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Case report

Identification process in mass graves from the Spanish Civil War II

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ABSTRACT

The identification process of a mass grave from the Spanish Civil War (1936–1939) is presented. The presumed location of the grave, as well as the presumed number and identities of the persons buried in the grave were obtained exclusively from witnesses' and relatives' testimonies. In agreement with the testimonies, the grave was located at the indicated location and five skeletons were exhumed. Also in agreement with the testimonies, the osteological and DNA study led investigators to propose the identification of two kin groups, a father and his son and a pair of brothers. But the genetic study did not support the identification of a fifth man presumed to have been buried in the grave. The differences and similarities between this case and another case reported earlier are discussed.

1. Introduction

In a previous paper, we discussed the identification process of 46 skeletonized individuals exhumed from a mass grave from the Spanish Civil War (1936–1939) [1]. The proposed identifications were based on the consistency between testimonial, archival, archeological and osteological findings, with special emphasis on the consistency between official documents specifying groups of people released from jail and subsequently killed, and the number of skeletons found at the grave. This corroboration of evidence allowed us to develop a working hypothesis where the identification proceeded in what Baraybar [2] would define as a closed synchronic system, and other authors would call closed assemblages [3]. This hypothesis simplified the identification process, which then resembled the identification process in, for instance, a bus accident, where the identities of all the victims are known [4]. Finally, a targeted approach for DNA typing was developed, and identifications were proposed for 17 out of 46 skeletons.

In this paper, we present the identification process for five skeletons exhumed from another mass grave from the Spanish Civil War (1936–1939), where the working hypothesis of a closed synchronic system was exclusively based on witnesses' and relatives' testimonies, and we discuss the main differences between this case and the one reported earlier [1].

2. Material and methods

2.1. Testimonies from relatives and witnesses

The exhumation was carried out at the request of people whose relatives were killed after the 18th July 1936 military coup. Relatives and witnesses' relatives were interviewed by volunteers from the *Asociación para la Recuperación de la Memoria Histórica* (ARMH). From this information, the presumed location of the grave, as well as the number and presumed identities of the people killed and buried in the mass grave, was obtained.

2.2. Location and exhumation of the grave

In the summer of 2008, five skeletons were exhumed from a mass grave located near the town of San Juan del Monte, province of Burgos. The location of the grave was indicated by the son of a witness. Residents of the nearby towns of Vadocondes and Arauzo de Miel provided accommodation for the archeological team, which consisted of four archeologists (including A.G.R., B.M. and A.A.) and one physical anthropologist (L.R.). The excavation of the grave was carried out by the present authors (L.R., A.G.R., B.M. and A.A.) together with three other archeologist and students, and with the help of volunteers from nearby towns. A square perimeter of 4 m long was delimited and the soil was wore down in extension in arbitrary layers of few centimeters of depth, until the changes in the coloration, consistence and texture of the sediment indicated the presence of the grave. Five skeletons were exposed and recovered from a single grave, with some clear post mortem displacements observed. The remains were delivered for study to the Anthropology Unit at the Universidad Autónoma de Madrid.

2.3. Osteological study

The state of preservation of the remains was moderate to good, with some bones heavily damaged by taphonomic factors, mainly plant roots. Some parts of the skeletons were specially affected in terms of destruction (vertebrae and ribs), whereas other were more fragmented but its state of conservation in terms of degree of mineralization and surface condition allowed reliable reconstructions to be carried out (cranium and some long bones). Some fragile region of the skeleton such as the pubic symphysis was preserved in all cases. Therefore, although the state of preservation of the skeletons precluded the use of some methods for the osteological study (e.g. sternal end of the fourth rib in all cases, anatomical method

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for stature estimation in two cases), it was possible to apply most of the methods explained elsewhere [1] for sex, age and stature estimation as well as for the recording of pathological conditions and non-metric traits.

2.4. Archival information

As explained elsewhere [1], three archives were researched by different peoples, including relatives themselves, as well as members of the archeological and anthropological teams. These archives included the *Archivo del Centro Penitenciario de Burgos* (Archive of the Penitentiary Center of Burgos), the *Archivo General Militar de Guadalajara* (Army General Archive at Guadalajara), and municipal archives. Information is potentially available in these archives regarding date and place of birth, occupation, stature and individual physical features.

