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Signs of Eagle Predation on a 22-kg Adult Primate

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ABSTRACT

Objectives: Some researchers have adopted a 20 kg upper limit to avian predation on primates, with no confirmed cases exceeding 13 kg. Here, we report evidence of eagle interactions with adult male olive baboons (*Papio anubis*) and evaluate the implications for understanding past predation pressures during hominin evolution.

Materials and Methods: Fieldwork was conducted in Réserve Naturelle et Culturelle d'Ennedi, Chad, in February–March 2025. Surveys of sandstone cliffs and talus deposits yielded cranial and postcranial remains of *P. anubis*, including proximal femora. We measured the superoinferior breadth of each femoral head to estimate body mass using established cercopithecid regression equations. The remains were examined for taphonomic signatures of eagle predation.

Results: Our sample of nine individuals includes eight adult males with a mean estimated body mass of 22.2 ± 3.8 kg. We observed punctured orbits in two males, along with a raked scapula, two telling signs of eagle predation and/or feeding activity. One male was associated with a femur, enabling a body mass estimate of 21.8 kg. Postscript: in June 2026, we recovered the cranium and partial skeleton of an adult male with an estimated body mass of 26.2 kg; and again, we observed evidence of talon punctures and severe raking of the scapulae.

Discussion: Our findings are consistent with the depredations of Verreaux's eagles (*Aquila verreauxii*). If confirmed, the interaction exceeds the primate body-mass threshold deemed susceptible to avian predation, indicating that moderately large primates, including some hominins, may have experienced greater avian predation pressure than previously recognized.

RÉSUMÉ

Objectifs: Plusieurs chercheurs ont adopté une limite maximale de 20 kg pour la prédation aviaire sur les primates, mais aucun cas confirmé n'a dépassé 13 kg. Nous présentons ici des preuves d'interactions entre des aigles et des babouins olives mâles adultes (Papio anubis) et évaluons les implications de ces résultats pour la compréhension des pressions de prédation passées au cours de l'évolution des hominidés.

Matériel et méthodes: Le travail de terrain a été mené dans la Réserve Naturelle et Culturelle d'Ennedi, au Tchad, entre février et mars 2025. Des prospections menées sur des falaises de grès et des éboulis ont permis de mettre au jour des restes crâniens et post-crâniens de *P. anubis*, notamment des fémurs proximaux. Nous avons mesuré la largeur supéro-inférieure de chaque tête fémorale afin d'estimer la masse corporelle à l'aide d'échelles établies pour les cercopithécidés. Les restes ont été examinés à la cherche de signatures taphonomiques de prédation par les aigles.

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Résultats: Notre échantillon de neuf individus comprend huit mâles adultes dont la masse corporelle moyenne estimée est de 22.2 ± 3.8 kg. Nous avons observé des orbites perforées chez deux mâles, ainsi qu'une omoplate raclée, deux signes révélateurs d'une prédation et/ou d'une activité alimentaire par les aigles. Un crâne mâle était associé à un fémur, ce qui a permis d'estimer sa masse corporelle à 21.8 kg. Post-scriptum: en juin 2026, nous avons récupéré le crâne et une partie du squelette d'un mâle adulte dont la masse corporelle était estimée à 26.2 kg; là encore, nous avons observé des traces de perforations par les serres et de graves griffures sur les omoplates.
Discussion: Nos résultats suggèrent une predation par des aigles de Verreaux (Aquila verreauxii). Si cela se confirme, cette interaction dépasse le seuil de masse corporelle des primates considéré comme sensible à la prédation aviaire, ce qui indique que les primates de taille relativement grande, y compris certains hominidés, ont peut-être subi une pression de prédation aviaire plus importante qu'on ne le pensait auparavant.

1 | Introduction

The frequency of avian predation on primates and the selective importance of large raptors during primate evolution are topics of enduring debate (McGraw and Berger 2013). Much of this debate stems from the foundational work of Berger and Clarke (1995), and their argument for the raptor-mediated death of Taung 1, the holotype specimen of *Australopithecus africanus*. In this paper and others (Berger 2006; Berger and McGraw 2007), the authors called attention to actualistic studies of avian nest and bone accumulations to identify taphonomic signatures of raptor predation, especially by African crowned eagles (*Stephanoaetus coronatus*). The crania of monkeys and other prey are common beneath the nests of *S. coronatus*, providing a key source of diagnostic evidence (Steyn 1982; Struhsaker and Leakey 1990; Shultz 2002). For example, the crania of adult monkeys are typically complete with mandibles, whereas those of younger animals are often found without mandibles, basicrania, or faces (Sanders et al. 2003; McGraw et al. 2006; Trapani et al. 2006). Talon punctures to orbits and scapulae are another common feature (Davies 1994; Sanders et al. 2003; McGraw et al. 2006; Trapani et al. 2006; Garbino et al. 2024).

Additional taphonomic evidence concerns the body masses of prey. To differentiate raptor prey assemblages from those of mammalian bone-accumulators such as leopards, hyenas, and porcupines, Berger and Clarke (1995) noted the uniform range of body sizes (2–20 kg) of species and individuals in Taung's faunal assemblage, and consistency with the "collecting capabilities" of large African eagles such as *S. coronatus* and Verreaux's eagle (*Aquila verreauxii*). The estimated maximum mass of Taung 1 (10–12 kg; Berger and Clarke 1995) is comparable to those of juvenile monkeys in the Hrdlička deposits at Taung (e.g., *Papio izodi*, *Procercocebus antiquus*), suggesting an upper size limit on primate prey. Indeed, the largest known primate victim of *S. coronatus* is an adult male sooty mangabey (*Cercocebus atys*) estimated at 11 kg (McGraw et al. 2006). Put differently, "no primate [exceeding] 13 kg is known to have been killed [by an avian predator]" (McGraw and Berger 2013).

