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Similar cranial trauma prevalence among Neanderthals and Upper Palaeolithic modern humans

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Supplementary Materials

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Supplementary Table 1: Neanderthal (NEA) specimens used in this study. Data collected from cited references. Column "n" displays the number of skeletal elements, column "sp-pres" displays specimen-preservation (rounded to the second decimal place).

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
Belgium	Spy 1	NEA	Central	old	male	8	0.48	no	43–46
	Spy 2	NEA	Central	young	male	8	0.46	no	43,45,46
Crimea	Zaskalnaya 5/Zsk VI-78	NEA	East	young	indet.	1	0.02	no	47,48
Croatia	Vindija 202	NEA	East	indet.	male	1	0.02	no	49–51
	Vindija 204/302	NEA	East	indet.	male	2	0.04	no	49–51
	Vindija 205	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 206	NEA	East	young	male	2	0.07	no	49–52
	Vindija 207	NEA	East	indet.	female	1	0.04	no	49,50,53–55
	Vindija 224	NEA	East	indet.	male	1	0.02	no	49–51
	Vindija 226/265	NEA	East	old	female	2	0.09	no	49–51
	Vindija 227/254	NEA	East	young	female	1	0.04	no	49–51
	Vindija 231	NEA	East	old	male	2	0.07	no	49–51
	Vindija 250	NEA	East	indet.	male	1	0.05	no	49–51
	Vindija 257	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 260	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 261/275	NEA	East	indet.	male	1	0.04	no	49–51
	Vindija 262	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 280	NEA	East	old	female	1	0.02	no	49–51
	Vindija 281	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 282	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 284-230-255-256/11.19-11.22-11.37-11.35	NEA	East	young	female	3	0.11	no	54
	Vindija 296	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 298	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 299	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 301	NEA	East	indet.	male	1	0.04	no	49–51
	Vindija 303	NEA	East	indet.	female	1	0.02	no	49–51
	Vindija 304	NEA	East	old	male	1	0.02	no	49–51
	Vindija 305	NEA	East	indet.	male	1	0.02	no	49–51
	Vindija 306	NEA	East	indet.	female	2	0.04	no	49–51
Czech Republic	Kůlna 1	NEA	East	young	male	1	0.04	no	43,56–60
	Kůlna 2	NEA	East	young	male	1	0.05	no	43,56–61
	Ochoz 1	NEA	East	indet.	indet.	2	0.07	no	43,60,62,63

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
France	Chapelle-aux-Saints 1	NEA	Central	old	male	12	0.86		43,64-68
	Combe Grenal A	NEA	Central	indet.	indet.	1	0.02	no	69
	Combe Grenal B	NEA	Central	indet.	indet.	1	0.02	no	69
	Combe Grenal C	NEA	Central	indet.	indet.	1	0.02	no	69
	Combe Grenal III	NEA	Central	young	indet.	1	0.04	no	69
	Combe Grenal IV	NEA	Central	young	indet.	1	0.02	no	69
	Combe Grenal 149	NEA	Central	indet.	indet.	1	0.04	no	69
	Ferrassie 1	NEA	Central	old	male	12	0.8	no	70-75
	Ferrassie 2	NEA	Central	young	female	2	0.07	no	70,71,73,74
	Fontéchevade 6	NEA	Central	old	male	3	0.16	no	76-78
	Genay 1	NEA	Central	old	male	5	0.11	no	79-84
	Hortus IV	NEA	Central	young	female	2	0.13	no	43,85,86
	Hortus V	NEA	Central	young	indet.	1	0.02	no	85,86
	Marillac 1	NEA	Central	indet.	indet.	1	0.02	no	85,87
	Marillac 2	NEA	Central	indet.	indet.	3	0.2	no	85,88
	Marillac 3	NEA	Central	indet.	indet.	2	0.05	no	87,89
	Marillac 12	NEA	Central	indet.	indet.	1	0.02	no	87
	Monsempron M8-95.2	NEA	Central	indet.	indet.	1	0.02	no	90
	Monsempron Grot1-Hom Rem 1	NEA	Central	indet.	indet.	1	0.07	no	90
	Le Moustier 1	NEA	Central	young	male	12	0.75	yes	91-98
	Petit-Puymoyen 2	NEA	Central	young	indet.	1	0.02	no	99-101
	Petit-Puymoyen 3	NEA	Central	young	indet.	2	0.05	no	99,100
	Petit-Puymoyen 7	NEA	Central	young	indet.	1	0.02	no	99,100
	Les Pradelles 31	NEA	Central	old	indet.	1	0.02	yes	87
	Les Pradelles 32 bis etc	NEA	Central	indet.	indet.	1	0.04	no	87,88
	Les Pradelles 34	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 42	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 44/44bis	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 50	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 58	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 60	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 64	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 73	NEA	Central	indet.	indet.	1	0.02	no	87
	Les Pradelles 74/74bis	NEA	Central	indet.	indet.	1	0.02	no	87

