Forensic dentistry case book 2: Dental identification of severely carbonised remains

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INTRODUCTION

A 19-year old adult male was reported missing after he failed to arrive on his scheduled flight, following a working gap year in the United Kingdom. His parents who had been in the arrivals hall for some time, had not seen or received any calls from their son. The next day, a burned out car was found on the N2, with several carbonised bone fragments, including a maxilla, assumed to be from a human corpse. Experts confirmed that accelerators had been used in an attempt to totally destroy any possible evidence in the torched vehicle. The extremely burnt remains were brought to the Medico-Legal mortuary for possible identification (Figure 1).

At first glance, any possibility of dental identification from the maxillary dentition seemed remote, as all the crowns of the teeth had been destroyed by the heat of the fire. On closer inspection, it was noted that the 15 and 25 had been extracted ante-mortally. A radiograph of the maxillary arch showed that the roots of the 4's had been orthodontically moved backwards and not just tilted with a removable apparatus, or left to drift after extraction of the second premolars. At this stage, no connection between the burned body on the N2 and the missing 19-year old was made. It was only later, after full details of the missing individual were provided by the parents to the investigating officer, that a link between the two incidents was suspected and a match could be attempted between the carbonised corpse on the N2 and the missing person from the London/Cape Town flight.

[Details of this case have been changed to protect the identity of the deceased. Permission to publish this case study was obtained from the Ethics Committee of the Faculty of Health Sciences, University of Pretoria. No informed consent required. This case has been cleared by the SAPS in terms of Section 20(4) of the Inquests Act 58 of 1959.]]

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Figure 1: Severely carbonised maxilla.

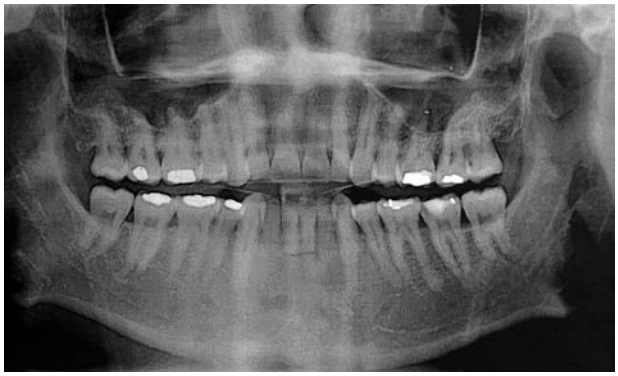

Figure 2: OPG ante-mortem record from orthodontist.

MATCHING OF ANTE-MORTEM RECORDS AND POST-MORTEM REMAINS

After receiving a printed orthopantomograph (OPG) from the orthodontist (Figure 2), a comparison of the post-mortem and ante-mortem material was conducted. The following points of concordance were established:

a. The teeth in the maxillary arch were well aligned
b. The 15 was missing ante-mortem.
c. The 25 was missing ante-mortem.
d. The 18 was missing ante-mortem. (from dental records but was still present on OPG)
e. The inclination of the root of the 14 was similar
f. The inclination of the root of the 24 was similar
g. The anatomy of the maxillary sinuses was similar
h. The relationship of the roots in both the first and second quadrants to the sinuses was similar.

Figure 3: Post mortem radiograph of 1st quadrant.

The conclusion of the forensic report read: "In the presence of multiple concordant maxillofacial and dental features present in the victim and the ante-mortem records supplied and no unexplained discrepancies, it can be stated with absolute certainty that corpse DR XXX is that of Mr YYY."

DISCUSSION

This case illustrates several important issues regarding the identification of mutilated or carbonised remains. Firstly, the human dentition remains fully or partially intact under even the most extreme conditions. Secondly, the importance of keeping dental records cannot be over-emphasised.[1] Thirdly, records can be used many years after last date of treatment and lastly, that in cases with little or no dentistry, comparisons can be made on dental arch morphology, anatomy of the sinuses and teeth missing within the dental arch.

In this case, the orthodontic treatment had been done several years previously, but excellent reference material was still available for comparison years later. The final comparison included the ante-mortem absence of the second premolars and the relationship of the roots of teeth 13,14 and 16 to the maxillary sinus cavity (Figure 3).

In a retrospective study of ante-mortem records, it was demonstrated that most dental practitioners do not comply with the requirements pertaining to dental charting and record keeping.[2] It should be noted that if an oral healthcare worker performs an oral examination of a patient and charges using an 8101 code, a charting is mandatory.[3] The study of van Niekerk and Bernitz[2] was restricted to private dental practitioners and did not include specialist orthodontists. In our experience, this speciality of dentistry can be relied on to produce good ante-mortem records. The reasons are multiple and varied, possibly including the litigious nature of orthodontic practice, but the bottom line is that orthodontists keep good, accurate records, as was evident in this case.

The exact circumstances leading to the demise of the unfortunate young man have never been established, but the parents have nevertheless achieved closure as they were able to bury their son.

References

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