

## **An unusual surgical treatment of the skull following trauma during the Copper Age (IV millennium B.C.) in Italy**

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A growing body of evidence, drawn from ancient human remains and from ethnographic accounts, greatly changed our views on past and “traditional” medicine. Surgical treatment of the skull, requiring intimate anatomical knowledge and high skills, has been very influential in that process (Ackerknecht, 1967; Capasso *et al.*, 2002). Forms of trephination, carried out in order to remove part of the injured skull, are documented since the Neolithic through historical times and in recent ethnographic reports (Aufderheide & Rodríguez-Martín, 1998; Margetts, 1967; Ortner, 2003).

The case presented here provides evidence of a less invasive technique applied to the skull of an adult individual found during archeological excavations in a cave deposit (Garbu du Surdu, Finale Ligure, Savona, Italy). A <sup>14</sup>C AMS date obtained from a fragment of the mandible (Erl-13879: 4624 +/- 21 BP) points to a calibrated age range between 3527-3328 BC, placing the material at the beginning of the Copper Age, in agreement with associated archaeological remains that include decorated pottery fragments and shell ornaments. The skull was lying on the surface deposit among other bones belonging to at least six individuals whose inhumations were strongly disturbed by natural events. The comingled state of the material made it impossible

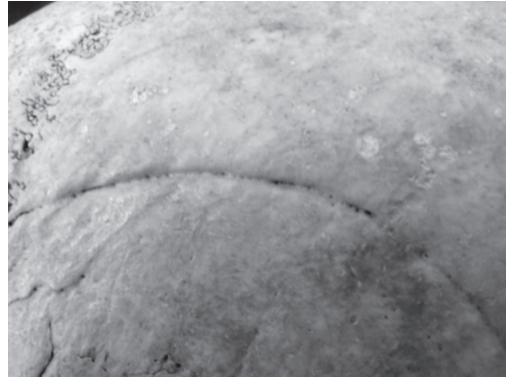
to associate any of the postcranial bones to this specific skull. Thus, in the absence of hip bones, sex attribution remains uncertain, although a diagnosis of female is suggested by cranial characteristics (Ferembach *et al.*, 1979) such as frontal and parietal bossing, weak glabella and supraorbital ridges, and small mastoid processes.

The skull is affected by a left temporal bone fracture healed with loss of bony fragments (Fig. 1). The squama appears slightly depressed and, radiographically, shows two main lines of fusion radiating from the lower part of the bone where three lacunae can be observed. On the parietal bone, immediately above the area affected by trauma, the skull exhibits two regularly curved grooves. One, about 3 cm long, starts from the posterior border of the squamosal suture; the other, 9 cm long, runs above the first and reaches the coronal suture. Remodelling of compacta indicates that the two incisions were made during life (Fig. 2).

These changes indicate that this individual suffered a violent blunt trauma that broke the temporal bone. No further evidence of injuries have been observed in the remaining material. The trauma, possibly resulting from a blow inflicted frontally by using a blunt instrument held with the right hand, was not lethal but required surgical treatment and care. We suggest



**Fig. 1- Lateral view of the skull: note the two grooves, the depressed appearance of the temporal bone and the loss of bony parts. The color version of this figure is available at the JASs website.**



**Fig. 2 – Close up view of the main groove showing remodeling of the compacta. The color version of this figure is available at the JASs website.**

that the skull was incised above the injured area with a pointed tool in order to isolate and detach the soft tissues overlying the fracture, remove isolated bone fragments and keep the wound clean. Considering the antiquity of the skull, the instrument used could have been made of copper, flint, or obsidian (a vitreous material of volcanic origin). The shorter incision was probably a first attempt interrupted for contingent reasons, possibly because it was too low.

This case provides the first evidence of such a treatment of an injured skull and proves once more the therapeutic knowledge of prehistoric populations, emphasizing their ability to modulate surgical procedures according to specific needs.

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