

VIOLENCE AND TRAUMA IN THE WARI HEARTLAND:
A STUDY OF ONE CIVILIZATION'S TREATMENT OF THEIR PEOPLE

by

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The Wari civilization lasted from A.D. 600 – 1000, in central Peru. They conquered other cultures during their reign, and their power spread from their capital city, Huari. However, little data has been compared to study the physical treatment of their people. In this paper, the trauma studied in the bones of the Wari people were compared with age, gender, and social status, respectively. This study shows that violence was seen in both sexes, but more so in the male population. However, 25% of the female population showed trauma, indicating that females could have possibly been involved in warfare, or more likely, ritualistic violence. When studying trauma by age, the age ranges that showed that violence was more common in young and mid-adults, although most of the trauma had healed, indicating that most of the attacks were nonlethal. However, due to the large sample size of the unaged adults, it was difficult to specifically see if trauma was more present in one age than another. Lastly, when studying burial treatments, it was concluded that intermediate and ruling elites had significantly less trauma than the general population, as well as fewer diseases and malnutrition. While there was not a lot of data to use for this particular study, it does seem evident that the elites had better treatment and less experience with violent situations. While more research still needs to be conducted, this study is a good start in understanding how the Wari treated their people.

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INTRODUCTION

Violence has been used for centuries to control people and populations, using their fear as a catalyst for emerging power. Hitler used it to extinguish millions of people he deemed inferior, and Stalin used it to keep his power when he feared that others were trying to take it from him. Violence is the key for conquering those cultures that resist. The signs of this violence can be seen and heard – in historical documents, on video, and from oral accounts, among others. However, when the civilization existed fourteen hundred years ago, the records of such violence will be scarce. When this situation arises, the bodies of the victims that sustained the violence are, perhaps, the best evidence for studies of violence. This is the case with the current research of violence in the Wari civilization.

The Wari civilization existed in the Middle Horizon from A.D. 600 – 1000, and dominated the central Andean highlands, in what is now Peru (Tung 2008). They were the first empire to emerge, rise, and fall in this area. At their peak, they ruled over a vast expanse of territory and people. Their influence extended from the Moquegua Valley in the south of Peru to Pikillacta in the east and Viracochapampa in the north (Figure 1). Their wide-ranging rule suggests that they conquered and incorporated groups into their culture, which very likely included violence. The site of Huari served as their capital city, containing ceremonial buildings, mortuary areas, and ritual structures (Tung 2008).

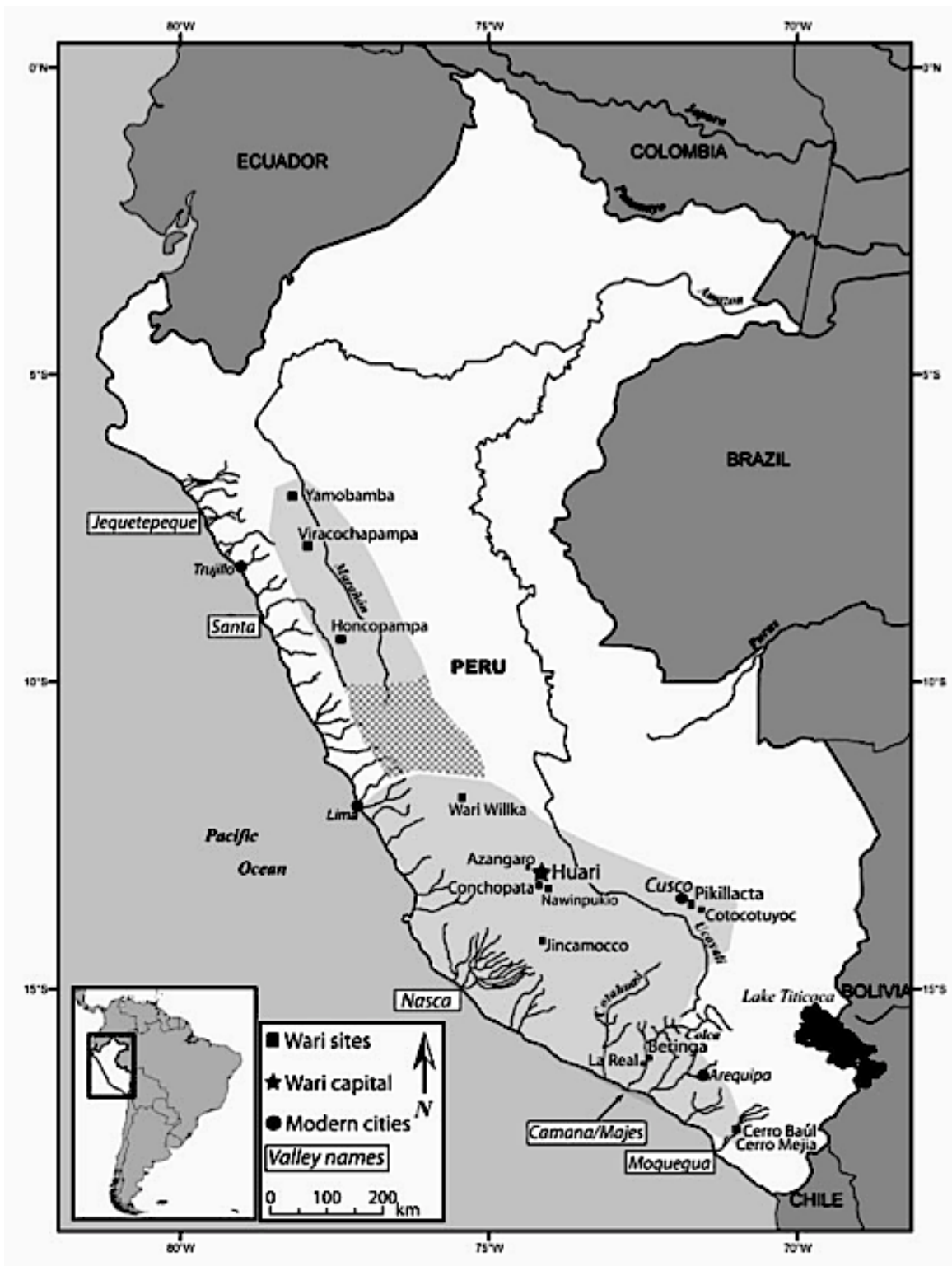


Figure 1. “Map of Peru showing several Wari sites and major valleys. Areas shaded in gray show an estimate of the geographical extent of the Wari empire... (Schreiber, 1992). The checkerboard area has been little studied, so Wari’s influence there has yet to be fully documented”. (Tung 2008, Fig. 1)

