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ORIGINAL ARTICLE

Tooth Evulsion in the Maghreb: Chronological and Geographical Patterns

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Abstract The practice of tooth evulsion was widespread in the Maghreb from the Iberomaurusian through to the Neolithic. We present an updated summary of the geographical and chronological distribution of different patterns of tooth evulsion during this period based on a site-by-site review. Tooth evulsion was almost universal during the Iberomaurusian but typically restricted to the upper central incisors. During the Transitional Epipalaeolithic, the practice was extended to include removal of a minimum of four central incisors in both males and females. During the Capsian the custom became less prevalent and more variable, suggesting regional difference and a possible change or diversification of social meaning. A markedly higher prevalence of tooth evulsion among females during the Capsian period supports this interpretation. The prevalence of tooth evulsion was further reduced in the Neolithic.

Résumé La pratique d'evulsion dentaire était répandue dans le Maghreb à partir de l'Iberomaurusien jusqu'au Néolithique. Nous présentons un résumé de la distribution géographique et chronologique des différents modèles d'evulsion dentaire pendant cette période, basé sur une revue des sites individuels. L'evulsion dentaire était presque universelle à l'époque Ibéromaurusienne, celle-ci étant limitée au niveau des incisives centrales supérieures. Pendant l'épipalaeolithique, la pratique s'est étendue au niveau des quatre incisives centrales, autant pour les homes que pour les femmes. Pendant le Capsien, la pratique devenait de moins en moins répandue et de plus en plus variée, suggérant des différences régionales et un possible changement ou diversification de signification sociale. Une predominance d'evulsion chez les femmes au Capsien est en faveur de cette interpretation. L'occurrence d'evulsion dentaire continuait à réduire au Néolithique.

Keywords Tooth evulsion · Maghreb · Iberomaurusian · Capsian · Neolithic · Late Upper Palaeolithic · Holocene

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Introduction

The practice of tooth evulsion was widespread in the Maghreb (the northern parts of Morocco, Algeria and Tunisia) during the late Pleistocene and Holocene starting during the Iberomaurusian and continuing into the Neolithic (Briggs 1955; Camps 1974; Camps-Fabrer 1975; Chamla 1978). Tooth evulsion (also known as tooth ablation) involves the deliberate removal of healthy teeth during the lifetime of an individual, and has been recorded in a variety of ancient and modern societies around the world (Tayles 1996, Han and Nakahashi 1996). The visual impact of this type of dental modification is very striking and would have been immediately obvious to other individuals from the same or different communities. Numerous reasons have been proposed for the custom including group identification, ornamentation, and rites of passage such as coming of age, marriage and mourning. The specific social meaning of tooth evulsion is likely to remain obscure for ancient populations and may have diversified over time within those groups (Han and Nakahashi 1996).

Dental evulsion can have a significant effect on the emergence, occlusion and wear patterns of the remaining teeth. The removal of the upper central incisors leads to a particularly distinctive mandibular morphology (Fig. 1). Ferembach et al. (1962) noted that evulsion of the upper central incisors in individuals from Taforalt caused an elevation of the symphyseal region of the associated mandible. The absence of the occluding upper incisors causes the lower incisors to emerge beyond their normal occlusal plane and to exhibit very little wear in comparison to the rest of the dentition. The lateral incisors, canines and sometimes the anterior premolars show a sloped pattern of wear, increasing towards the back of the mouth, in a curved or occasionally stepwise fashion. This gradient is observed in the anterior mandibular dentition as a whole and on individual teeth. Typically the lateral incisors demonstrate the steepest gradient between the mesial and distal edges of

Fig. 1 Characteristic changes in the emergence and wear of the lower dentition in a young adult male from Hattab II individual showing evulsion of the permanent upper central incisors. The lower incisors have emerged above their normal occlusal plane into the void created by the absence of the upper incisors, and exhibit very little wear relative to the rest of the dentition. The lower lateral incisors, canine and premolar display a sloping wear gradient, with wear increasing from the front to back of these teeth. In some individuals the visual impact of this uneven wear pattern is further emphasised as a result of premature loss of the posterior teeth caused by dental disease. Photo by Ian R. Cartwright

the tooth. The alteration of the normal occlusal plane and the uneven wear patterns create the impression of an elevated symphyseal region that has been described by previous authors (Ferembach et al. 1962) and is sometimes referred to as "compensation" (e.g. Marchand 1936).This pattern is so distinctive that it can be regarded as evidence of evulsion of the maxillary incisors, even in the absence of an associated maxilla.

