

# Interdental Papilla Reconstruction

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# Introduction

It has been a long time since we were told that "interdental papilla reconstruction is very difficult." There was a time when "very difficult" became "impossible," as if it were a message relay game. The difficulty lies in the anatomical characteristics unique to the interdental papillae, and case reports of reconstructive techniques that take these characteristics into account have been published since the 1990s. Furthermore, with the development of microsurgery in recent years, the number of such reports seems to have increased.

The author has been involved in interdental papilla reconstruction since the 1990s, and through the many cases he has handled with trial and error, he seems to have developed a fundamental approach to interdental papilla reconstruction. One of these concepts is that "when the height of the interdental papilla is increased, the width of the interdental papilla should be increased simultaneously. The technique we developed based on this idea is the "IPAC (Interproximal Pouch Approach using CTG), which is described in detail in this book.

The approach to interdental papilla reconstruction is complex, and no single technique can cover everything, as it must be modified according to the individual intraoral environment. The "Interdental papilla" can have various presences because the oral cavity has many different aspects, depending on prosthetic appliances such as implants or bridge pontics. The interdental papilla can exist in six different environments such as between "tooth-tooth," "pontic-pontic," "implant-implant," "tooth-pontic," "tooth-implant," and "pontic-implant. It is very important to select an appropriate interdental papilla reconstruction technique based on the abovementioned characteristics.

In this book, we have tried to explain in an easy-to-understand manner, with numerous illustrations and photographs, the basic concepts and actual techniques of interdental papilla reconstruction, as well as the points to consider when selecting each technique, while presenting many case reports. We hope this book encourages readers who deal with the interdental papilla reconstruction to turn "extremely difficult" into a "possible" procedure.

Finally, I would like to take this opportunity to show my deepest gratitude to Dr. Fumiyo Yamaguchi for his excellent clinical practice and for always providing me with new insights, Dr. Masahito Takahashi, my co-author, for the delicate and easy-to-understand illustrations in this book, the doctors of the Japanese Society of Clinical Dentistry, with whom I am always in friendly competition, and my clinical staff who have always supported my work.

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Masana Suzuki

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### ③ Labial Partial Thickness Flap

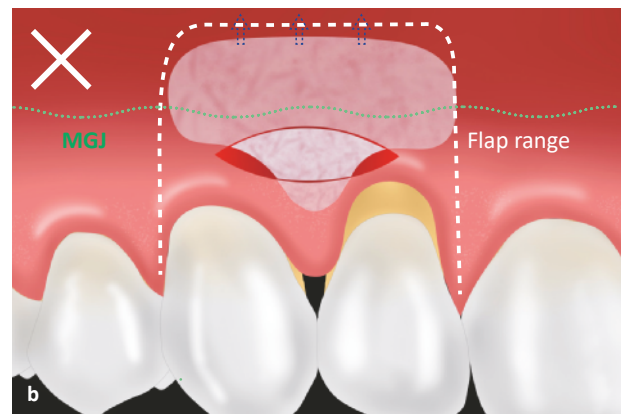
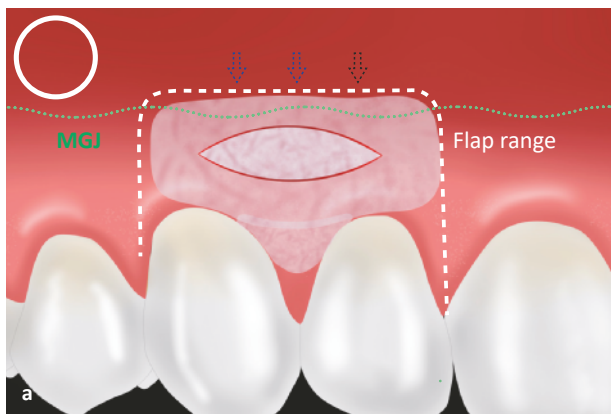
Since the interdental papillae have a poor vascular supply and are in contact with a non-vascularized tooth surface, it is desirable to dissect them with a partial thickness flap to maintain a good vascular supply to the grafted connective tissue.