There are two main theories of how the Wari came to power. They were one of many independent polities in the Andean region during the Middle Horizon, and they came to dominate a wide region of the central Andes, incorporating many communities into their society until their decline. One hypothesis states that the Wari empire was just one autonomous polity among many others. It states that the Wari's control did not extend to the north as far as others think it did (Tung 2008). Instead, Wari-related sites were made up of kin groups and lineages. The general idea that is shared among researchers is that no one society was dominant over another (Tung 2008). The second hypothesis states that the Wari were politically centralized and expanded their empire through militaristic means. This view places emphasis on the militaristic means the Wari employed, and studies have been conducted on the ceramics from the site of Huari that illustrate Wari soldiers wielding weapons and armor, and displaying trophy heads of their conquered enemy. This theory is the more widely accepted view among scholars (Schreiber 1987).

The evidence suggests that the Wari were extremely violent when defeating other societies, so the question remains – were they just as violent to their own people? While studies have been conducted on what types of weapons the Wari used and how they defeated their enemies, more research still needs to be conducted on how they treated their own people. Violence against members of the Wari civilization would demonstrate how they governed their society and how they conquered them violently, and might possibly shed some light on how they treated certain subgroups within their own population. Studying the bones of the Wari people is the most accurate way of determining how they were treated by their government and rulers.

This paper will compare the violence, trauma, and pathologies seen in the bones of the Wari people with respect to age, gender, and social status. It will also take into account whether

the bones belonged to a local of the Wari civilization, a migrant, or a captive using the measurements of the strontium isotope (specifically strontium isotopes 86 and 87) in their bones. The four main sites from which the remains were excavated are Conchopata in central Peru, Beringa and La Real in the south, and Pikillacta in the east, with a couple of remains coming from small communities. All three main sites lie within the boundaries of what is considered to be Wari territory, and Conchopata lies at the heart of the Wari empire (Tung 2008). Conchopata is considered to be an urban Wari site, while Beringa is a village site, with domestic and mortuary services, and La Real is seen as a site that served rituals and ceremonial purposes (Tung 2008). Trephinations and trophy heads are also considered, and included as trauma. This study will shed light on living conditions for the Wari, and will help others studying the Wari civilization to understand how they governed their society.

BACKGROUND

In the past 3000 years, there have been periods of time in the Andean region known as “Horizons” that have widespread continuity in them, such as similar ceramics, architecture, and/or rituals, among other similarities (Tung 2003). The Wari civilization existed from A.D. 600 – 1000, also known as the Middle Horizon, in what is now modern day Peru (Tung 2012). It evolved out of the remains of the Huarpa Empire, and expanded by incorporating other societies in to their own culture (Tung 2012). They existed during the same time period as Tiwanaku, which was less expansive than the Wari. Scholar John Rowe was the first to split the Wari and Tiwanaku civilizations into separate societies, as they were previously thought to be branches of each other (Tung 2012). It is not known how the Wari fell, and it was completely forgotten until its ruins were encountered by Spanish chronicler Pedro de Cieza de Leon in 1550 (Tung 2012).

The Wari Empire seems to have been the inspiration for the Inca imperial state. It had its main sites along a highway system, with the largest site in the heartland of Wari territory, serving as the primary location of information and goods (McEwan 2005). It was a state-level society, as seen by its architecture and iconography, and they focused on the expansion of their empire in terms of economic and social activities (McEwan 2005). They were a “centralized hierarchical system growing out of hydraulic management requirements”, utilizing storage facilities along their highway system as administrative sites, as well (McEwan 2005, 4). The four main sites used for skeletal samples were Pikillacta, Beringa, La Real, and Conchopata.

The site of Pikillacta, located in the eastern part of the Wari empire, was the second largest Wari site. It was categorized as an administrative site that also included homes and

ceremonial sections (McEwan 2005). Unusually, when excavated, there were almost no surface artifacts, and there is almost a complete absence of potsherds. This made associating the site with Wari almost impossible, until the late 1950s when the similarities between the architecture at Pikillacta and the Wari site of Ayacucho was noted (McEwan 2005). The site of Pikillacta is extremely complex, with an intricate aqueduct system that was built before construction began and numerous sectors that were assembled as their need became evident. Pikillacta evolved as the Wari civilization did, and mainly served as a place for ancestor veneration and ritual feasting (McEwan 2005). While the sample selection of human skeletal remains from Pikillacta is small, it is still possible to form an image of how people were treated. Artificial cranial deformation is seen, which could suggest social diversity, and the burials themselves shows how complex the Wari were, which will be discussed further in the analysis.

Beringa is located in the middle of the Ayacucho Basin in southern Peru. Many different types of crops were cultivated there, and burials with ceramics suggest that those buried might be of some importance (Tung 2007b). Beringa is a frontier site, which might result in more violence and trauma seen in the remains here, due to less protection than the bigger cities provided (Tung 2007b). The majority of injuries seen here are on the posterior of the skeleton, suggesting that raids were common at this site. Beringa also contains mortuary contexts, and could be labeled as a domestic village, much smaller than Pikillacta (Tung 2007b).