Removal of the two lower central incisors at a sufficiently young age can cause the remaining lower teeth to migrate forward, causing a mesial inclination of the crown of each tooth relative to the root, and occlusal abnormalities (Briggs 1955). In the absence of any confirmed examples of removal of the mandibular incisors without evulsion of the associated maxillary incisors, it is not possible to demonstrate what effect this would have on the emergence and wear of the maxillary teeth. Camps (1974) and Camps-Fabrer (1975) both include records of individuals with evulsion of (just) the lower incisors, but we have not been able to confirm the existence of any individual showing this pattern of evulsion where both mandible and maxilla could be observed. Deliberate removal of anterior teeth can also have a marked influence on the morphology of the craniofacial skeleton. Alveolar bone loss associated with the removal of the upper incisors is associated with a noticeable reduction in facial height (nasion-prosthion) and other measurements that use prosthion as a landmark (Arambourg et al. 1934; Ferembach et al. 1962; Lubell et al. 1984). Hadjouis (2002) provides a detailed account of the effect of tooth evulsion during development on craniofacial architecture.

Over the years several authors have undertaken comprehensive or partial reviews of the pattern of tooth evulsion in the Maghreb during the Iberomaurusian to Neolithic periods (Briggs 1955; Camps 1974; Camps-Fabrer 1975; Chamla 1978). Previous reviews of tooth evulsion in the Maghreb have addressed three main factors that may contribute to variation in the expression and prevalence of this practice: (a) Differences between the Iberomaurusian and subsequent groups including Capsian and various different Neolithic groups; (b) differences between males and females and (c) variation in the age at which evulsion was practiced.

Camps (1974) noted that Iberomaurusian groups belonging to the Mechta Afalou type systematically practiced evulsion of the upper incisors, and that the practice continued into the Neolithic in related groups. The most common practice involved removal of the upper central incisors, and the minimum expression involved evulsion of one central incisor. Since tooth evulsion was almost universal during the Iberomaurusian, there is no clear difference between the sexes (Camps 1974). During the Capsian, tooth evulsion was not universal but when practiced, it typically involved both upper and lower incisors (Camps-Fabrer 1975; Chamla 1978). Briggs (1955) suggested that there was no regular sexual preference governing the practice of evulsion during the Capsian, pointing out that the presence and absence of evulsion could be observed in both males and females. More recently, Chamla (1978) observed that during the Capsian period tooth evulsion was more common in females (77.7% out of 18) than in males (46.6% out of 15). During the Neolithic, tooth evulsion could involve maxillary and mandibular teeth or just maxillary teeth and was not universally practiced. Several authors have suggested that distinct regional differences in the prevalence and pattern of evulsion had developed by the Neolithic. Camps (1974) noted that evulsion in the Mediterranean

Neolithic commonly involved teeth from both jaws. Chamla (1978) reported that evulsion was rare in the east with only 1 out of 28 individuals affected, but more common in the west where 30 out of 42 individuals (71%) were affected. Males and females seem to have been equally affected during the Neolithic (Chamla 1978).