The labial flap should extend horizontally from the distal to the distal of both adjacent teeth with black triangles and vertically from the horizontal access

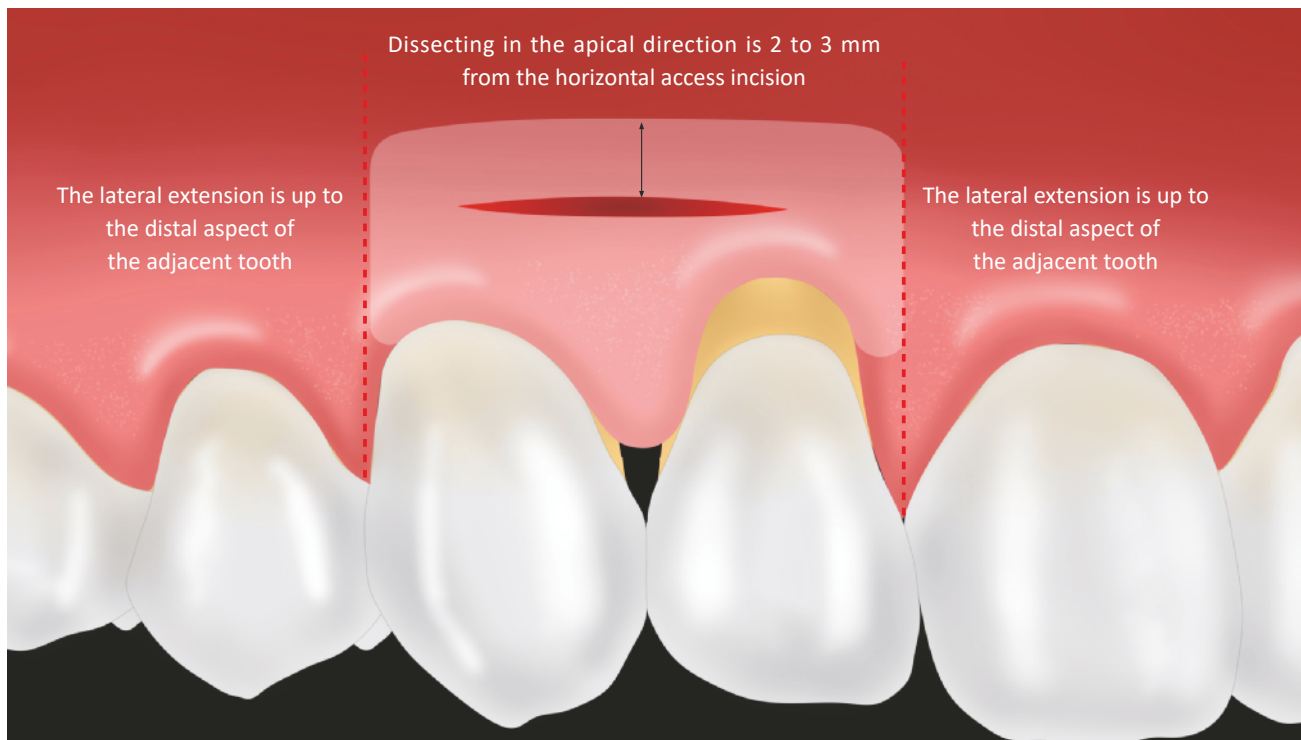
incision to the gingival sulcus incision and 2 to 3 mm apical from the horizontal access incision. This extension is to cover as much as possible with the labial flap so that the vascular supply to the second graft, which is placed on the labial side, can be predictably achieved. However, if the partial thickness flap is formed beyond the MGJ, the second graft is challenging to position, and it is difficult for the first graft to serve as a stopper. (Figure 14).

The labial partial thickness flap is dissected from

#### Lateral Extent of Labial Detachment



**Figure 14a, b** If a partial thickness flap is prepared extensively beyond the MGJ, it will not be able to serve as a stopper for the first graft, so care must be taken.