Another Wari site that yielded skeletal remains is La Real, located near Beringa in the Ayacucho Basin. It has been interpreted as a high status ceremonial and mortuary site (Tung 2012). In addition to housing the deceased, there is evidence for ritual battles, or *tinku*, “a ritual battle in which men square off and fight with fists or maces, or they hurl stones at each other with slings, often leading to serious skull fractures” (Tung 2007a, 952). Since many of the

remains found at this site contain non-lethal cranial wounds, the presence of *tinku* here would make sense.

The final site of my analysis is Conchopata, located in the heartland of the Wari empire near the capital city of Huari. It covers about 20 ha, and houses mortuary areas, ritual structures, and civic-ceremonial buildings (Tung 2007a). This city contained elite households, it became the center for ceramic production, and it is believed that ancestor veneration was practiced there (Tung 2007a). There are an overwhelming number of trophy heads that were excavated from Conchopata, suggesting that this city was for warriors and captives. Wari iconography depicts their enemies transformed into trophy heads for display and/or adornment (Tung and Knudson 2010). Evidence found in ritual spaces in circular and D-shaped structures also support the hypothesis that this city was a location where military triumphs were celebrated.

Trophy heads are seen quite frequently in South American history, and there is no lack of them in Wari society. They can be created through several different means: decapitation, surgical removal in the case of an ancestor, or collection after an execution (Tung and Knudson 2010). The subject who has their head removed could be an ancestor, an enemy, or a criminal. In the archaeological record in Wari civilization, trophy heads are found in ritual spaces, and based on the measured levels of strontium isotopes 86 and 87 ($^{87}\text{Sr}/^{86}\text{Sr}$), all the trophy heads are from non-locals – either migrants or captives (Tung and Knudson 2011). Each trophy head is modified specifically, with a drilled hole located on the occipital bone and one on the apex of the head (Figure 2) (Tung 2008). The heads required time and resources, which were valuable, so the trophy heads can be seen as important objects and may represent power and prestige. They could also be used as a device used to intimidate opponents in battle, and the fact that they are found in locations of Wari influence suggests that they worked.



Figure 2. Trophy heads from the Wari Empire (Tung 2008, Fig. 2).

Another interesting modification found throughout the Wari population is trephination. Trephination is “the surgical removal of part of the cranium” and “was first identified in 1865 by E. George Squier, in Cuzco, Peru” (Andrushko and Verano 2008, 4). It is believed that the Wari used trephination as a medical treatment and not as a cultural practice, unlike other civilizations around the world. It was also suggested that trephination may have served some sort of ritual purpose since there were multiple trephinations on many skulls, possibly indicating that this person had some importance. The majority of the procedures were conducted near the midline of the skull and on the left side, while the occipital and temporal bones were, for the most part, left alone (Figure 3) (Andrushko and Verano 2008). The presence of trephination illustrates the advancement and sophistication of the Wari, and the survival rate was extremely high with a very low infection rate (Andrushko and Verano 2008). Surviving trephination can be seen in the skull of the patient, examining if the hole that was excised had started to heal, which would show rounded edges of the cut (Andrushko and Verano 2008).



Figure 3. An individual with seven trepanations (Andrushko and Verano 2008, Fig. 2).

The burials excavated in each of the four sites demonstrated a large number of graves with multiple sets of remains. The majority of the burials were buried in the flexed position, accompanied by ceramics and personal items. The graves were all of varying depths, with the deepest about eight meters deep (Conlee, et al. 2009).

The Wari were extremely violent, as is seen through their conquering of other peoples and cultures. They displayed their violence in public displays, known as *tinku*, a ritual fight that might have occasionally led to death, but more often “result[ed] in nonfatal skeletal trauma, which can be observed osteologically” (Tung and Owen 2006, 439). This act was very common in Andean cultures, and the goal was to spill the opponent’s blood, possibly as an offering for better crops, and corresponding with festivals and harvests (Tung and Owen 2006). However, even though this ritual is brutal, it is also “meant to maintain balance and harmony” (Tung and

Owen 2006, 456). It involves the opponents in a face-to-face battle while they hurl stones, maces, and their fists at each other. While men were the primary players, women did occasionally perform this ritual battle (Tung 2007a).

The Wari spread throughout southern Peru by using militaristic means, incorporating populations as they moved. However, they did not start their imperialistic expansion until around A.D. 650, and it lasted until approximately A.D. 1000 (Tung 2003). The administrative sites located along their central highway and into their peripheral regions illustrate the strength and intensity of Wari control. They moved north and conquered the site of Viracochapampa, a large city where they immediately began construction on their signature buildings – patio groups and a D-shaped ritual structure (Tung 2003). Their grasp also extended south and east, to the city of Pikillacta and smaller Nasca sites that were abandoned. As the Wari grew, so did their use of violence.

METHODOLOGY

This paper compiles data from several different sources, as the excavations had already been completed and the data was available. The data of the remains was collected from: Andrushko and Torres 2011, McEwan 2005, Tung 2003, Tung 2007a, Tung 2008, Tung and Cook 2006, and Tung and Knudson 2010. Each source listed the minimum number of individuals (MNI) and how many of the remains showed trauma. There was no minimum number of injuries necessary to include the remains in the study – if there was trauma, anything at all, located on the bones, it was counted and placed in the data set. Sexing and aging was also attempted on the remains, but due to missing bones, this was impossible for some of the remains. Trauma was described, if present, on the remains, along with pathologies. Trauma was first organized by gender, separating males and females, and was totaled. Next, trauma was classified by age. Age groups were separated into 6 groups, and the data was sorted into each category. Lastly, trauma and social status was studied, using the excavation of five tombs as an indicator of the physical treatment that intermediate and high elites were subjected to (Tung and Cook 2006).

