

## Outcomes of Delayed Primary Palatoplasty

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### Abstract

**Background:** Despite advances in health awareness programs and general approval of the ideal time for primary palatal repair before two years of life, we still face many patients with untouched or unrepaired palate. Which put the surgeon in a dilemma especially regarding patients' expectations for improvement of nasality, regurgitation and speech.

**Objective:** Determining reasons of delayed presenting with cleft palate and the effect of palatoplasty.

**Patients and Methods:** We included all patients'  $\geq 6$  years with untouched cleft palate with or without previous cleft lip repair. Data was collected about age, sex, type of cleft, reasons of delay. All Patients underwent two flap palatoplasty and followed postoperatively for complications, improvement of hypernasality and nasal regurgitation.

**Results:** A total of 24 patients with delayed presentation of untreated cleft palate between the years 2011 and 2021 were included in this study. The most common reason for delayed presentation was lacking nearby service (37.5%). The most common presentation was unilateral cleft lip and palate with repaired lip (37.5%). The intra-operative blood loss which need blood transfusion was (8.3%). Also the post-operative complication like bleeding, airway compromise, wound disruption and fistula rate were (49.9%). Nasal regurgitation was improved in 58.3% after palatoplasty only but in 33.3% of patients another intervention needed. Improvement of hypernasality was extremely linked to the patient's age.

**Conclusion:** We recommend intervention for lately presenting patients with cleft palate even for adult's despite being accustomed for regurgitation and nasality as the benefits are much more than the drawbacks.

**Key Words:** Unrepaired – Cleft Palate – Adult – Late Presentation.

**Ethical Committee:** The study was approved by the Ethical Committee of Ain Shams University, (code FWA 000017585; date: 7/12/2023).

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### Introduction

Many studies have discussed the ideal time for primary palatal repair and concluded that the best protocol is to finalize lip and palate repair by the age of two years [1]. The intervention at that age allows a sound Speech development which necessitates a structurally and functionally intact oral anatomy [2].

Nevertheless, timely closure of palatal cleft could improve speech outcome [3]. And on the other hand, delayed palatoplasty worsens the speech outcomes [4]. Also, the intervention at that age will improve the middle ear function and hearing level [5].

The persistence of oronasal communication in cleft palate patients till adolescence has a great impact on psychological status with depression, social avoidance, and guilty feelings [6].

In fact, the early presentation and intervention for patients with cleft palate is the key stone for best outcomes. But the actual problem is with delayed presentation of untreated cases. The matter differs with the time of presentation. At childhood, still we hope some improvements. But when facing an adult with untreated palate, it's difficult to take a decision, whether to intervene or not? And what are the expectations to be discussed with the patient?

So, in this study, we tried to answer these questions and to highlight the reasons, the management, the outcomes and prevention.

### Patients and Methods

This was a prospective study conducted at the Department of Plastic, Burn and Maxillofacial Surgery, Faculty of Medicine, Ain Shams University, Cairo, Egypt between 2011 and 2021. We included all patients'  $\geq 6$  years with untouched cleft palate with or without previous cleft lip repair. Data was

collected about age, sex, type of cleft, reasons of delay.

All surgical interventions were carried out by the senior author. Two-flap palatoplasty was performed under general anesthesia 7 (Figs. 1,2).

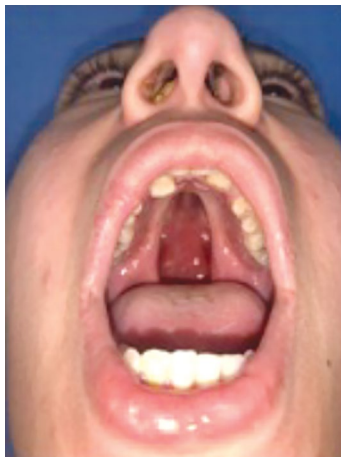
After infiltration of hard and soft palate by 1/200000 adrenaline solution, medial incision of soft palate then separation of the muscles of the palate off posterior edge the hard palate and off the periosteum on the nasal side was done. The muscles were repositioned medially and distally - a critical step to recreate the palatal muscle sling and lengthen the soft palate.

Muscle repair is performed, from distal at the uvula and proceeding forward toward the posterior edge of hard palate, two mucoperiosteal flaps were

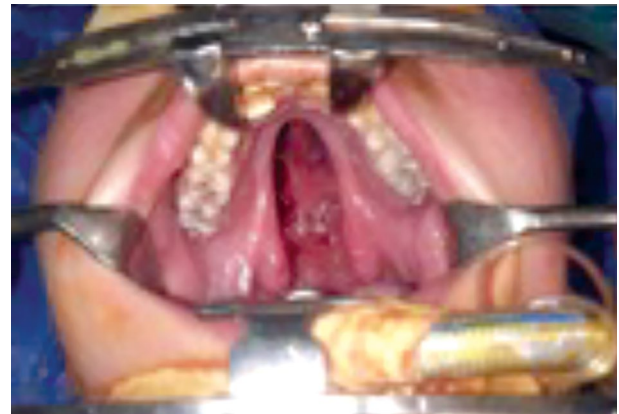
elevated. Closure of nasal, muscle and oral layers respectively was done.