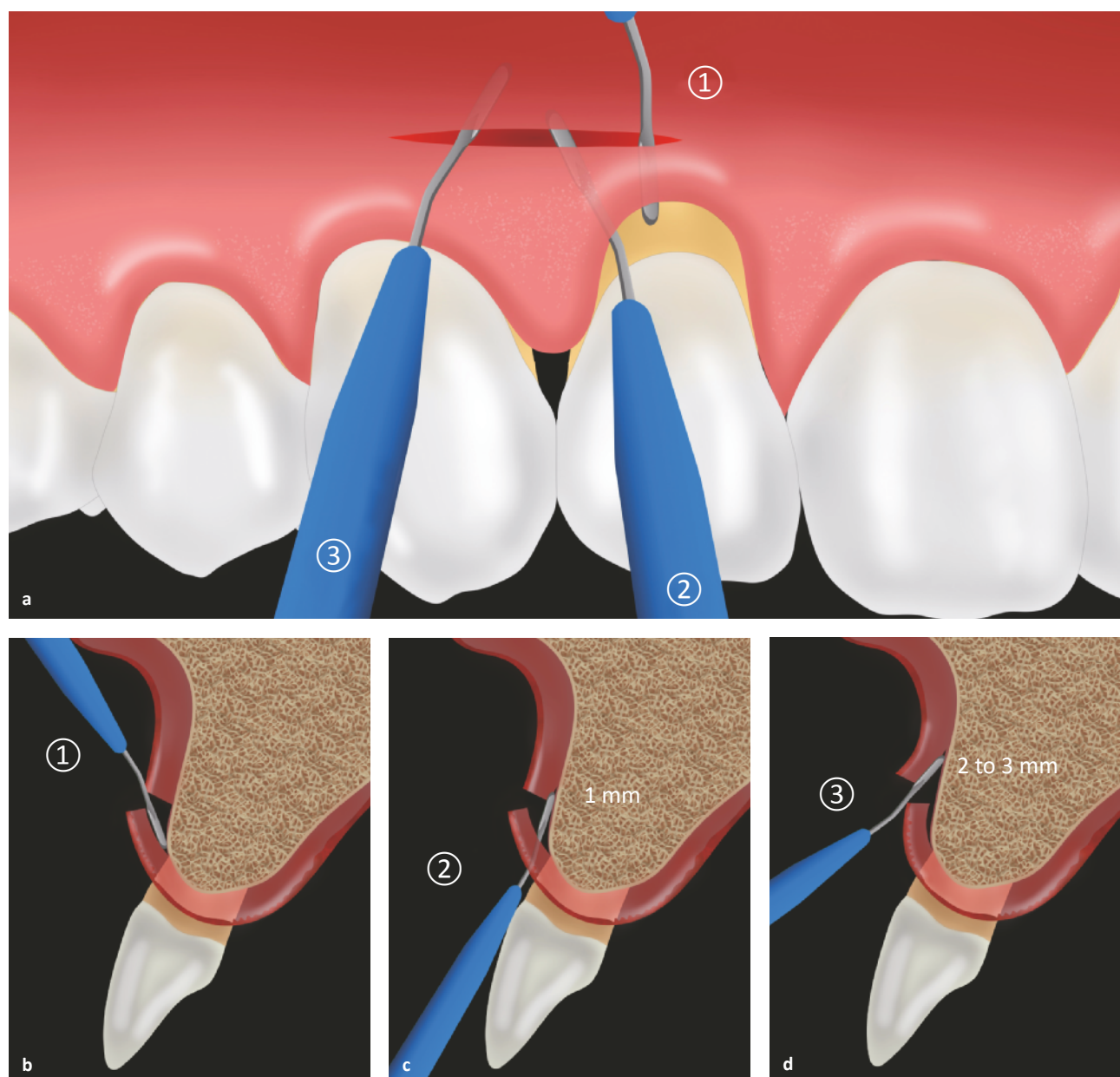
**Figure 14c** The extent of the labial flap is horizontally defined from distal to distal of both adjacent teeth with black triangles, and vertically from horizontal access incision to gingival sulcus incision and 2 to 3 mm from horizontal access incision to the apex of the root with partial thickness flap.

three directions while holding the probe in the left hand and the mini crescent knife in the right hand. First, partial thickness flap dissection is performed from ① the horizontal access incision to the gingival groove just below the interdental papillae and on both adjacent teeth (**Figure 15a, b**), and then ② the scalpel is turned backward to form a partial thickness flap from the gingival sulcus incision to the horizontal access incision so that both are connected. At that time, the surgical window of the horizontal access incision is opened, and the gingival sulcus incision or

the gingival sulcus incision is opened. The tip of the miniature crescent knife can be seen through these openings.

The partial thickness flap is extended 1 mm toward the apex through the horizontal access incision, and the beginning of the partial thickness flap toward the apex is created through the horizontal access incision (**Figure 15a, c**). Finally, a mini crescent knife is reinserted through the horizontal access incision to extend the partial thickness flap 2 to 3 mm toward the apex (**Figure 15a, d**).