After the compilation of data, a χ^2 test was conducted on the trauma by gender data to determine if the type/number of trauma was connected to differences in sex. A χ^2 test determines if the data present is significant or not by presenting a p-value. Significant data indicates that the data is not due to randomness, but instead, that there is a pattern happening with the data, and the p-value would be closer to 0. If the p-value were closer to 1, it would indicate that the data was due to random chance. Additionally, Crammer's V was calculated, which indicates the strength associated with the χ^2 results. The closer Crammer's V is to 1, the

stronger the relationship between the two variables. Conversely, the closer Crammer's V is to 0, the relationship between variables is seen as weak.

The bones were grouped into three categories: local, migrant, or captive. This was achieved by measuring the levels of Strontium isotopes in the bones. Strontium is a naturally occurring element that is consumed through water and soil. An isotope has the same number of protons of the particular element, but a different number of neutrons (Tung and Knudson 2011). Strontium isotopes 86 and 87 were measured, and a difference of at least 0.001 in the samples was necessary to be considered a migrant or captive (Tung and Knudson 2011). This process was completed when the excavations took place, and studied when analyzing the data. When studying the data from each source, it became clear that every trophy head was considered a migrant or captive due to the varying levels of $^{87}\text{Sr}/^{86}\text{Sr}$ (Tung and Knudson 2011).

In addition to using statistics, I also looked at the pathologies evident on the bones, which helped in determining what that person did in their daily life as well as understanding the social status of the individual whose bones were begin studied, assuming that higher status individuals would not show the same 'wear-and-tear' on their bones as the general population would. Osteoarthritis is a common indicator that the same movements have been performed repeatedly for an extended period of time (Tung and Cook 2006). This pathology would be present in the remains of a person who had worked the same occupation continuously. However, it would not appear in the remains of an elite, who would have had people to do their manual labor.

Trophy heads and trephinations were also considered, possibly indicating if the remains belonged to a captive, whose head most likely would have been turned into a trophy. Trephination could indicate that the remains belonged to an important individual, who either received the operation in a ritual or as means to save his/her life. The presence of either of these

pathologies was seen as trauma. There were no trephinations included in the sources used to compile the data, so a study conducted by Andrushko and Verano (2008) was instead.

DATA

The age-at-death and sex had already been determined by the authors of each paper used to compile the sets of data. These data sets were combined (explained above) to allow for a sample size large enough to be able to see if there were any patterns present. The sites that the remains came from were Conchopata, Pikillacta, Beringa, and La Real. The trauma found in the bones will be compared with age, sex, and social status, separately.

Trauma by Gender

It is hard to determine anything about the remains of a child, considering that their epiphyseal plates have not fully fused, so their height, sometimes sex, and age are unable to be specifically determined. In addition, their pelvis and skull, the two most helpful bones in sexing an individual, have not fully formed. In this paper, the children are unsexed, so they are not included when comparing trauma and violence with gender. Males and females are both well represented, with a total of 158 females, 144 males, and 30 unsexed adults (Table 1).

Pathologies that were common within these groups include carious lesions (cavities), osteoarthritis, and dentine exposure (Tung and Cook 2006). The two pathologies relating to teeth are common, and probably not related to trauma, but caused by a diet that consisted mostly of corn, and the teeth were worn down and not properly cared for, causing the damage (Tung and Cook 2006). The osteoarthritis is incredibly widespread, and seen in almost every skeleton. Osteoarthritis is a degenerative joint disease that is genetic, and is usually found in places that are used continuously, such as the upper and lower vertebrae (Tung and Cook 2006, 81). This

pathology suggests that almost every Wari person had some sort of task or job that required manual labor, while the ruling elites were exempt.

Table 1. Trauma by Gender

	Females	Males	Total
With Trauma	39 (25%)	60 (42%)	99
Without Trauma	119 (75%)	84 (58%)	203
Totals	158	144	302

Females

Of the 158 females, 39 of them show trauma (25%), either cranial trauma, postcranial trauma, or both. Most of the cranial trauma occurred on the left anterior portion of the skull. The wound pattern suggested blunt force trauma, and was mostly clustered to the left side of the face, indicating that their attacker was right handed (Tung 2007a). In addition, several parry fractures were observed. Parry fractures are found on the ulnae and radii, and occur when a person shields his/her body, and puts their arm in front of them to block a blow (Tung 2007a). However, because these fractures do not correspond with other trauma, it is possible that these fractures were accidental or part of a ritual purpose. It is also possible that these females were subject to abuse, however there is not enough evidence to prove this right or wrong.

Males

Of the 144 males that were studied, 60 of them exhibited cranial trauma (42%), as well as postcranial trauma. Rib fractures are prominent in males, most likely due to a frontal attack, but all of these fractures had healed, and none of them were cause of death (Tung 2007a).

Metacarpal fractures are also common, called a boxer's fracture, and indicate that some sort of fighting took place (Tung 2007a). The males also sustained more trauma to the posterior of the cranium, suggesting that these wounds occurred during some sort of battle, where the victim did not have time to try and defend themselves. However, most of the cranial trauma was not the cause of death either, and showed either partial or complete healing. Cause of death is hard to determine with just the bones, and is much easier to determine with skin and muscles present. Even though there are 30 unsexed adults that cannot be used for this part of the study, their bones were used to compare age-at-death trauma.

A chi-square test was performed on trauma data when males and females were compared, and with one degree of freedom, $\chi^2 = 15.98$. This resulted in a p-value < 0.001 , which indicated that there was less than a .1% probability that this data was random. It also indicated that the data was very significant and there was a pattern to it. However, Crammer's $V = 0.18$, which indicated that while the data is significant, the relationship between trauma and gender is relatively weak.