A number of different approaches have been used to ascertain the age at which evulsion was practiced (Briggs 1955). First, among large samples including children, adolescents and young adults, the age distribution of individuals with and without evulsion may reveal a consistent pattern. In practice it has only been possible to apply this approach to a small number of ossuary samples in which individuals of all age ranges are reasonably well represented (Arambourg et al. 1934; Chamla 1970). In the case of multiple tooth extractions, the possibility of an age related progression could also be investigated. Second the amount of wear on opposing teeth that were retained could reveal whether the occluding tooth was present for long enough to cause wear. Third, the extent of drift of teeth retained in the same jaw and the degree of inclination of their long axis could give an indication of when the gap appeared. Another potentially informative feature would be the degree of alveolar bone resorption and remodelling among young adults of different ages.

In this review we present an updated summary of the geographical and chronological distribution of different patterns of tooth evulsion in the Maghreb during the Late Upper Palaeolithic and early Holocene (Fig. 2), using stricter criteria than those employed by previous authors. We have excluded cases where there is uncertainty over the dating of a site or the relationship of a burial to the cultural horizon in which it was found. We include only those individuals represented by a sufficiently complete maxilla and mandible, and have excluded individuals where this is uncertain (for example at Aïn Keda in Algeria).

Iberomaurusian Sites

The Iberomaurusian represents the earliest Upper Palaeolithic/Late Stone Age technology in the Maghreb and covers a time span of more than 10,000 years from >20,000 to at least 10,000 BP (Lubell 2001; Bouzouggar et al. 2008). The majority of Iberomaurusian human remains are from caves and rock shelters located fairly close to the present day coastline (Fig. 2). Data are available for eight sites (Appendix): Afalou-bou-Rhummel, Columnata, Hattab II, Ifri n'Ammar, Kef-oum-Touiza, Rachgoun, Taforalt, Taza.

Capsian Sites

The Capsian period dates from around 9,800 BP and can be divided into an earlier Typical Capsian and a later Upper Capsian (see Jackes and Lubell 2008). Most human remains assigned to the Capsian period were excavated from *escargotières*, small to large open-air mounds characterised by large quantities of edible land snails within a dark grey ashy deposit (Lubell 2001). Sites are inland and concentrated in

