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Determination of Late Postclassic Kaqchikel Maya Diet, Disease, and Cause of Death through Analysis of Skeletons from Iximché, Guatemala



Research Year: 1995

Culture: Maya

Chronology: Late Postclassic

Location: Guatemala

Site: Iximché

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Introduction

Iximché was the capital of the Kaqchikel realm, founded by refugees from the Quiché kingdom in the 1470s or 1480s ([Figure 1](#)). The Quiché attacked and tried to conquer the city at least once. This attempt met with failure and the Kaqchikel captured many Quiché warriors.

Spaniards under Pedro de Alvarado arrived in the highlands in 1524. With the Kaqchikel as allies, they conquered the Guatemalan polities which had been enemies of Iximché. On July 25, Alvarado founded the first colonial capital of Guatemala near Iximché. This action led to the outbreak of hostilities between the Kaqchikel and the Spanish and the ultimate destruction and abandonment of Iximché in 1526.

George Guillemin, a Swiss archaeologist, excavated Iximché between the late 1950s and the early 1970s. His main interest was architecture, and his crews uncovered large expanses of the site, exposing and then restoring plazas, palaces, altars, and temples.

Unfortunately, Guillemin was much less interested in analyzing the large amounts of materials that came from the digging. His excavation notes, archived at the Centro de Investigaciones Regionales de Mesoamerica (CIRMA) in Antigua, do not mention the location, associated artifacts, or basic layout of some complete skeletons. Even worse, for years the excavated materials were stored in what was essentially a chicken coop. Bags broke open, artifacts and bones from various contexts became mixed together, and tags with provenience information rotted away or became separated from their bags.

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Figure 1. Map of Guatemala, showing the location of Iximché.

Fieldwork

In 1991 Edgar Vinicio García of the Instituto de Antropología e Historia introduced me to the site and its excavation history. He put me in touch with Roger Nance of the University of Alabama, who had begun the task of reorganizing the artifacts. It was clear from what I saw of the bones that their preservation was remarkably good for a site in the Maya area. In 1992 Dave Reed of Penn State University and I began work on the skeletons at a laboratory in Guatemala City. I returned again in 1993 and then, with \$7,526 in funding from the Foundation for the Advancement for Mesoamerican Studies, Inc. (FAMSI), for a last time in 1995.

The 1995 phase of the project began July 9 in Guatemala City. Project personnel were Brad Adams of the University of Tennessee and Pam Snow, Cindy Risley, and Hanna Sanders of the University of Maine. I supervised the students and performed the analysis of age, sex, trauma, and diseases. Adams had previous experience with osteology and acted as my primary assistant in this analysis. In addition, he was interested in non-metric traits of skulls and undertook a study of them. Snow, Sanders, and Risley sorted body parts, reconstructed fragmented bones, compared crania to excavation photos in order to obtain provenience information, and measured bone and tooth sizes. Snow also acted as project photographer, taking color slides and black and white photos of significant bones.

Fieldwork ended August 18. During the intervening six weeks we met all of the goals set out in my proposal to FAMSI with one exception: Unfortunately, the Instituto denied me permission to export teeth from the country for stable isotope analysis. We did, however, reconstruct and identify as many skeletal remains as possible. We recorded data pertaining to evidence of infectious and nutritional diseases; trauma caused by work, warfare, and sacrifice; and cultural modifications of bones and teeth. We documented our findings with notes and photographs, with copies provided to the Instituto. In addition, we completed the first modern study of non-metric traits in highland Maya skeletons, studied skeletal remains from test pitting done by Eugenia Robinson at other Kaqchikel sites, and performed a forensic analysis of bones sent to us by the Public Ministry, all unanticipated in my proposal. I took the students to Iximché to provide them with necessary background and to CIRMA to locate excavation photographs critical to identifying crania. Our last action was to return the bones, padded and packed in plastic boxes, to storage at Iximché.

In the United States, Risley entered data into a SYSTAT database to facilitate eventual statistical analysis. I presented preliminary results in a symposium at the April annual meeting of the Society for American Archaeology. Data analysis remains incomplete at this time, but I will continue working on it as time permits. I have hired Juan Pablo Ruiz, a Guatemalan student at the University of Maine, to translate some of Guillemín's notes and articles from Spanish into English and to translate my results into Spanish for submission to the Instituto. Ruiz's work will end June 30.

Analysis

I have enough data to produce a monograph which can either stand alone or be part of a larger synthesis of archaeological work at Iximché with Roger Nance. However, given my full schedule as a museum director I do not anticipate producing this work until the summer of 1997. What follows is what FAMSI funding has permitted us to learn so far about the people buried at Iximché.