Berger and Clarke's prey range of 2–20 kg is a tidy whole-numbered order of magnitude, and it has become an attractive convenience for inferring avian predation in the primate fossil record, including Plio-Pleistocene cercopithecids < 20 kg (Gilbert et al. 2009) and Holocene lemurs < 20 kg [specifically, subadults of *Palaeopropithecus* as the adults of *P. ingens* (42 kg) and *P. maximus* (46 kg) are considered too large for predation by the now-extinct Malagasy crowned eagle, *Stephanoaetus mahery* (Goodman and Jungers 2014; body mass estimates: Jungers et al. 2008)]. Echoing Berger and Clarke's upper bound, these studies speak to the emergence of a general rule-of-thumb: that juvenile and adult primates < 13 kg are unequivocally susceptible and sensitive to the depredations of eagles; that medium-sized primates (13–20 kg) are only vulnerable in theory based on observed or inferred nest accumulations that include ungulates in this size class; and that large-bodied primates > 20 kg are essentially released from avian predation pressure. The importance of these body-size categories is far-reaching, informing theoretical developments in the allied fields of palaeoanthropology and primatology (Willems and van Schaik 2017; Hart and Sussman 2018), so possible exceptions are worthy of attention, and it is this possibility that motivates our report from the Ennedi Plateau.

1.1 | Ennedi Plateau

The Ennedi Plateau, northeastern Chad, is an extensive (≈60,000 km^2) sandstone-dominated erosional landform in the Sahara that extends across a 250-km east–west arc to the border of Sudan. The geomorphology is characterized by spectacular weathering forms—natural arches, isolated pillars, mushroom rocks—sandstone hills (buttes and inselbergs), relict and sand-filled alluvial wadi channels, and, in exceptional cases, permanent water-filled pools (gueltas). The northern escarpment is continuous and well-defined, whereas the southern boundary is fractured into smaller, uplifted sandstone surfaces that are interspersed with eolian sand belts and dry fluvial canyons. The elevation reaches 1450 m asl, and the relative relief with respect to the surrounding landscape is up to 600 m. Annual rainfall varies between 50 and 150 mm (or hyperarid to marginally semiarid) with wetter regions found on the southern edges (Knight 2023).

Ennedi is home to relict populations of patas monkeys (*Erythrocebus patas*) and olive baboons (*Papio anubis*). Its avifauna includes two species of eagle, the golden eagle (*Aquila chrysaetos*) and Verreaux's eagle (*A. verreauxii*), both of which elicit alarm calls and other antipredation behaviors from monkeys (Zinner and Peláez 1999; Bautista et al. 2018). Many primate alarm calls are predator species-specific (Seyfarth and Cheney 1986), so much so that the behavior is viewed as a form of "taphonomic" evidence of past predation pressure. For example, Zinner and Peláez (1999) observed a series of attacks by a pair of Verreaux's eagles on hamadryas baboons (*P. hamadryas*). The baboons' reactions (including alarm barks and the rapid return

of juveniles to adult caretakers) were notably distinct from those toward other raptor species, leading Zinner and Peláez (1999) to argue for Verreaux's eagles as an important but overlooked predator of juvenile baboons. Indeed, juvenile chacma baboons (*P. ursinus*) have been recorded in the bone assemblages of *A. verreauxii* in southern Africa (Steyn 1982; Gargett 1990; Boshoff et al. 1991; Davies 1994).

During fieldwork in Ennedi, we observed *A. verreauxii* in the vicinity of Johe, a guelta in Wadi Nohi (Figure 1A). In addition, we found a skull (Figure 1B) and cranium (Figure 1C) of two adult male baboons in the rockfall (talus) at the bases of the vertical sandstone cliffs. Conspicuous punctures to their orbits resemble those of Taung 1 (Figure 2A) and a cranium recovered from a bone assemblage of *S. coronatus* (Figure 2B). It is tempting, then, to view eagles as the cause of their deaths, but adult male baboons are large, formidable animals. In the case of *P. anubis*, adult males have a mean body mass of 25.1 kg (Smith and Jungers 1997), and avian predation on monkeys of this size is a concept without precedent.

1.2 | Study Aims

We found five proximal femora from four baboons, including two associated with the skull in Figure 2B. Our aim is to use these femora to estimate body mass, and our objective is to fold the findings into a discussion of *A. verreauxii* and its unique hunting strategies in vertiginous habitats, while also drawing attention to the antipredator behaviors of adult male primates. Though speculative, our discussion is instructive for interpreting the primate fossil record and assessing the importance of avian predation during hominin evolution.

2 | Materials and Methods

We conducted fieldwork in Réserve Naturelle et Culturelle d'Ennedi between February 18 and March 4 2025, visiting three locations: Wadi Nohi and Guelta de Johe (34Q 0625075 1870314 UTM), Guelta de Bachikelé (34Q 0642892 1826760 UTM), and Guelta d'Archei (34Q 0582596 1867894 UTM). Baboons were present in each locale, and we observed feeding, drinking, and social behaviors, along with skilled locomotion on vertical cliff-faces reaching 150 m in height. Pedestrian surveys beneath the sandstone cliffs led to the recovery of skeletal material for isotope analysis, with a particular focus on three species: olive baboon (*P. anubis*), rock hyrax (*Procavia capensis*), and feral donkey (*Equus asinus*). The primate osteological material was cleaned, labeled, photographed, and stored in the biomonitoring collection at the headquarters of African Parks in Fada.