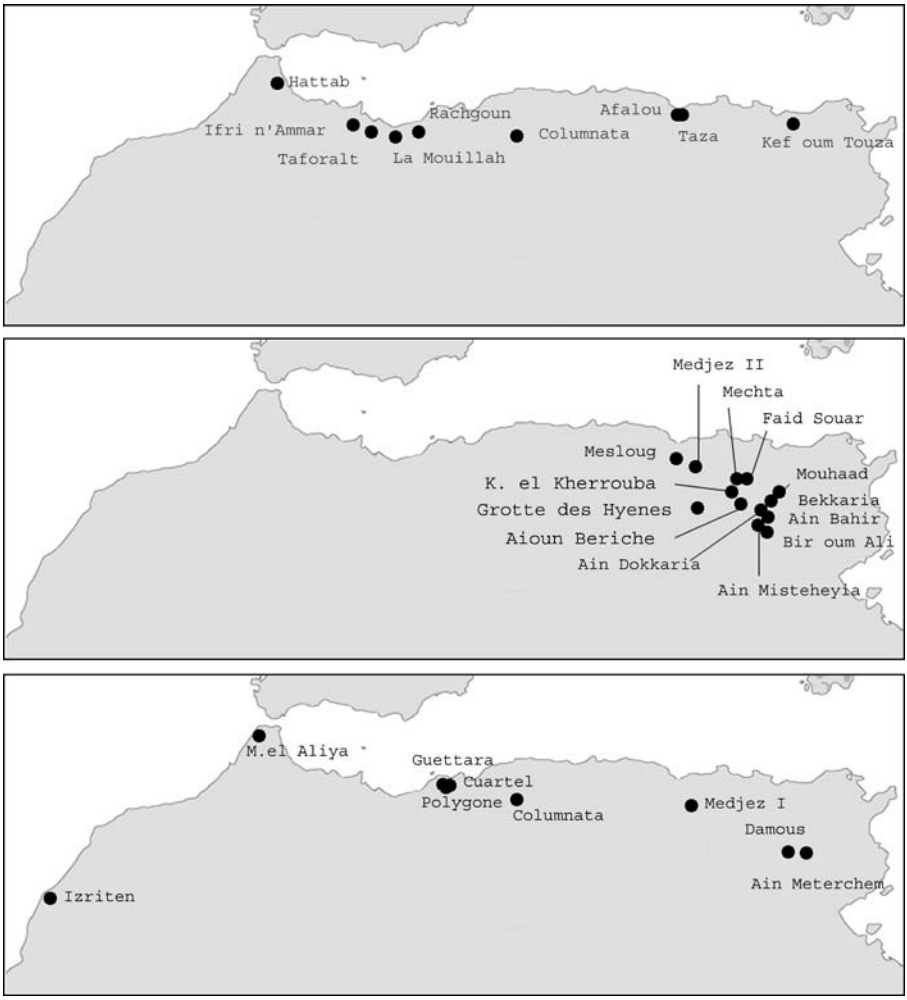

Fig. 2 Distribution of archaeological sites with human remains from the Iberomaurusian (*top*) Capsian (*middle*) and Neolithic (*bottom*) periods in Morocco, Algeria and Tunisia

Eastern Algeria and Tunisia (Fig. 2). Most known Capsian sites contain human remains and those that meet the criteria for inclusion here (Appendix) are: Aïoun Beriche (site 12), Aïn Bahir, Aïn Dokkara, Aïn Misteheyia, Bekkaria, Bir Oum Ali, Faïd Souar II, Grotte des Hyènes, Koudiat-el-Kherrouba, Khanguet el Mouhaâd, Mechta el Arbi, Medjez II, and Mesloug.

Neolithic Sites

Human remains assigned to the Neolithic belong to a number of different cultural traditions and are found in a variety of open air localities, caves and rock shelters, both coastal and inland (Fig. 2). Those included here (Appendix) are: Aïn Guettara,

Aïn Meterchem, Columnata, El Cuartel, Damous-el-Ahmar, Grotte du Polygone, Izriten (Site 11), Medjez I and Mugharet al Aliya.

Discussion

The sites presented in this review represent only a small proportion of the localities which have yielded human remains from the Iberomaurusian, Capsian and Neolithic periods. Fragmentary remains from numerous other sites reveal evidence of tooth evulsion, either directly, where teeth are missing in one of the jaws, or indirectly, where an isolated mandible shows a pattern of tooth emergence and wear that is characteristic of individuals with evulsion of the maxillary incisors. Since it is not usually possible to establish the pattern of evulsion in the missing jaw, we have excluded material from these sites in this summary. Information from the other sites may be helpful in establishing the chronological and temporal boundaries of particular practices but does not allow patterns of evulsion to be reconstructed on an individual by individual basis. In other cases we have had to exclude material due to lack of information. In many site reports, particularly those relating to sites from the Neolithic, tooth evulsion is simply not mentioned. This could be for several reasons, including lack of a comprehensive anthropological report or poor preservation, and may not imply the absence of tooth evulsion at those sites. Poor excavation and curatorial standards have led to the loss of a great deal of material excavated in the early part of the last century or previously, and in several cases, skeletal remains were lost before they had been fully described (Balout 1954; Briggs 1955). An example is the site of La Mouillah in Algeria where fragmentary remains of at least 15–16 individuals were excavated from a series of rock shelters between 1908 and 1910 (Balout 1954). Early reports imply that evulsion of the upper incisors, typically the upper centrals, was common in this series (Marchand 1936), but no details concerning the age and sex of these individuals were published and by 1949 the series was considered to be too damaged for inclusion in a broader comparative study (Briggs 1955).

