# Mucogingival Pouch Flap for Sandwich Bone Augmentation: Technique and Rationale

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*This article introduces a novel flap design, mucogingival pouch flap (MPF), to enhance the clinical outcome of sandwich bone augmentation. MPF uses a pouch flap reflection via mucogingival junction extension incisions to provide an improved graft retention, minimized membrane exposure, preserved papilla dimension, and soft tissue camouflage for improved esthetics.There are 4 implant-associated buccal dehiscence defects in 3 patients treated with sandwich bone augmentation technique in conjunction with MPF. All cases yielded an adequate new bone thickness of 1.5–3.5 mm as well as a height of 84% to 100% at 6 months. Rationales, indications, contraindications, advantages, and disadvantages for MPF designs are further discussed. (Implant Dent 2005;14:349–356)*

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Pilot concept studies on the guided tissue/bone regeneration technique have proved that predictable bone regeneration/augmentation is possible when the wound stabilization[1] is attained *via* tenting, space maintenance, complete gingival coverage of the membrane, and epithelial cell exclusion.[2-5] Guided bone regeneration has evolved *via* various phases: (1) improvement of the material properties (*e.g.*, bone particle size,[6] tissue integration, biodegradation, membrane porosity); (2) modification of the host bone bed for maximized osteopromotive potential (*e.g.*, decortication[7], cortical penetration[8]); (3) strategic layering of the overlying bone particles (*i.e.*, sandwich technique)[9]; (4) addition of growth factors for enhanced early wound healing; and (5) improvement of a flap design for early wound closure and minimized membrane exposure.[10] Long-term studies in human beings showed that the loaded implants within the regenerated bone are equivalent to that in native bone.[11-13] A systemic review of 13 studies (1741 patients) has further confirmed that the guided bone regeneration technique yielded predictable survival rates ranging from 85.7% to 100%.[14] Therefore, the guided bone regeneration technique has proved many times over the years as an effective alternative to block grafting procedures.

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Despite the advancement of guided bone augmentation, significant variations exist in flap designs among different studies. Although not a sole factor, a poorly designed flap, for instance, may result in an increased incidence of early membrane exposure, which is often associated with significant reduction in new bone formation (21% to 65%) compared to unexposed cases (75% to 100%).[15-18] To maintain the soft tissue closure over surgical sites, different flap designs have been introduced: vestibular approach,[19] split flap approach,[20] coronally positioned palatal sliding flap,[21] rotational buccal pedicle flap,[22] and a rotated palatal pedicle flap.[10] However, many of these designs rely on the adequate gingival thickness for connective tissue harvesting or extension. Therefore, their use may be limited in the area where vital structures are in the vicinity and where a thin gingiva was present. This article presents 4 successful sandwich bone augmentations (SBAs) in 3 patients using a new flap design (mucogingival pouch flap [MPF]), which may overcome some of the limitations faced by the earlier designs, emphasizing in particular the early wound healing, improved graft retention, minimized membrane exposure, and improved esthetics.

## Surgical Technique– "Mucogingival Pouch Flap (MPF)"

### Technique and Rationale

Table 1 describes and shows the rationales and technique associated with MPF design. Detailed description of this flap design is listed in the following.

### Semilunar Crestal Incision

A beveled semilunar crestal incision is placed using the keratinized gingiva width of adjacent teeth as a reference (Fig. 1A). In cases in which gingival recession is present, one must add the gingival recession to the keratinized gingival width in determining the position of the semilunar crestal incision.