3. Results and discussion

3.1. Testimonies, archeology and archives

The relatives interviewed included sons, daughters, and grandchildren of the victims. The older generation of relatives had been informed that after the 18th July 1936 military coup, their relatives had been kidnapped, killed and subsequently buried in a mass grave near the town of San Juan del Monte, although the site of the grave was unknown to them. The exact location of the grave was indicated by E.C.G., who had been informed about the precise burial site by his father. E.C.G.'s father saw the disturbance caused by the burial during the days following the killings and the digging of the grave. Both E.C.G. and his father were workers specialized in resin extraction that spent their working days in the forests, including the forest where the grave was located. In the postwar years, during their work, E.C.G. was informed by his father of the exact location of the grave. In addition, diverse testimonies from the inhabitants of San Juan del Monte and other nearby towns, including the testimony of E.C.G., agreed as to the number of people buried in the grave and their identities: five men were killed and buried in the grave, including two kin groups made up of

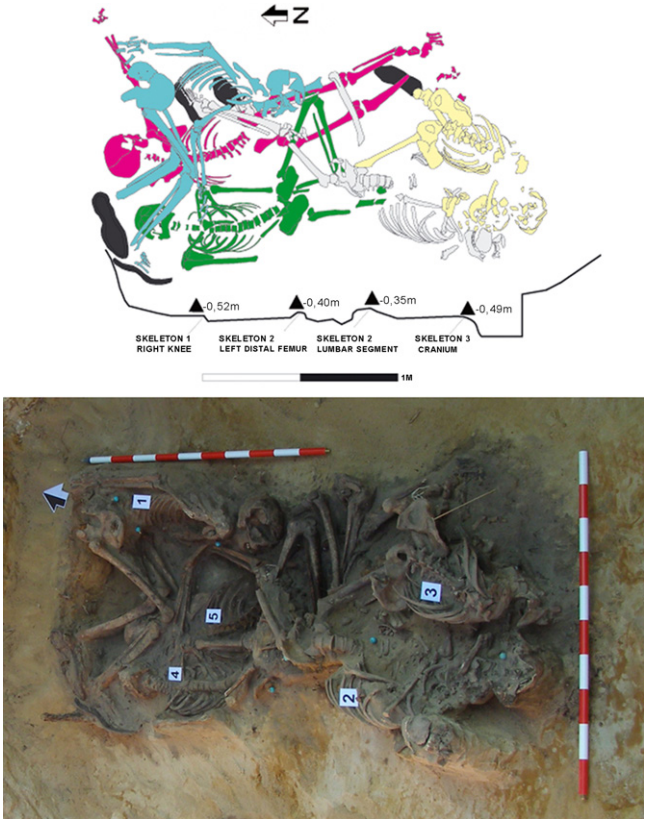

Fig. 1. Archeological drawing and photograph of the grave.

Table 1
Ante mortem information regarding the five men presumably buried at the grave of San Juan del Monte.

	Date of birth	Age (years)	Stature (cm)	Family groups
Brother 1	27/4/1901[a]	35	163[b]	Brothers
Brother 2	10/11/1903[a]	33	–	
Son	16/6/1910[b]	26	159.6[b]	Father and son
Father	–	60[c]	–	
Fifth man	–	35[c]	–	–

[a] From birth certificates found at the archives of the Municipalities.
[b] From military files found at the Army Archive.
[c] From testimonies of relatives.

a pair of brothers and a father and his son. On August 15, 2008, E.C.G. indicated the exact location of the grave to the archeological team. The grave was found in the place indicated, and five skeletons were recovered. The position of the skeletons can be observed in the archeological drawing and photograph (Fig. 1). The only personal belongings found associated to the skeletons were shoe soles (skeletons 1, 2, 3 and 5), fragments of small metal buckles (skeletons 2 and 4), and a pencil graphite mine associated to skeleton 1. The grave was located a few meters away from a secondary road, 39 km away from the place of residence of the presumed victims. The spatial associations between grave location, grave landscape, location of primary and secondary roads, location of places of residence or detention of the victims, location of other graves and other variables are worth investigating but it is beyond the scope of the present work.