Five proximal femora with fused epiphyses expressed the cercopithecid morphotype, and we classified each as *P. anubis* due to the high sphericity of the femoral head. To estimate the body masses of these individuals, we imported scaled photographs into ImageJ v. 1.54 to estimate the superoinferior (SI) breadth of the femoral head (Ruff 2002). Then we estimated body mass using Ruff's (2003) formula for cercopithecid monkeys: $\ln(y) = 2.388 \ln(x) - 4.560$, where y represents body mass (in kg) and x represents SI breadth (in mm).

3 | Results

Our findings are illustrated in Figure 3. Estimated body masses ranged from 20.1 to 28.9 kg, a span that far exceeds the mean

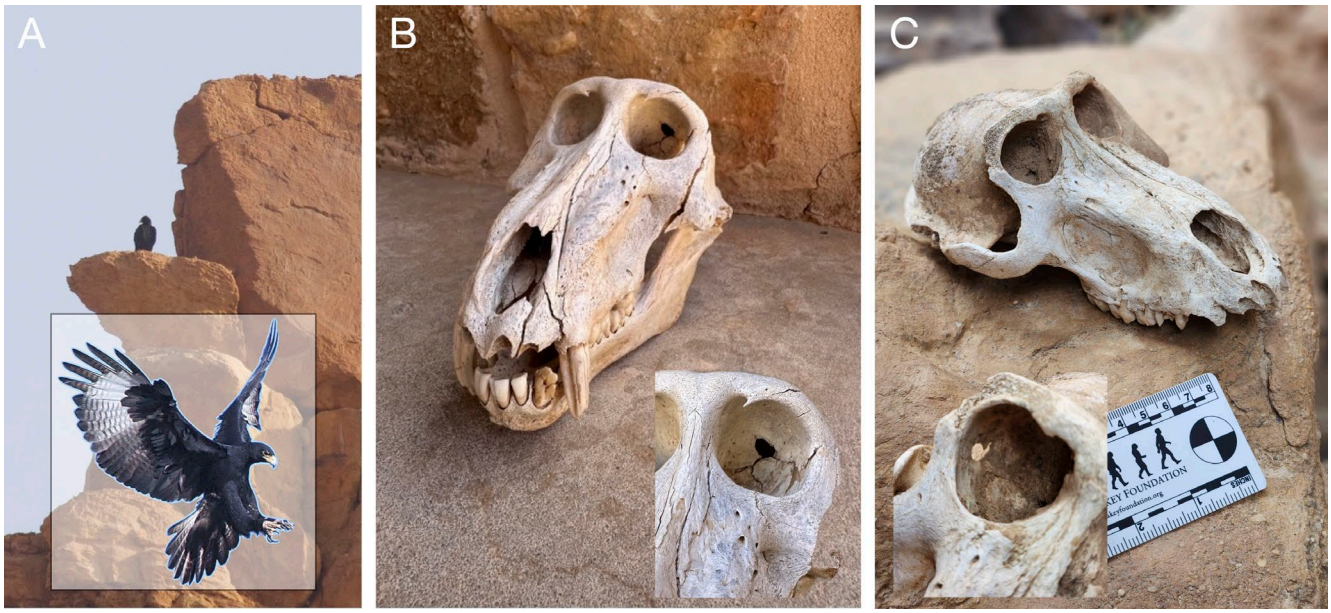


FIGURE 1 | Evidence of plausible eagle-baboon conflict and/or predation. (A) Verreaux's eagle (*Aquila verreauxii*) perched on a crag above Guelta de Johe. Inset depicts the coal black plumage of adults (photograph by Steve Garvie, reproduced under a CC BY-SA2.0 license). (B) Skull of adult Male 1 found near Guelta de Johe with a presumed talon puncture to the left post-orbital septum. (C) Cranium of adult Male 2 found in Guelta de Bachikelé with a presumed talon puncture to the lateral orbital wall. No additional damage was observed, and neither puncture showed signs of healing indicating perimortem damage. Three-dimensional meshes were deposited in the Zenodo repository (doi:10.5281/zenodo.22124137) and MorphoSource data archive (http://morphosource.org; media nos. 910924, 910945, 910950, 910955, and 910960).