Trauma by Age

The age-at-death was also studied and compared with trauma and violence. The organization of ages is listed in Table 2. Almost every adult cranium contained at least one healed fracture, if not more. This suggests that most attacks were non-lethal, and might have been entirely ritualistic. At the site of Beringa, of the 14 adult crania with antemortem cranial injuries, 71.3% of them show complete healing (Tung 2007b). 39% of remains under the age of 15 years showed at least one traumatic injury, if not more (Table 3) (Tung 2007b). However, trophy heads are included in this percentage, considering that the process of making a trophy head causes the death of the victim. In a burial at the site of Conchopata, seven child trophy heads were uncovered, and

cutmarks on the posterior of the mandible and on the ramus and gonial angle, indicate that the victim was beheaded (Tung and Knudson 2012). In other words, these trophy heads were not from the body of a long deceased child, but instead from a child whose head was still completely attached to its body (Figure 4).

Table 2. Age Classification

Infant/Child	Under 15 years old
Adolescent	15-19 years old
Young Adult	20-34 years old
Mid-Adult	35-49 years old
Old Adult	50+ years old
Adult (age undetermined)	20+ years old

While only three trophy heads were tested for $^{86/87}\text{Sr}$ levels, two of them showed isotope levels that indicated nonlocals, and probably captives (Tung and Knudson 2011). The third head could have belonged to a child who was first held in containment, and had a chance to drink and eat local foods, causing his/her levels to normalize for the population of Conchpata. The high mortality rate of young children and infants also indicates that the birth rate was extremely high (Tung and Knudson 2011).

The next age group was the adolescents, or from ages 15-19 years. Only 9% of these remains showed trauma or violence, and again, these injuries, for the most part, were non-lethal. At the site of Beringa, 14 adolescents exhibited at least one cranial wound (36%) (Tung 2007b). The majority of these remains were male. Yet again, these wounds showed signs of healing, so they were not the cause of death. The next age group studied was the young adults, or ages 20-

34 years. 22% of these individuals showed signs of trauma (Table 2). This is much higher than the adolescents, yet still smaller than those under 15 years. At this age, young adults would be finding their niche in society, and would be possibly specializing in a certain are of production.

Table 3. Trauma by Age

	With Trauma	Without Trauma	Total
Infant/Child	31 (32%)	67 (68%)	98
Adolescent	26 (57%)	20 (43%)	46
Young Adult	75 (97%)	2 (3%)	77
Mid-Adult	38 (88%)	5 (12%)	43
Old Adult	14 (74%)	5 (26%)	19
Adult	232 (29%)	555 (71%)	787
Total	416 (39%)	654 (61%)	1070

More pathologies of shoulder dislocations and lipping on the vertebrae appear, signifying repeated movements and rubbing of these surfaces, as if this action had been performed every day (Tung 2007a). Parry fractures also appeared in this age group, possibly meaning that it was at this age that men (and possibly women) were sent into battle or to help spread the Wari culture and conquer other villages (Figure 5).



Figure 4. Cutmarks on a child's mandible, along with a drilled hole on the ascending ramus (Tung and Knudson 2010, Fig. 6).

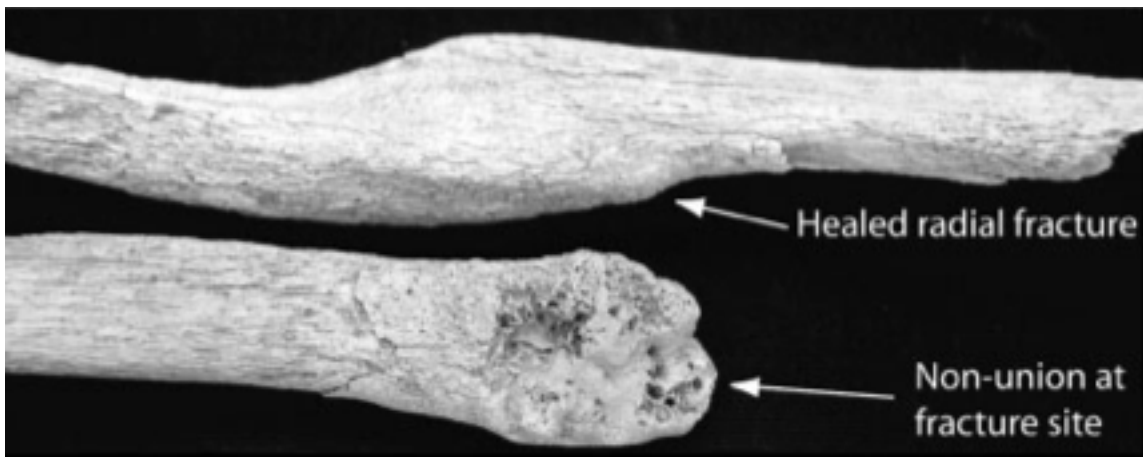


Figure 5. Parry fracture on right radius (Tung 2007, Fig. 6).

Continuing to the next age group, mid-adults (35-49 years) showed a similar pattern of trauma with the young adults. 18% of mid-adults contained at least one traumatic injury, and this group was the best represented in the archaeological record (Table 3). It was at this age that death was common, and many did not make it past the age of fifty. Old adults came next, and while there was a small sample population, 74% of old adults had at least one traumatic injury. However, most of them had healed, indicating that these wounds were inflicted years prior to their death, and most likely, during their young to mid-adult years. The group of adults that went unaged had a very large sample size, but only 29% of those adults showed trauma. Overall, 39% of the remains that were excavated showed some sort of trauma.

