

# The Significance of Uvula After Palatoplasty: A New Technique to Improve the Aesthetic Outcome

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## Abstract

**Objective:** This study aims to examine the importance of the uvula as a part of palatoplasty outcome and to assess the aesthetic results of the conventional versus a new technique for uvuloplasty.

**Design/Participants:** The study included 2 groups of patients undergoing palatoplasty. Group I consisted of 20 cleft palate patients repaired with the conventional uvula repair, combining the 2 hemi-uvulae. Group II consisted of 20 patients repaired with our new technique, sacrificing one hemi-uvula and centralizing the remaining one. The aesthetic outcome was assessed in both groups. A questionnaire was distributed to the families of both groups to assess their concern about the uvula after palate repair.

**Setting:** Cleft unit at a tertiary care center.

**Results:** Sixty-five percent of parents considered the uvula as important functionally and aesthetically after palate repair whereas 35% either did not care or were not sure about its importance. Results of the aesthetic outcome of the 2 techniques for uvula reconstruction showed that uvula was absent in 4 cases in group I versus 1 in group II ( $P > .05$ ), small in 8 cases of group I versus 4 in group II ( $P > .05$ ), bifid in 5 cases of group I versus none in group II ( $P < .05$ ), became deviated in no case of group I versus 4 in group II ( $P > .05$ ), and was satisfactory in 3 cases of group I versus 11 in group II ( $P < .05$ ).

**Conclusions:** Among the respondents, the uvula was a significant concern to the parents of cleft patients and should be given more attention during repair. The described technique had better aesthetic outcome over the conventional one of combining the 2 hemi-uvulae.

## Keywords

cleft palate, uvula, uvuloplasty

## Introduction

The uvula is a distinct feature of the palate and is a frequent source of worry for patients' families after cleft palate repair. Evidence suggests that the uvula has no function in velopharyngeal mechanism. The uvula is largely devoid of muscles and mainly consists of glandular and connective tissue (Huang et al., 1997). The uvula in cleft palate patients is split into 2 hemi-uvulae. Conventionally, the uvula is repaired during palatoplasty by simple suturing of both hemi-uvulae together (nasal and oral sides) after baring the cleft margin by incising the junction between the oral and nasal mucosa along the cleft margin until the tip of the uvula. To our knowledge, there is only 1 report about the aesthetic outcome of uvula repair after palatoplasty (Rossell-Perry et al., 2014).

The aims of this study were to explore the significance of the shape of the uvula as part of the palatoplasty outcome from the

parents' perspective, to describe the details of a new technique for uvula repair that improves the aesthetic result and to assess its aesthetic outcome compared with the conventional uvula repair during palatoplasty.

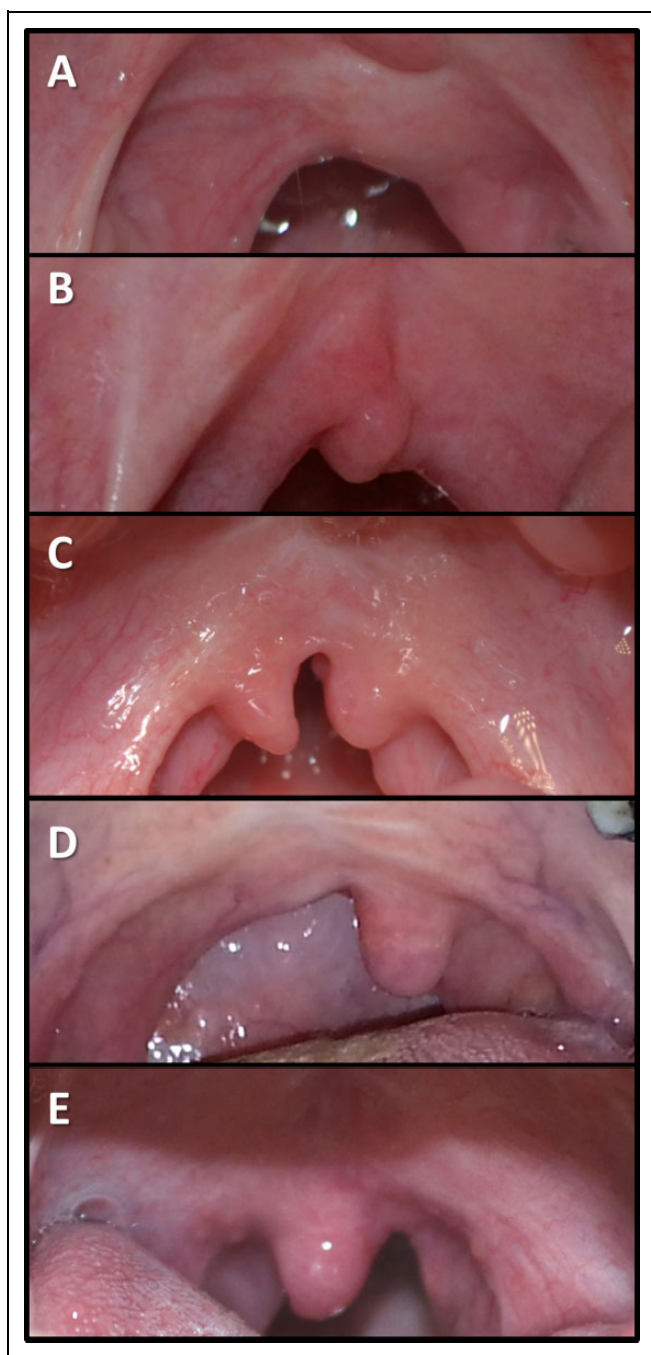
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**Figure 1.** Aesthetic outcomes of the uvula after palatoplasty: (A) Absent, (B) small remnant, (C) bifid, (D) deviated, and (E) satisfactory.