### Labial Partial Thickness Flap Elevation



**Figure 15a-d** Labial partial thickness flap. ① From the horizontal access incision, the gingival sulcus just below the interdental papilla and on both adjacent teeth is aimed for the partial thickness flap dissection. ② The scalpel is turned in the opposite direction, and the partial thickness flap is formed from the gingival sulcus incision to the horizontal access incision so that the two are connected. ③ Reinsert the mini crescent knife through the horizontal access incision and extend the partial thickness flap 2 to 3 mm toward the apex of the root (Note that if the partial thickness flap is formed extensively beyond MGJ, the second graft will be challenging to position and it will be more difficult for the first graft to serve as a stopper)

## STEP 3

## Suture

- ① Placement and fixation of the first graft
- ② Placement and fixation of the second graft
- ③ Suturing of horizontal access incision

### ① Placement and Fixation of the First Graft

The first step is to start with a mirror view. Holding the micro-mirror in the left hand and the micro-needle in the right hand, the suture needle is inserted from the palatal to the labial side after confirming the first entry point about 1 to 2 mm above the palatal marginal gingival margin. The next step is to change to direct view, hold the probe in the interdental papillae above the horizontal access incision, and remove the suture needle from the palate through the

interdental papilla as it is raised. The suture is then passed through the graft extraorally, with the needle going from the lower bottom to the upper bottom of the triangular pyramidal graft. The suture is again passed back into the palate through a horizontal access incision on the labial side and sutured toward the second entry point on the coronal 0.5 to 1 mm from the palatal marginal gingival margin. Pass the sutures through the palate. Pulling slowly on the two sutures that have passed through the palate, the graft is pulled into the interdental papilla, placed in the appropriate location, and sutured on the palatal side to secure the graft (**Figure 35, 36**).

The narrow interdental space allows the grafts to fit better, so suturing can be considered simple.

### Confirmation of Entry Point



**Figure 35a-c** Placement and fixation of the graft.



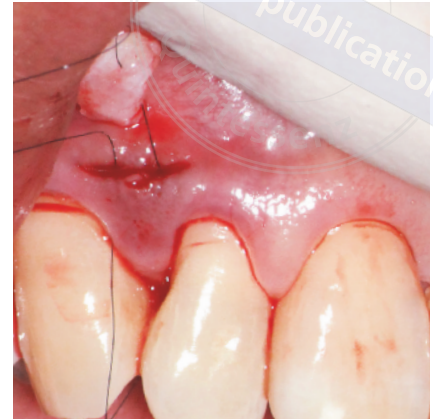
## Suture ①



**Figure 36a** Two pieces of connective tissue were used as grafts. The first graft was sutured to the interdental papilla area. The figure shows the suture needle being pulled out from the palatal papilla to the distal aspect of tooth #7.



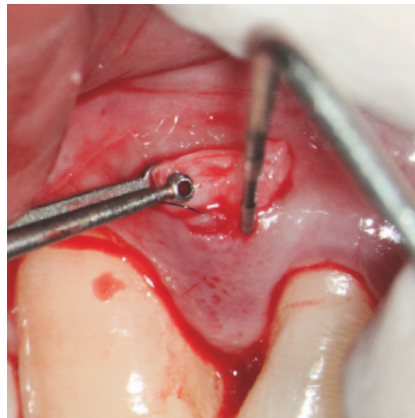
**Figure 36b** The needle is passed through the horizontal incision.



**Figure 36c** Threading the graft outside the gingival flap.



**Figure 36d** The needle is again passed under the gingival flap and into the palatal papilla.



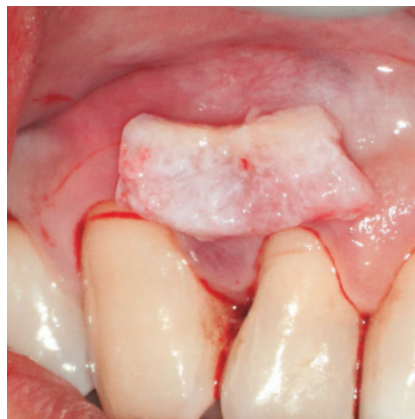
**Figure 36e** The graft is inserted under the interdental papilla.