The ante mortem information obtained from testimonies and archival research is summarized in Table 1. It is important to indicate that the testimonies were consistent regarding the fact that these persons were not taken to prison and therefore records were not expected to be found at the penitentiary archive, as had happened, in contrast, in the case of the mass grave reported earlier [1]. It is also important to state that the place of birth of the five men was located outside the province of Burgos, making the research at the municipal archives, carried out by the relatives themselves, more difficult. Finally, as can be observed in Table 1, no documentary information was found for two of the victims, and therefore the ages at death of these persons relied entirely on relatives' testimony.

3.2. Osteological analyses

The visual [5,6] and metric [7] study of the pelvis unequivocally indicated that all the skeletons were male. Next, age and stature were estimated, as discussed elsewhere [1]. The main findings regarding sex, age and stature are summarized in Table 2. It can be observed that only skeleton 4 presented what was interpreted as recent epiphyseal maturation at the medial end of both clavicles (Fig. 2), while for the other skeletons age was estimated by the observation of pubic symphyses and auricular surface. No morphological feature was observed, defined by Komar and Lathrop [12] as "a physical characteristic that endures throughout the decomposition process and is recognizable postmortem ... examples include ante mortem fractures and evidence of surgical conditions or pathological conditions". The main finding was observed in skeleton 3, which presented dental work, made of a golden metallic substance with possible gold content, affecting 16 teeth (Fig. 3). The presence of this dental work could be useful for the identification process for two reasons. First and most obvious, because of the possible concordance of this finding with an ante mortem testimony stating the presence of dental work in a victim. Second, this finding could be indicative of the victim's socioeconomic status, an inaccurate valuation but one that could be compared with the available ante mortem information.

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Table 2
Osteological findings regarding sex, age and stature.

Case	Sex		Age at death (years)		Stature (cm)	
	Visual[a]	DSP[b]	Maturation	Pubic symphysis[d]	Anatomic[e]	Mathematic[f]
1	Male	Male (0.999)	–	45.6 (27–66)	165.3	163 ± 8.44
2	Male	Male (0.972)	–	23.4 (19–34)	–	156.82 ± 8.44
3	Male	Male (0.999)	–	35.2 (23–57)	–	167 ± 8.44
4	Male	Male (0.980)	21–30[c]	23.4 (19–34)	–	163.2 ± 6.96
5	Male	ND (0.939)	–	23.4 (19–34)	161.98	156.8 ± 8.44

[a] Evaluation of diverse pelvic features [5,6].
[b] Probability of being classified as male, if lower than 0.95 the case is labeled not determined or ND [7].
[c] Age range from [8].
[d] Mean age and 95% range associated with the correspondent Suchey–Brooks phase [9].
[e] Following Raxter et al. [10].
[f] Following de Mendonça [11].

Two kin groups were presumed to have been buried in the grave, but no sound conclusion was reached regarding the identification of a possible family group. Diverse discrete traits were observed (e.g. os acromiale and os trigonum), but the most interesting were shoveling and bipartition of the superior facets of the first cervical vertebra. Shoveling was observed in the upper lateral incisors for skeletons 2, 4 and 5. Due to carious lesions and ante mortem losses it was not possible to score the dentition of skeleton 1 or of teeth 22 and 12 for skeletons 4 and 5, respectively. This trait was scored following the criteria of the ASU DAS (Arizona State University Dental Anthropology System) as detailed by Turner et al. [13], who describe shoveling as "The presence of lingual marginal ridges" [13,14], with the scoring scale ranging from 0 (absence) to 7 (exceeding grade 6, which is defined as the contact of the mesial and distal ridges at the cingulum). Skeleton 5 was scored as grade 2–3, skeleton 2 as grades 1–2, skeleton 4 as grade 0 and skeleton 3 as grade 0 (Fig. 4). These grades of expression were not as high as those reported for other traits that were used to suggest the presence of a family group in another mass grave [1], and the scoring of intermediate degrees of expression is more problematic. Besides, the frequencies of shoveling in a recently studied Spanish sample for grades of expression 1, 2 and 3 in the upper lateral incisors were 47.31%, 25.38% and 3.46% respectively [14]. On the other hand, skeletons 1 and 4 presented unilateral and bilateral bipartition, respectively, of the superior articular facets of the first cervical vertebra (Fig. 4). In a recent study, the frequency of this variant in a diverse human sample was observed to be 20.8% [15]. After evaluating all the information, we arrived at the conclusion that these observations could not be considered solid evidence for proposing the presence of a kin group, although they could still be considered useful for organizing the DNA study.