The sample consists of the remains of at least 66 individuals. This report centers mostly on cranial remains and changes induced in them by human actions. I have undertaken only preliminary analysis of postcranial remains to date.

In [Figure 2](#), the 66 individuals are broken down by various characteristics. We positively identified 17 crania from Guillemín's excavation photos as being decapitations, the majority coming from the group of 48 crania deposited together adjacent to a tzompantli, or skull rack (Guillemín, 1969:26). Eleven are possible decapitations. They were not positively identified from photos, but in each case either the cranium or vertebrae have damage identified as arising from the process of decapitation. Four are possible complete burials. For these individuals, either a complete skeleton which also exhibits decapitation damage is present, or provenience information found with a cranium indicates that it is part of a complete burial whose postcranial bones have been lost. Finally, four complete skeletons and one nearly complete skeleton which excavation photos show was a secondary burial exhibit no signs of decapitation. Of all the burials in the sample, only for the last five can a good case be made that they represent Kaqchikel inhabitants of Iximché.

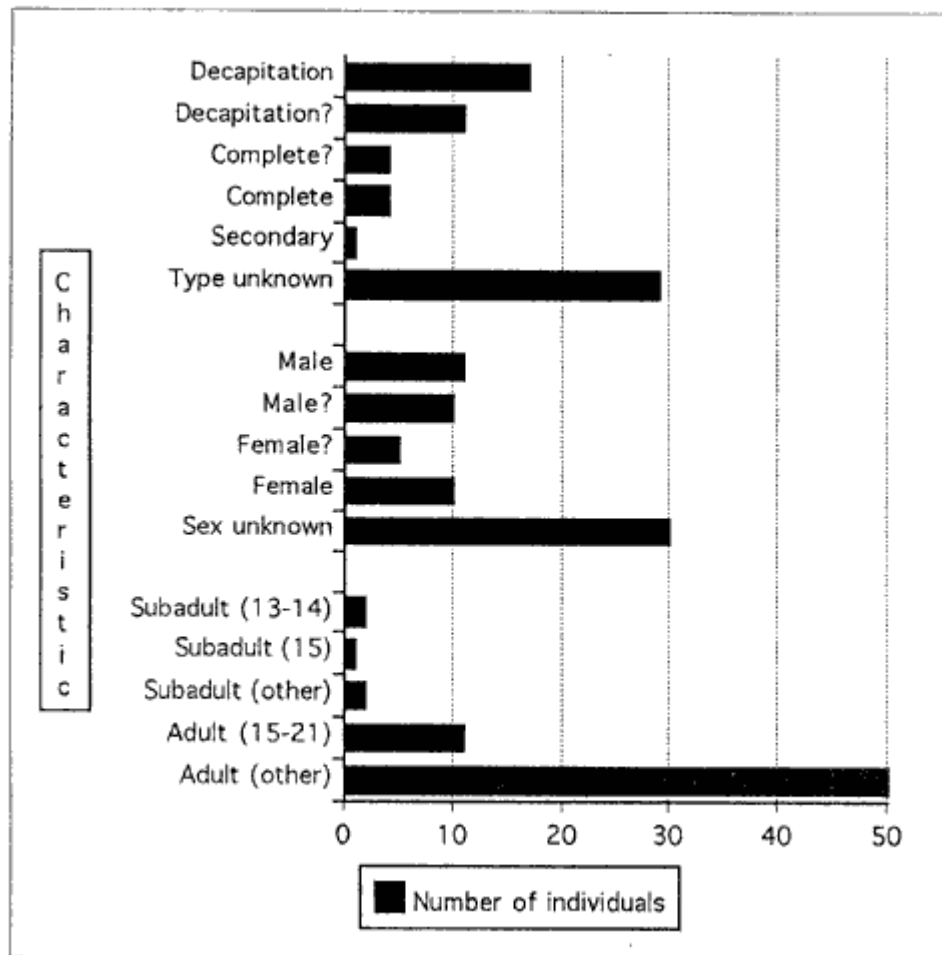


Figure 2. Breakdown of the 66 individuals in the Iximché sample of human skeletons by type of burial, sex, and age at death.

I determined the age and sex of individuals by observing a suite of characteristics on the cranium that osteologists commonly use (Bass, 1971). Securely sexed individuals are approximately evenly divided between males and females, although less securely sexed individuals are preponderantly males. A small proportion of individuals are subadults, most of which are teenagers. The majority of adults cannot be placed in restricted age categories, but at least 11 appear to have died between the ages of 15 and 21, based on their lack of third molar eruption.

