
Cranial Fractures in the Guanche Population of Tenerife (500 BC-1500 AD)

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Introduction

Tenerife is divided in two slopes by the Anaga Cordillera, the north being humid and the south dry. The main economic activity of the prehispanic population or Guanches was shepherding while agriculture, forest gathering and fishing were less important. In the opinion of Canarian archaeologists (Diego Cuscoy, '68; González & Tejera, '81), shepherding was a constant cause of fighting among the Guanches due to stealing, invasion of territories, etc. So, it is not rare that most cranial fractures in that population were caused by violence rather than accidents. Metals did not exist in the Canaries, so the weapons were made of stone, wood, horn and animal bones.

In this study we are referring to cranial fractures produced by interpersonal violence. Accidental trauma was much less common.

Material and methods

408 skulls were observed in this study. These skulls belong to the bioanthropological collection of Tenerife's Archaeological Museum and were selected because their provenance and archaeological context were known, and the conditions of preservation were good enough. Geographical criteria were also applied in the selection: 251 skulls come from the south and

157 from the north. The sexual distribution of the skulls show 259 males and 149 females.

Results

* Prevalence and geographic distribution

30 (7.4%) fractures were detected in this sample. However, the prevalence varies depending on the region studied. So, most cases (26 or 10.4%) occurred in the southern slope of Tenerife while in the north the prevalence was far from this (4 cases or 2.5%), being the south-north ratio: 4.2:1, that is significant.

The highest prevalence in the south was that of Orchilla at Abona (17.7%) while in the north was located in Barranco de Santos at La Laguna (3.2%).

* Sexual and age distribution

22 cases were observed in males representing 8.6% and 8 cases in females or 5.4%, being the sexual ratio 1.6:1.

Regarding the distribution by age groups, no cases were detected in subadults and the youngest individual injured was a male between 15 and 18 years. The complete series is:

- 15-24 years: 13 cases
- 25-34 years: 14 cases
- + 35 years: 3 cases

Of course, this does not mean that the age at which the individual was injured corresponded to that of the death because most of them survived the trauma, but this suggests that most individuals fall into the period of greatest physical activity, including war or violent practices.

* Pathology

+ *Types of fractures*

5 different types of fractures were observed in this Guanche series: small crushing injuries, simple linear fractures, penetrating injuries, gross crushing injuries, and incised wounds.

Small crushing injuries constitute the most common type accounting for 14 cases or 46.7% of all fractures. However, this group can be separated in 2 subgroups:

- Circular injuries, probably due to a special weapon, similar to the typical Argentinian Gaucho bolas, used as a mace in face-to-face fighting and made of rounded and polished stones and leather. These fractures represent almost 37% of the whole sample of cranial fractures.
- Irregular fractures produced by the throwing of stones account for 10%.

Simple linear fractures constitute the second most frequent type with 6 cases (20%) and these are caused by a weapon called a "banot", constructed of fire hardened wood, that can be used as javelin or stake (as in these fractures).

The third group, with 4 cases (13.3%), is that of penetrating wounds. In this case the banot was clearly used as a dart or javelin.

The other types of injuries (gross crushing injuries and incised wounds) are far less common than the others.

Combined lesions, with more than one injury, were observed in 3 individuals.

+ *Topographical distribution in the skull*

The anterior and lateral parts of the skull vault are much more commonly involved than the posterior parts and the facial skeleton. The frontal bone and the frontoparietal region is injured in more than 50% of the cases, being the right side slightly more involved than the left. The most common fractures in the frontal bone are small crushing injuries, circular and irregular. The second more involved cranial bones are the parietals, especially the left parietal that most commonly shows simple linear fractures. The only incised wound was also seen in a left parietal. The malar bone was injured only once (small crushing injury) as well as the occipital bone (simple linear fracture).

All these data suggest that face-to-face fighting were common among the Guanches. However, it is difficult to state the use of only one hand in the fighting because the distribution of the fractures on the both skull sides is rather similar. Perhaps, the ancient chroniclers and early Canarian historians were right when they affirmed that the Guanches used both hands in their attacks, especially with the "banot".

+ *Other pathological data*

The internal table and diploe were clearly involved by the injuries in the whole series. Radiating lines are only present in 3 cases of small crushing injuries.

The size of the lesions varies depending on the type. So, irregular crushing fractures show a maximum length of 8 cms and a maximum width of 4 cms, while the injuries caused by bolas fluctuate between 2 and 3.5 cms in diameter.

Regarding the other types of lesions, it is interesting to note that in simple linear fractures, the length is also variable being the mean length 13 cms; penetrating wounds show a diameter of 1.2 to 1.8 cms corresponding exactly to that of

the banot used as a javelin; and the only case of incised wound (showing a double lesion) has a length of 7 cms in the greater lesion and 4 cms in the smaller injury.

* *Rate of survival and complications*

Only 5 cases (around 17% of the sample) were diagnosed as perimortem, the remainder cranial fractures (around 83%) show clear signs of healing with more or less long survival. Of course, it is obvious that several of the fractures observed may produce posttraumatic complications and a few of them could lead to death several weeks or months after trauma. Besides osteomyelitis complicating the healing process, the most probable complications could be:

- Epilepsy and other cerebral and neurological complications due to the depth of the lesion and area of impact.
- Eye loss caused by direct impact on the orbit or periorbital structures.
- Posttraumatic frontal sinusitis.