Trauma by Social Status

Conchopata was most likely ruled by the elites that resided at the capital site of Huari. Based on this assumption, the Wari signature architecture would be present and widespread, from “tomb types, grave goods, and ritual paraphernalia” (Tung and Cook 2006, 72). The most common ritual structures were D-shaped and circular, and could have also served as spaces for feasting ceremonies (Tung and Cook 2006). There were also about 99 human burials in these areas at Conchopata, under house floors (Tung and Cook 2006). The elite community at Conchopata can be seen by the variation in burials and wealth accumulations. Tung and Cook (2006) also argue that the increase in the types of tombs signifies a growing population in different social groups. However, Kate Meyers states that there are only seven types of burials during the Wari period, which is very small considering how advanced the Wari were (Figure 6) (Meyers 2011). Most of these burials were for the elites, either intermediate elites or ruling elites, while the rest of the

population was buried in cemetery-like places, with not as many grave goods or exotic items.

The fifth tomb type, not shown, is a combination of tombs 1-4, 6 and 7, all in a mortuary room.

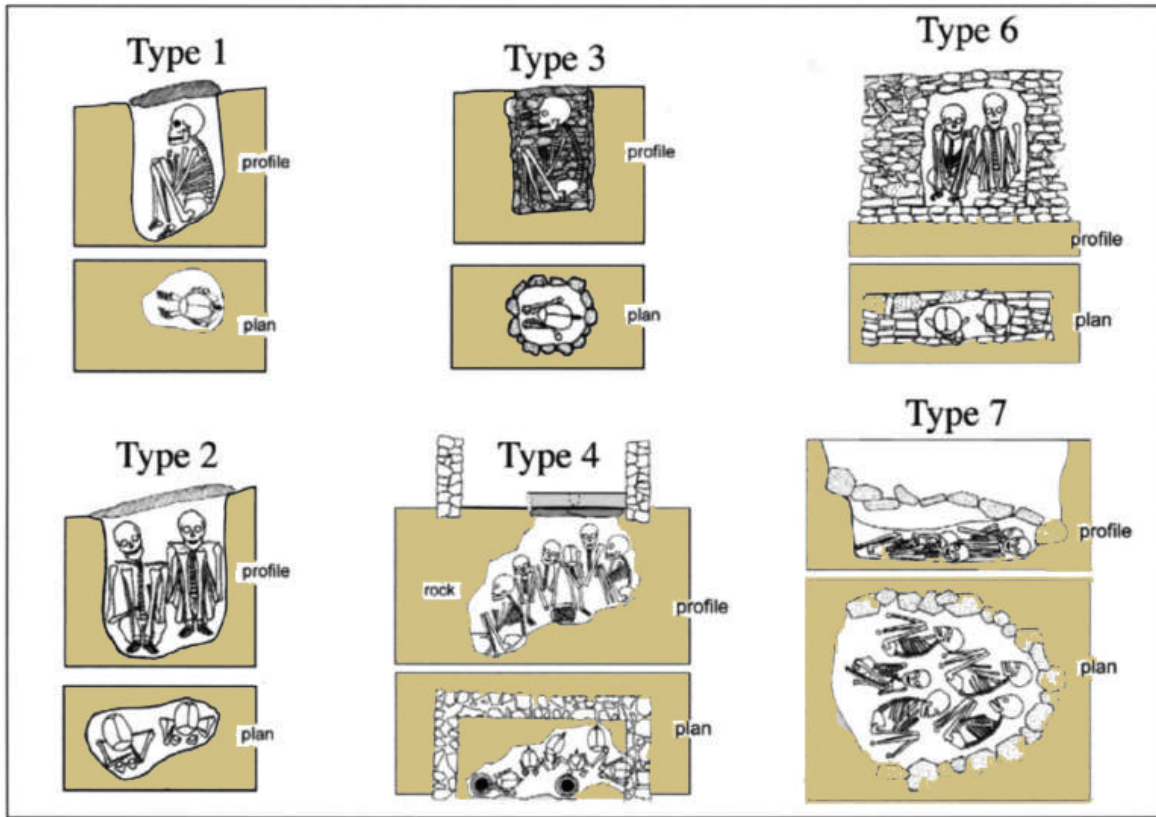


Figure 6. Six of the seven burial types utilized by the Wari (Meyers 2011).

The large stone-slab burials were reserved for the elites, and the grave goods found there included shells, turquoise, gold, and ceramics (Meyers 2011). At Conchopata, 62% of the burials are female, while 38% are males (Tung and Cook 2006). Tung and Cook (2006) focused specifically on six tombs, most likely housing elite individuals and families. In the first tomb, labeled EA 105, 14 individuals were found. One of the adult females was pregnant at the time of burial, while another one held an infant in her arms. The ages of the deceased ranged from fetuses, to infants and children, and then to adults. All of the skeletons shared a vastus notch on

the patella, a genetic trait that indicates that these people belonged to a kin group, and were added to the tomb over time instead of all at once. Located with the burial were collections of pottery, copper pins, and other funerary objects (Tung and Cook 2006).

Osteoarthritis was a common paleopathology in the skeletons of tomb EA 105, especially in the back. Half of the adults (three) showed spinal osteoarthritis, a degenerative joint disease, which could indicate that they were involved in some sort of repetitive, strenuous activity. The joint disease was also seen in two shoulders of females (Tung and Cook 2006). This data may indicate that even though these people were buried with extravagancies, they were not exempt from daily work. Another common ailment seen among the occupants of EA 105 were bone fractures. Four of the eight adolescent/adult skeletons showed healed postcranial fractures, while three of the individuals displayed healed cranial trauma (Tung and Cook 2006). Each adult exhibited trauma to the posterior portion of the cranium, suggesting the wound was due to violence as opposed to an accidental fall. Five of the seven individuals also displayed at least one cavity, which could indicate a high consumption of maize (Tung and Cook 2006).