The characteristics of the 17 individuals positively identified from excavation photos as decapitations provide us with some insights into Late Postclassic (A.D. 1200-1524) highland warfare and human sacrifice ([Figure 3](#)). Even though the majority of the individuals appear to have been males, at least some were females. Many of the individuals were aged 15 to 21 at time of death. All but one of the individuals have physical evidence on the base of the skull, the vertebrae, or both of the decapitation process. The tool of choice for decapitations appears to have been a stone knife with a jagged edge. Widespread damage typically occurred to the structures of the base of the skull. Vertebrae deposited with the cranium frequently are heavily damaged or even cut completely through. The form of damage is so standardized that even decapitations not positively identified from excavation photos can be tentatively identified.

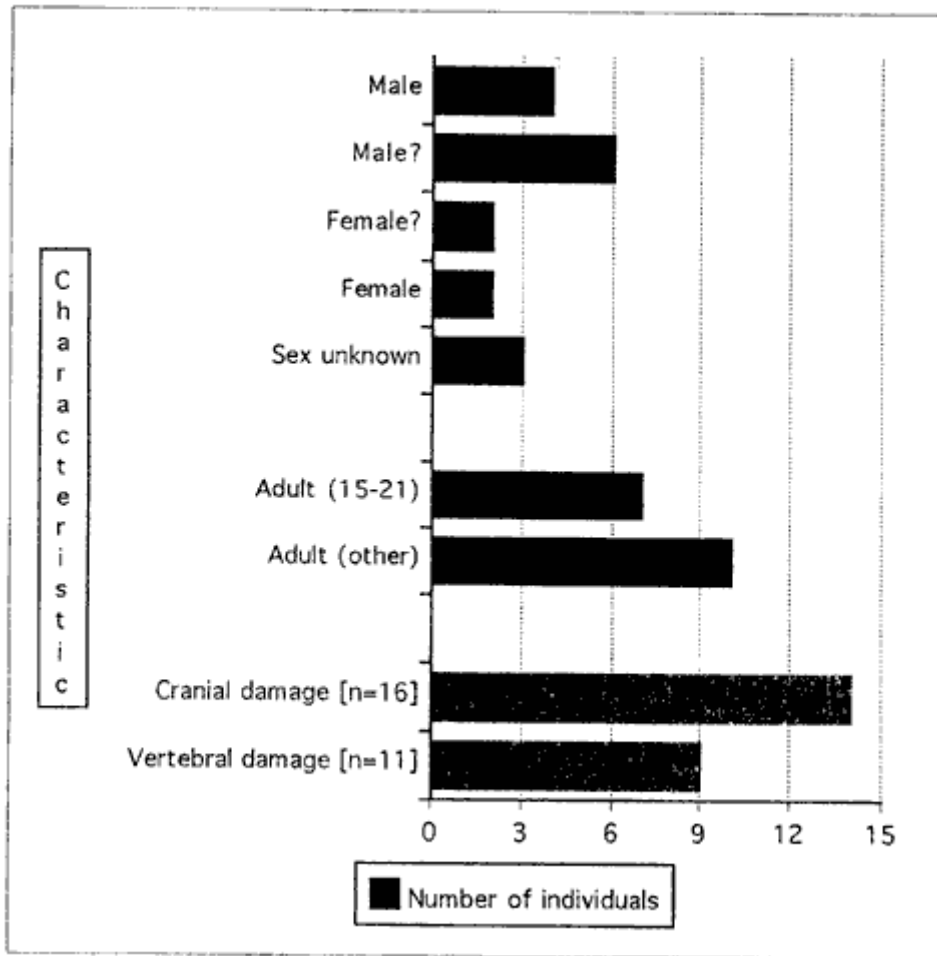


Figure 3. Breakdown of the 17 individuals positively identified as being decapitations in the Iximché sample by sex, age at death, and presence of decapitation damage.

Warfare presumably caused some other trauma to bones of individuals in the overall sample of 66 individuals. Puncture wounds of the type caused by the thrust of a pointed weapon appear on the pelvic bones of two individuals and a lumbar vertebra of a third. Cuts with well-defined edges from around the time of death mark the cranial or long bones of a few individuals.

Late Postclassic highlanders purposely or accidentally modified bones of the skeleton in various ways. In 16 individuals, one or more anterior mandibular teeth exhibit polishing of the labial surface. I am convinced that it represents abrasion caused by use of a stone or metal labret, or bezote. I know of no labrets excavated at Iximché, but Carmack (1981:262) reported one of amber found with a burial excavated at the Quiché capital.