## Methods

An IRB-approved prospective study included 40 consecutive cleft palate patients who attended Sohag multidisciplinary cleft clinic. Group I (n=20) had cleft palate repair with the conventional uvula repair technique and operated by a single cleft surgeon. Group II (n=20) had cleft palate repair with our new technique for uvula repair and operated by a different cleft surgeon. Distribution to each group was randomized according to the scheduling system for surgery for each surgeon. Analysis of the aesthetic outcome of

the uvula in these patients was performed at least 6 month post-operatively with non-blind process done by 2 surgeons who should agree on the category selected for the outcome. The aesthetic outcome categories of the uvula were either “satisfactory,” “deviated,” “bifid,” “small,” or “absent” (Figure 1)—satisfactory when it is naturally looking with average size, small when it is small remnant, and deviated when it is satisfactory but only deviated. Bifid and absent are self-explanatory.

## The Questionnaire

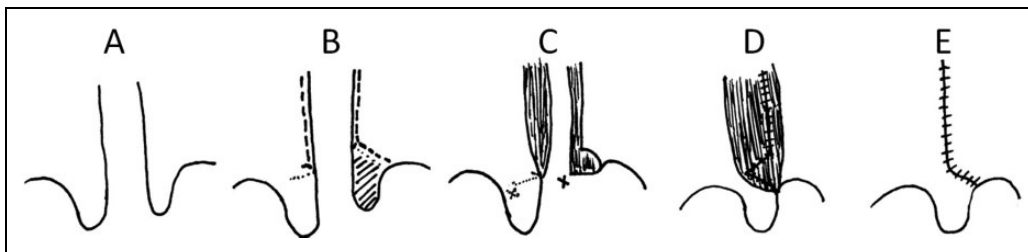
A questionnaire was distributed to the families preoperatively to assess how much they were concerned about the uvula. The simple questionnaire was as following.

1. Do you recognize / know the uvula? (Yes / No)? (A picture of a palate is displayed and an arrow is pointing to the uvula)
2. After palate repair, do you think the uvula is important cosmetically and/or functionally? (Yes, I think so / No, I don't care / I'm not sure)
3. If you got abnormal uvula / failed uvula repair after palate repair, would you request another surgery to repair it? (Yes / No)

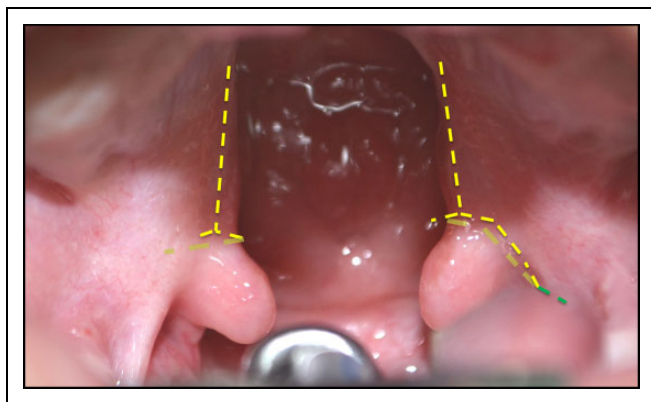
## Surgical Technique (Figures 2 and 3)

