ABSTRACT Recent reanalysis of the human remains unearthed from the grave cists of the necropolis of Casas Velhas (Melides, Portugal) from the Southwest Iberian Middle Bronze Age, with a minimal number of 25 individuals (23 adults and 2 non-adults), allowed relevant anthropological data. This culture, although widespread in southern Portugal and nearby areas of southwest Spain in the Middle Bronze Age, is characterized by the paucity of preserved human remains and thus the anthropological knowledge of these human populations. The adult female skeleton exhumed from cist 30, the last interment of this double burial, exhibit a complete perforation on the right parietal bone. The aim of this paper is to present and discuss this defect, which most probable diagnosis is trepanation.

The hole is oval shape exhibiting long term healing. A shallow remodelled area is visible around the defect, which suggests scraping method. No complications or evident reasons for the intervention were observed. In terms of mortuary practices no clear distinction was observed between this individual and others from this cemetery.

The features of this trepanation fit in the major points summarized by Silva (2003) for prehistoric Portuguese trepanation. These data sustain the existence of an old tradition of this procedure in this region of Iberia, present, at least, since the Middle Neolithic. Copyright © 2016 John Wiley & Sons, Ltd.

Key words: trepanation; Southwest Iberian Middle Bronze Age; small grave cists; adult female
Portuguese archaeological literature (Tavares da Silva & Soares, 1981; Silva et al., 2016). The majority of them were previously destroyed or disturbed by farming activities and/or plunders. Few revealed human bones always poorly preserved. Therefore, the anthropological knowledge of the individuals buried in these tombs is scarce. To this date, Casas Velhas Necropolis represents the site with best preserved human remains in Portugal for this culture and period. Radiocarbon dating of human bones from two cists confirmed the Bronze Age chronology of these remains (cist 14 – 3255 ± 55BP, 1670–1410 cal BC – 2 sigma, OxA-5551; and cist 35 – 3260 ± 60BP; 1680–1415 cal BC – 2 sigma; Beta-127904) (Soares & Tavares da Silva, 1995, 1998, Tavares da Silva & Soares, 2009).

Of the 35 graves, 21 revealed human bones, but only 20 were available for detailed anthropological analysis. Of these, 16 were individual tombs, 3 double and 1 triple, corresponding to a minimum number of 25 individuals, 23 adults and 2 non-adults. Cist 30 contained the bones of two adults. The last interment of this tomb, belonging to an adult female more than 30 years old displays signs of a remodelled cranial trauma, the subject of the present paper.

The double burial of cist 30: the human remains

The majority of the bones recovered from cist 30 (Figure 2) probably belong to the second and last inhumation in this tomb, an adult female. This female was deposited in crouched position, lying on its right side, orientated East (head) – West. The analysis of the field drawings of this cist confirmed that this tomb had been previously disturbed leading to the displacement of several bones from their initial position (Figure 3). In front of the pelvic region of this skeleton a ceramic vessel was recovered. The bones from the left forelimb of an adult individual of *Bos taurus* (radius, ulna, lunate and...
scaphoid bone) were also recovered from this cist, although only the exact position of the Bos radius is known, apparently associated with the last interment.

This female was more than 30 years old at the time of death (sternal end of left clavicle are fused). No sign of closure of the sagittal and coronal sutures was observed. The absence of suture closures, the morphology of the auricular surface (Lovejoy et al., 1985) and of the pubic symphysis (Brooks & Suchey, 1990) of the coxal bone and the moderate dental wear suggest a middle aged adult. Sex diagnosis was based on the morphology of pelvic bone (Ferembach et al., 1980, Bruzek, 2002), metric analysis of distal end of the humerus (Wasterlain, 2000), calcaneus and talus bones (Silva, 1995). Height was estimated based on the right femur: 154.5 ± 3.56 cm (Olivier et al., 1978). The right femur reveals flatness (platimeric index: 76.27, according to Martin & Saller, 1957) unlike the left tibia (platicnemic index: 63.88). Slight osteoarthritic changes are visible in the body of a thoracic vertebra, the distal end of left humerus and proximal end of both tibias. Minimum enthesopathic lesions were scored for the brachioradialis of the right humerus, the gluteus maximus of the right femur and both calcaneal Achilles tendons. The analysis of the dental remains reveal a moderate dental wear (mean = 3.77; n = 11, according to Smith scale, (1984) adapted by Silva, 1996), and no cariogenic lesions or calculus deposits were registered. Evidence of two remodelled traumas was observed: an oblique distal third fracture of the diaphysis of a proximal phalange of the hand and a cranial perforation, the subject of the present paper.