In addition, another tomb's occupants were studied – tomb EA 31 – with ten occupants inside. They ranged in age from infants, children, and juvenile, to young adults and adults. There were several healed bone fractures and evidence for osteoarthritis, similar to tomb EA 105, but there was no indication of infectious disease and malnutrition (Tung and Cook 2006). The young adult male in the tomb had osteoarthritis of the spine and right elbow, while another unsexed adult had a vertebral compression fracture. Another unsexed adult in the tomb suffered from spinal osteoarthritis, apparently a very common disease among the Wari whether elite or not, and a healed fracture on the third left metacarpal (Tung and Cook 2006). The only juvenile

in the tomb, a female, was interred with many grave goods, and her remains were void of disease and trauma (Tung and Cook 2006).

Only five remains were found in tomb EA 150, which Tung and Cook identified as distinctly different from the other tombs studied in this area (Tung and Cook 2006). This tomb was a rectangular mausoleum-like structure and the most elaborate burial excavated. The occupants included “two young adult females, one “old” or senior female (approximately 50 years of age), one juvenile, and one child” (Tung and Cook 2006, 84). Just as in the previous tombs, these remains were accompanied by extravagant goods, including shells, turquoise, copper tupus, and, unlike the other tombs, gold. This find is extremely significant, due to the fact that no other gold had been found in the other tombs, and that this tomb had been partially looted. These women had obviously been important in society. The senior woman was the only skeleton that showed osteoarthritis (in the spinal column, left hip, and both elbows), and tooth loss after death, possibly due to carious lesions in life. No trauma was found in the remains of tomb EA 150.

Tung and Cook combined three tombs together, EA 88, EA 147, and EA 154, because they were all bench burials. These types of graves had been reserved for children and infants, and seventeen remains were found in these graves – ten infants and seven children. Grave goods included ceramic bowls, along with other exotic goods (Figure 7). It is hypothesized that these children belonged to elite families. The cause of death was unable to be determined for these remains, and no diseases or trauma was found on the bones.

Trephination was not seen in any of the remains studied, and seems to have been rare. However, when it was present, there seemed to be many cases that displayed multiple trephinations. Andrushko and Verano (2008) studied 11 burials, where 66 individuals (out of

411 individuals) exhibited trephinations, and there was an overall survival rate of 83%. The data favored the males with more trephinations present than the females ($\chi^2 = 4.20$; $df = 1$; $p = 0.041$). When compared with age, Andrushko and Verano (2008) saw an increase in trepanned individuals in the Middle and Old Adult categories.



Figure 7. Examples of potsherds found in elite burials (McEwan 2005, Fig. 3.26).

ANALYSIS

This paper has combined many sources of data to look at the treatment of the Wari people by their own government. It has studied the trauma and violence seen in the remains, comparing them to age, gender, and social status. This study has taken into account diseases and burial type, specifically when looking at social status, and has also studied the presence of trophy heads, determining that the majority of them were from people foreign to the Wari region. The following summarizes the results of this study, and explains how the data shows the treatment of the Wari population.

The data for trauma by gender suggests that men consistently experienced more violence than women, but that women were still subject to trauma, as well (Figure 8). However, this could have been ritualistic violence, for ceremonies and ancestor veneration, or possible spousal abuse. Most of the trauma was directed towards the left anterior part of the frontal bone, indicating that most of the attackers were right handed. It has also been suggested that the violence could have been performed in the process of ransacking a village, and the attackers only wanted to incapacitate the women to bring them back to their hometown. However, this theory and spousal abuse is hard to confirm without written accounts. The most probable cause of most of the nonfatal wounds was the ritual *tinku*. The goal of this ritual was not to kill the opponent, but make them shed blood. Fists, rocks, and maces were used, and the primary target was the skull of the opponent (Tung and Owen 2006). With a p-value < 0.001 , it is easy to conclude that the violence was directed more towards the male population, but that women weren't exempt from violence and could have participated in these rituals. However, with the weak Cramer's

V (0.18), the relationship between trauma and gender is not strong, and may possibly indicate another factor in this comparison that was affecting who was chosen to inflict violence upon.

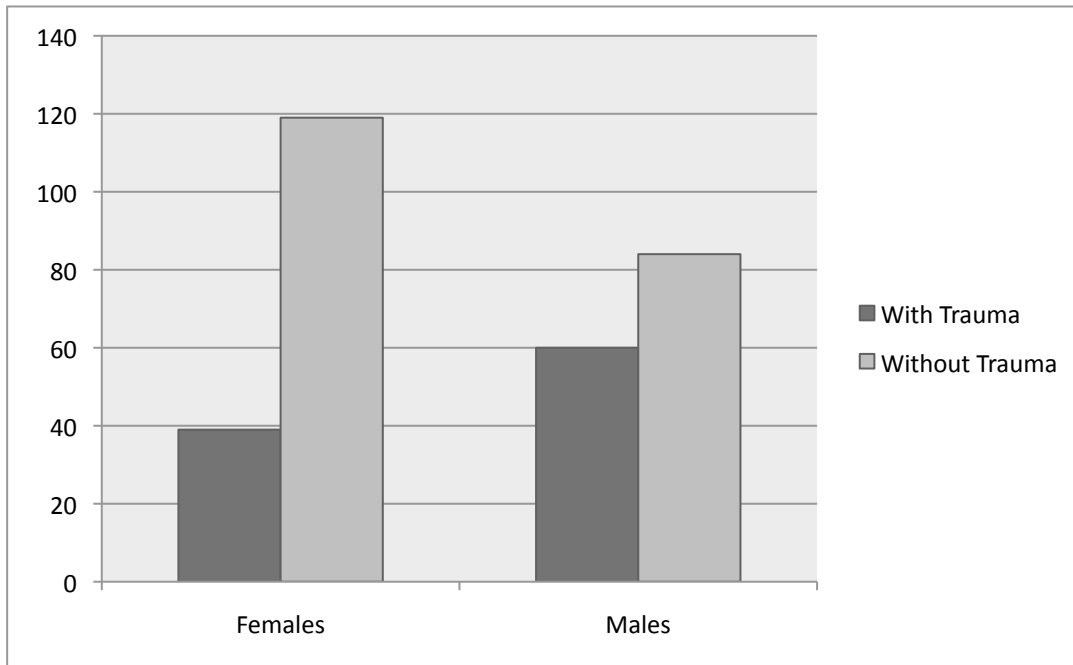


Figure 8. Trauma by Gender.