Discussion

The study of injuries to the skull have attracted different authors in the Canaries for more than a century. Verneau (1887) and Luschan (1896) observed those injuries and stated that 25% of the Guanches were afflicted, but this datum is obviously exaggerated.

Later, Hooton (1925) indicated that these lesions consisted in healed depressed areas located in the frontal and parietal bones, especially on the left side due to right-handed blows (something that does not appear so clearly as we previously observed in our series). The frequencies given by the American are rather similar to those of the present study.

According to Bosch Millares (1944, 1961-62, 1975), Guanche cranial fractures could be divided in 3 types: incised wounds, crushing injuries and penetrating wounds, being the frontal and parietal bones the most commonly involved areas of the skull.

More recently, Rodríguez-Martin et al. (1985) noted that most cranial injuries in the Guanche population were produced by intraspecific violence in face-to-face fighting. No subadults were affected.

The last study commented here is that of Kelley and Smeenk (1992) who found a frequency around 18% of cranial lesions. These authors state that over 90% of the depressed fractures were located on the frontal and/or parietal regions. Regarding the side, 43% occurred in the right side and 57% in the left. They did not find injuries in subadults and the highest frequency was observed in individuals between 18 and 25 years of age, being males much more commonly affected than females.

It is important to note that Kelley and Smeenk considered all lesions to the skull (erosions, small cuts, lesions without involvement of the internal table, etc.), and not only true fractures, so the frequency increased significantly.

Conclusions

1. The frequency of cranial fractures among the Guanches is relatively high accounting for more than 7%. In some parts of the southern slope of the island, such as Orchilla at San Miguel de Abona, the frequency increases until almost 18%.
2. The ages of strongest physical activity, including fighting and war practices, those between 15 and 34 years, show the highest frequency of cranial fractures.
3. Males were 60% more affected than females. However, as stated by the early chroniclers and historians of the Canary Islands, it is important to note that women could take part in

these conflicts because the frequency in that sex is also important (more than 5%).

4. Small crushing injuries, both circular and irregular, produced by stones and bolas are the most common types of the cranial fractures suggesting that violence was the main cause of these lesions, especially in face-to-face combats. Linear fractures and penetrating wounds produced by the "banot", as well as the location of fractures in the anterior and lateral parts of the cranial vault, confirm this point.

5. Healing occurred in more than 80% of the individuals, although it is difficult to assess the exact length of survival in some cases as well as the secondary neurological problems derived of the different lesions.

6. Osteomyelitis appeared in only 10 to 15% from the cases.

7. Regarding the geographical distribution of the lesions it seems clear that two hypotheses can be stated due to the very high frequency in the south of the island: the first is that the southern inhabitants were implicated in a lot of fighting, almost daily, and the second is that they were subjugated by the northern warriors, more expert in war practices, when searching for pastures or in conflicts for cattle. This last hypothesis could be plausible because during the Spanish conquest the southern inhabitants remained neutral or went to the Spanish side, while the people of the north were the true defendants of the island offering strong resistance to the conquest.

Bibliography

Bosch Millares, J. 1944. Las armas y fracturas de cráneo de los Guanches. *El Museo Canario*, V: 6-29.

Bosch Millares, J. 1961-62. La medicina canaria en la época prehispánica. *Anuario de Estudios Atlánticos*, 7: 539-620; 8: 11-63.

Bosch Millares, J. 1975. Paleopatología ósea de los primitivos pobladores de Canarias. Las Palmas: Excmo. Cabildo Insular de Gran Canaria.

Diego Cuscoy, L. 1968. Armas de los primitivos canarios. Santa Cruz de Tenerife: Aula de Cultura de Tenerife.

González Antón, R. & Tejera Gaspar, A. 1981. Los aborígenes canarios (Gran Canaria y Tenerife). La Laguna: Sec. Publ. Universidad de La Laguna.

Hooton, E.A. 1925. The ancient inhabitants of the Canary Islands. Cambridge (MA): Harvard African Studies VII.

Kelley, M.a. & Smeenk, L.M. 1992. Cranial injuries found in ancient Guanche remains of Tenerife. Proceedings of the I World Congress on Mummy Studies (Museo Arqueológico de Tenerife-OAMC Cabildo de Tenerife), vol. I: 201-208.

Luschan, F. von. 1896. Über eine schädelsammlung von den Canarischen Inseln. In Meyer, H.: Die insel Tenerife. Leipzig: Hirzel.

Rodríguez-martín, C.; Rodríguez Maffiotte, C.; & Rodríguez Martín, B. 1985. Fracturas por agresión producidas en cráneos prehispánicos de Tenerife. Santa Cruz de Tenerife: Parlamento de Canarias-CCPC.

Verneau, R. 1887. Rapport sur une mission scientifique dans l'Archipel Canarien. *Archives des Missions Scientifiques et Littéraires*, 3, 13: 592-812.

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