The other individual was identified through the duplication of some teeth, belonging to an adult of unknown sex. This adult revealed a lower mean dental wear, of 2.83 (n = 6), but was also the only individual unearthed from this necropolis with a cariogenic lesion, in the first upper left premolar. Signs of chipping were also scored in the same tooth. Besides teeth, no other bone fragment could be undoubtedly assigned to this individual.

**Cranial lesion**

The preserved skull bones from the last interment of cist 30 include the left and right parietal bones, fragments from the frontal, occipital and the right temporal bones. In the right parietal bone, a roughly oval-shape complete perforation was located 50 mm from the sagittal suture and 36 mm from the coronal suture (Figure 4). The hole measures around 10 mm by 6.5 mm. In the ectocranium, the hole shows bevelled edges exhibiting signs of bone healing. Smooth remodelled bone covers the diploe. The area of the defect is surrounded by a shallow area that gently slopes towards the opening (Figures 5 and 6).

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**Figure 4.** Complete perforation in the right parietal bone from the last interment of cist 30 – an adult female that died with more than 30 years. This figure is available in colour online at wileyonlinelibrary.com/journal/oa

**Figure 5.** Close up of the perforation: note the remodelled area of scraping surrounding the oval hole with signs of long healing. Laterally, to the hole, a slight depression is visible. Near its lateral limit, a small line of granulomatous aspect is visible (large arrow). The linear fractures were interpreted as taphonomic post mortem damage. This figure is available in colour online at wileyonlinelibrary.com/journal/oa
No signs of infection were observed. In endocranial view (Figure 7), no evidence of bevelling was observed, although some damage due to taphonomic agents makes the observations of the entire margins difficult. Laterally to this hole, a slight oval/almond shape depression is visible on ectocranial view, measuring around 20 mm by 14 mm. Near the lateral limit of this depression a small line (around 0.8 cm) of granulomatous aspect is visible (Figure 5 – large arrow).

Two linear fractures towards the hole are visible, exhibiting no signs of healing.

**Discussion**

Nowadays, trepanation is a worldwide discussed phenomenon (Andrushko & Verano, 2008; Bereczki & Marcisik, 2005; Bereczki et al., 2015; Campillo, 2007; Gresky et al., 2016; Erdal & Erdal, 2011; Nikita et al., 2013; Piek et al., 1999; Verano, 2016, among others). Nevertheless, only since the end of the 19th century, when it was first realized that ancient people made holes in the skull of the living, has trepanation started to fascinate anthropologists, surgeons, neurologists and the general public. So it is not surprising that, shortly after, the first two cases found in Portugal were described. In 1880, during the ‘Congrès International d’Anthropologie et d’Archéologie Prehistoriques’ held in Lisbon, Néry Delgado (1880) described two incomplete trepanations dated to the Neolithic. The first case, recovered from the cave of Furninha (Leiria) represents a parietal bone fragment exhibiting a circular hole (20 mm per 5 mm) with signs of healing. A possible second case, unearthed from the cave of Casa da Moura, refers to an incomplete circular trepanation (20 mm × 6 mm) observed in a left parietal bone of an male adult without signs of healing. During the 20th century, occasional reports are published adding few more cases. More recently, in a review paper published in 2003, Silva surveyed the evidence for prehistoric trepanation in Portugal, and reported new cases. In this paper, 22 trepanations dated from the Neolithic to the Bronze Age, mostly from the former period, are discussed. Yet, the earliest evidence of trepanation from Portugal dates to the Mesolithic period (Crubézy et al., 2001), as the earliest European cases (Campillo, 1977, 2007, 2011; Weber & Wahl, 2006). More recently, new cases from nowadays Portuguese territory dated from the Middle Neolithic were presented in International Meetings (unpublished data from the first author). Even so, the number of cases is rather low when compared with other regions of Europe, as France and Spain (Gama & Cunha, 2003; Silva, 2003; Campillo, 2011). However, several factors can hinder the detection of this procedure: mortuary practices, namely, the use of collective burials, which can compromise the completeness of the skulls; very low preservation rates of bones in some regions of Portugal, as
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Alentejo where the soil is very acid, and old excavations without a detailed study of the bones.