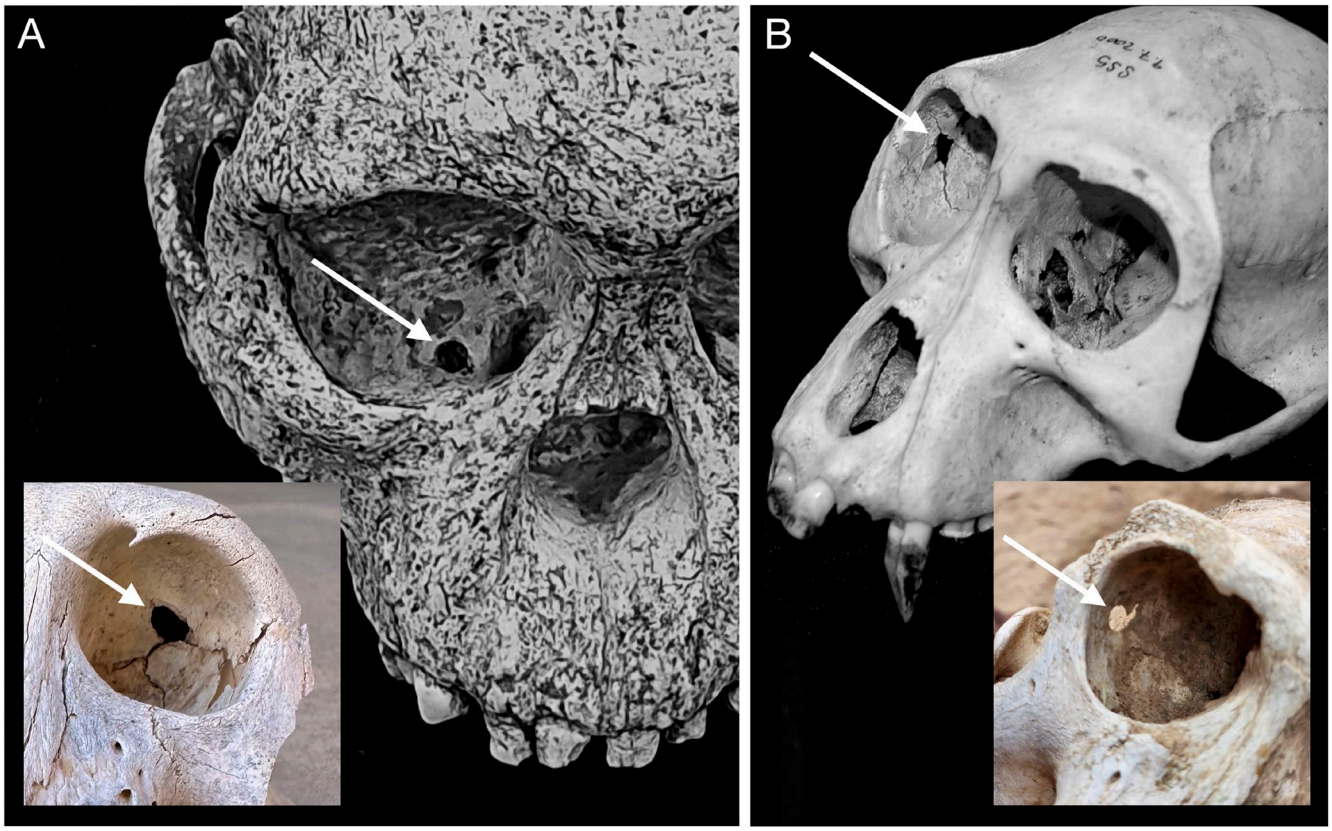


FIGURE 2 | Comparative morphology and position of talon punctures to primate orbits, both inferred and observed. (A) Anterosuperior oblique view of Taung 1; the puncture to its right orbital floor resembles the puncture (arrows) to the left post-orbital septum of adult Male 1 (inset). See Berger (2006) and Berger and McGraw (2007). Photograph of Taung 1 by Bernhard Zipfel, reproduced with permission. (B) Cranium of an adult male sooty mangabey (*Cercocebus atys*) found beneath the nest of crowned eagles in Taï Forest, Côte d'Ivoire (see McGraw et al. 2006; photograph by Scott McGraw, reproduced with permission); the puncture to its lateral orbital wall resembles the puncture (arrows) evident on adult Male 2 (inset).

body mass of adult females (13.3 kg; Smith and Jungers 1997), suggesting a uniform sample of adult males. A verified adult male (craniodentally) was found in association with its left and right femoral heads (Figure 3); accordingly, we averaged the SI measures to calculate an estimated body mass of 21.8 kg for this individual. The range and mean estimated body mass (22.8 kg) of our sample are consistent with the best available data for *P. anubis* (based on sample sizes of 10–50 free-ranging individuals, and with adult status defined) in Smith and Jungers (1997). Their review summarized mean values for adult males that ranged from 21.2 kg (Phillips-Conroy and Jolly 1981) to 27.1 kg (Popp 1983). The low end of this size range represents males inhabiting the Awash Valley of Ethiopia, an arid thornbush habitat at the edge of the species' geographic range. Smith and Jungers (1997) viewed the smaller sizes of Awash males as a reflection of their relatively impoverished environment. Their argument is an appealing explanation for the similarly small average size of adult males in our limited sample.

4 | Discussion

Here we report punctures to the orbits of two adult male baboons, one of which had a body mass of approximately 22 kg. This same animal suffered punctures and raking to its right scapula, a common pattern of damage associated with crowned eagles (Figure 4). The punctures alone indicate eagle handling activities, but at least two non-raptor explanations invite consideration, including (i) gunshot and (ii) canine perforation during male–male aggression, a known cause of mortality among baboons (MacCormick et al. 2012). In the case of gunshot, we would expect substantial additional damage to the crania, which was absent. In the case of male aggression, we would expect cranial damage of a different type—evidence of crushing, additional tooth gouges (MacCormick et al. 2012)—neither of which were present.

Verreaux's eagles are occasional scavengers (Martins et al. 2026), and dismemberment of the body during scavenging is a plausible explanation for the raked scapula in Figure 4B. The talon punctures in Figure 2, however, are far more severe than the shallow, circumorbital pits caused by the grip of one golden eagle during low-stakes grasping of a dead Barbary macaque (*Macaca sylvanus*; Rufà et al. 2020). Thus, we cannot definitively rule out scavenging activity, but the severity of punctures is suggestive of lethal interactions through a killing grip. Further, our limited sample has a pronounced adult male age- and sex-bias, a demographic pattern that argues against the indiscriminate scavenging of eagles (a topic addressed in Sections 4.2 and 4.4). But what kind of eagle-baboon interaction could have led to such fatal outcomes, conflict or predation?