Overall, 39% of the Wari population showed trauma in their remains. While this is less than half of the entire population, 39% is still a large portion of the population to have some sort of injury. Another factor to consider is that most of these injuries were either partially or completely healed. The trauma is supported in every age group, even though some of the age groups have smaller samples (Figure 9). Trauma to children and infants is most common in the form of trophy heads (Tung and Knudson 2010), while in the adult age range, almost all of the victims have at least one cranial wound. This could be indicative of ritualistic activity, such as *tinku*. Most of the trauma clustered around mid- and young adults. The fact that most of these wounds were nonlethal and, by the time they reached 50+ years, were almost completely healed,

indicates that most violence was subjected in the mid-adult range. It seems to have been almost impossible to age without sustaining at least one injury.

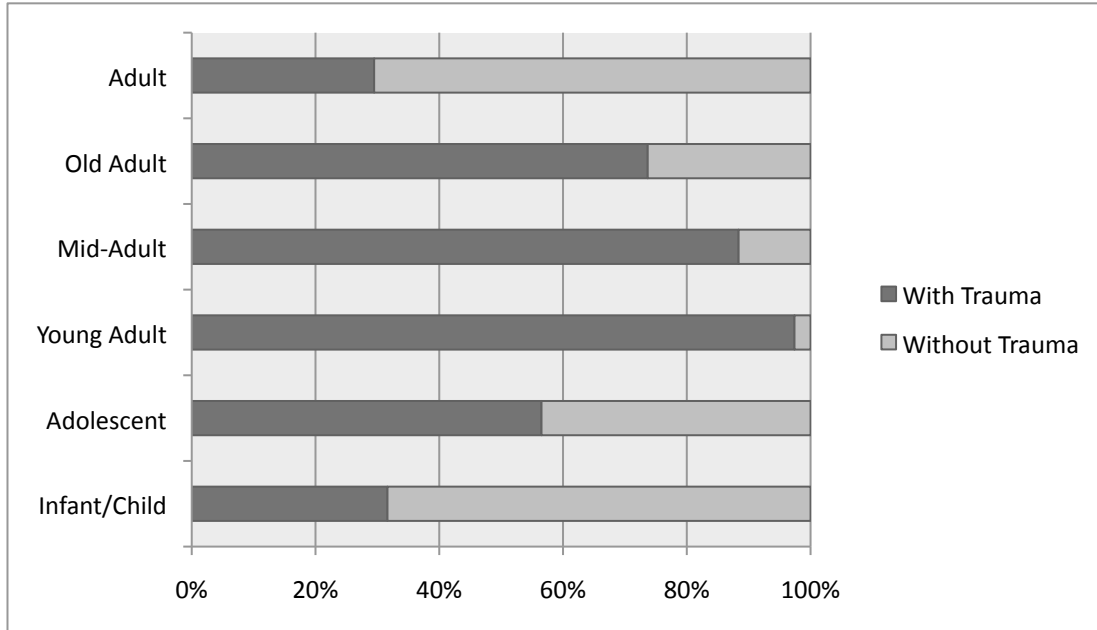


Figure 9. Trauma by Age.

When researching the trephination study conducted by Andrushko and Verano (2008), the results showed that the data favored the Mid- and Old Adult age groups. This supports the trauma data collected, showing that Young and Mid-Adults showed the most evidence for trauma. The trauma occurred earlier in life, and had then healed by the end of the Mid-Adult range. It was probably at this point that their previous injuries began to cause them problems, and trephinations were performed on them to try and counteract symptoms. These symptoms include “nauseau, vomiting, headache, and seizure-like activity” (White and Likavec 1992, 1508). They can also turn into life threatening symptoms, such as tissue hemorrhage, bilateral hemispherical damage, and hematoma (White and Likavec 1992). Trephinations release the cranial pressure in the cranium, and help the brain to stop swelling (Anrushko and Verano 2008).

While there was no quantitative data for determining social status, Tung and Cook (2006) were thorough in their study of elite burials and the condition of their remains. Preliminary results showed that intermediate elites, such as the occupants of tombs EA 105 and EA 31, did not have as many traumatic wounds, but still displayed osteoarthritis of the spine and occasionally the shoulders and elbows. This could indicate that while these elites were not in direct contact with violence, they still had daily work to accomplish and were not exempt from hard labor. The occupants of tomb EA 150 were distinctly different than the other tombs studied, due to the presence of gold and almost a complete absence of infectious disease, malnutrition, trauma, and osteoarthritis. The only member of this tomb that did show osteoarthritis was an old female adult, over the age of 50 years. This could indicate that there was some separation of the elites from the general population, and that a caste system was in place that favored the elites. The women and children in tomb EA 150 demonstrated that they were given the best access to health care, and were protected from the violence that seemed very common with the rest of the Wari people.

While this study is a good start on understanding how the Wari treated their people, more research still needs to be conducted, especially concerning the pathologies of the bones. The diseases prominent in the Wari need to be studied to determine if there really was a difference between the ruling elites and the general population, or if the remains used in this study were not a good sample of the Wari elites. A detailed study with complete skeletons needs to be conducted, because with just pieces of remains it is hard to view the big picture. However, this paper can demonstrate that the Wari used violence with their people, especially men, and they had no problem beheading a non-local child for the purposes of a trophy head. Violence seems to have ruled their society, and it seems to have been very effective.

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