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
France	Les Pradelles	NEA	Central	indet.	indet.	1	0.02	no	87
	78/78bis/78ter/ 78quater								
	La Quina H5	NEA	Central	indet.	indet.	10	0.59	no	43,102–104
	La Quina H9	NEA	Central	indet.	indet.	1	0.07	no	105,106
	La Quina H10	NEA	Central	indet.	indet.	1	0.07	no	43,85,103
	La Quina- Amont 23a	NEA	Central	indet.	indet.	1	0.02	no	107,108
	La Quina- Amont 23b	NEA	Central	indet.	indet.	2	0.04	no	107,108
	La Quina- Amont 23c	NEA	Central	indet.	indet.	1	0.02	no	107,108
	La Quina H 27	NEA	Central	indet.	indet.	1	0.07	no	43,85,103,109
	La Quina 28	NEA	Central	old	indet.	1	0.02	no	107,110
	La Quina 34	NEA	Central	indet.	indet.	3	0.07	no	107,110
	Régourdou 1	NEA	Central	young	male	2	0.13	no	111–114
	St. Césaire 1	NEA	Central	young	male	8	0.36	yes	115,116
	Sakajia 1	NEA	Near East	young	indet.	1	0.02	no	117–119
	Feldhofer 1	NEA	Central	old	male	8	0.36	yes	120–123
Germany	Sarstedt II	NEA	Central	indet.	indet.	1	0.04	no	52,124,125
	Sarstedt III	NEA	Central	indet.	indet.	1	0.04	no	52,124,125
	Warendorf- Neuwarendorf	NEA	Central	young	indet.	1	0.04	yes	52,126,127
Gibraltar	Gibraltar 1	NEA	Iberia	old	female	10	0.66	no	43,128–130
Hungary	Subalyuk 1	NEA	East	young	female	3	0.09	no	63,131
Iraq	Shanidar 1	NEA	Near East	old	male	12	0.73	yes	132–135
	Shanidar 2	NEA	Near East	young	male	12	0.52	no	133,135
	Shanidar 4	NEA	Near East	old	male	12	0.48	no	133,135
	Shanidar 5	NEA	Near East	old	male	10	0.61	yes	133–136
	Shanidar 6	NEA	Near East	young	female	2	0.04	no	133,135
	Shanidar 8	NEA	Near East	young	female	1	0.02	no	133,135
	Amud 1	NEA	Near East	young	male	12	0.71	no	137–141
	Amud 2	NEA	Near East	indet.	male	1	0.02	no	137,139,140
Israel	Amud 14	NEA	Near East	indet.	indet.	1	0.04	no	142
	Kebara 2	NEA	Near East	old	male	2	0.14	no	134,143–149
	Kebara 6	NEA	Near East	old	indet.	1	0.02	no	144,149
	Breuil 1	NEA	South	indet.	indet.	1	0.04	no	150–152
	Ciota Ciara 1	NEA	South	indet.	indet.	1	0.04	no	151
Italy									

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
Italy	Fate 3	NEA	South	old	indet.	1	0.04	no	106,153
	Fate 4	NEA	South	indet.	indet.	1	0.02	no	106,153
	Guattari 1	NEA	South	old	male	11	0.77	no	43,106,151,154–156
	Guattari 2	NEA	South	old	male	2	0.11	no	43,101,106,151,154,156
	Guattari 3	NEA	South	young	male	1	0.07	no	43,101,106,151,154,156
Netherlands	Zeeland Ridges	NEA	Central	indet.	male	1	0.02	no	157
Russia	Chagyrskaya 5	NEA	East	indet.	indet.	1	0.04	no	158
Spain	Cova Foradà I	NEA	Iberia	old	female	3	0.07	no	159–161
	Cova Negra Parietal I	NEA	Iberia	young	male	1	0.07	yes	162–165
	Cova Negra Parietal II	NEA	Iberia	young	indet.	1	0.05	no	164
	Gegant 1	NEA	Iberia	young	indet.	2	0.07	no	166–168
	Horá 1	NEA	Iberia	young	indet.	1	0.02	yes	169
	Palomas 1	NEA	Iberia	old	indet.	2	0.09	no	170–172
	Palomas 59	NEA	Iberia	young	indet.	1	0.04	no	170,171
	Palomas 96	NEA	Iberia	young	female	6	0.21	no	173
	Contentcher	NEA	Central	old	female	2	0.05	no	174–177

Supplementary Table 2: Early Upper Paleolithic modern human (UPH) specimens used in this study. Data collected from cited references. Column "n" displays the number of skeletal elements, column "sp-pres" displays specimen-preservation (rounded to the second decimal place).

