

# A new classification of surgical guides for crown lengthening

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## ABSTRACT

Crown lengthening is a commonly performed surgical procedure in dental practice. Surgical guides assist clinicians to establish appropriate soft and hard tissue architecture. Herein, a new classification of surgical guides for crown lengthening is introduced in the present study. According to the features of the length indicator unit (LIU), the surgical guides are classified as three types. Type I, LIU indicates the planed gingival margin at the tissue level. Type II, LIU indicates both the planed gingival margin and alveolar crest at the tissue level. Type III, LIU indicates the planed gingival margin at the tissue level and the alveolar crest at the bone level, respectively.

## KEYWORDS

Dental Esthetics; Crown Lengthening; Gingivectomy; Alveolectomy

Crown lengthening to create gingival symmetry and harmony is a commonly performed surgical procedure in dental practice. The clinical result is strongly affected by several variables, of which the position of the gingival incision and the extent of the alveolectomy are very important.<sup>1</sup> Herein a new classification of surgical guides for crown lengthening based on the length indicator unit (LIU) are introduced.

## CLASSIFICATION

The clinical scenario of crown lengthening for maxillary incisors, involving gingivectomy and alveolectomy, is used to illustrate the LIU classification (Table 1 & Fig. 1).

**Table 1.** Classification of surgical guides for crown lengthening.

Classification	Length Indicator Unit	Yes / No	Placement level
Type I	Gingival margin	Yes	Tissue level
	Alveolar crest	No	—
Type II	Gingival margin	Yes	Tissue level
	Alveolar crest	Yes	Tissue level
Type III	Gingival margin	Yes	Tissue level
	Alveolar crest	Yes	Bone level

### 1 Type I

The type I guide has an LIU that indicates the planed gingival margin at the tissue level (Fig. 1A).<sup>3-5</sup> It enable the surgeon to visualise the anticipated gingival margin more accurately. However, when performing the alveolectomy, the surgeon is required to measure the distance from the gingival margin to the alveolar crest using a periodontal probe, and determine the appropriate amount of alveolar bone to remove based on visual examination (Fig. 1B). “Mapping out” the incision rather than determining it by freehand or by “eyeballing” the relevant parameters reportedly yields more predictable results.<sup>4</sup> But the lack of a guide for bone resection may result in inadequate and unpredictable post treatment esthetics.<sup>6</sup>

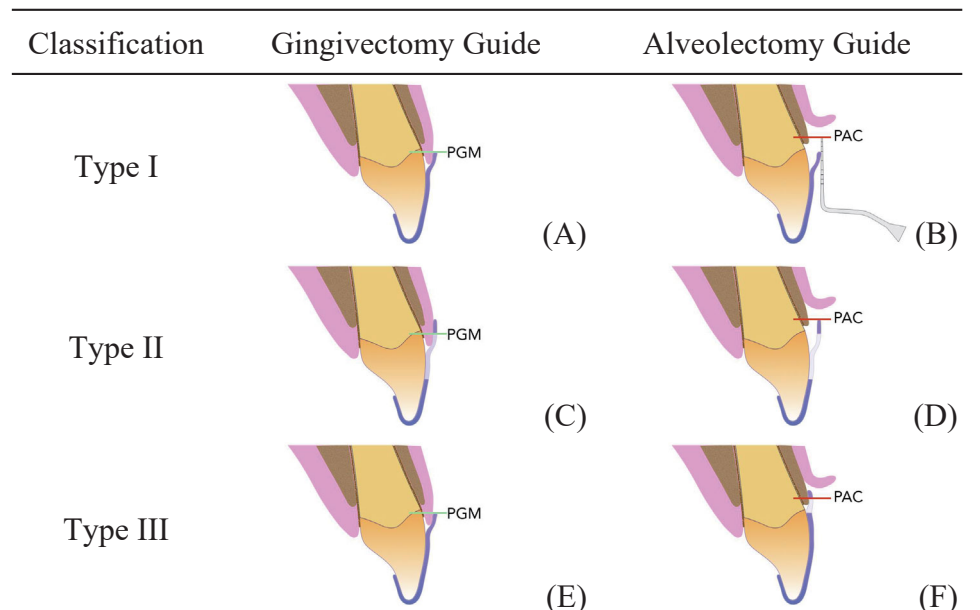
### 2 Type II

Type II guides have a double LIU that indicates both the planed gingival margin and alveolar crest at the tissue level (Fig. 1C–D),<sup>7</sup> therefore reducing guesswork and surgical time. However, this type of guide adheres to the gingival surface rather than the bone surface. It is remote from the bone architecture after flap elevation, and marking the bone quantity removal will lead to undesired outcomes attributable to parallax.<sup>6</sup> In addition, the surgical

guide is removed when performing the alveolectomy. As a result, the range of bone resection is not constrained and the reserved alveolar cannot be protected. These considerations may compromise accuracy.

### 3 Type III

Type III guides have a double LIU that indicates the planed gingival margin at the tissue level (Fig. 1E) and the alveolar crest at the bone level (Fig. 1F).<sup>6</sup> The references at their respective levels avoid parallax and subsequent inaccuracy, thus enhancing treatment predictability.<sup>6</sup> In addition, the excess bone is removed through a window in the alveolectomy guide that is placed during the surgery, so as not to damage any reserved bone.



**Fig. 1.** LIU classification of surgical guides for crown lengthening. Gingivectomy guide (A, C, E) and alveolectomy guide (B, D, F) of type I (A, B), type II (C, D) and type III (E, F) surgical guides at sagittal view. LIU, length indicator unit. PGM, planed gingival margin (green line). PAC, planed alveolar crest (red line).

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