Fig. 2. Medial end of both clavicles of skeleton 4. No active fusion is observed since there is no empty space between the epiphysis and the metaphyseal surface, but the epiphysis does not cover the whole metaphyseal area.

3.3. Identifications

When all the information was gathered, data from the four different sources were partially compatible, as indicated in Fig. 5. The presumed location of the grave and the presumed number of persons buried in it, according to the testimonies, were consistent with the exact location of the grave and the exhumation of five skeletons. But the match between the ante mortem and osteological findings was partial, due to a lack of information, as the ante mortem data regarding two of the persons presumably buried in the grave relied exclusively on testimonies from relatives, and the stated ages at death were not considered fully accurate. The presence of a young adult with recent skeletal maturation at the clavicle was compatible with the presence of a 26-year-old man, and the two skeletons showing phase II from the Suchey–Brooks system were compatible with the presence of 33 and 35-year-old men, although the 95% range of phase II is 19–34 years [9]. The pubic symphyses of the two remaining skeletons were scored as phase V using the Suchey–Brooks system, an assessment compatible with the presence of 35- and 60-year-old men (ages at death from testimonies), although our criterion was that the scores of the auricular surface, the dental status and the presence of degenerative joint disease in the spine indicated an age above 35 years for both skeletons. There was no eyewitness testimony which suggested the presence of any significant ante-mortem dental work in those individuals presumed to have been buried in the grave.

The corroboration of the information from different sources was partial, but it was considered enough to request a DNA study, with compatible identities as indicated in Table 3. This study concluded that skeletons 1 and 4 corresponded to the father and his son, whereas skeletons 2 and 5 corresponded to the two brothers. These results coincide with the aforementioned observations of non-metric traits (Fig. 4). However, based on the available information, it was not possible to conclude, from the osteological study, that the presence of these variants was due to a genetic relationship instead of chance. As indicated in Table 4, with regard to the identity of skeletons 2 and 5, a complete match was observed for 16 Y-STR loci between the reference sample C and skeleton 2, whereas a mismatch was observed in one Y-STR locus with skeleton 5. The subsequent comparison of the autosomal STR profiles made it possible to propose the identification of skeleton 2 and skeleton 5 as the father and uncle, respectively, of reference sample C. However, it is important to observe that a mismatch in 12 Y-STR loci was observed between skeleton 3 and the reference sample D, presumably the son of the fifth man. This result contrasted with the genetic matches for the other skeletons and the decision was made to locate another relative in order to

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Fig. 3. Occlusal and lateral views of the dental work presented by skeleton 3.

develop a second analyses. A cousin, the son of a brother of the father of reference sample D was contacted, and the study of the Y-STRs indicated a complete match between both reference samples, but exclusion between reference sample E and skeleton 3. Based on this information, skeleton 3 could not have represented the fifth individual presumed to have been buried in the grave, and instead represents and individual of as-yet unknown identity. Therefore, the skeleton which presented the most useful feature, a priori, for identification was the only one that remained without a proposed identity.