A further and perhaps ultimately more important problem concerns the absence of direct dating at many of the sites that have yielded human remains. Several potentially interesting samples were excluded from this study as a result of differences in opinion concerning their age and cultural affiliation, including Grotte de La Tranchée, Gambetta, Djebel Taya, Grotte d'Ali Bacha and Champlain (Arambourg et al. 1934; Balout 1954; Balout and Briggs 1949a, b; Chamla 1978; Camps 1974). In the absence of independent dating, the age of a skeleton has sometimes been inferred from the cultural context, burial rites and items associated with the burial, and even the state of preservation or pattern of tooth evulsion. It is also possible that important material from some early excavations has been overlooked. Camps-Fabrer (1975: 319) warns that archaeologists may have been too quick to assume burials that are shallow, buried in an extended position, or lacking evulsion, could not be Capsian even if found in an *escargotière*.

A summary of the prevalence of different patterns of tooth evulsion according to period and sex is presented in Table 1. Among the Iberomaurusian sample, 97% of individuals had undergone extraction of at least one incisor from only the upper jaw.

Table 1 Summary of tooth evulsion according to period and sex

	Male	Female	Undetermined
Ibéromaurusian			
No evulsion	Kef-oum-Touiza		
Evulsion of upper teeth only	Afalou (*n*=22) Taforalt (*n*=10) Columnata H2/a Hatttab 2 Ifri n'Ammar Rachgoun H3	Afalou (*n*=11) Taforalt (*n*=7) Rachgoun H4 Taza	Afalou (*n*=2) Taforalt (*n*=2) Rachgoun H1
Evulsion of upper and lower teeth			Columnata H1/a
Transitional Epipalaeolithic			
Evulsion of upper and lower teeth	Columnata H3/a Columnata H5-H6/a Columnata H10/a Columnata H36/a Columnata H40/a	Columnata H5-H6b Columnata H5-H6/c Columnata H8/a Columnata H22 Columnata H33/a Columnata H49	Columnata H43
Capsian			
No evulsion	Aïn Dokkara Aïn Misteheyia Bir Oum Ali Medjez II H1 Medjez II H3	Aïn Bahir	Bekkaria 1 Bekkaria 8
Evulsion of upper teeth only			Mechta "Florance"
Evulsion of upper and lower teeth	Aïoun Beriche (n=2) Mechta 8	Aïoun Beriche Faïd Souar Koudiat-el-Kherouba Khanguet el Mouhaâd Mechta 9 Mechta 32 Medjez II H2	Grotte des Hyenes Mesloug
Neolithic			
No evulsion	Aïn Meterchem Columnata H29 Mugharet al Aliya	Izriten 1 Medjez I	Damous-el-Ahmar 1 Damous-el-Ahmar 2 Izriten 2
Evulsion of upper teeth only	Aïn Guettara El Cuartel		
Evulsion of upper and lower teeth			Grotte du Polygone

The most common pattern of tooth evulsion involved removal of both upper central incisors. The only Iberomaurusian individual recorded as showing evulsion of both upper and lower incisors is an adolescent from Columnata (H1a) aged between 15 and 18 years, and in this case it may be reasonable to ask whether the burial has been correctly identified as belonging to the Iberomaurusian period. Unusually for this period, one adult male, from Kef-oum-Touiza, lacked tooth evulsion, but this individual had an abnormal fusion of the first and second upper right incisors and a small natural midline gap in the maxilla, so the absence of evulsion may be due to the unusual natural configuration of the anterior dentition. Evulsion of the upper two central incisors can be considered characteristic but not diagnostic of the Iberomaurusian period.

Within the scope of this survey, the Transitional Epipalaeolithic is represented at a single site, Columnata. The minimum expression of tooth evulsion among adults within this sample involved removal of the four upper and lower central incisors. Half of the adult sample had experienced removal of all eight permanent incisors, and a further quarter had lost at least one lateral incisor. Since all adults in the sample had experienced tooth evulsion, there were no differences in the prevalence of this practice between males and females. The average number of teeth lost to evulsion was marginally higher in males (6.6) than in females (6.3.)