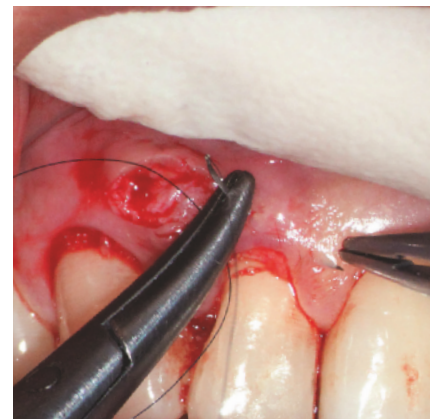
**Figure 36f** Suture palatally and secure the graft under the interdental papilla.



**Figure 36g** After trimming, recheck the size of the graft. The graft is slightly large, so it is trimmed again.



**Figure 36h** Trimming the graft to the planned size.



**Figure 36i** The graft is inserted into the labial flap and sutured. The graft is first sutured from the mesial side. The suture is fixed by passing the needle through the gingival flap and the graft in the mesial part at once.

## Case 1: Tooth-Pontic Interdental Papilla Reconstruction

### Before Treatment



**Figure 7** Intraoral photograph before treatment. An esthetic disturbance due to cleft lip and palate was observed. A temporary bridge was placed in #9-X-11. Collapse of the alveolar ridge in the #9 edentulous area, along with linear scar tissue and gingival recession in the #9 and #11 areas, was observed.

### After Treatment



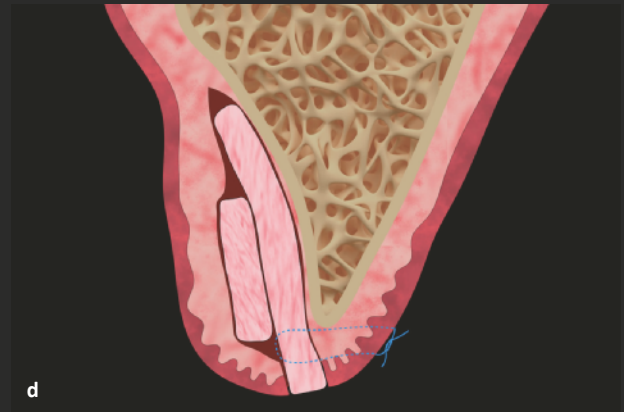
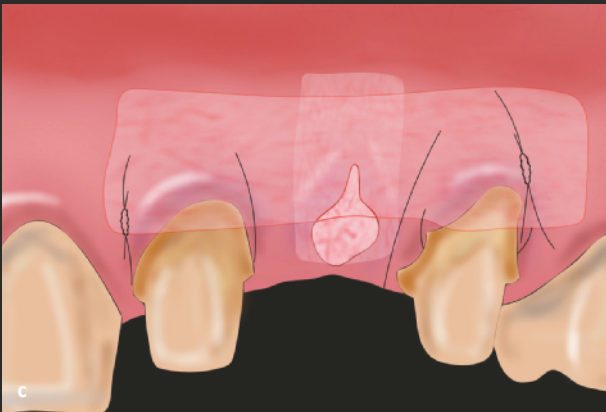
**Figure 8** Intraoral photograph after treatment. A three-unit bridge was used to restore the area with #9 and #11 as the abutment tooth. The esthetic appearance was restored by alveolar ridge augmentation in the #10 pontic area and root coverage in the #9 and #11 areas. Connective tissue grafting is effective in cases of cleft lip and palate.



### Alveolar Ridge Augmentation of #10 Pontic Area and Root Coverage and Interdental Papilla Reconstruction in the Areas of #9 and #11



**Figure 9a, b** A connective tissue graft procedure was performed to simultaneously correct the alveolar ridge collapse in the #10 defective area and the gingival recession in #9 and #11. First, the scar tissue from the cleft of #10 was excised, and then an envelope flap was created using a tunneling technique from the mesial of #9 to the distal of #11. The connective tissue graft procedure was performed after adjusting the flap to move in a coronal direction.



**Figure 9c, d** To obtain the volume of the alveolar ridge of the #10 defect, a layered technique was used in which two pieces of connective tissue were stacked on each other. The first graft was inserted into the #10 defect area and fixed to the palatal gingiva with simple sutures, and the second graft was sutured and fixed to the labial side of the #9, 10, and 11 areas with sling sutures.

### Delivery of the Final Prosthesis



**Figure 10a, b** Modified gingival type was adapted to make the pontic base contact in a deeper position in the alveolar ridge in order to obtain a high esthetic result (prosthetic treatment: Dr. Masao Yamazaki).



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