The palatoplasty technique used in both groups was the von Langenbeck repair with radical muscle dissection (Sommerlad, 2003). The margins of the cleft are incised at the junction between oral and nasal mucosa until the base of the uvula without any incisions in the uvula (Figures 2A and 3). One uvula is kept and the other is totally excised. Factors determining which uvula to use are the one belonging to the longer-sided hemi soft palate. Excision of the short-sided uvula allows for lengthening of the shorter hemi soft palate by extending the incision to the posterior border of the soft palate (posterior palatal pillar) (Figure 3). If both hemi-palates are of equal length, we select the bigger and longer uvula. An oblique back-cut is done in the nasal mucosa at the base of the retained uvula. Care is taken to totally excise the discarded uvula and any remaining thin uvular mucosa at its base. The cleft margin incision of side of the discarded uvula is continued to the posterior border of the palate if needed to lengthen the hemi soft palate (Figure 2C). This palatal lengthening may also allow a more complete transverse reorientation of the levator veli palatini muscle sling by lengthening the mucosal envelope of the shorter side. The posterior free angle of the nasal mucosa at the stump of the discarded uvula is sutured into the defect on the other side created by the nasal mucosa back-cut (Figure 2D). Remaining nasal and oral mucosa are sutured anatomically with the stump of the discarded uvula sutured to the half base of the remaining uvula (Figure 2E). The uvula is now formed totally by the longer one.

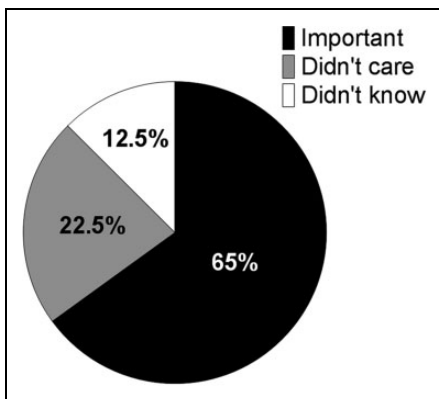
Statistical comparison between the 2 groups and different aesthetic outcomes of the uvula were performed with



**Figure 2.** (A) The uvulae in cleft palate. (B) Incisions: at the cleft margins, around the base of the retained uvula and excision of the other uvula. (C) Back-cut at the base of the retained uvula in the nasal layer. (D) Suturing the nasal mucosa with advancing the tip of the posterior border of the nasal mucosa to the back-cut of the retained uvula side. (E) Closure of the oral mucosa.



**Figure 3.** The incision lines (yellow). The (green) incision extension is done at the posterior border of the soft palate (posterior palatal pillar) when the hemi soft palate on that side is shorter than the other in order to lengthen it to match the length of the other longer hemi soft palate.

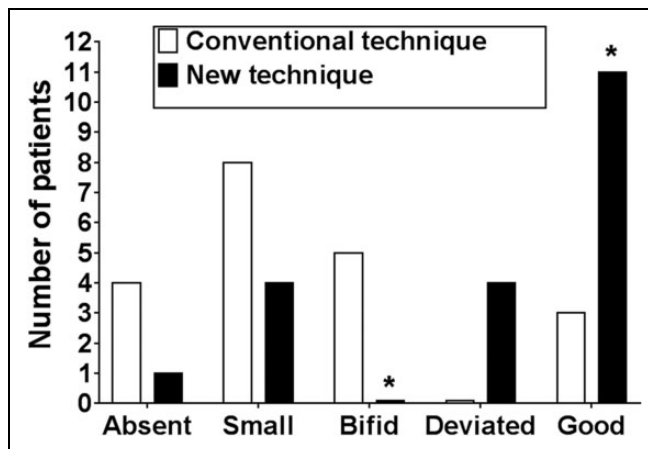


**Figure 4.** Parents' attitude toward the importance of the uvula after palatoplasty.

SPSS version 20 (SPSS Inc, Chicago, IL) with the Fisher exact test.

