



Brief communication

The face of conflict: Significant sharp force trauma to the mid-facial skeleton in an individual of probable 16th–17th century date excavated from Byczyna, Poland



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ABSTRACT

A variety of injuries have always been associated with violence, consequences of which people had to deal with. In this paper we present a complex of craniofacial and dental injuries resulted from sharp force trauma. The basis of our study was historical skeletal material excavated from archeological site in Byczyna (11th–17th century), Poland. An individual whose skeleton was exhumed from the grave No. 610 exhibited healed, oblique trauma of the left maxilla, damage to the crowns of right central and lateral incisors and concomitant luxation of the right maxillary central incisor. We describe the mechanism of this trauma and complications that resulted from damage to the masticatory apparatus.

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1. Introduction

Most published data concerning cranial trauma observed in skeletal material from archaeological contexts relates to the cranial vault, whilst descriptions of injuries affecting the facial skeleton, especially that caused by an edged weapon, are relatively rarely described. In most cases of violence related craniofacial trauma, the respective authors observed injuries on the supraorbital part of the frontal bone (Kanz and Grossschmidt, 2006; Van Der Merwe et al., 2010), nasal bones (Jurmain and Bellifemine, 1997) and the zygomatic arch (Hershkowitz et al., 1996). *Ante mortem* tooth loss could also be linked to traumatic events (Lukacs, 2007) although it is difficult to specify the circumstances in which teeth were lost.

The aim of our study is to present an example of craniofacial trauma observed in a skeleton (No. 610) excavated from a historical cemetery (11th–19th century) in Byczyna (Kluczbork district, Poland). The case described in our article enables us to be specific both in terms of the lesion location as well as the mechanism of its production. This article emphasizes the explanation of the trauma causation and how its after-effects influenced the quality of life of the individual.

2. Material and methods

2.1. Archaeological context of the burial

Grave No. 610 was unearthed at the cemetery surrounding the St. Nicholas church located in the center of historical Byczyna. Archaeological rescue excavations in Byczyna at site 1 (medieval town graveyard) were conducted between 1 July 2009 and 1 August 2010. During the excavations, 670 11th–18th century graves were discovered.

The archaeological context of grave No. 610 was typical for Christian rite, with east–west orientation of the inhumed body. The individual was buried in an upright position with hands resting on the pelvis (Fig. 1).

The skeleton excavated from grave No. 610 was complete, and most of the bones had good cortical surface preservation, with no peeling and cracking. The cranium was slightly deformed *post mortem* by the burial environment, which resulted in linear fractures within the occipital and palatine bones.

The sex of the individual was estimated as male, according to the method developed by Acsádi and Nemeskeíri (1970) and description of the pubic bone morphology (Phenice, 1969). Age at death was estimated as an old adult (Buikstra and Ubelaker, 1994) based on the involutionary changes within the symphyseal surface of the pubic bones (Brooks and Suchey, 1990) and assessment of the cra-

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Fig. 1. View showing position of the skeleton in the burial pit.

nial suture closure stages (Meindl and Lovejoy, 1985). Dental wear scoring methods (Murphy, 1959; Molnar, 1971; Brothwell, 1981; Lovejoy, 1985) were not reliable in age at death assessment due to the fact that extensive craniofacial trauma significantly changed the morphology of the masticatory apparatus (more information in the Supplementary material S1).

2.2. Archaeological dating of the specimen

A damaged silver coin was found next to the fourth metacarpal bone of the left hand (Fig. 2). The coin has been identified as a German ½ Batzen (2 Kreuzers) minted in the years 1657–1658, in Palatinate-Simmern, from the Charles Louis commend (1648–1680) (Krause and Mishler, 1996). Those coins were in use most intensively during the reign of the Elector of Rheine Palatine, who had the privilege of minting coins, but the monetary situation in the 17th century Opolian Silesia was complex (Butent-Stefaniak and Baran, 2016), and it is difficult to determine the real usage period of those monetary units (more information in the Supplementary material S2).

A sample of bone (fragment of the left parietal bone) was also submitted for radiocarbon dating in Poznań Radiocarbon Laboratory. The calibrated C-14 results indicate a date range from 1664 to 1914 as the most probable time, when the individual's death occurred (Fig. 3). The lower limit of dating is also consistent with the date of the reign of Charles Louis, which suggests that this individual could have lived during the second half of the 17th century.

3. Results

The most significant feature of the cranial morphology was an injury observed on the left side of the skull, which resulted in a loss of the alveolar process in the maxilla (Fig. 4). The most probable cause of the trauma was a blow with an edged weapon, as the alveolar process seems to have been separated from the rest of the maxilla. At the moment of impact the blade struck in the alveolar process and then slid to the right incisors, causing subsequent damage.

In the photograph of the traumatized region (Fig. 5), the crown of the right central incisor was apparently cut from the root, but the X-ray revealed that, in fact, it was avulsed (Fig. 6). The force of the impact was so significant that the crown of the central incisor was fractured, and the pulp was exposed (oblique fracture involving enamel, dentine and pulpal cavity). The tooth was additionally displaced within the socket, relocated horizontally in the alveolar process.



Fig. 2. Position of the damaged silver coin in the hand of the individual buried in the grave 610.

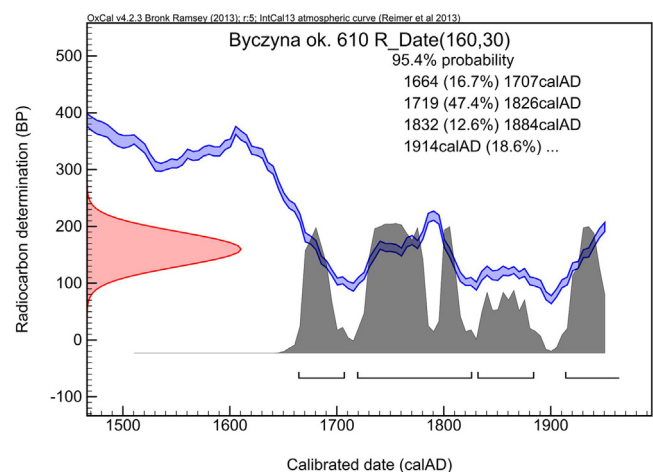


Fig. 3. The results of bone sample radiocarbon dating (Bronk Ramsey and Lee, 2013).

Luxation and avulsion injuries to the teeth usually result in severe blood supply impairment, which may lead to pulpal necrosis and subsequent root canal obliteration. Extensive damage enable the penetration of bacteria into the bone tissue of the alveolus, which created the possibility of developing an inflammatory process (Bakland and Andreasen, 2004). The radiograph of the skull revealed some bone loss around the malpositioned central incisor and the root of the lateral incisor, which are consequences of a sus-

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