

News and Views

## A one-million-year-old human pubic symphysis

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In the hominin fossil record, the pubis is seldom preserved and the pubic symphysis is even more rarely encountered. The earliest pubic specimens are those from *A. afarensis* (AL 288-1ao) and *A. africanus* (Sts 14) (Broom et al., 1950; Johanson et al., 1982; Meindl et al., 1985). However, there is not another known hominin pubis until the Middle Pleistocene Sima de los Huesos, Atapuerca Spain (Arsuaga et al., 1999; Bonmatí and Arsuaga, 2005); after this, the pubis is more commonly recovered in European and Levantine Neandertal assemblages (Trinkaus, 1976, 1983; Vandermeersch, 1981). Thus, between the Late Pliocene and the Middle Pleistocene there are no hominin specimens that retain the pubic symphysis and its face. This is unfortunate, since in modern humans this bone provides key information about sex, age, and maturational pattern (Buikstra and Ubelaker, 1994; White, 2002).

Here, we describe an intact, undistorted, adult pubic symphysis (UA-466) from the ~1 Ma Uadi Aalad site in the Buia sedimentary basin of the Eritrean Danakil (Bondioli et al., 2005). The left pubis was discovered in November 2003 from surface collections near where a cranium, two isolated teeth,

and two right innominate fragments were previously found from a single outcrop (Abbate et al., 1998; Macchiarelli et al., 2004). UA-466 comes from the same sedimentological level as these other remains, exhibits similar fossilization and coloration, and is embedded in a similar black matrix. However, UA-466 was found on the surface about 15 meters from the other remains. At present, it cannot be determined if any of the bones belong to the same individual.

The magnetostratigraphic record from Buia indicates that the *Homo*-bearing layer is ~1 Ma, falling near the top of the Jaramillo normal subchron (Abbate et al., 1998; Albianelli and Napoleone, 2004). Fission-track dating of an intercalated tephra confirms this chronology (Bigazzi et al., 2004), which is further corroborated by the mammalian biochronology (Ferretti et al., 2003; Martínez-Navarro et al., 2004). Associated Oldowan and Acheulean stone tool assemblages are also widespread at Uadi Aalad and surrounding areas (Martini et al., 2004).

### Preservation, size, and morphology of UA-466

UA-466 preserves the medial-most aspect of the superior pubic ramus, the incomplete pubic tubercle, the entire symphyseal face, the inferior angle of the obturator foramen, and the ischiopubic ramus just below the symphysis (Fig. 1).

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The pubis shows no distortion and remarkably little damage other than ancient breaks at the inferior and superior rami and of the thin bone medial and superior to the obturator foramen. The symphyseal face exhibits very minor erosion with the loss of only the fine covering of surface bone. There is some cracking or fragmentation on the other surfaces, but none of this distorts the anatomy. The most extensive damage occurs on the ventral surface where a large depression (about  $15 \times 15$  mm) below the pubic tubercle (Fig. 1a) appears to be the result of ancient crushing. The depression is filled with a black manganese matrix that penetrates the bone's trabecular lacunae. Lateral and inferior to this area, the superior two-

thirds of the anterior edge of the obturator foramen is chipped and eroded away. On the dorsal surface (Fig. 1b), the specimen is broken close to the obturator foramen's anterior edge. Here, just below the bone's center, are two crushed, square areas that are considerably smaller (measuring  $4 \times 4$  mm) and shallower than the large depression on the ventral surface. They are covered with the same manganese matrix. There is no evidence of carnivore tooth marks or stone-tool cut marks on any part of UA-466.

Ventrally, the superior border extends 28 mm laterally from the symphyseal face to the pubic ramus and includes the base of the pubic tubercle (Fig. 1a). An anterior-posterior



Fig. 1. The Buia pubic symphysis (UA-466) in four views. a: ventral; b: dorsal; c: lateral; d: medial (face).

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