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
Austria	Willendorf 2	UPH	East	indet.	female	2	0.04	no	178,179
Bulgaria	Bacho Kiro 3575	UPH	East	old	indet.	1	0.02	no	180–182
Crimea	Buran Kaya III (1)	UPH	East	indet.	indet.	1	0.02	no	183
	Buran Kaya III (2)	UPH	East	indet.	indet.	1	0.02	no	183
	Buran Kaya III (3)	UPH	East	indet.	indet.	2	0.04	no	183
Croatia	Vindija 210/267	UPH	East	indet.	female	2	0.13	no	49,50,54
	Vindija 235	UPH	East	indet.	male	1	0.02	no	49,50,54
	Vindija n.n.	UPH	East	indet.	indet.	1	0.02	no	49,50,54
Czech Republic	Brno I	UPH	East	young	male	2	0.14	no	43,184,185
	Brno II	UPH	East	old	male	9	0.46	no	43,185–190
	Dolní Věstonice 3	UPH	East	old	female	14	0.93	yes	191–199
	Dolní Věstonice 11/12	UPH	East	old	male	5	0.25	yes	191– 193,196,198,198,200
	Dolní Věstonice 13	UPH	East	young	male	12	0.86	yes	191–196,200,201
	Dolní Věstonice 14	UPH	East	young	male	12	0.75	no	191–196,201
	Dolní Věstonice 15	UPH	East	young	male	12	0.84	yes	191–196,201–203
	Dolní Věstonice 16	UPH	East	old	male	12	0.82	yes	191–196,198,199,204
	Mladeč 1	UPH	East	young	female	12	0.84	no	205–208
	Mladeč 2, 7	UPH	East	young	female	9	0.48	no	205–208
	Mladeč 5	UPH	East	old	male	6	0.39	yes	205–211
	Mladeč 6	UPH	East	old	male	6	0.27	yes	205–208,210,211
	Mladeč 8	UPH	East	old	male	2	0.07	no	205–208,210
	Mladeč 39	UPH	East	young	male	1	0.02	no	205,206,208,210
	Mladeč 40	UPH	East	young	male	2	0.04	no	205,206,208,210
	Mladeč 48, 49, 52	UPH	East	young	indet.	2	0.07	no	205,206,208,210
	Mladeč 54	UPH	East	indet.	male	2	0.09	no	205,206,208,210
	Pavlov 1	UPH	East	old	male	11	0.64	yes	191–193,195,196
	Pavlov 3	UPH	East	young	indet.	1	0.02	no	191,192,195
	Pavlov 4	UPH	East	young	indet.	1	0.02	no	191,192,195
	Predmost 1	UPH	East	young	male	12	0.79	no	212–214
	Predmost 3	UPH	East	old	male	14	0.98	no	85,212–214
	Predmost 4	UPH	East	young	female	13	0.91	no	85,212–214
	Predmost 9	UPH	East	young	indet.	14	0.96	no	85,212–214
	Predmost 10	UPH	East	young	indet.	14	0.95	no	85,212–214

