

DENTAL MISIDENTIFICATION ON THE BASIS OF PRESUMED UNIQUE FEATURES

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ABSTRACT

Positive identification of skeletal remains by dental comparison depends on the demonstrable concordance between post-mortem and antemortem records. However, there is no accepted norm for the number of points of concordance and there are circumstances when a single (or a few) unique features may allow positive identification. We present a recent case in which superficial similarity may have led to misidentification. We argue that misidentification is particularly likely with over-reliance on apparently unique features. The fact that a single inexplicable inconsistency will rule out a positive dental identification is highlighted. (*J Forensic Odontostomatol* 2001;19:36-9)

Key Words: Dental identification, forensic anthropology

INTRODUCTION

The positive identification of a deceased person is of importance in civil, probate and criminal law.¹ Misidentification of skeletal remains can have serious legal implications that can lead to tortuous actions. In a well publicized case the erroneous identification of Lieutenant Colonel Thomas Hart led to large damages being awarded against the United States Army.² Many questions of forensic identification are best answered by using the comparative method in conjunction with special knowledge of the precise anatomy and features of the dentition and its dental restorations. The most controversial aspect of this approach is the level of concordance that is acceptable because there is simply no universally accepted number of concordant points for a positive dental identification.³ In the present communication, we report a case where reliance on an apparently unique feature may in fact have been the cause of misidentification of a skeletonised human mandibular fragment.

CASE REPORT

On 11 May 2000 the Forensic Dental Unit at the School of Dentistry, University of Otago, received a human jaw fragment containing three teeth for examination and was requested to give a second opinion regarding its identification. The remains had previously been identified as belonging to a person who had been reported missing from Christchurch,

New Zealand in September 1999. The jaw fragment had been found on 18 April 2000 washed up on a local beach.

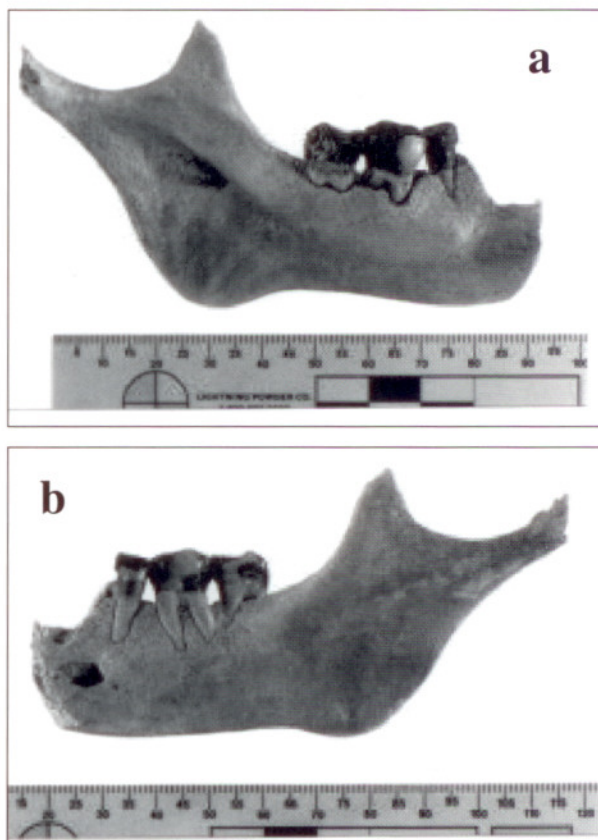


Fig.1: Mandibular fragment washed ashore. Top is lingual view, bottom buccal view

The specimen was that of a fragment of the lower left jaw of an adult human, fractured anteriorly near the socket of a missing first premolar and posteriorly at the junction of the neck of the mandible and the condyle (Figs. 1 a and b). While the specimen was quite well preserved, there was evidence of sand-caused erosion and subsequent loss of cortical bone, particularly on the buccal plate.