Within our Capsian sample, five males, one female and two individuals of undetermined sex showed no evidence of tooth evulsion, one individual of undetermined sex showed evulsion in only the maxilla, and three males, seven females and two individuals of undetermined sex had lost teeth in both jaws. In total, 62% of Capsian individuals experienced tooth evulsion, but the practice was noticeably more common among females (88%) than among males (38%).

The practice of tooth evulsion remained widespread in the Neolithic but very little material was sufficiently complete or sufficiently well described for inclusion in this study. Within our small sample, only three out of 11 individuals (27%) showed evidence of tooth evulsion. Of these, two individuals showed evulsion in only the upper jaw and one individual had lost teeth from both jaws.

Inferences concerning the age at which evulsion was practiced are very preliminary since few cranial remains of juveniles and adolescents have been recovered and fully described. At Afalou-bou-Rhummel, the youngest individual in the sample showing tooth evulsion was aged between 14 and 16 years, but two other adolescents, aged 12–14 years and 16 years, still have their incisors intact. One child of approximately six years had lost an upper deciduous incisor some time prior to death, but this loss may have been coincidental since three other children aged between 3 and 6 years showed no evidence of tooth evulsion. At Columnata, the youngest individual in the sample showing tooth evulsion was aged at 12–15 years (H43) whereas several juveniles aged between 6 and 10 years year lacked any evidence of evulsion. On this basis Chamla (1970) tentatively suggested that evulsion may have been practised on individuals aged between 10 and 12 years, which may be slightly earlier than what is implied at Afalou-bou-Rhummel. One juvenile aged approximately 11 years from the Capsian site of Aïoun Beriche lacked tooth evulsion, whereas three adults from the site had undergone evulsion of all eight incisors (Mary Jackes and David Lubell, personal communication).

This survey reveals marked regional and cultural variation in the prevalence of tooth evulsion and the manner is which it was expressed in the Late Pleistocene and early Holocene populations of the Maghreb, but these variations are not sufficiently distinct to be considered culturally diagnostic at the individual level. During the Iberomaurusian, tooth evulsion was almost universal but typically restricted to the upper central incisors. Among the epipalaeolithic sample from Columnata, evulsion remains universal and was extended to include removal of at least four upper and lower incisors in both males and females. During the Capsian the practice of tooth evulsion became less prevalent and more variable suggesting a possible change or diversification of social meaning. This diversification is notable in view the relative

spatial proximity of the Capsian sites included in this survey (Fig. 2) as it may point to localised variation in the underlying meaning or differential group identification within a relatively restricted region. The marked bias towards females among Capsian individuals who experienced tooth evulsion supports this interpretation (see also Rahmani 2003: 296–7). The prevalence of tooth evulsion was further reduced in the Neolithic, but the small sample discussed here probably fails to represent a diversity of traditions among different Neolithic groups. The underlying motivation for this type of dental modification may never be known but further work focussing on the age of occurrence and other subtle variations between cultural groups may contribute to a greater understanding of this practice, which showed remarkable persistence for a period of more than 10,000 years.

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Appendix: Instances of Evulsion at Different North African Sites