**Results**

In the parents' questionnaire, 65% of parents believed that the uvula is important functionally and esthetically after cleft palate repair and even would request additional surgery



**Figure 5.** Aesthetic outcome of the uvula after palatoplasty in group I (conventional technique) and group II (the new technique). \*Significant values.

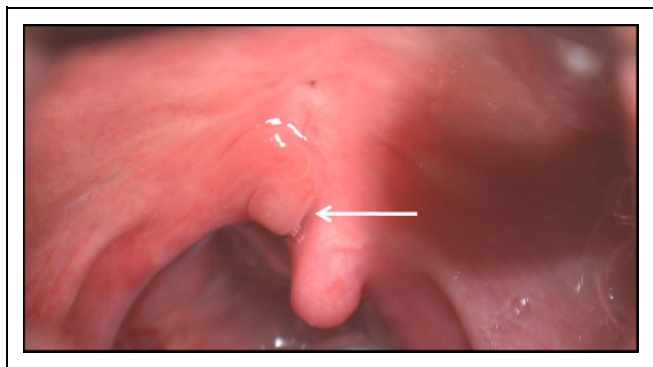
exclusively to correct it. The remaining 35% of parents either did not care about it (22.5%) or were not sure about its importance (12.5%) (Figure 4).

Regarding the aesthetic outcome of the uvula after palatoplasty (Figure 5), the uvula was absent in 4 cases in group I versus 1 case in group II ( $P > .05$ ), small remnant in 8 cases of group I versus 4 cases in group II ( $P > .05$ ), bifid in 5 cases of group I versus no case in group II ( $P < 0.05$ ), became deviated in 1 case of group I versus 4 cases in group II ( $P > .05$ ), and satisfactory in 3 cases of group I versus 11 cases in group II ( $P < .05$ ).

**Discussion**

Uvula reconstruction has not been given much emphasis in the literature. However, it seems to be an important outcome measure from the parents' perspective probably because of its familiarity as a distinct part of the palate anatomy. When the uvula sometimes becomes bifid after palate repair, some parents may consider this finding a failure of surgery (Agrawal, 2009). As cleft caregivers, we have noted family worries and concerns about the uvula as probably most other cleft surgeons have. Also it is a matter of discussion and worry between families in Internet discussion forums (Baby center community online forum, 2011).

Uvula disappearance (20%) and shrinkage (40%) were the commonest reported outcomes after conventional uvula repair



**Figure 6.** Partial dehiscence at the base of the retained uvula due to incomplete excision of the excised uvula including its base.

during palatoplasty. This could be explained by the contracture of the midline scars both in the oral and nasal layers pulling the uvula with its delicate structure towards the palate or onto its superior aspect. Incorporation of a triangular flap in a back-cut at the base of the uvula in the nasal mucosa could prevent this upward pull. Scarring within the uvula itself might lead to significant distortion and contracture of the uvula because of its delicate nature. This is not the case in the new technique because most of the uvula is kept untouched without any incisions throughout its length or suturing (except in its base in one side).

The post-palatoplasty bifid uvula (25%) is probably also explained by the contracture of the midline scars, and/or suturing the thin mucosa of the uvula may fail with a high dehiscence rate. For this reason, we recommend that the excision of the discarded uvula should be complete through its base, removing all delicate mucosa of the uvula base, reaching the tougher palatal mucosa for better healing. Figure 6 shows one of the earlier cases where some of the uvular base thin mucosa was not completely excised, resulting in partial dehiscence at the base of the retained uvula.

Agrawal (2009) reported the importance of the uvula for the patients' families and recommended a careful repair of the uvula in 2 layers and the use of 2 to 3 mattress sutures for better approximation of the edges. We think that the mucosa of the uvula is very thin and may not withstand mattress sutures well as evident by the high rate of bifid uvula post palatoplasty.