Unlike Classic period lowland Maya, the skeletons from Iximché never exhibit artificially modified teeth with either filed edges or inlaid jade, pyrite, obsidian, or coral. The

pattern at Iximché also differs from that reported for contemporaneous Mixco Viejo, also in the highlands, where some teeth had been filed (Gervais-Cloris, 1985-1986).

Cranial deformation is present in at least 42 individuals, although in three cases the modification is so slight that it may have been an unintentional side effect of some other action, such as always lying on one side when sleeping. The majority of individuals exhibit markedly asymmetrical deformation, known as plagiocephaly, which has been noted in crania from Zaculeu (Weiss, 1967) and Mixco Viejo (Gervais-Cloris, 1985-1986).

Evidence of iron deficiency anemia, caused by either malnutrition or the anemia of infection, is present as the pitting of porotic hyperostosis on the outer surface of at least one cranial bone from seven individuals, six adults, and one subadult. All cases have pits with rounded edges, indicating that the lesions were healed at time of death.

Periosteal reactions resulting from infections are present on one or more cranial bones of nine individuals, as well as on two additional fragments. Reactions which were active at time of death, generally with sharply defined edges, rough surfaces, and a gray appearance, are not widespread or pronounced enough in any individual to indicate that infection was the direct cause of death. The lesions may have resulted from localized trauma to the overlying soft tissue or they may be the only remaining evidence of some more general infection.

Bony reactions involving the maxillas of nine individuals deserve separate treatment because of their different characteristics and causes. Within the maxillary sinuses or nasal passages of six individuals is a very thin layer of smooth bone with well-defined edges lying atop the normal bone surface. Boocock et al. (1995) described of this type of bone in skeletons from medieval Chichester, England and attribute it to sinusitis. Two other individuals have different lesions probably related to sinusitis, while the ninth has a reaction within the right maxillary sinus caused by a dental abscess.

The vault bones of one individual aged about 15 have a spongy appearance and an unusually thin outer surface marked by many pinprick holes. These characteristics most closely match those described by Ortner and Putschar (1985:28) for osteomalacia, or inadequate deposition of calcium or vitamin D.

Bony deposits, lipping, or pitting, evidence of arthritis, appears on the cranial bones of only three individuals.

Anthropologists attempt to estimate the genetic relationship, or biological distance, between or within samples through studies based on non-metric traits (Buikstra, 1976; Corruccini, 1974; Sciulli, 1990). The significance of these traits lies in their presence or absence, or in variations in number or location. Following the format outlined in the 1994 Standards for Data Collection from Human Remains (Buikstra and Ubelaker, 1994), Brad Adams observed 30 non-metric traits on cranial bones ([Figure 4](#)). The results of his analysis are of interest now mainly because they provide baseline values for traits in highland Guatemala during the Late Postclassic. We cannot undertake a

significant study utilizing these data at this time. Lack of comparative material from other sites precludes comparisons between samples. Problems inherent within the Iximché sample even preclude within-sample comparisons. New excavations of skeletons and analysis of existing skeletal samples in storage may provide comparative data to make the Iximché data more valuable in the future.

<u>Bilateral Traits</u>			
Supraorbital notch	Supraorbital foramen	Infraorbital suture	Multiple infraorbital foramina
Zygomatico-facial foramen	Parietal foramen	Epipteric bone	Coronal ossicle
Lambdoid ossicle	Asterionic bone	Parietal notch bone	Postcondylar canal
Divided hypoglossal canal	Foramen ovale incomplete	Foramen spinosum incomp.	Tympanic dehiscence
Auditory exostosis	Mastoid foramen location	Mastoid foramen number	Mental foramen
Mandibular torus	Mylohyoid bridge location	Mylohyoid bridge degree	Occipito-mastoid ossicle
<u>Midline Traits</u>			
Metopic suture	Bregmatic bone	Sagittal ossicle	Apical bone
Inca bone	Superior sagittal sulcus flex.		

Figure 4. Cranial non-metric traits studied at Iximché.

The future of the skeletons and other materials excavated at Iximché appears more positive than it did a decade ago. They are secure and protected from the elements in a new storage building constructed at the site a few years ago. The bones are clean, reconstructed, and stored with existing provenience information within layers of padding in strong plastic boxes. We can hope that the materials excavated at Iximché will continue to be well curated and that past mistakes which necessitated this rescue osteology project will not be repeated for other sites in highland Guatemala.

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