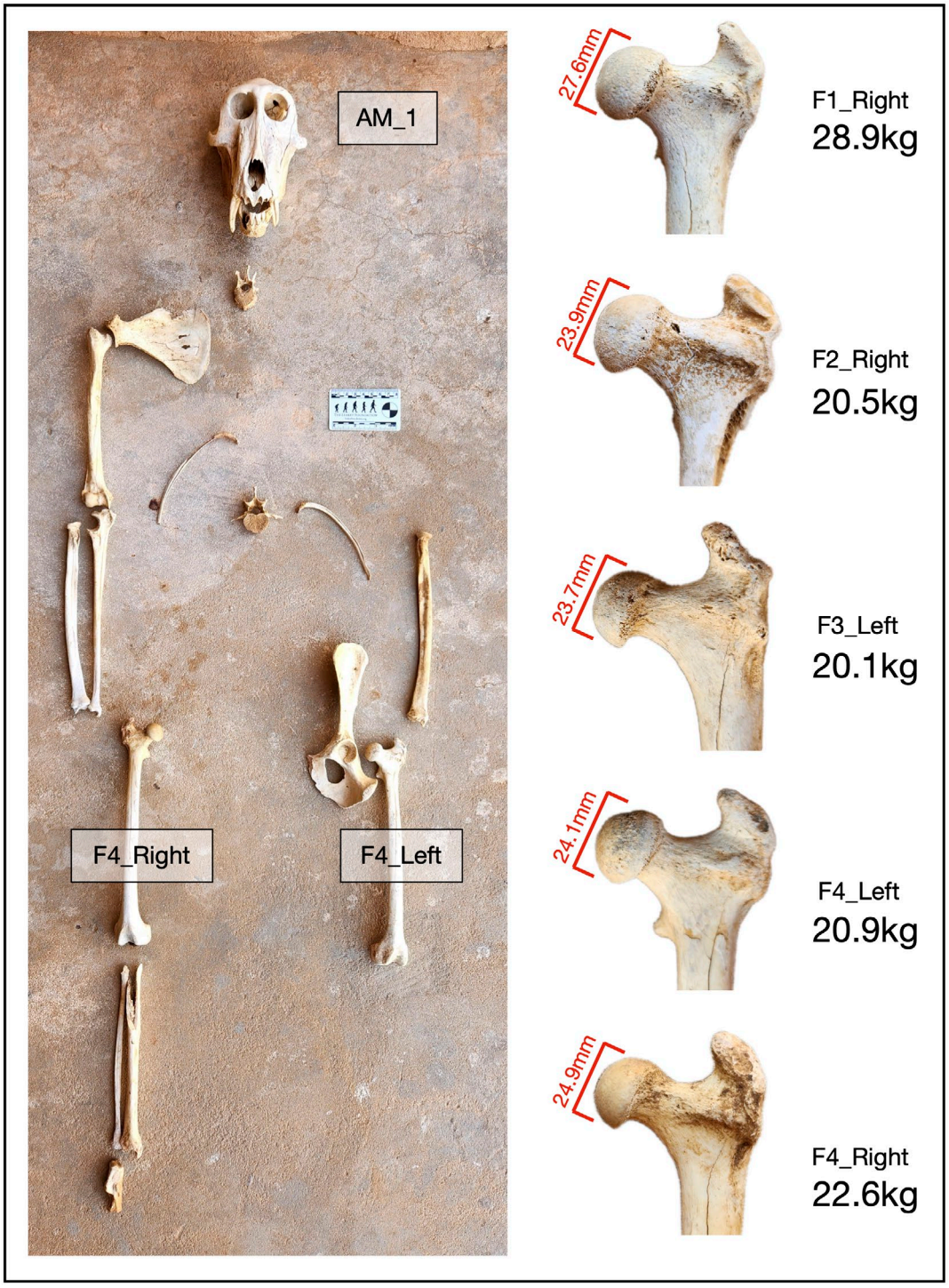


FIGURE 3 | Partial skeletal of adult male 1 and the five proximal femora used to estimate the body mass of individual baboons. In each case, scaled photographs of the femoral head were imported into ImageJ to estimate the superoinferior (SI) breadth (in red font) of the femoral head (cf. Ruff 2002, 2003).

4.1 | Eagle-Baboon Conflict

> "The black eagle is a most spectacular bird."
>
> (Brain 1981, 104)

Steep cliffs and wide cliff-ledges are a valuable resource for baboons and eagles, especially Verreaux's eagle. For baboons, difficult-to-access sleeping sites offer a degree of safety from lions and leopards (Iwamoto et al. 1996; Cowlishaw 1997; Bidner et al. 2018). For Verreaux's eagles, these same spaces function as ideal hunting perches or aeries (Gargett 1990; Davies 1994). Astonishing photographs of chacma baboons sleeping *in* the nests of Verreaux's eagles are a testament to the great value of wide cliff-ledges (Malan and Padayachee 2020), and it follows

