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Short Communication

Tooth eruption versus tooth emergence

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ABSTRACT

The use of the term 'eruption' to designate the moment a tooth breaks out through the gum is a common linguistic misconception. We think the term 'emergence' is more appropriate. However, the dental literature has employed the term 'eruption' much earlier and more frequently. In this paper, we have addressed this misconception in detail, provided some statistics about the use of the two terms in the dental literature and provided our recommendations.

Introduction

Tooth eruption is a developmental process "whereby a tooth moves from its developmental position in the jaw into its functional position in the mouth" [1]. This definition infers that the process is essentially a dynamic one comprising all tooth movements from the earliest stages of crown development whereby the position of the developing tooth is affected by the growth of the jaw and the development of adjacent teeth, through root development and the resulting axial intra-osseous migration, leading to cutting through the overlying gingival mucosa and the intra-oral axial movement until the tooth reaches the occlusal plane, contacts the tooth/teeth of the opposing arch and starts its masticatory function in the mouth. However, in clinical practice and in the dental literature, tooth eruption is often used only to describe the momentary stage of cutting through the overlying gingival mucosa, which should be more appropriately referred to as 'emergence'. We consider this inappropriate use of the term 'tooth eruption' a misconception, and thus, the aim of this paper is to address this issue in more details, highlighting the linguistic origins of the terms 'eruption' and 'emergence' and their use in other linguistic contexts and presenting some statistics for using the two terms in the dental literature.

The term 'eruption' arises from the Latin term "erupttione" which means "output with momentum" [2]. According to Oxford dictionary, the verb 'erupt' is derived from the Latin term 'ērumpĕre' which literally means to break out, burst forth, throw out or force out [3]. The term 'eruption' is used in various fields of biological and non-biological sciences. For instance, in biology and anatomy, it is used to describe the moment the tooth breaks out through the gum and appears into the mouth. In dermatology, it is used to describe sudden appearance of skin lesions and infections (e.g. pustules) [4]. Furthermore, it can be used to indicate the release of molecular materials (e.g. release of immune mediators such as cytokines) [5]. In non-biological sciences, the term eruption is used even more frequently. It is used in geology (e.g. rupture of rivers and springs), volcanology (e.g. forcing out lava) [6]. and astronomy and solar sciences (e.g. eruption of solar filaments) [7]. It is also used in sociology and politics and various other fields (e.g. violence has erupted between the two parties). In all of the aforementioned, it is note-worthy that the term eruption is being employed to refer to something breaking out suddenly, dramatically and sometimes forcefully and infers dynamicity.

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The term ‘emerge’, on the other hand, is derived from and Latin ēmergĕre through French émerger and means “to come forth into view; to pass out, issue, from an enclosed space, area of obscuration” [3]. It is more generic than ‘erupt’ and it can be applied in any context to designate anything appearing from invisibility. In contrast to ‘erupt’, ‘emerge’ is momentary and neither infers sudden, forceful or dramatic breaking out nor does it designate dynamicity.

Both ‘eruption’ and ‘emergence’ are used in the dental literature to describe the moment a tooth breaks out through the overlying mucosa, though eruption is used more frequently. Medline electronic database (1946 – present) was used to search for published papers containing the terms ‘eruption’ and ‘emergence’ according to the following combining sets (including animal studies):

- ‘Emergence’ search: (("tooth" or "teeth" or "dent*") and ("age*" or "timing" or "time*" or "sequence*" or "pattern*" or "standard*" or "order*") and emergence).m_titl.
- ‘Eruption’ search: (("tooth" or "teeth" or "dent*") and ("age*" or "timing" or "time*" or "sequence*" or "pattern*" or "standard*" or "order*") and eruption).m_titl.