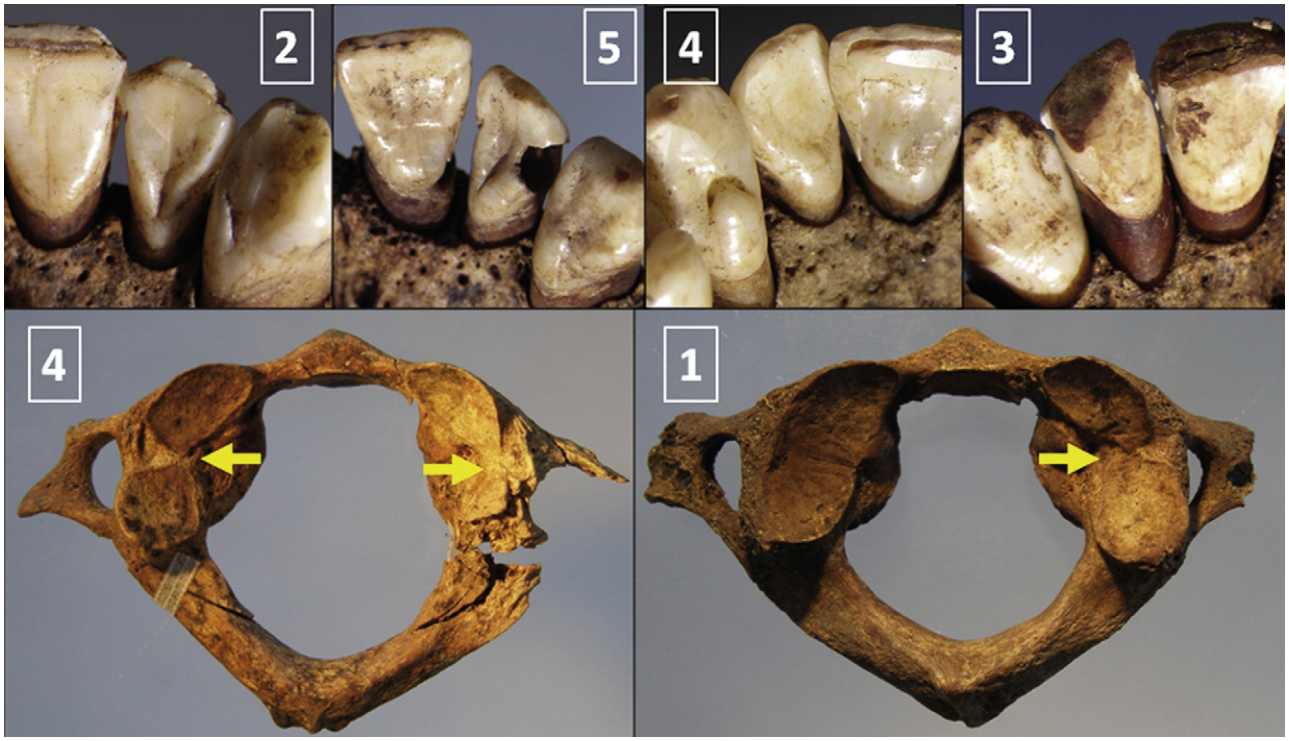

Fig. 4. Upper row: different grades of shoveling in the upper lateral incisors of the dentitions of skeletons 2, 5, 4 and 3. Lower row: bilateral (skeleton 4) and unilateral (skeleton 1) bipartition of the superior articular facets of the first cervical vertebra.

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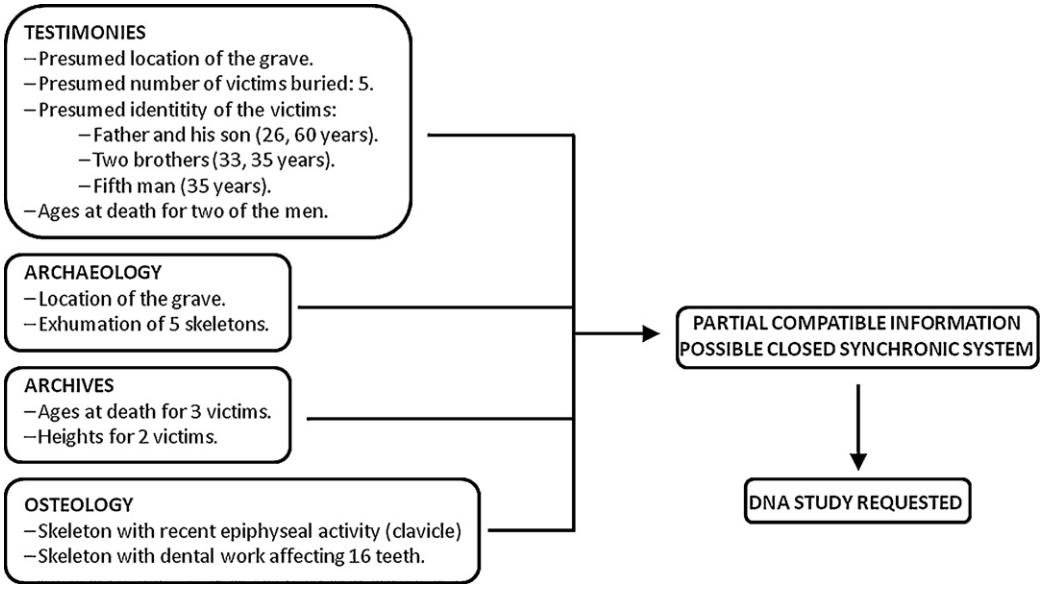

Fig. 5. Consistency of different sources of information led to request the DNA study.