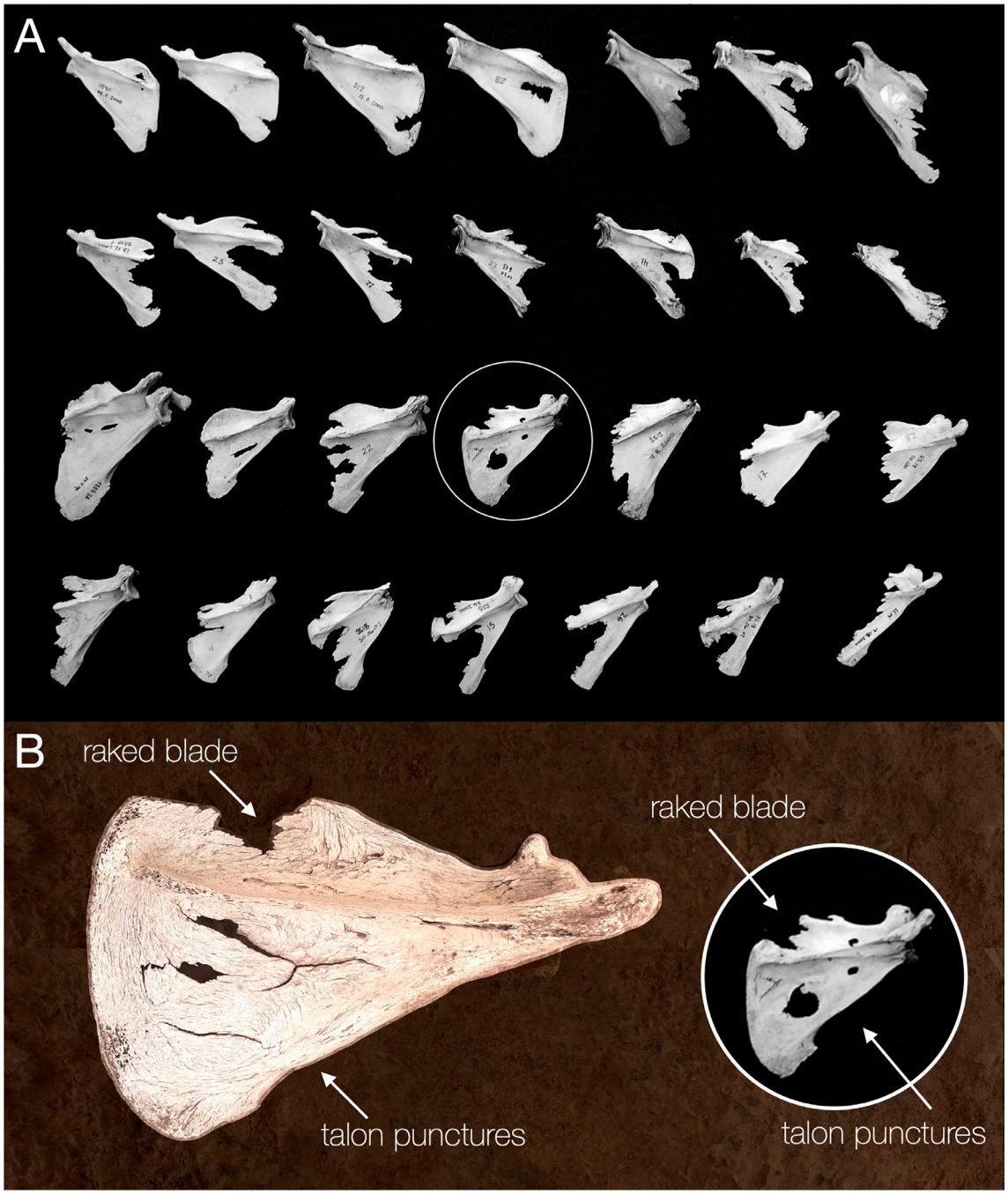


FIGURE 4 | Comparative damage to cercopithecid scapulae. (A) Scapulae recovered from below the nests of crowned eagles (*Stephanoaetus coronatus*) inhabiting Taï National Park, Ivory Coast (McGraw et al. 2006). The damage ranges from single talon punctures to severe raking from the margins inward (Sanders et al. 2003). Raking occurs when the eagle opens the body cavity to extract the heart and lungs. (B) Detailed view of the scapula in Figure 3. The punctures and raking of the superior margin resemble patterns of eagle damage.

that competition over ledges could bring baboons and eagles into conflict.

In the Matabo Hills of Zimbabwe, agonism on cliffs has been observed between chacma baboons and Verreaux's eagles, including the destruction of eggs and nestlings by male baboons (Gargett 1990). In at least one case, a 10-week-old eaglet was killed but not eaten (Gargett 1990), raising the possibility of intentional mitigation of future predation pressure, as argued for attacks on leopard cubs by chimpanzees (Hiraiwa-Hasegawa et al. 2008; Byrne and Byrne 1988). Whatever the case, Verreaux's eagles view some primates as a threat to their reproductive fitness; they are known to dive aggressively toward baboons and humans who approach their nests or food (Cowden 1969; Gargett 1990; Simmons 2014).

A problem with these two conflict scenarios is that neither solves the puzzle of how two adult male baboons suffered orbital punctures. The wadis of Ennedi have no shortage of cliff-ledges and there was no aerie above or near the crania, ruling out nest

defense as a plausible explanation. This reasoning naturally leads us to another explanation, even if it seems implausible: eagle-baboon predation.

4.2 | Eagle-Baboon Predation

> "It is a simple question of weight ratios. A five-ounce bird could not carry a 1-pound coconut." *Monty Python and the Holy Grail*

Arguments against raptor-mediated predation of Taung 1 focused on its body mass and the load-carrying abilities of eagles (Hedenstrom 1995; McKee 2001). Yet, eagles can kill large ungulates, dismember them, and carry liftable portions to their nestlings (Brown 1971). Such events are exceptional, but a 30-kg adult bushbuck (*Tragelaphus scriptus*) is viable prey for crowned eagles (Steyn 1982) and golden eagles have killed 100-kg domestic calves (Phillips et al. 1996). Germane here is a hunting technique—the "low flight with sustained grip attack" (Watson 2010)—used by eagles in habitats with steep terrain. Briefly, an eagle will land on the back or neck of a moderately large ungulate, gripping it firmly with its talons. If the prey withstands knocking to the ground, the eagle will ride it with wings outstretched and flapping to maintain balance until the quarry collapses, either from exhaustion, shock, or internal injury.[1] A similar tactic is described in the extraordinary report of a Harpy eagle (*Harpia harpyja*) attacking a 52-kg adult woman (Epelboin et al. 2025). In general, however, sustained grip attacks are used when preferred prey are scarce, and when mammals are vulnerable to slipping on vertical cliff-faces (Watson 2010).

Similar methods are used by Verreaux's eagles (Steyn 1982; Gargett 1990), the "ecological equivalent" of golden eagles (Watson 2010, 97). Hyraxes (≈4 kg) are the preferred prey of Verreaux's eagles, but they can kill antelopes (klipspringer; mountain reedbuck) estimated at 15 or 18 kg (Rowe 1947; Brain 1981; Gargett 1990; Henwood and Howells 1990; Boshoff et al. 1991; Davies 1994; Ferguson-Lees et al. 2001; Chiweshe 2007). Primate prey include adult vervets and juvenile baboons, which are sometimes hunted by tandem pairs and knocked from cliffs (Steyn 1982; Gargett 1990). Predation pressure on juveniles readily explains the alarm-calling of hamadryas baboons in the highlands of Eritrea (Zinner and Peláez 1999), but not talon punctures to the cranium of a 22-kg adult male (Figure 1B). The answer to this enigma may lie in other factors.

