



Elongated odontoid process in late Holocene skeletal remains from B6 archaeological site, Mendoza, Argentina

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ABSTRACT

The odontoid process of the axis can be affected by congenital or acquired pathologies. While abnormalities such as os odontoideum, agenesis, and fractures are reported in archaeological remains, the abnormality of an elongated length of the odontoid process has not been described in the paleopathological literature. The aim of this paper is to evaluate two individuals with elongated odontoid processes from a skeletal assemblage from the B6 archaeological site (Mendoza, Argentina), and to discuss the possible etiologies of the condition, with particular attention given to the relation to trauma and Crowned Dens Syndrome (CDS), a condition characterized by the ossification of ligaments of the odontoid process of the second cervical vertebra.

1. Introduction

The odontoid process (the dens) is an anatomical feature of the second cervical vertebra (C2), and is the central pillar of the cranio-vertebral junction. Defects of the odontoid process can be produced by congenital or acquired conditions. Congenital conditions, reported in the clinical and archaeological literature, include os odontoideum, odontoid aplasia and persistent ossiculum terminale (Curate, 2008; Hensinger et al., 1978; Jain et al., 2016). Acquired defects may be produced by trauma or degenerative, infectious or metabolic diseases (Jain et al., 2016). Defects of the odontoid process are seldomly reported in archaeological remains, but a few cases of os odontoideum, in which the dens is separated from the vertebral body (e.g. Curate, 2008; Mann et al., 2013), agenesis (e.g. Barnes, 2012), and fractures (e.g. Weber et al., 2003) appear in the literature. On the contrary, as far as we know, the elongated length of the odontoid process, recorded in clinical research as evidence of trauma or inflammatory diseases, has not been described in the paleopathological literature.

The aim of this paper is to evaluate and report the presence of two cases of elongated odontoid processes found on skeletal remains from a late Holocene multiple burial (site B6) in Mendoza (Argentina). The recognition of this trait in skeletal remains could be helpful for paleopathologists seeking to complete differential diagnoses of the hitherto rarely reported pathological condition in archaeological remains.

2. Material and methods

2.1. Archaeological background

The archaeological locality of Barrancas is located at the eastern lowlands of Maipú Department, Mendoza, Argentina (Fig. 1). The largest multiple burial of Barrancas is the B6 site (Fig. 1), a cemetery encompassing 8 m² found in 2009 (Novellino et al., 2013). The skeletal assemblage from this site consists of 34 individuals (16 non-adults and 18 adults; 6 females, 11 males and 17 of indeterminate sex). Twenty-nine of individuals, including the two skeletons reported here, were buried in a semicircle (Fig. 2) (Barberena et al., 2017; Novellino et al., 2013). The only cultural artifacts are two projectile points, one lodged in a dorso-ventral direction in the sternum of Skeleton 19, and the other between two lumbar vertebrae of Skeleton 30, both adult males aged > 45 years old. The skeletons from the B6 site are currently housed at the Museum of Natural and Anthropological Sciences “J. Cornelio Moyano”, Mendoza, Argentina.

Three radiocarbon dates were obtained from human bone samples from this site, resulting in non-calibrated dates of 2260 ± 80 years BP -LP-2387 (Novellino et al., 2013), 2450 ± 60 years BP -LP-3110 and 2251 ± 49 years BP-AA98707. A foraging subsistence was suggested for human groups living during the middle-late Holocene, based on technological, zooarchaeological, and stable isotopic data (Barberena

