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Trepanation in the Late Bronze Age and Early Iron Age in Armenia

A. Yu. Khudaverdyan

Institute of Archaeology and Ethnography, National Academy of Science, Republic of Armenia, Charents st. 15, 0025 Yerevan, Armenia

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ABSTRACT

In this study, trepanations in ancient Armenia are discussed. In total, 10 cases were studied. Seven were male, 1 female and 2 were children. Age of the individuals ranged from 6 to 65 years. Among nine cases of surgical trepanations four had possible healing signs. In these cases the individuals showed evidence of previous trauma to the skull or infection (mastoiditis, tuberculosis), suggesting that the operation had been carried out for therapeutic purposes. This provides further support for the suggestion that trepanation (or trephination) was performed primarily for therapeutic purposes, and because of cranial infection or injury. In one case, a symbolic trepanation could imitate real penetration into the skull cavity. This study shows that archaeological sites of Armenia and anthropological materials have a potential to supply essential information on ancient history of the Armenian people and the region.

Introduction

Trepanation (from the Greek word trypanon that means a “borer”, or an “auger”, a type of a carpenter’s tool) is, perhaps, the oldest form of neurosurgery. Ancient skulls with premortem evidence of surgical interventions are of interest to anthropologists, archaeologists, pathologists and radiologists. Trepanation is defined as the intentional perforation of the cranial vault with removal of a part of skull bone. Hippocrates (460-355 BCE), who already knew the use of the perforating trepan and of the crown trepan (prion), gave precise clinical and methodological instructions, recommending trepanation for wounds of the head resulting in splintered fissures (Hippocrates, V, II: 1–25; VI, V: 16; 1988, 1994). There are proofs of trepanation from all inhabited continents. As the record suggest, trepanation was practiced during various periods of history in all European countries (Baggieri and Di Giacomo, 2003; Campillo, 1993, 2007; Derums, 1979; Facchini et al., 2003; Gokhman, 1989; Holck, 2008; Mariani-Costantini et al., 2000; Mays, 2006; McKinley, 1992; Mednikova, 2001; Moghaddam et al., 2015; Mountrakis et al., 2011; Nemeskéri et al., 1965; Powers, 2005; Roberts and McKinley, 2003; Rokhlin, 1965; Rubini, 2008; Silva, 2003; Vlček, 1972), in Africa, i.e., Egypt (Rawlings and Rossitch, 1994), Asia (including China, India, Japan and Southern Siberia) (Goroshenko, 1899; Han and Chen, 2007; Meschig and Schadewaldt, 1981; Richards, 1995; Sankhyan and Weber, 2001), in the Middle East (Açikkol et al., 2009; Angel, 1971; Aufderheide and Rodriguez-Martin, 1998; Erbengi, 1993; Erdal and Erdal, 2011; Ferembach, 1970, 1984; Güleç and Pelin, 1998; Hershkovitz, 1987; Smith, 1990; Starkey, 1936; Wolska, 1994; Zias and Pomeranz, 1992) and in South America (Aufderheide and Rodriguez-Martin, 1998; Erbengi, 1993; Ferembach, 1970, 1984; Smith, 1990; Zias and Pomeranz, 1992).

E-mail addresses: ankhudaverdyan@gmail.com, akhudaverdyan@mail.ru

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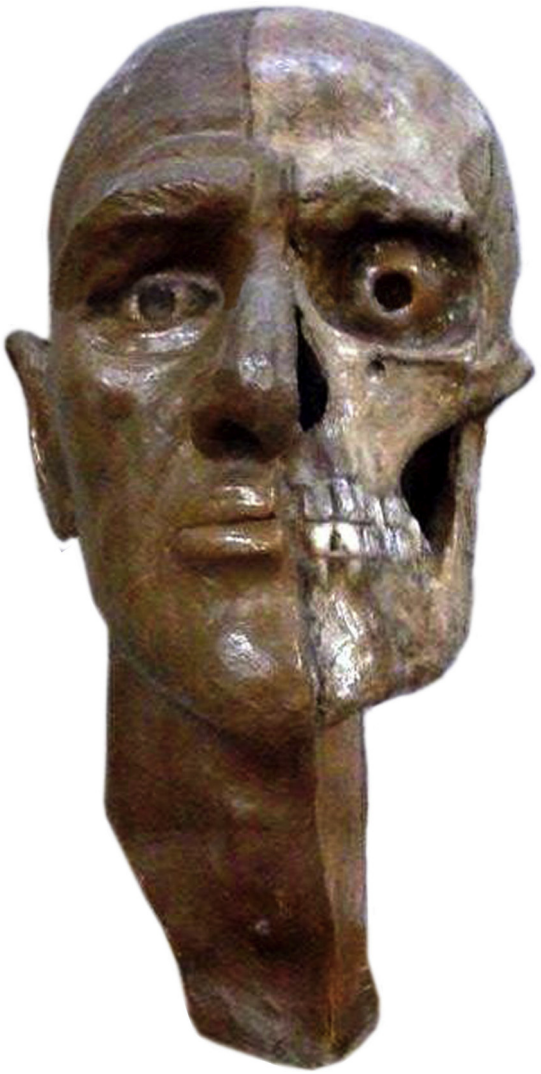

Fig. 1. Skull of an adult male from Bronze Age Lchashen site; (a) facial reconstruction by A.D. Dzhagaryan; (b) intravital perforation of the left parietal bone (foto Sjuzanna Muradjyan).

Trepanation has been performed since prehistoric times also in Armenia. One of the examples is the skull of an individual from a burial ground of Lchashen described earlier by the author (Khudaverdyan, 2010). The half-face facial reconstruction, made by the doctor A.D. Dzhagaryan and currently housed in the musem in Sardarabad, shows possible intravital perforation of the skull on its exposed side (Fig. 1, see also Fig. 12).

In the Armenian Late Bronze Age, the holes in trepanned skulls were made by scraping the bone away with sharp stones such as flint or obsidian; later, primitive drilling tools were used to drill small holes arranged in circles, after which the piece of bone inside the circle was removed. We have a record of two skulls from Lchashen with evidence of this surgery. The individuals have had single trepanation orifice. One individual has an artificial hole of seven millimetres in the parietal bone, the second individual has a hole of twenty millimetres on the left zygomatic (Khudaverdyan, 2010). In the Armenian Late Iron Age the holes in trepanned skulls were also made by scraping. We have a record of one skull from Shirakavan I with evidence of this surgery (Khudaverdyan et al., 2013). Other cases of trepanations were collected at the two archaeological settlements (Black Fortress I and Shirakavan: Classical/Late Antiquity period/1st century BCE – 3rd century CE) (Khudaverdyan, 2011b). Trepanation from Black Fortress I using a drilling technique, created a hole seen on the left lambdoid suture. From the ectocranial aspect, the hole seemed to have resulted from two separate drilling attempts. The internal walls of the hole were laterally inclined. The skull from Shirakavan also showed evidence of trepanation. The individual was a juvenile (8–9 year old). The drilling technique was used to make a funnel-shaped hole (8 mm in diameter) located on the right parietal bone. Since there was no evident biological reason for trepanation in this individual, and given the fact that this individual was quite young, this procedure was possibly a part of a ritual or religious ceremony (Khudaverdyan, 2011b).