The wadis and cliffs of Ennedi are well matched to the functional anatomy and hunting strategies of Verreaux's eagles, and they host an abundant population of rock hyraxes (*Procavia capensis*), the eagles' preferred prey species. Steep cliff faces and warm air produce powerful updrafts, which enable efficient soaring with long tapered wings, ideal conditions for spotting prey (Pennycuick 1972; Davies 1994). Winding wadis let eagles conceal their approach with a low-quartering flight; that is, fast flying near the ground and in the lower visual field of prey in trees or on cliffs (Davies 1994). Rapid closing speeds and arrhythmic wingbeats are difficult for primates to detect (Clark 1970; Hobaiter and Dominy 2025). When hunting in pairs, the female eagle typically arrives first, startling prey for the oncoming male, which attacks from beneath to force prey from cliffs (Ferguson-Lees et al. 2001). This tactic is effective on steep terrain, a landform that characterizes the geographic distribution of Verreaux's eagles, which maps closely to the mountains and escarpments of eastern and southern Africa. The talons of Verreaux's eagles are similar to those of golden eagles, but their feet are approximately 20% wider for a grip diameter up to 40 cm (Davies 1994)—more than double the width of an adult male baboon cranium.

Many baboons use cliffs to access sleeping sites; it is a common antipredator behavior (Hamilton III 1982; Bidner et al. 2018). But the baboons of Ennedi appear to spend much of their day positioned on vertical cliff faces. The floor of the wadi—where baboons can access fresh water (at gueltas) and food (primarily fruit of the doum palm *Hyphaene thebaica*)—provides scant shade or shelter, which could explain why we observed groups on vertical cliff faces for extended periods. Behaviors such as rest, play, and key social interactions (grooming, sexual behavior, etc.) occurred on steep-to-vertical surfaces; a vulnerable position given the hunting strategies of golden and Verreaux's eagles. Gargett (1990) observed a telling interaction with a cliff-climbing baboon: "at the last moment before hitting the baboon the [Verreaux's] eagle swung away, the baboon rearing back precariously with raised arms. It was a performance guaranteed to arouse terror" (p. 41).

Gargett did not specify the age or sex of the baboon, but she notes the counter-offenses of adult males (barking, lunging) toward Verreaux's eagles, a common intervention to thwart attacks on juveniles (Altmann and Altmann 1970; Zinner and Peláez 1999; Paciência et al. 2017). Such age- and sex-specific behaviors could increase the susceptibility of males to predation, especially on vertical cliffs (Figure S1). Males of some prey species are overrepresented in the diets of some golden eagles (McGrady 1997), and adult male monkeys are overrepresented in the diets of the crowned eagles of Kibale (Struhsaker and Leakey 1990; Mitani et al. 2001). Even so, an adult male baboon is a formidable creature, and the idea of eagle-mediated predation on a 22-kg individual would seem to exist on the thin edge of possibility. But after weighing alternative possibilities, predation seems the likeliest explanation for the punctures and raking depicted in Figures 2 and 4, and it is this conjecture that impels a brief discussion of hominin evolution.

4.3 | Implications for Hominin Evolution

Eagles seldom attempt predation on humans, although two episodes are well documented, including those of a 21-kg boy and a 52-kg woman (Stjernstedt 1975; Epelboin et al. 2025). Accordingly, it is natural for paleoanthropologists to focus theoretical attention on the role of mammalian predators during hominin evolution, especially large cats. Felid predation pressures have been linked to the evolution of bipedalism (Hammond et al. 2025), social group size and behavior (e.g., Treves and Palmqvist 2007; Hart and Sussman 2011, 2018), and the use of fire-adapted landscapes (Hoare 2019). But this narrow view of potential predation