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
Czech Republic	Predmost 14	UPH	East	old	male	7	0.39	no	85,212–214
	Predmost 18	UPH	East	young	male	6	0.18	no	85,212–214
	Predmost 19	UPH	East	indet.	female	1	0.04	no	85,212–214
	Predmost 21	UPH	East	indet.	female	1	0.05	no	85,212,214,215
	Predmost 26	UPH	East	indet.	female	1	0.05	no	85,212,214
	Predmost 30	UPH	East	young	indet.	2	0.11	no	214
	Abri Pataud 1	UPH	Central	young	female	14	1.00	no	43,216,217
	La Balauzière 1	UPH	Central	old	female	3	0.13	no	218,219
	La Balauzière 2	UPH	Central	young	indet.	5	0.14	no	218,219
	Brassempouy 316	UPH	Central	old	indet.	2	0.04	no	220–222
	Cro Magnon 1	UPH	Central	old	male	14	0.95	no	223–226
	Cro Magnon 2	UPH	Central	old	female	11	0.61	no	223–226
	Cro Magnon 3	UPH	Central	old	male	4	0.27	no	223–225
	Crouzade 5	UPH	Central	indet.	indet.	2	0.09	no	227–229
	Crouzade 6	UPH	Central	young	indet.	1	0.02	no	227–229
	Cussac L2A	UPH	Central	indet.	male	9	0.64	no	230,231
France	Fontéchevade 5 (Homo I)	UPH	Central	indet.	female	1	0.02	no	76,77,85,232
	Isturitz 70	UPH	Central	indet.	indet.	2	0.09	no	229,233
	Vilhonneur 1	UPH	Central	young	male	4	0.29	no	77,234,235
	Tapolca 1	UPH	East	young	female	1	0.05	no	85,236–238
	el-Wad EM 3915	UPH	Near East	indet.	indet.	1	0.07	no	239–241
	el-Wad EM 3916	UPH	Near East	young	female	1	0.07	no	239–241
	el-Wad EM 3936	UPH	Near East	indet.	indet.	1	0.04	no	240,241
	Ohalo II H2	UPH	Near East	old	male	14	0.98	no	148,242–246
	Arene Candide	UPH	South	young	male	13	0.89	no	199,247,248
	"Principe"								
Hungary	Baousso da Torre 1	UPH	South	indet.	male	4	0.14	no	151,249,250
	Barma Grande 1	UPH	South	old	male	8	0.36	no	234,251,252
	Barma Grande 2	UPH	South	old	male	7	0.46	no	252–254
	Barma Grande 5	UPH	South	indet.	male	13	0.86	no	43,251–253,255
	Caviglione 1	UPH	South	old	female	13	0.09	no	256
	Grotta Paglicci 14 B	UPH	South	old	male	1	0.02	no	151,257,258
	Grotta Paglicci 15 C	UPH	South	indet.	male	1	0.64	no	151,257,258
	Grotta Paglicci 16 D	UPH	South	indet.	indet.	1	0.02	no	151,257
	Grotta Paglicci 20 I	UPH	South	young	female	1	0.09	no	151,257–259
	Grotta Paglicci 24 N	UPH	South	indet.	female	1	0.29	no	151,257–259
Israel									
Italy									

Country	Specimen	Taxon	Region	Age	Sex	n	sp-pres	Trauma	Ref.
Italy	Grotta Paglicci 25	UPH	South	young	female	12	0.05	no	151,260,261
	Grotta Paglicci 34	UPH	South	indet.	male	1	0.07	no	151,257,262
	Grotta Paglicci 36	UPH	South	young	male	1	0.07	no	151,257,262
	Grotta Paglicci 37	UPH	South	young	male	1	0.04	no	151,257,262
	Grotte des Enfants 4	UPH	South	indet.	male	14	0.98	no	43,151,263
	Grotte des Enfants 5	UPH	South	old	female	14	0.89	no	43,151,263,264
	Ostuni 1	UPH	South	young	female	14	0.14	no	151,265
Portugal	Caldeirão 1	UPH	Iberia	indet.	indet.	1	0.36	no	266,267
Romania	Cioclovina 1	UPH	East	old	male	8	0.46	yes	268–271
	Muierii 1	UPH	East	old	female	11	0.86	no	237,272–274
	Muierii 2	UPH	East	young	male	1	0.09	no	273–275
	Oase 1	UPH	East	young	male	2	0.14	no	275–278
	Oase 2	UPH	East	young	indet.	12	0.71	no	275–277,279
	Kostenki 2 Zamiatnin	UPH	East	old	male	9	0.54	no	280,281
	Kostenki 8 Telmanskaia	UPH	East	old	male	1	0.04	yes	281–283
Russia	Kostenki 14	UPH	East	young	male	14	1.00	yes	284–289
	Markina Gora								
	Pokrovka 2	UPH	East	young	indet.	1	0.05	no	288
	Sunghir 1	UPH	East	old	male	14	1.00	no	290–295
	Sunghir 5	UPH	East	old	indet.	10	0.48	yes	293–295
	Sunghir 6	UPH	East	young	indet.	2	0.11	no	293–295
	Mollet III 379	UPH	Iberia	old	female	5	0.3	no	296
Spain	Parpalló 1	UPH	Iberia	young	female	11	0.73	no	258,297–299

Supplementary Table 3: Cranial traumatic lesions of Neanderthals (NEA) and early Upper Paleolithic modern humans (UPH). Descriptions are summarized from cited references and reproduce the original authors' descriptions and diagnoses.