Table 3
Compatible identities, reference samples, and results of the genetic study.

Skeleton	Compatible identity	Reference genetic sample	Match
1	Father	Son (reference sample A)	16 Y-STRs, 6 STRs
4	Son	Brother (reference sample A)	16 Y-STRs
		Daughter (reference sample B)	10 STRs
2	Brother 1	Son (reference sample C)	15 Y-STRs
5	Brother 2	Nephew son of brother (reference sample C)	15 Y-STRs
3	Fifth man	Son (reference sample D)	Exclusion
		Nephew son of brother (reference sample E)	

Table 4
Match between 16 Y-STR loci for skeletons 2 and 5 and reference sample C. A mismatch can be observed at DYS390 between the reference sample and skeleton 5 (in bold).

Y-STR	Reference sample C	Skeleton 2	Skeleton 5
DYS456	16	16	16
DYS389I	14	14	14
DYS390	**25**	**25**	**24**
DYS389II	31	31	31
DYS458	18	18	18
DYS19	14	14	14
DYS385	11/14	–	11/14
DYS393	13	13	13
DYS391	10	10	10
DYS439	12	12	12
DYS635	23	23	23
DYS392	13	13	13
Y-GATA-H4	12	12	12
DYS437	15	15	15
DYS438	12	12	12
DYS448	18	18	18

4. Conclusion

As discussed elsewhere, in the case of the Spanish Civil War and postwar mass graves and cemeteries, the designation of a mass grave as a closed system is of primary importance, as it simplifies the identification process considerably [1]. From the case presented here, we have to conclude that information recovered from testimonies is of crucial importance for the location of mass graves, as well as for obtaining information regarding the presumed number and identities of the people buried in those graves. Testimonies are especially important when the presence of a grave containing a low number of victims is suspected, as in the case presented here, where the exact number and identities of the people presumably buried in the grave were obtained from witnesses and relatives, and the designation as a closed system relied mainly on this information. The ante mortem individual data and the osteological findings were compatible, but the information regarding the ages at death of two persons was not considered fully accurate (Table 1), no morphological features were observed [12], no kin group could be proposed based on anatomical variants, and there was no testimony from the relatives regarding the presence of dental work on any of the victims. However, after the evaluation of the testimonial, archival, archeological and osteological findings, the decision was made to request a DNA study that made it possible to propose the identification of four out of the five skeletons exhumed. However, as indicated before [1], we have to be cautious about any statement regarding the identification of a group of people (or one person, as in the case presented here) presumably buried together once the identification for one or more of the persons from the group has been proposed. Various events may have transpired between the kidnapping of people from towns and their assassination in the countryside, precluding in some cases a complete coincidence between testimonies and archeological and osteological findings. In the absence of a requesting relative, once the identification of the two kin groups was achieved for the skeletons exhumed at the grave of San Juan del Monte, the available information could have been evaluated as consistent enough to indicate that skeleton 3 was the fifth man identified by witnesses as the father of reference sample D. In that case, our criterion would have been to indicate that a positive identification could not be proposed, although in light of the

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accumulated evidence it could have been reasonable to point to a compatible identity awaiting a DNA study. Although the testimonies were accurate regarding grave location and number of victims buried, one out of the five presumed identities was not supported by the identification process.

In this regard, special care should be taken to systematize the information obtained from testimonies, since inaccuracies can exist. With regard to the case reported here, the presence of social anthropologists and historians devoted to compiling testimonies and documents from the archives could have been important for two reasons. First, in order to obtain exact documentary information regarding date of birth (and subsequently age at death) for all the persons presumably buried in the grave, information unavailable to date for two of the victims and that had to be searched for in the other cases by the relatives themselves. Second, the extensive dental work found in skeleton 3, a possible indicator of a certain social status, could be potentially useful for identification if a systematic census of the people killed in the nearby municipalities was available, a job that still remains to be done for identification purposes.

In a future paper, we will discuss a more complex case where four mass graves were found in the same location, containing a different number of skeletons and with a disparity of testimonial and archival information regarding the persons presumed to be buried in there. To conclude, we would like to indicate again that the task of identifying human skeletal remains from the mass graves of the Spanish Civil War is a complex objective that depends on the specific circumstances of the case under study. But our results, together with those obtained from other research groups working in different Spanish provinces, show that this goal can be achieved with reasonable success.

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