Table 2 Details of tooth evulsion at North Africa sites

Site	Period	Type of site	Excavated	Evulsion: description	References
Afalou-bou-Rhummel	Iberomaurusian	Rock shelter	1928–9, 1983–93	At least 35 adults excavated in 1928–9 exhibit evulsion of the upper incisors and no mandibular evulsion is reported. Four patterns are represented: (a) evulsion of a single central incisor (3 males, 1 female); (b) evulsion of both upper central incisors (15 males, 8 females, 2 unknown); (c) evulsion of both upper central and one lateral incisor (2 males, 1 female); (d) evulsion of both upper central and both lateral incisors (2 males, 1 female). A further eight disarticulated skeletons were found in a separate burial chamber (Hachi 1996)	Arambourg et al. 1934; Hachi 1996
Columnata	Iberomaurusian, transitional Epipalaeolithic and Neolithic	Rock shelter	Mid twentieth century	More than 100 partial skeletons are recorded representing several periods. Fifteen are sufficiently well preserved to allow full evaluation. An Iberomaurusian adult male (H2/a) shows evulsion of the upper central incisors and an adolescent (H1/a) assigned to this period has evulsion of all eight incisors. All 12 individuals from the Transitional Epipalaeolithic had incisors removed from both jaws, with no clear difference in the pattern observed in males and females: Evulsion of all eight incisors was observed in 50% of individuals (two adult males, three adult females, one adolescent). H29, a Neolithic adult male has no evulsion.	Chamla 1970
Hattab II	Iberomaurusian	Cave	2002–3	A young adult male shows evulsion of both upper central incisors and no mandibular evulsion.	Barton et al. 2008
Ifri n'Ammar	Iberomaurusian	Cave	2002	A young adult male shows evulsion of both upper entral incisors and no mandibular evulsion.	Moser 2003
Kef-oum-Touiza	Iberomaurusian	Cave	1938	A male less than 30 years has an unusual dental configuration but no evulsion.	Balout and Briggs 1949a

Rachgoun	Iberomaurusian	open air shell midden	1954, 1966	Four partial skeletons show evulsion of the upper central incisors. H3 (adult male) also had evulsion of the upper right lateral incisor. Three mandibles associated with H1, H3 (male) and H4 (female) lack evulsion.	Camps 1966
Taforalt	Iberomaurusian	Cave	1944–47, 1950–77	An estimated 80 adults and up to 100 subadults were recovered near the back of Grotte des Pigeons. All adults showed evulsion of one or both upper central incisors, with no other teeth affected. The most common form of evulsion involved removal of both upper central incisors, with seven males, five females and two adults of indeterminate sex affected (67% of cases). Three males and two females are reported to show evulsion of only one upper central incisor, but these observations may have been made on incomplete maxillae.	Ferembach et al. 1962
Taza	Iberomaurusian	Cave	1990	Isolated skull of a middle aged female from the upper level at Taza Cave 1 shows evulsion of the upper central incisors and no mandibular evulsion.	Meier et al. 2003
Aïoun Beriche (Site 12)	Capsian	*Escargotière*	1930	Approximately 20 individuals were excavated during the 1930 Logan Museum expedition. Of these, only three adult skulls, two males and female, are in reasonably good condition and both show evulsion of all eight incisors.	Balout 1954; Briggs 1955; Haverkort and Lubell 1999; M. Jackes and D. Lubell, personal communication
Aïn Bahir	Capsian	*Escargotière*	1934	A fragmentary skull and mandible of an aged female shows no evidence of evulsion.	Balout 1954
Aïn Dokkara	Capsian	*Escargotière*	1949	A male aged between 25 and 30 years shows no evidence of evulsion.	Balout 1954; Chamla 1973
Aïn Misteheyia	Capsian	*Escargotière*	1976	A young adult male skeleton with almost complete dentition and no evidence of evulsion.	Meiklejohn et al. 1979; Lubell et al. 1982–83
Bekkaria	Capsian	*Escargotière*	1937	Eight adults and two children were excavated. Individuals 1 and 8 (no sex recorded) show no evidence of evulsion. An adult female (individual 2) shows evulsion of the lower central incisors, but it is not clear if the maxilla was observed.	Le Du and Sérée de Roch 1953; Balout 1954
Bir Oum Ali	Capsian	*Escargotière*		A partial male skeleton shows no evulsion.	Balout 1954

Table 2 (continued)