Specimen	Taxon	Skeletal element	Traumatic lesions	Timing	Examination method	Ref
Les Pradelles 31	NEA	maxilla right	(1) <i>hypervascularization on right maxillary torus, inconclusive etiology:</i> Mussini (2011) describes a developed hypervascularization on the right maxillary torus above first molar, with a size of 18x4 mm. Localized areas of hypervascularization and intensified bone remodeling can stem from various conditions like infectious, traumatic, neurovascular, or tumorous, she reports.	antemortem	macroscopic	87
Le Moustier 1	NEA	frontal	(1) <i>lesion on left orbit/superciliary arch:</i> Ullrich (2005) describes a defect (18x24 mm) centered above the left orbital margin. The external table chipped off (17x5 mm), exposing diploë and the frontal sinus. The defect shows an irregular medial margin and a regular, slightly curved lateral margin. Ullrich identifies several bone fragments at the margins of the lesion which are depressed yet still attached, and describes a fracture line originating from the upper margin of the lesion. He interprets the lesion to be the result of a strong impact when the bone was still fresh.	perimortal	macroscopic	95
		parietal left	(2) <i>defect on left parietal, possibly perimortal, inconclusive etiology:</i> On the left parietal bone, Ullrich (2005) describes an area of missing bone reaching from the coronal to the lambdoid suture. The defect has a more regular superior and an irregular inferior margin and exhibits no fissures or fracture lines. Previously, this defect has been interpreted as an intentional blow to the head by Gieseler (1952). Yet, the defect's margins exhibit edges at right angles to the bone surface as well as splintered-off regions exposing diploë and the inner table. According to Ullrich the former would suggest a postmortem defect, while the latter could indicate a perimortal fracture, therefore precluding the defect from a definite diagnosis.	peri- or postmortal	macroscopic	95,300
		parietal right	(3) <i>comminuted fracture to right parietal:</i> The right parietal bone was reconstructed from several fragments. Ullrich (2005) describes eight radiating fracture lines originating from a central fractured area (35x24 mm) close to the parietal tuber (25 mm from the sagittal, and 50 mm from the lambdoid sutures), as well as some concentric fractures. Most of the fracture lines are also visible endocranially. On the inside of the skull the internal table is splintered-off (40x40 mm) at the location of the central fractured area. Ulrich concludes that such characteristic are clearly indicative of a comminuted perimortal fracture.	perimortal	macroscopic	95
		mandible left	(4) <i>healed mandibular fracture, deformed mandibular condyle:</i> The origin - whether pathologic or taphonomic - of the deformed left mandibular condyle of Moustier 1 and its elevated left mandibular ramus has been debated since its discovery. Ponce de Léon & Zollikofer (1999, 2005) argue for a condylar neck fracture resulting from a fall or	antemortem	macroscopic	93,301

blunt trauma. They observe bone resorption and apposition of the left condylar neck, as well as remodeling extending to the ramus mandibulae and external acoustic meatus. They rule out a taphonomic origin of the deformation because the deformed condyle fits well into the glenoid fossa. As differential diagnosis they propose condylar ankylosing spondylitis.

St. Césaire 1	NEA	frontal	(1) <i>healed trauma on frontal bone, extending to right parietal:</i> Zollikofer et al. (2002) interpret the rounded medial margins (68 mm long) of aligned fronto-parietal fragments as antemortem trauma. The rounded edges are covered with cortical bone and do not exhibit diploë, excluding postmortem damage as an explanation. Regarding its location at an oblique angle right of the mediansagittal plane, and its rather smooth edges, the authors argue against the possibility that the margin could represent a cranial suture, ossicle or remnants of a fontanelle. Instead, they interpret that the lesion was inflicted by a sharp implement, and that the site of impact was close to the coronal suture, as indicated by a fractured and dislocated inner bone table. Advanced bone remodeling evidences a survival of the injury.	antemortem	CT Scan	115
		parietal right	(2) <i>healed lesion on right parietal:</i> Continuation of lesion (1) described above.	antemortem	CT Scan	115
Feldhofer 1	NEA	frontal	(1) <i>healed trauma above right orbit:</i> Schultz (2006) describes a healed rounded lesion (15x6 mm) above the right orbit, characterized by an upper and a lower facet within the depression of the lesion, of which the latter exhibits irregular ridges. He interprets these features to be the result of a sharp and pointed impact causing bone loss, most likely by a stone tool or a fall on a sharp rock. The lesion is well healed.	antemortem	macro- & microscopic (magnifying glass, binocular low magnifying microscope)	121
Warendorf-Neuwarendorf	NEA	parietal right	(1) <i>lesion with inflammatory signs on right parietal:</i> The surface of the external table of the parietal fragment is irregularly thickened and porotic. Czarnetzki & Trellisó Carreño (1999) suggest that this vascularization could be post-traumatic, and could have resulted from an osteomyelitis, caused by an injury to the scalp and its subsequent inflammation.	antemortem	macroscopic, x-ray	126,302
Shanidar 1	NEA	frontal	(1) <i>healed superficial lesions on right side of frontal:</i> Trinkaus (1983) mentions healed ectocranial lesions (not specified how many) on the right frontal bone, close to the frontal tuber. These probably resulted from injuries that damaged the periosteum but not the bone itself.	antemortem	macroscopic	132,133
			(1.1) <i>healed trauma to left orbit, extending to left zygomatic:</i> On the left side of the face, Trinkaus (1983) diagnoses a healed trauma which affected the orbit and zygomatic bone and resulted in an irreversible facial deformity. He reports a flattened lateral orbital margin with signs of bone healing, and a reduced breadth of the left orbit compared to the right. Trinkaus assumes that this lesion caused blindness to the left eye.	antemortem	macroscopic	