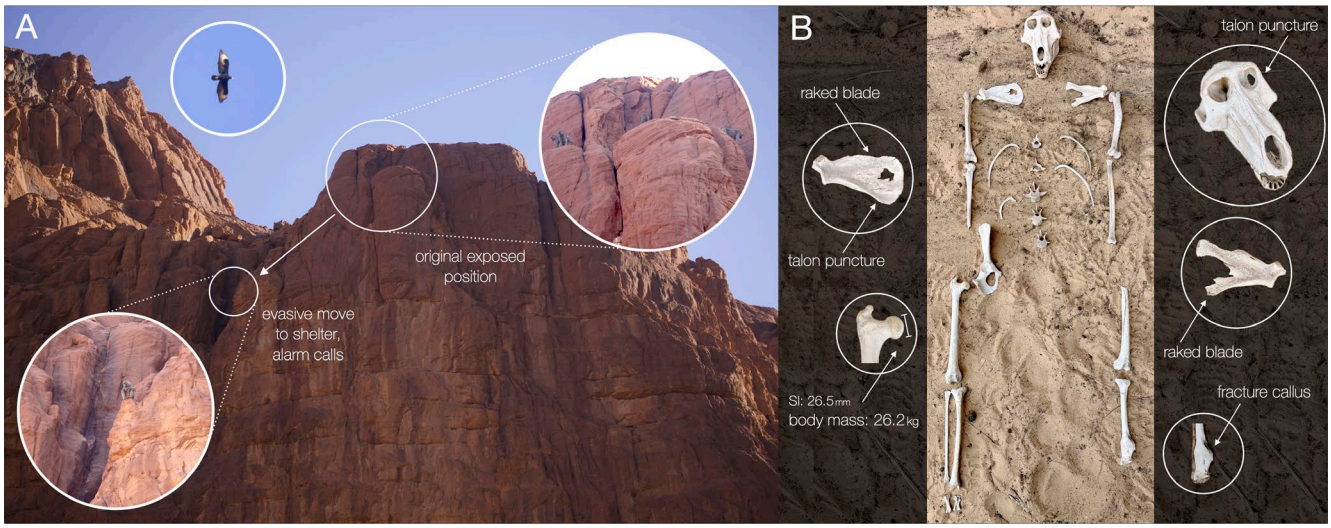


FIGURE 5 | Additional observations in June 2026. (A) A pair of Verreaux's eagles were observed daily in Wadi Nohi. On June 19, we observed a group of baboons on the north cliff of the wadi resting and grooming on the exposed shelves and pinnacles. A pair of Verreaux's eagles flew in the distance over the plateau from east to west, circled back and flew east along the cliff face in the direction of the baboons. Several individuals alarm called, and those in more exposed areas dropped rapidly to sheltered positions. Regular exposure to other raptors (e.g., the short-toed snake-eagle, *Circaetus gallicus*) elicited no response from the baboons. (B) Partial skeleton of an adult male with evidence of talon punctures to the left postorbital septum and right scapula. Raking is evident on both scapulae (cf. Figure 4). The large bony callus on the left distal tibia indicates a displaced, overriding fracture and malunion of the bone, resulting in a shortened hindlimb. The superoinferior (SI) breadth of the right femoral head indicates a body mass of 26.2 kg.

pressure overlooks the distinctly different defenses of cercopithecid primates toward felids and raptors (Gursky and Nekaris 2007; Wheeler 2008; Crofoot 2013). Males regularly intervene during eagle predation events, so much so, that these 'anti-predation services' are suggested to function as a form of costly signaling (van Schaik et al. 2022). If Verreaux's eagles are regular predators of adult male baboons exceeding 20 kg, then it stands to reason that some individual hominins were viable prey for eagles. It is a predation pressure that could have shaped the evolution of several key hominin traits, including body-size dimorphism and male cooperation and infant care.

4.4 | Postscript

Fieldwork in June 2026 led to further findings, including observations of baboons alarm calling toward and evading an approaching pair of Verreaux's eagles (Figure 5A), both behaviors that are specific to predatory species (Seyfarth and Cheney 1986; Zinner and Peláez 1999). We also found the partial skeleton of an adult male with an estimated mass of 26.2 kg (Figure 5B). Its punctured orbit and raked scapulae are consistent with the depredations of a large eagle (Figure 5B). Five additional femoral heads (Figure S2)—including that in Figure 5B—increased our total sample to nine individuals, eight of which are adult males with a mean estimated body mass of 22.2 ± 3.8 kg. The ninth individual (Figure S2_F7; at 13.7 kg) is either an unusually large female or a subadult male, when compared to adult conspecifics in the Awash Valley, Ethiopia (females: $\bar{x} = 11.7 \pm 1.3$ kg; males: $\bar{x} = 21.2 \pm 2.1$ kg; Phillips-Conroy and Jolly 1981). The male sex-bias in our sample is puzzling, but it argues against bone damage during avian scavenging, a phenomenon indifferent to sex. Taken together, these new findings expand and reinforce the preceding discussion and bolster the evidence that large male baboons are susceptible to avian predation.

Author Contributions

Catherine Hobaiter: conceptualization, investigation, funding acquisition, writing – original draft, methodology, validation, visualization, writing – review and editing, data curation, resources. **Tewogbade J. D. Akpona:** conceptualization, investigation, funding acquisition, writing – original draft, writing – review and editing, resources. **Gisela H. Kopp:** conceptualization, investigation, funding acquisition, writing – original draft, writing – review and editing, resources. **Nathaniel J. Dominy:** conceptualization, investigation, funding acquisition, writing – original draft, writing – review and editing, resources.

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Ethics Statement

All research was conducted under local and international research permissions, including the Animal Welfare and Ethics Committee of the University of St Andrews.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that supports the findings of this study are available in the Supplementary Material of this article.

Endnotes

[1] Extraordinary film footage of golden eagles using this strategy to hunt Spanish ibex (*Capra pyrenaica*; 24 kg) and chamois (*Rupicapra rupicapra*; adult yearlings: 15–20 kg; adult females: 25–45 kg) can be viewed in the Spanish television series *El Hombre y la Tierra* (episode 47, "El Águila Real II"; 1976), the semi-documentary drama *Brothers of the Wind* (2015), and the BBC television series *Frozen Planet II* (episode 3, "Frozen Peaks"; 2022).

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Figure S1:** Speculative face-off between an adult male baboon and Verreaux's eagle, drawn to scale. Direct confrontation is a typical counter-offense of adult male baboons toward some eagle species, along with barking and lunging. In this scenario, the eye and orbit are punctured by the rear (hallucal) talon (see insert), mapping the orbital damage seen in our cranial material. The hallucal talon is the primary killing talon of Verreaux's eagle, with typical lengths of 4.5–6 cm. Illustrations by Javier Lázaro. **Figure S2:** Five additional proximal femora collected in 2026 and used to estimate body mass of the individual baboons. In each case, scaled photographs of the femoral head were imported into ImageJ to estimate the superoinferior (SI) breadth (in red font) of the femoral head (cf. Ruff 2002, 2003). Estimated body masses ranged from 13.7 to 26.2 kg. Note that the two lightest individuals (F7, F9) are missing the greater trochanter apophysis indicating incomplete ossification of at the greater trochanteric physis, suggesting subadult age. If so, all nine individuals in our sample are male.