Site	Period	Type of site	Excavated	Evulsion: description	References
Faïd Souar II	Capsian	*Escargotière*	1954	The skull of a young adult female has undergone a number of pre- and post-mortem modifications including evulsion of all four upper incisors and both lower central incisors.	Vallois 1971
Grotte des Hyènes	Capsian	Cave	1925–6	At least six individuals excavated. The only skull described in detail shows evulsion of all eight incisors. It has been considered either male or female.	Arambourg et al. 1934; Balout 1954; Chamla 1978; Briggs 1954; 1955; Lubell et al. 1984
Koudiat-el-Kherrouba	Capsian	*Escargotière*	1933	A fragmentary female skull shows evulsion of all eight incisors.	Arambourg et al. 1934; Balout 1954
Khanguet el Mouhaâd	Capsian	*Escargotière*	1921–49	At least five individuals were excavated, but only Mouhaâd 5, found in 1944, is reliably associated with the Capsian deposits. This young adult female shows all eight incisors and both lower canines removed.	Balout 1954; Briggs 1953, 1955
Mechta el Arbi	Capsian	*Escargotière*	1907–27	A large number of human remains were removed during a series of excavations. Several different numbering systems have been applied and it is not always possible to find an exact correspondence between numbering systems and varying descriptions of the material. For this reason we have only included four individuals in this survey. The "type male" skull found by Debruge and Mercier in 1912 (Briggs' "Mechta 8" = 1912-III) shows evulsion of the upper and lower central incisors, and the same pattern is reported for the "Mechta 9" (=1912-IV) female. A skull excavated by Debruge and Florance in 1913 and illustrated by Arambourg et al. (1934), and considered by them to be male, shows evulsion of the upper central incisors only. Three adult crania found by the Logan Museum expedition of 1926–7 and initially described by Cole (1928) were re-examined by Briggs (1950) who disagreed with many aspects of the original interpretation. Both authors are agreed that the third	Cole 1928; Arambourg et al. 1934; Briggs 1950; Balout 1954; Briggs 1955

				skull (Cole's III, Briggs' Mechta 32 = 1927-IV) was that of a young female who had undergone evulsion of the upper and lower central incisors.	
Medjez II	Capsian	*Escargotière*	1966–68	Four adults and three neonates were excavated. Two adult males (H1 and H3) show no evulsion. An older adult female (H2) had lost two maxillary and possibly all four mandibular incisors as well as a lower canine and premolar, although some of these losses may not be due to evulsion.	Camps-Fabrer 1975
Mesloug	Capsian	*Escargotière*	1927	Two partial mandibles show evulsion of the lower central incisors. One shows a characteristic sloped wear pattern on the lateral incisors, suggesting that the upper central incisors had also been removed pre-mortem.	Balout 1954
Aïn Guettara	Neolithic	*Escargotière*		A male skull from the Neolithic level shows evulsion of both upper central and one upper lateral incisor.	Camps 1974; Chamla 1978
Aïn Meterchem	Neolithic	*Escargotière*	1948	A male aged between 40 and 50 shows no evidence of tooth evulsion.	Camps 1974; Chamla 1978; Vallois and de Felice 1979
El Cuartel	Neolithic	Cave	1892–3	One adult male maxilla exhibits evulsion of the upper central incisors, and is associated with a mandible showing characteristic over-emergence of the incisors. Several other mandibles were found both with and without evulsion of the incisors, but these lack associated maxillae.	Vaufrey 1939; Balout 1954; Chamla 1978
Damous-el-Ahmar	Neolithic	Cave	1912	Two skeletons (H1, H2) and an ochre stained skull (H3) have been lost, but surviving photographs indicate that H1 and H2 lack tooth evulsion.	Cluzel 1979; Roubet 2006
Grotte du Polygone	Neolithic	Cave	1888 and 1890s	Disarticulated human remains include several mandibles with and without evulsion of the lower incisors. A complete skull of a young adult shows evulsion of two upper and four lower incisors.	Balout 1954; Vaufrey 1939
Izriten (Site 11)	Neolithic	Coastal shell midden	1961–2	Partial skeletons of a young adult female, a second young adult and an adolescent were recovered. Both adults had all permanent teeth present.	Charon et al. 1973
Medjez I	Neolithic	*Escargotière*	1965	A female shows no evidence of tooth evulsion.	Cluzel 1979
Mugharet al Aliya	Neolithic	Cave	1936–38	A young adult male shows no evidence of tooth evulsion.	Balout 1954

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