		zygoma left	(2) <i>deformed zygomatic bone, caused by same traumatic event as (1.1):</i> Continuation of lesion (1.1) described above. Like the orbit, the left zygomatic bone is altered in shape and exhibits an enlarged craniocaudal height, as well as signs of healing across the entire bone.	antemortem	macroscopic	132,133
Shanidar 5	NEA	frontal	(1) <i>healed superficial lesion on frontal:</i> The frontal squama exhibits a depressed, rough groove (5mm wide) running anteriorly, but roughly parallel to the coronal suture, from the midline to left stephanion. The diploë and inner table are not affected. Trinkaus and Zimmermann (1982) suggest that the groove was caused by an injury to the scalp which damaged the periosteum. The lesion is fully healed.	antemortem	macroscopic	132,133
Cova Negra Parietal I	NEA	parietal right	(1) <i>lesion on right parietal:</i> In its anterosuperior portion, the Cova Negra parietal shows a rough surface (25 mm wide) between the temporal line and the sagittal suture. Additionally, bone thickness appears to be reduced. Fusté (1953) attributes these features to represent bone remodeling following a trauma which did not affect the inner table.	antemortem	macroscopic	163,165
Horá 1	NEA	frontal	(1) <i>notch of possible traumatic origin, inconclusive etiology:</i> Haber Uriarte (2002) mentions a little notch on the Horá fragment which might be related to a trauma during lifetime (no further information provided).	if trauma: antemortem?	macroscopic	169
Dolní Věstonice 3	UPH	frontal	(1) <i>healed minor lesion on frontal:</i> There is a shallow, healed lesion to the frontal bone (16.5x13 mm), which is restricted to the outer bone table. Trinkaus et al. (2006) conclude a minor trauma to the periosteum and outer table. Remodeled bone indicates healing.	antemortem	macroscopic	198
			(1.1) <i>deformation left orbit:</i> Same traumatic event as lesion (3). See description below.	antemortem	macroscopic	
		temporal left	(2) <i>deformation left temporal:</i> Same traumatic event as lesion (3). See description below.	antemortem	macroscopic	198
		mandible left	(3) <i>fractured left mandibular condyle:</i> The viscerocranium of DV3 shows facial asymmetry. Trinkaus et al. (2006) favor the explanation that a trauma fracturing the left mandibular condyle (and possibly the zygomatic bone) caused these changes. Remodeling processes, both during healing and as a secondary response to altered biomechanical loads, resulted in the observed altered morphology of the mandibular ramus, zygomatic and frontal bones (orbit), and caused the arthritic condition in the glenoid fossa of the left temporal. Nevertheless, the injury was survived and healed.	antemortem	macroscopic	198
		zygoma left	(4) <i>deformation left zygomatic:</i> Same traumatic event as lesion (3). See description above.	antemortem	macroscopic	198