The searches relied on using either of the two terms in the paper title in conjunction with other relevant title keywords. Since the misconception we propose was only limited to using ‘eruption’ to describe the momentary stage of breaking out through the overlying gingiva and not the dynamic axial intra-osseous and intra-oral migration process of the tooth, we have carefully used keywords to only include the former situation. (Table 1) provides the statistics of the search results. There was a total of 327 papers that used either of ‘emergence’ or ‘eruption’ in conjunction with other title keywords. Only 56 papers used ‘emergence’ and the rest (270) used ‘eruption’. The ratio of the use of ‘eruption’ to the use of ‘emergence was 1.0: 4.8, which means for each paper using ‘emergence’, there were 4.8 papers using ‘eruption’. It is apparent that the term ‘eruption’ was used in the dental literature much earlier than ‘emergence’. In fact, the first publication that used ‘emergence’ was dated in 1963, whereas ‘eruption’ was used in 1946, the starting year of publication in the database[8]. (Figure 1) is bar graph plotting of the number of publications shown in table 1 and presents the decade-wise frequency distribution of the publications. It is obvious that the seventies witnessed the highest number of publications using ‘eruption’ and the nineties the lowest numbers for using both ‘eruption’ and ‘emergence’. The eighties and the current decades record the highest number of using ‘emergence’ across all decades. In conclusion, ‘eruption’ has been much earlier and more frequently used than ‘emergence’.

Linguistically, the term ‘eruption’ infers dynamic, forceful and sudden breaking out. This may be a successful employment of the term in geology, volcanology and solar sciences. In fact, the moment a tooth cuts through the overlying mucosa is very slow, passive and clinically predictable. The tooth crown is usually showing through or bulging underneath. Therefore, we find the term ‘emergence’ more linguistically appropriate because it literally means to come forth into view from concealment which is what actually happens in the moment a tooth appears into the mouth.

Nevertheless, we think ‘eruption’ is still appropriate to use to label the full dynamic process of tooth migration from the earliest formation up until occlusal contact. In fact, there is no evidence that this eruption process stops after the tooth has made an occlusal contact with its antagonist since the removal of the opposing tooth may lead to over-eruption of that previously-stable tooth [1]. The full process of eruption can be further subdivided to two phases; the intra-osseous and the intraoral. The intra-oral phase of tooth eruption may be also named ‘clinical eruption’ or ‘clinical duration of eruption’ whereby the tooth is clinically visible in the mouth making its way toward occlusal contact [9, 10]. The term ‘functional eruption’ refers to the moment when the tooth reaches the occlusal plane and establishes contact with the opposing tooth/teeth [10].

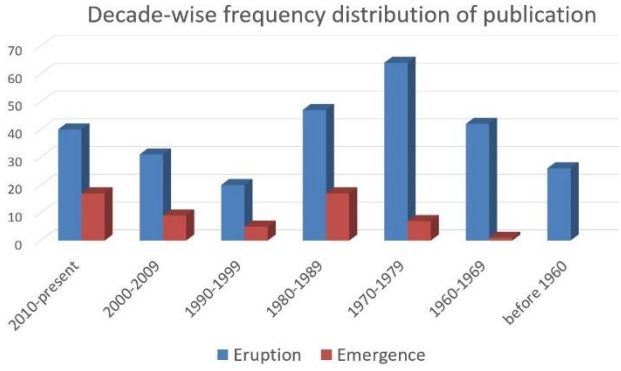

Figure 1: A bar graph presenting decade-wise distribution of ‘emergence’ and ‘eruption’ Medline publications.

Table 1: Decade-wise distribution of Medline publications containing the terms ‘eruption’ and ‘emergence’ to describe the moment of breaking through the gum

Decade	Emergence search	Eruption search	Total	Emergence: Eruption
2010-present	17 (30.4%)	40 (14.8%)	57 (17.4%)	1.0: 2.4
2000-2009	9 (16.1%)	31 (11.5%)	40 (12.2%)	1.0: 3.4
1990-1999	5 (8.9%)	20 (7.4%)	25 (7.6%)	1.0: 4.0
1980-1989	17 (30.4%)	47 (17.4%)	64 (19.6%)	1.0: 2.8
1970-1979	7 (12.5%)	64 (23.7%)	71 (21.7%)	1.0: 9.1
1960-1969	1 (1.8%)	42 (15.6%)	44 (13.5%)	1.0: 42.0
Before 1960	0 (0%)	26 (9.6%)	26 (8.0%)	
1954 - present	56 (100%)	270 (100%)	327 (100%)	1.00: 4.8

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