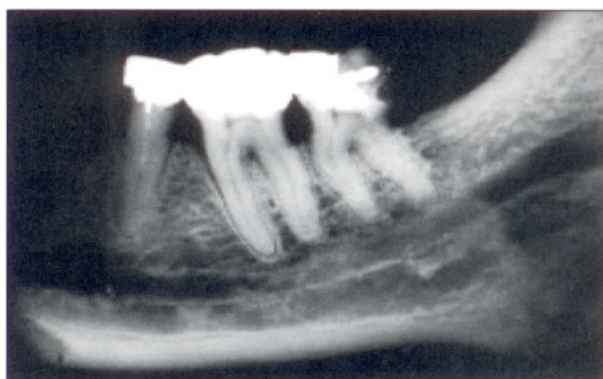


Fig.2: Radiograph of mandibular fragment

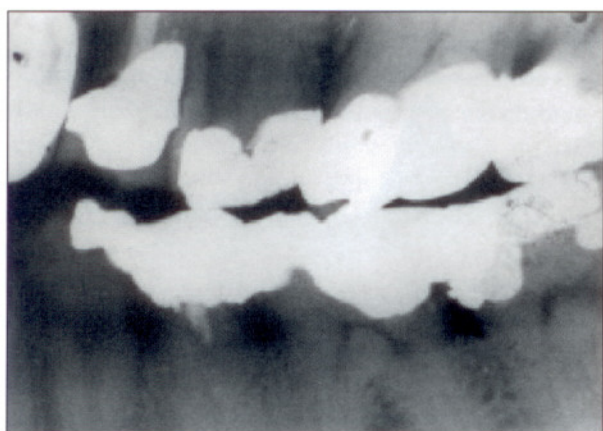


Fig.3: Most recent antemortem dental radiograph

Three teeth were present – the permanent mandibular second premolar, first molar and second molar. When examined and radiographed (Fig. 2), dental restorations were noted as follows:

Second premolar 35 had a complex restoration which was pin-retained over a poorly filled root canal.

First molar 36 had a large mesio-occluso-distal restoration with a small round buccal metal restoration above the origin of the distal root.

Second molar 37 had a mesio-occlusal restoration, fractured at the isthmus of what must have been a

mesio-occluso-distal filling antemortem. There was a small, bean-shaped buccal restoration at the origin of the distal root.

When these postmortem features were compared to the most recent radiographs of the supposed victim, we noted the following (Figs. 3 and 4):

1. *Tooth 35* (antemortem) had a domed restoration which was flat-topped in the postmortem image (Fig. 4) (1). The root filling also differed between ante- and postmortem views and was more diffuse in the latter (Fig. 4 a and b).
2. *Tooth 36*, while displaying a large restoration on both views demonstrated that their lateral outline was only superficially similar. On careful examination the antemortem radiograph showed a bulbous distal extension while the postmortem filling was well short of the distal aspect of the pulp chamber, with the buccal filling creating an illusion of similarity to the antemortem view (Fig. 4) (2d). Additionally, the antemortem tooth appeared to have two distal canals whereas the postmortem tooth had only one (Fig. 4) (e).
3. *Tooth 37* showed the greatest discordance. What was clearly a mesio-occlusal filling antemortem was in fact a fractured mesio-occluso-distal filling postmortem. This filling had an overhang antemortem which was clearly absent postmortem (Fig. 4) (3f). There were two additional points of discordance – the shape of the cervical filling and also the curvature of the mesial roots (Fig. 4) (4g).

Posterior bitewing radiographs were taken using a Philips Oralix50* intraoral unit set at 50kV and 7mA and Ektaspeed Plus film** (exposure time 0.4 seconds). The initial exposure was at an angle to duplicate optimal characteristics of a bitewing radiograph although further exposures were undertaken with the film positioned correctly and vertical and horizontal tube shifts were employed to duplicate the likely errors that may have occurred during the taking of the antemortem radiographs (Fig. 5).

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**Eastman Kodak Company, Rochester, New York, 14650, USA.

