Less-Invasive Sublabial Unilateral Transseptal Approach for Transsphenoidal Surgery

—Technical Note—

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Abstract

A less-invasive sublabial approach was developed to overcome the disadvantages associated with the conventional sublabial approach. The basic differences between this modified sublabial approach and the conventional approach are: a smaller incision (1–1.5 cm long) and almost midline vertical skin incision underneath the upper lip; minimal development of an inferior tunnel; no widening of the maxillary rim of the piriform aperture; and a strictly unilateral approach. This less-invasive approach uses a slim and small nasal speculum originally designed for the transnasal approach. This modified sublabial approach was applied to 41 of 133 patients who underwent transsphenoidal surgery between August 1998 and the end of 2000. These cases confirmed that this approach is a simple, rapid, and less-invasive technique with significantly fewer mucosal complications compared to the conventional approach. We conclude that this modified sublabial approach offers a good alternative to the conventional standard sublabial approach.

Key words: less-invasive technique, nasal speculum, pituitary tumors, sublabial approach, transnasal approach, transsphenoidal surgery

Introduction

Transsphenoidal surgery is presently carried out using the sublabial transseptal and transnasal transseptal approaches as the most widely accepted standard techniques.⁸⁾ The transnasal approach has several advantages in comparison to the sublabial approach and has been used more frequently,^{8,11)} but the sublabial approach still remains a standard method for patients with small nostrils, especially Asian women and children.⁴⁾ We describe a less-invasive sublabial approach to overcome the disadvantages associated with the conventional sublabial approach.

Technique

This modification of the sublabial approach has been used at Toranomon Hospital since August 1998. The upper lip is retracted slightly by an assistant, and a small (1–1.5 cm long) vertical mucosal incision is made 1–2 mm left from the midline (to

avoid injuring the frenulum) (Fig. 1A). The incision is deep enough to expose the anterior edge of the septal cartilage (Fig. 1B) and the rhinoseptal mucosa is separated to denude the septal cartilage and nasal spine on the patient's left side (right side for a left-handed surgeon) (Fig. 1C). This method does not require extensive exposure of the anterior surface of the nasal bony orifice, elevation of the mucosa from the floor of the naris, or removal of the maxillary rim of the piriform aperture. The cartilage and the anterior bony crest are separated, allowing deflection of the cartilaginous septum to the right. The following procedure is quite similar to that of the unilateral transseptal approach. The right side of the septal mucosa is left attached to the septum. However, the conventional large nasal speculum used for the standard sublabial approach is too large to be inserted. A small and slim nasal speculum (Fujita Ikkikai Co., Ltd., Tokyo), which was originally designed for the transnasal approach, is more suitable for this less-invasive sublabial approach (Fig. 2B). A wide surgical field also can be obtained despite the small incision, because the blades of the speculum are designed to fan out when opened (Fig. 2C). In addition, a lip guard is usually unnecessary for this ap-

Fig. 1 Photographs showing the operative procedure for the modified less-invasive sublabial trans-septal approach. **A:** The sublabial small mucosal incision is made almost midline but avoids injuring the frenulum. Black thread indicates the midline. **B:** The incision is deep enough to expose the anterior edge of the septal cartilage (arrow). **C:** The mucoperichondrium is separated to expose the nasal septum (arrow) on the left. **D:** Closing of the skin incision after surgery. Mucosal laceration is usually negligible and no additional mucosal incision is necessary which prevents mucosal laceration.

proach (Fig. 2A) and no additional mucosal incision is needed which prevents mucosal laceration (Fig. 1D).

Clinical Results

133 patients underwent transsphenoidal surgery between August 1998 and the end of 2000. This modified sublabial approach was applied to patients whose nostrils are relatively small. Consequently, 41 patients, 18 women and 23 men including two children, four with prolactinoma, six with Cushing's disease, 24 with nonfunctioning adenoma, and seven with other pituitary lesions, underwent this technique, whereas 92 patients, 40 women and 52 men, 48 with acromegaly, five with prolactinoma, 30 with nonfunctioning adenoma, and nine with Rathke's cleft cyst, underwent the transnasal approach.

In all cases of the modified sublabial approach, the operative field was as wide as in the conventional

sublabial approach and surgery was successful even for two children. The average time taken to reach the floor of the sphenoidal sinus was approximately 15 minutes, which is longer than the transnasal approach but much shorter than the standard sublabial approach. Blood loss was negligible in all cases. Oral complications due to the modified sublabial approach were studied by interviewing the patients over a period of 3 months. All patients could eat on the day after surgery, although upper lip swelling was found in 11 patients. Mild upper lip dysesthesia was found in only four patients and caused no problem in their daily activities. None of our patients had permanent anesthesia of the upper lip or teeth, gingival atrophy, speech disturbance, stiffness of smile, or required remolded dentures (8 wore dentures), and there were no postoperative nasal deformities or significant septal perforations.

