difficult to examine due to the odor and presence of insects (e.g., maggots, flies, beetles, etc.).
 - b. Jaws need to be resected.
 - 4. Burned.
 - a. Access to the teeth is very difficult as the tissues are very rigid.
 - b. Jaws need to be resected.
 - c. Caution is advised in resecting heavily burned or calcined jaws since they are extremely fragile. Fixation with clear acrylic spray is recommended.
 - 5. Mutilated.
 - a. Teeth and jaws may be fragmented and distorted.
 - b. Recovery of all the teeth may be a problem.
 - c. Dental evidence may be imbedded in other areas of the body or strewn about the area.

- F.** Resection of the maxilla (upper jaw) and the mandible (lower jaw).
 1. Usually in cases of advanced decomposition, severe mutilation and bodies that are charred or burned beyond recognition, the jaws will need to be resected or removed.
 2. Resection of the jaws should be accomplished if there is no open casket or viewing of the body.
 3. The forensic odontologist can accomplish a more complete and comprehensive examination and obtain better quality x-rays and photographs by resection of the jaws.
 4. If the jaws need to be retained for a period of time, they may be preserved in 10% formalin.

Preparation of Postmortem Records

- A.** Photographs.
 1. Full face.
 2. Close-up of the anterior or front teeth.
 3. Right and left lateral views of the teeth in occlusion or their proper bite.
 4. Views of the occlusal or chewing surfaces of the teeth in the upper jaw and in the lower jaw.
 5. Close-up photography of any additional features which may be important.
- B.** Radiographs or x-rays.
 1. Essential to any forensic dental examination.
 2. Exposure time is reduced by $\frac{1}{3}$ for resected jaws and $\frac{1}{2}$ for skeletonized jaws.
 3. X-ray examination is mandatory for estimation of age of the victim.
- C.** Notes and charts.
 1. A dental chart should be prepared indicating all pertinent information.
 2. This information should include, but is not limited to:
 - a. Which teeth are present and which are missing.
 - b. Which teeth are restored or filled, what the restoration or filling material is, and which surfaces of the teeth are involved.
 - c. Indicate if root canals have been performed.
 - d. Describe any prosthetic and/or orthodontic appliances.

- e. Describe the location and size of the decayed surfaces (cavities) of the teeth or if there are any chipped or fractured teeth.
- f. Describe any malpositions or rotations of teeth.
- g. Describe unusual anatomy or shapes of teeth.
- h. Describe the occlusion (the manner in which the teeth bite together).
- i. Describe any oral pathology or other anatomic features which may be of potential importance.

D. Study models or casts of the teeth.

1. Impressions can be taken of the victim's teeth and then casts are made by using dental stone.
2. It is usually not necessary or practical to take impressions of the victim's teeth. However, there have been many occasions where casts have proven to be very valuable.
3. The consulting forensic odontologist will decide if this procedure is warranted.



Fig. 27-1
Example of charred dental remains. The mandible (lower jaw) has the crowns of the teeth fractured off.



Fig. 27-2
Examples of charred fragmentary dental remains (teeth and bone fragments).



Fig. 27-3
Examples of charred, fragmentary dental remains. Many of the fragments may look like charred pieces of wood or debris. The fragment that is second from the left in the top row is a charred piece of wood.

Securing of Ante Mortem Records

A. Types of ante mortem records.

1. X-rays.
 - a. X-rays are the most important ante mortem records.
 - b. Recover and submit all x-rays, including those x-rays taken 10-20 years ago. These x-rays may reveal additional information and may compare more favorably with the postmortem x-rays of the remains.
 - c. Obtain the original x-rays if at all possible. The dentist should duplicate the x-rays and retain the duplicates for his/her records. The original film should be a better quality x-ray than the duplicate.
 - d. Obtain the most recent ante mortem records. Most individuals have probably been treated by more than one dentist throughout their lifetime.
 - e. If conventional dental x-rays are unavailable, recover medical or chiropractic x-rays that may show the teeth.
 - f. Electronic transmission of scanned images of dental x-rays saved as bit map files can be accomplished when expediency is required. An initial rule-in or rule-out comparison can be made of the electronic image on screen. The original films can be sent later if necessary.
2. Dental charts.
 - a. Obtain the original dental chart if possible. If the dentist sends a copy, make sure the copy is legible.

- b. Dental charts can be very valuable, but the forensic odontologist must be aware that there may be errors incorporated into the chart by the dentist, the dental assistant or the hygienist making the entry. For this reason, x-rays are a much better means of making a comparison.
 3. Study models or casts of the teeth. If the dentist has retained models, they can be very valuable. If the individual has seen an orthodontist, there may be a very good possibility of obtaining study models.
 4. Photographs.
 - a. Many dentists obtain photographs of their patient's teeth as a means of documenting dental condition.
 - b. Family snapshots, graduation, wedding or military pictures may reveal a "smiling photograph." Teeth may be visible and disclose a missing, discolored, broken or chipped tooth.
 5. If partial dentures or full dentures are involved, request that all additional sets of dentures be recovered. A bite splint, mouth guard or orthodontic retainer should also be recovered.
- B.** Recover all ante mortem records available (including charts, x-rays, photographs and study models). X-rays that may be requested are bite-wing x-rays, periapical x-rays, a full mouth series of x-rays (consists of periapical and bite-wing x-rays), a panoramic x-ray or a lateral skull x-ray.
- C.** How to locate the treating dentist to obtain the ante mortem dental records.
 1. Inquire of family, friends and co-workers what dental clinic or dentist treated the individual.
 2. Inquire if the individual was treated or consulted a dental specialist (oral surgeon, orthodontist, etc.).
 3. Inquire if the individual had a dental insurance plan, a union dental plan, medical assistance or welfare benefits. This could lead to a dentist's name.
 4. Examine military and prison records.
 5. Examine medical records to see if the physician has a record of the name of the dentist.
 6. In a small community, it may be necessary to contact all the dentists and inquire if they have treated this individual.

Comparison of the Ante Mortem and Postmortem Records and X-rays

- A.** The more areas of alterations or problems with the teeth, the greater the potential for a positive identification. With a perfect set of teeth (no decay, no fillings or restorations and a good occlusion or bite), or if there are minimal postmortem or ante mortem remains for examination, an identification may be more difficult. It may still be accomplished; however, meticulous attention needs to be paid to all minute detail. Excellent ante mortem and postmortem x-rays are always preferable.
- B.** A positive identification must bear no unexplainable inconsistencies. Any differences in the ante mortem and postmortem records must be thoroughly and adequately explained.
- C.** There is no specific number of characteristics needed for a positive identification. Occasionally, a single tooth or jaw fragment may possess the degree of specificity necessary to establish a positive identification. The final decision as to the degree of credibility of the dental identification rests with the judgment and experience of the forensic odontologist.
- D.** Occasionally, the postmortem records are only consistent with the ante mortem records, and a positive identification cannot be effected based on the dental information alone. However, a dental finding of “consistent” may be a significant contribution. It may be used in combination with other modes of identification (fingerprints, personal effects, anthropological or other medical findings, serology, etc.), and serve as corroborating evidence and increase the credibility of the final identification.