The collection of Casas Velhas was recently studied, revealing important data about funerary anthropology, demography, morphology and pathology of these Bronze Age individuals buried in small cists. Among the observed pathologies, a hole in the right parietal bone of an adult female skull was noted. The regular shape of the perforation, the shallow external inclining to the opening, the remodelled margins of the defect and the surrounded area, suggests the intentional removal of bone (Weber & Wahl, 2006). The margins of the defect exhibit signs of long-term healing, and an obliterated diploe, which permits to exclude post mortem damage (Weber & Wahl, 2006). The external bevelling of the margins and the presence of a shallow area around the opening is consistent with trepanation by scraping method. This procedure involves making orifices of rounded/oval shape with large rings of abrasion around it with a wide shallow external inclination around the orifice. All these features are observed in this female skull. The presence of a sloping crater around the perforation permits to exclude the diagnosis of tangential cuts (Verano, 2016). Two linear fractures are visible in the defect, but they were interpreted as the result of taphonomic post mortem damage because they do not reveal any signs of healing (like the margins of the hole). Other possible factors that can result in bone perforation are depressed fractures, metastatic carcinoma, myeloma and infectious diseases (Kaufman et al., 1997; Bereczki & Marcsik, 2005; Nikita et al., 2013; Verano, 2016). However, in all these, the produced lesions are irregular in shape, which does not match the case here presented. Developmental and congenital defects can also be excluded because the defect is not localized in their typical location as around sutures lines (Kaufman et al., 1997; Verano, 2016). So trepanation by scraping method seems to be the most probable diagnosis. Scraping is the oldest trepanning technique and, according to Kirkup (2003), it involves the lowest risk of damaging the brain. This method is also according to Silva (2003) the most used by Portuguese prehistoric surgeons, but not in nowadays Spain were drilling technique seems to be the prevalent method followed by scraping (Campillo, 1977, 2007, 2011). The former one is, however, rare in Portugal and apparently performed mostly in the earliest cases, as the only Portuguese case known from the Mesolithic period, a partial trepanation on a frontal bone belonging to an male adult individual from Moita do Sebastião (Crubézy et al., 2001).

Other features of this trepanation, as location (right parietal bone) being a complete and remodelled lesion, are in accordance with the trend observed by Silva (2003), except the sex of the individual. In Silva’s compilation, trepanations were observed in male and unknown sex individuals. However, more recent described cases include female individuals (Boaventura et al., 2014; unpublished data from first author). These data suggest a long tradition of this procedure in nowadays central/south Portugal dating back, at least, to the Middle Neolithic.

For this procedure, sharp-edged oval stone may have been the tool used. This, according to Löwen (1997), is a sterile surgical instrument and could be responsible for the low infection rates of these operations. Moreover, it has also been suggested that these populations had the knowledge of plants and other products with analgesic and antibiotic properties (Piek et al., 1999). The knowledge and use of medicinal plants and other natural products for therapeutic reasons were still very common in rural Portugal until the middle of last century (oral communication by relatives living in these areas of the first author).

No reasons for the intervention were observed is this female skull, although some parts of the cranium are missing. The slight oval shape depression observed antero-laterally to this hole is intriguing. It is impossible to confirm if it is related to the described defect. Concerning possible aetiologies, it could represent an earlier incomplete trepanation but other aetiologies as, depressed cranial fracture, small soft tissue tumours, infections, superficial skull lesions or taphonomic agents cannot be excluded.

In terms of funerary practices, this individual was among the few from this Necropolis that were accompanied by a ceramic vessel and fauna offerings of Bos taurus. Still, for the majority of the burials, it was not possible to confirm the existence of these items because they were previously very disturbed. Although the anthropological knowledge of human groups belonging to the Southwest Iberian Middle Bronze Age is scarce because of the almost inexistence of human remains, this is apparently not the first case of trepanation from this culture. In 1965, F.N. Ribeiro shortly mentioned a healed trepanation in one of the four individuals found in cist 12 from the necropolis of Ulmo (Beja). Unfortunately, it was not possible, until now, to locate these human remains to confirm this case.

**Final remarks**

The trepanation observed in the adult female skeleton from cist 30 of Casas Velhas belongs to a culture – Southwest Iberian Middle Bronze Age – that is almost
unknown in terms of anthropological data due to the paucity of preserved human remains. Several features of this trepanation, as the location, the size, the method used and long-term evidence of healing without any signs of post-operative complications, confirm the skills and experiences of these ‘prehistoric surgeons’ and allows the suggestion of an old and long tradition of this practice in the present Portuguese territory since, at least, the Middle Neolithic. Recent findings, including the present case, confirm the practice of trepanation in female individual in this region of Iberia, which was an unknown aspect until recently.

Acknowledgements

The authors wish to thank the Museu de Arqueologia e Etnologia do Distrito de Setúbal for permitting the study of the human remains. We are grateful to both reviewers for their helpful comments. Lucy Evangelista for the English revision of the manuscript.

Conflict of interest

The authors have no conflict of interest to declare.

References


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