Dolní Věstonice 11/12	UPH	frontal	<i>(1) healed depressed trauma on frontal squamous:</i> There is a healed, depressed lesion (27x19 mm) above the right orbit which left traces on both fragments DV11 and 12 (not aligned). The DV12 fragment exhibits a pronounced depression with an irregular surface, resulting from bone remodeling. The traumatic impact was severe enough to not only damage the external table and diploë, but also leave a permanent yet minor deformation of the internal table. Nevertheless, the injury is well healed. As described by Trinkaus et al. (2006), the same traumatic lesion is observable on the DV11 calotte. Right of the midline, the frontal fragment of the calotte exhibits a bevelled and rounded inferior edge (17 mm wide) with vascular porosities, which Trinkaus interprets to be the superior edge of the lesion.	antemortem	macroscopic	198,303
			<i>(1.1) abnormal thinning of squamous frontal:</i> Along the edge of DV12's lateral left side, Trinkaus et al. (2006) distinguish a rounded bevelled edge (5 mm long), exhibiting no diploë, from neighbouring postmortem damage and recognize a thinning of the frontal squama. The authors agree for a traumatic origin of the lesion. As a less likely differential diagnosis, they propose senile thinning of the frontal squama.	not specified, but presumably antemortem	macroscopic	
		parietal right	<i>(2) lesion on right parietal, inconclusive etiology:</i> The DV11 calotte exhibits a shallow depression (11x15 mm) in the right parietal, located in the anteromedial angle between the coronal and sagittal sutures. While Vlček (1991) interprets this lesion to be a healed minor trauma, Trinkaus et al. (2006) express uncertainty about its etiology.	if trauma: antemortem	macroscopic	198,303
Dolní Věstonice 13	UPH	frontal	<i>(1) minor healed frontal trauma:</i> The frontal bone shows a shallow depression (20 x 8 mm) located 40 mm above the right orbit, close to the midline. The diploë is not affected. There is root-etching in the area of interest, too, but Trinkaus et al. (2006) identify signs of bone remodeling and therefore argue for a traumatic origin of this healed minor lesion.	antemortem	macroscopic	198
		parietal right	<i>(2) healed lesion on right parietal:</i> There is a minor lesion (12 x 11 mm) in the anteromedial angle of the right parietal bone. Trinkaus et al. (2006) cannot specify whether the trauma affected the diploë or was restricted to the periosteum and the outer bone table. Anyway, the lesion is healed.	antemortem	macroscopic	198
		occipital	<i>(3) bone deposit on occipital:</i> Trinkaus et al. (2006) mention a raised formation of new bone (20 x 6.5 mm) at the superior nuchal line of the occipital bone, located close to the left mastoid process. The authors assume an association of this muscle attachment irregularity with a minor trauma.	not specified	macroscopic	198
Dolní Věstonice 15	UPH	frontal	<i>(1) small healed lesion on frontal:</i> The frontal bone exhibits an irregularly shaped shallow lesion (12x9 mm) left of the median-sagittal line below bregma. The minor injury was fully healed as indicated by remodeling.	antemortem	macroscopic	198

		parietal right	<i>(2) healed depression on right parietal:</i> A small lesion (7 mm in diameter) with circular edges is observable on the right parietal bone. Even though it is very shallow, Trinkaus et al. (2006) assume that the outer bone table was fractured and the lesion was not only superficial. Yet, the edges are well healed. <i>(2.1) vertical notch on right parietal, inconclusive etiology:</i> Also in the right parietal, Trinkaus et al. (2006) identify a groove (13 mm long) located alongside the squamomastoid suture. The authors mention morphological similarities with a healed trauma, but, since it could also be remnants of the suture, its etiology remains unclear.	antemortem	macroscopic	198
Dolní Věstonice 16	UPH	frontal	<i>(1) healed frontal lesion:</i> Trinkaus et al. (2006) describe a lesion (ca. 18x13 mm) located approx. in the midline of the frontal bone, close to the coronal suture. It remains unclear whether the well-healed lesion was a superficial trauma to the periosteum, or damaged the outer bone table, too. Either way, it did not affect the diploë. <i>(1.1) small lesion on frontal:</i> Just 23 mm away from lesion (1), there is a second superficial minor lesion (ca. 9x7 mm) on the frontal bone of DV16. Trinkaus et al. (2006) speak of either “a small compression fracture or scrape” (Trinkaus et al. 2006, 446) which is healed. <i>(1.3) groove on frontal, inconclusive etiology:</i> Above the right orbit, there is a linear groove (ca. 15 mm long), which could either represent a unilateral frontal groove or a healed injury, as stated by Trinkaus et al. (2006).	antemortem	macroscopic	198,303
		occipital	<i>(2) groove on occipital:</i> Another groove (25 mm long) is located on the left side of the occipital bone at the nuchal line, and is bulging at its inferior end. Trinkaus et al. (2006) speak of it being a possible healed injury.	antemortem	macroscopic	198,303
		maxilla left	<i>(3) maxilla malposition:</i> The viscerocranium of DV16 appears asymmetric due to an anterosuperior displacement of the left maxilla, involving morphological alterations to the orbit, zygomatic bone and mandibular occlusion. Trinkaus et al. (2006) argue for a congenital or developmental etiology of the features, but discuss an antemortem traumatic origin as an alternative, yet less likely, explanation.	if trauma: antemortem	macroscopic	198,303
Mladeč 5	UPH	frontal	<i>(1) healed traumatic lesion on frontal:</i> There is a depressed lesion (12 x 8 mm) with an irregular ground surface above the left orbit, which damaged the outer bone table and diploë. Bone remodeling indicates full healing of this suggested antemortem blunt force trauma.	antemortem	macroscopic, CT Scan	207,210