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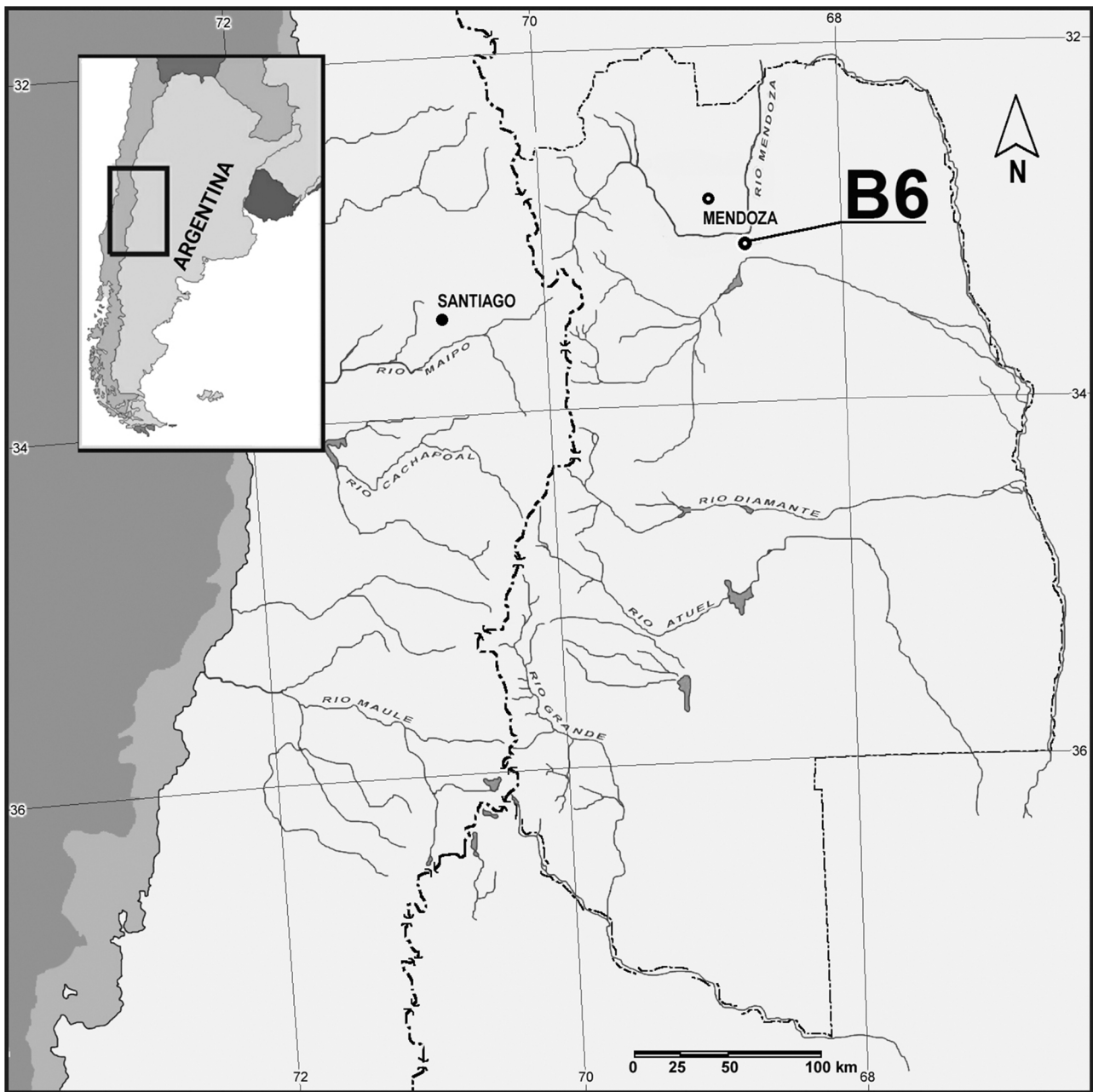


Fig. 1. Location of the B6 archaeological site in Mendoza Province, Argentina.



Fig. 2. Multiple burials found in the B6 archaeological site, Mendoza Province, Argentina.

et al., 2017), with diets predominantly based on animal protein (Gil et al., 2014a; Novellino et al., 2013). Infrequent migration between lowland and highland regions was also proposed from strontium and oxygen stable isotope data (Barberena et al., 2017; Gil et al., 2014b).

2.2. The individuals

Skeletons 2 and 8 (Sk 2 and Sk 8) from the B6 site are well preserved and almost complete. They were determined to be males based on the presence of rugose features of the crania, and morphological features of the os coxa, including narrow sciatic notches, acute subpubic angles, and lack of ventral arcs (Buikstra and Ubelaker, 1994). Based on the morphological changes of the auricular surface (Lovejoy et al., 1985) and the pubic symphysis (Brooks and Suchey, 1990; Todd, 1921a,b), the age-at-death of Sk 2 was determined to be 35–50 years old, while Sk 8 was 50+ years old.

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