DISCUSSION

The foregoing case illustrates the dangers of an over-reliance on what appear to be unique features in the identification of this specimen. Silverstein⁵ has defined the degrees of certainty of identification as follows:

1. *positive identification* depends on a pre- and postmortem match in such detail as to establish first that they are from the same individual and secondly that there are no irreconcilable discrepancies.
2. *possible identification* rests on pre- and postmortem features that match, but because of the quality of either the antemortem records or the postmortem remains it is not possible to establish a positive dental identification. There should be no unexplained discrepant features.
3. *insufficient evidence* implies that the information available is insufficient to provide grounds for a conclusive identification.
4. *exclusion* results from a mismatch of ante- and postmortem observations. A single inexplicable inconsistency can rule out a positive identification.⁶

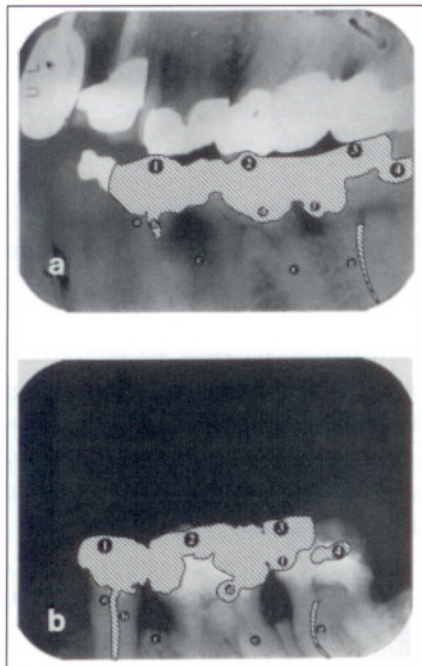


Fig.4: Contrasting features antemortem (top) and post-mortem radiographs as discussed in text

A detailed examination of such features as the radiographic appearance of restorations, pulpal morphology, root form, etc. may provide the necessary level of distinction or concordance needed to compare ante- and postmortem data. While the number of concordant points required for positive identification remains controversial,⁷ it has been repeatedly stated that a simple unique characteristic may be sufficient to establish identity.^{3,7,8} This case report illustrates the danger of focussing on what may be perceived to be unique distinguishing characters. Over-reliance on superficial similarity can favour misidentification, especially when faced with fragmented or partial remains.

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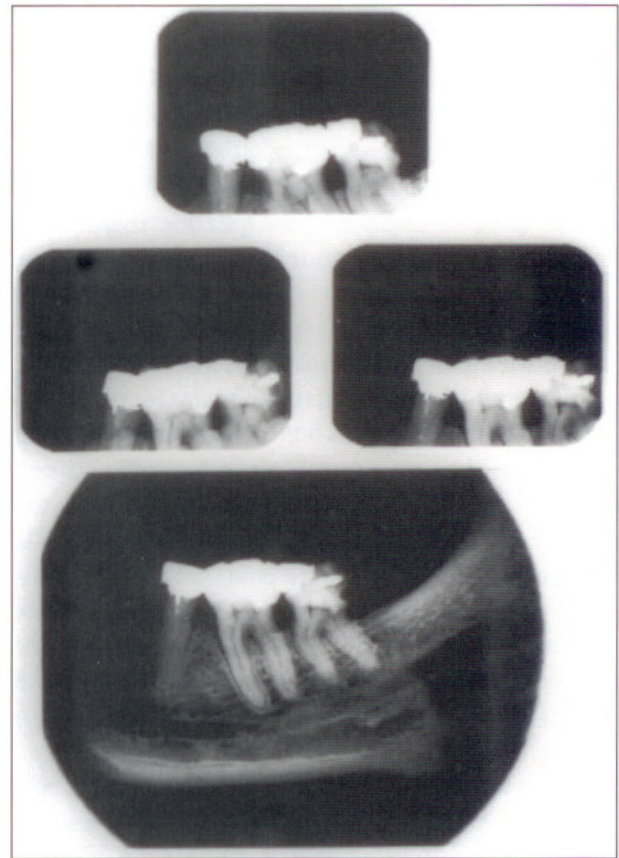


Fig 5: Radiographs taken at an angle to duplicate optimal characteristics of a bitewing radiograph (top) and additional exposures with vertical (left) and horizontal tube shifts (right) to duplicate likely errors during antemortem radiography. Bottom radiograph is a reference to Fig. 1

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