		parietal right	<i>(2) depression on right parietal, etiology and timing inconclusive:</i> In its anterior part the right parietal bone exhibits a large depression (40 x 25/30 mm). Szombathy (1925) described this to be an injury which was associated with a sagittally oriented fracture line (35 mm long) on the internal table. Macroscopically, Teschler-Nicola et al. (2006) could not verify this endocranial fracture line due to recent restoration work. Yet, CT images revealed an involvement of both the outer and inner tables, but no signs of healing or remodeling which would verify the depression as antemortem trauma. Frayer et al. (2006) discuss whether the depression was caused postmortem, or if it might represents an anatomical feature (parasagittal depression). Its etiology and possible timing remains unclear.	inconclusive	macroscopic, CT Scan	207,209,210
			<i>(2.1) healed lesion on right parietal:</i> There is another lesion (9x6 mm) on the right parietal bone, located posterior to the parietal tuber. The ground of the depression, which is limited to the external table, is slightly porous. Teschler-Nicola et al. (2006) and Frayer et al. (2006) suggest an antemortem, fully healed traumatic lesion.	antemortem	macroscopic	
Mladeč 6	UPH	frontal	<i>(1) small healed depression on frontal:</i> The left frontal squama exhibits a depressed area (13x6 mm), which is surrounded by a porotic and irregular surface, indicative of remodeling and healing. <i>(1.1) minor depression, inconclusive etiology:</i> Frayer et al. (2006) mention a second minor depression on the frontal bone, which may also represent a healed trauma. However, since the specimen is a cast, its etiology is not definite.	antemortem	macroscopic	207,210
		parietal right	<i>(2, 2.1) two porous areas on right parietal, inconclusive etiology:</i> Two areas of severe porotic hyperostosis can be found on the right parietal bone. Such porosities are often related to malnutrition, but can also results from soft tissue inflammations following a trauma, as suggested by Teschler-Nicola et al. (2006).	if trauma: antemortem	macroscopic	207
Pavlov 1	UPH	parietal left	<i>(1) healed lesion on left parietal:</i> Trinkaus et al. (2006) describe a curved depressed line (60 mm long, max. 5 mm wide) running from the the left temporal line towards bregma. He interprets the shallow groove as a healed minor injury to the scalp.	antemortem	macroscopic	198
		parietal right	<i>(2) small depression on right parietal:</i> There is a small depression (9 mm in diameter) in the inferior part of the right parietal, close to the lambdoid suture, exhibiting small bony outgrowths. Trinkaus et al. (2006) describe this lesion, but without providing an interpretation. <i>(2.1) depression on right parietal, inconclusive etiology:</i> Trinkaus et al. (2006) describe a second lesion, identifiable as a depressed area (10-15 mm in diameter), located between the coronal and sagittal sutures and the right parietal tuber.	not specified	macroscopic	198
				if trauma: antemortem	macroscopic	

			However, the authors express uncertainty about its etiology (healed minor trauma, depression evoked by swellings along the coronal and sagittal sutures, or normal anatomical variation).			
Cioclovina 1	UPH	frontal	(1) <i>healed lesion above nasion:</i> First mentioned by Rainer & Simionescu (1942), there is a traumatic depression (12 mm in diameter) on the frontal bone, right of the midline (ca. 50 mm above nasion). The minor lesion, restricted to the outer bone table, is well healed.	antemortem	macroscopic	269,304
			(1.1) <i>healed lesion above right orbit:</i> On the right side of the frontal bone, above the right orbit, there is a second minor healed traumatic lesion (9 mm in diameter), which is also limited to the outer bone table.	antemortem	macroscopic	
Kostenki 8 Telmanskaia	UPH	frontal	(1) <i>healed lesion on frontal bone, probably trepanation:</i> The frontal bone exhibits a marked cone-shaped depression (8 mm) on its right squamous portion, which did not extend to the inner bone table. Mednikova et al. (2012) suggest an intravital trepanation as the most likely explanation for the lesion. They discuss a tumour or blunt force trauma as alternative explanations but assume them less conclusive regarding morphological features. The rounded margins of the lesion reveal it was fully healed.	antemortem	macroscopic, x-ray	282
Kostenki 14 Markina Gora	UPH	frontal	(1) <i>healed trauma on right side of frontal bone:</i> On the right side of the frontal bone Kostenki 14 exhibits a healed lesion (10-12 mm).	antemortem	macroscopic, CT scan	287,289
		parietal right	(1) <i>healed trauma on right parietal:</i> The right parietal bone shows a healed lesion. The authors also identified an intracranial calcified hemorrhaging in the right parietal, possibly caused by a traumatic blow.	antemortem	macroscopic, CT scan	287,289
Sunghir 5	UPH	frontal	(1) <i>healed minor lesion on frontal:</i> Trinkaus et al. (2014) report a minor healed trauma, indicated by a small depressed area just above the right orbital margin. The latter appears slightly vaulted downwards.	antemortem	macroscopic	295

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