Fig. 2 Photographs of the nasal speculum. **A:** Pituitary speculum is inserted. A lip guard is usually unnecessary. **B, C:** The modified speculum (1) is slim (**B**) and fans out when opened (**C**) compared to the conventional nasal speculum (2).

Discussion

The sublabial transsphenoidal approach was first reported by Cushing in 1914, but was discontinued because he favored craniotomy for pituitary surgery. The procedure was kept continued by Dott, renewed by Guiot, and further popularized by Hardy in 1960s.⁹⁾ The original sublabial transseptal approach involved a sublabial incision between the canines (approximately 4 cm long), the septal mucosa was dissected bilaterally (bilateral transseptal approaches), and the edges of the nares or the anterior nasal spine were removed.^{5,6)} Several modifications of this original sublabial approach have been reported.^{2-4,7,11-13)} The sublabial approach provides excellent exposure for patients with small noses, but the significant disadvantages include an overhanging upper lip during surgery, postoperative lip edema, and oral complications from the sublabial incision.⁹⁾ Oral complications attributable to the sublabial approach occur in up to 52% of cases.^{1,9,10)} However, a shorter sublabial mucosal incision can reduce the occurrence of oral complications such as upper lip dysesthesia or incisor teeth paresthesia, because the main branch of the anterior superior alveolar nerve innervating the upper lip or incisor teeth comes down to the canine.

Like our present modification, a much shorter mucosal sublabial incision was also developed using a very tiny mucosal incision (5 mm).²⁾ However, this shorter mucosal incision is still horizontal and the

advantages or disadvantages are not clear. We also adopted this approach initially. However, postoperative upper lip swelling seems to be more common with horizontal incisions than with vertical incisions, since the force to the lip mucosa exerted by a nasal speculum may be stronger in the former than the latter. In contrast, our small vertical mucosal incision (1 cm long) in the upper lip is not only less invasive but also avoids upper lip and incisor teeth numbness because no infraorbital and anterior superior alveolar nerve damage is caused due to the vertical course of both nerves innervating the upper lip or incisor teeth.⁹⁾ Indeed, we found oral complications attributed to this approach were significantly rarer compared to the conventional sublabial approach. Mild upper lip dysesthesia was found in only four of 41 patients undergoing this modified sublabial approach, but occurred in 17 of 46 patients (37%) in the conventional sublabial approach.¹⁾ In addition, despite the small incision, the operative field is as wide as in the conventional method by using the specialized small and slim pituitary speculum which is designed to fan out. Moreover, the same pituitary speculum can be used for both approaches (the transnasal and this modified sublabial approach), so provides an additional advantage from the economical standpoint. However, care should be taken not to perforate the upper lip in this approach if the incision is deep enough to expose the anterior edge of the septal cartilage.

At present, we are adopting the transnasal ap-

proach for all patients with acromegaly and most male patients and the modified sublabial approach for most female patients or child patients using the same pituitary speculum in our department.

This less-invasive modified sublabial unilateral transseptal approach has provided excellent and rapid exposure for transsphenoidal surgery with few oral complications. We conclude that this modified approach offers a good alternative to the conventional standard sublabial approach.

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Commentary on this paper appears on the next page.

Commentary

This is not a new approach for transsphenoidal surgery but is the ideal procedure, although a little complicated for young neurosurgeons. Vertical incision of the sublabial mucosa is the characteristic element of this approach. The authors mentioned a lower incidence of postoperative complications such as upper lip edema, dysesthesia or teeth paresthesia due to damage to the anterior superior alveolar nerve compared to the conventional sublabial approach (ref. 6 of this article). Certainly, vertical incision of the sublabial mucosa avoids injury to the alveolar nerves and postoperative gingival atrophy. Another advantage of this approach is the shorter route to the sphenoid sinus than the conventional sublabial approach. On the other hand, the authors use a specialized small and slim bivalve nasal speculum to adjust to the small mucosal incision. The endonasal approach¹⁾ is a much easier and shorter route to reach sphenoid sinus without upper lip swelling, dysesthesia, injury of the alveolar nerves, and mucosal perforation. Many neurosurgeons think that the endonasal approach for Asian patients is difficult due to their small nostrils. The endonasal approach could be applicable to Asian adults with larger nostrils and/or with acromegaly. The advantage of this approach is the special small and slim bivalve nasal speculum which is equally suitable for adults and children irrespective of the size of the nostrils.^{2,3)}

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The authors have developed a less-invasive sublabial unilateral transseptal approach for transsphenoidal microsurgery. This improved new technique is simple, rapid, safe and less invasive and less fewer complications compared with the Hardy operation. The authors operated on 41 patients with pituitary adenomas, and the results were good. I believe that the technique is reasonable, particularly for small noses and children. The small and slim nasal speculum is important for the operation.

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