Rossell-Perry et al. (2014) described a technique for uvular repair in patients with cleft palate using one hemi-uvula. The technique also included excision of the smaller hemi-uvula but with the addition of Z-plasty in the oral mucosa. They compared the velopharyngeal gap size measured with CT and nasality score between their new technique and the conventional technique. They found in a prospective study that no differences existed between the 2 groups (Rossell-Perry et al., 2014). But 1 year later in another retrospective study by the same authors, they found a significantly better outcome in favor of the new technique. They also found that their method resulted in better shape of the uvula compared with the conventional method (Rossell-Perry et al., 2015). We did not wait to get the speech outcome in our patients. It is the position of the levator

muscle sling posteriorly in the palate that determines the functional length of the palate and produces the levator knee, which achieves contact with the posterior pharyngeal wall (Sommerlad et al., 2002). Any length posterior to the muscle sling probably has no function in velopharyngeal closure including the uvula itself. Our technique has the advantage of lengthening the shorter side soft palate to equalize its length with the longer side by recruiting extra tissues from the posterior pillar of the shorter-sided palate. After the uvula is removed in the shorter side, the cleft margin incision is continued to the posterior border of the palate. On closure, this recruits tissues from the posterior pillar and lengthens the shorter-sided soft palate to better match the longer one.

The function of musculus uvulae is not clear in velopharyngeal competence mechanism and its fibers do not continue in the uvula. Muscle fibers are absent or very sparse in the uvula. The uvula contains a mixture of glandular, adipose, and collagen fibers in varying proportions (Kuehn and Kahane, 1990). Hence, mostly the uvula has no contributing function in velopharyngeal competence. Many reports of uvulectomy cases done in Africa were described without reporting any velopharyngeal incompetence. Uvulectomy is a common practice in Africa done by traditional healers aiming to prevent infections and other oral and throat disorders. Hartley and Rowe-Jones (1994) reported 2 cases that had uvulectomy in Africa; they noticed that they did not develop any velopharyngeal incompetence (Hartley and Rowe-Jones, 1994).

Having a good-sized nonscarred uvula may not only have a positive psychological impact on the family, but also have a benefit from its possible lubricating function. Finklestein et al. (1992) stated that the uvula is a highly organized lubricating organ to the pharynx which can suddenly secrete large amounts of thin saliva rich in fluid owing to the presence of seromucous glands with large secretory ducts. The remaining part of the soft palate has only mucous glands that secrete viscous saliva. Our technique provides a uvula without a midline scar in contrast to the scarred uvula after the conventional technique. Scarring could destroy the secretory function of the uvula. Back et al. (2004) observed with the flexible nasoendoscope that the uvula swings back and forth in an anterior-posterior direction during the intermittent contraction of the soft palate to move upward and backward in speech and swallowing. They suggested that during this motion, the saliva secreted from the uvula is spread around the oropharynx and helps keep its mucosa wet and effectively lubricated. This view is supported by a common finding of pharyngeal dryness and discomfort late after uvulopalatopharyngoplasty (UPPP). This finding was attributed largely to the removal of the uvula (Back et al., 2004).

Two studies showed a 1-year follow-up complication rate of pharyngeal dryness after UPPP of 31% (Haavisto and Suonpaa, 1994) and 22% (Croft and Golding-Wood, 1990), respectively, and one study noted a complaint of pharyngeal dryness in 60% of patients 3 years after UPPP (Hagert et al., 2000). So, maintaining a healthy and good-sized uvula could have its advantages.



This new simple technique has significantly improved the aesthetic outcome compared to the conventional technique. It can be combined with any palatoplasty technique. It is faster than the conventional technique as there is no need to incise each of the 2 hemi-uvulae and struggle suturing them meticulously. The avoidance of the midline scar within the uvula prevents it from becoming bifid, contracted, or shrunken with the possibility of retaining its lubricating function. Also the triangular flap insertion in the nasal layer will help the uvula to hang naturally and prevents the subsequent straight-line scar contraction to avoid shrinkage or disappearance upward. There is no worry about jeopardizing the blood supply of the uvula by the back-cut in the nasal layer. We did not find any vascular compromise of the uvulae in our series. A histologic study of the velum and uvula revealed a significantly higher content of blood vessels in the uvula compared to other parts of the soft palate (Kuehn and Kahane, 1990).

## Conclusion

Surprisingly, the uvula represents a significant concern to the parents and should be given more attention during its repair. The described technique is simple and had better aesthetic outcome over the conventional one. With the global improvement of outcome of palate repair, taking care of this small detail is a step forward to achieve a near normal-looking and functioning palate for a better quality of life for these patients and their families.

## Declaration of Conflicting Interests

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