Intraoperative complications and difficulties were reported e.g., estimated blood loss, need for intra-oral flaps e.g., buccinator myomucosal flaps and buccal pad of fat flap. Post-operative patients were followed up for early post-operative complications such as bleeding, wound disruption, and airway obstruction. And patients were discharged home after ensuring their airway, no signs of bleeding and starting oral intake.

Patients were evaluated based on clinical evaluation for sound healing without fistulas, speech improvement as reported subjectively by speech pathologist using Auditory-perceptual assessment (APA), improvement of nasal regurgitation and otitis media.



(A)



(B)



(C)



(D)

Fig. (1): 18 year's old female patient case with first presentation of bilateral cleft primary palate (A); intraoperative photo after application of the mouth gag (B) and after starting repair of nasal layer and elevation of mucoperiosteal bipedicled flaps (C); at the end of surgery with 2 flaps palatoplasty (D).

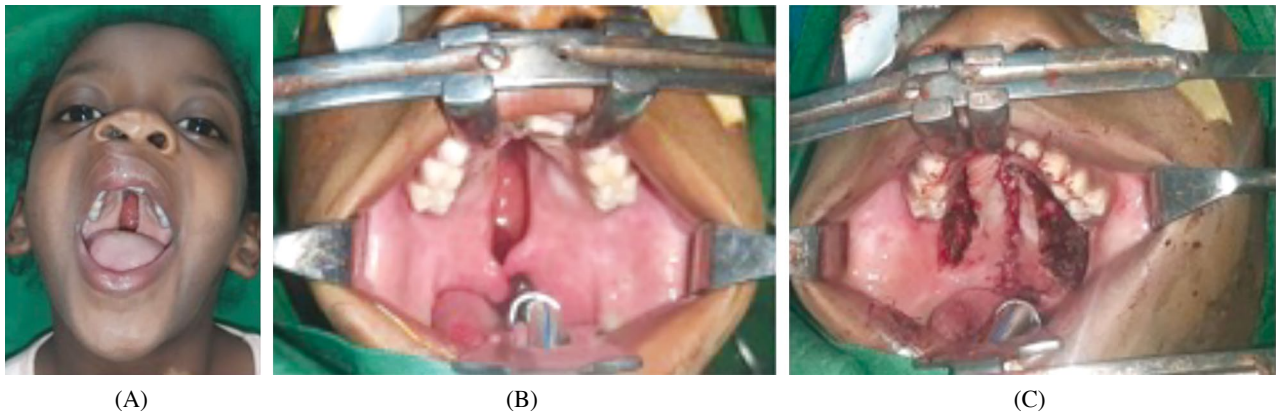


Fig. (2): Another 7 year's old female patient case presented lately with untouched cleft palate (A); Intraoperative photo (B) At the end of surgery (C).

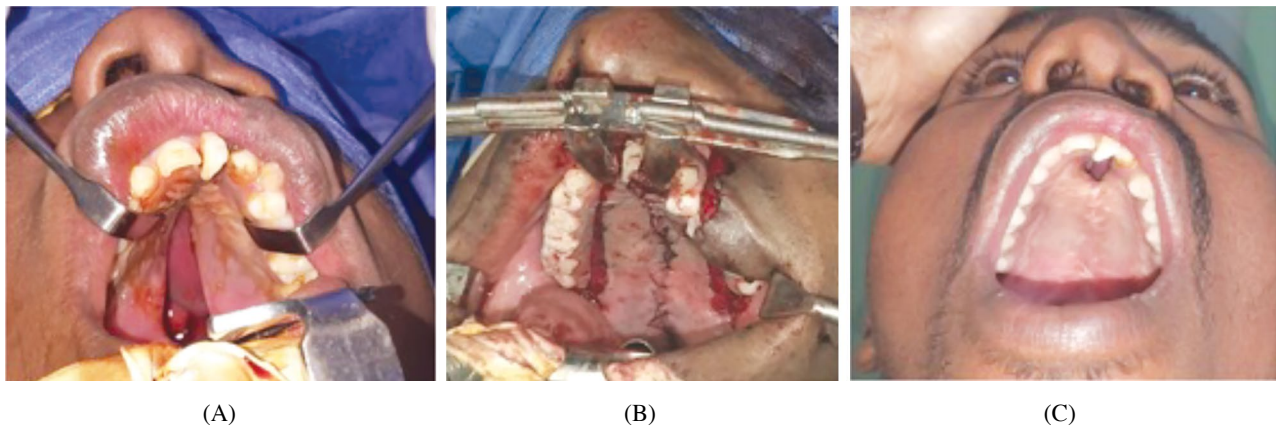


Fig. (3): Another 23 year's old male patient case with delayed presented lately with untreated cleft palate (A); Intraoperative photo (B) complicated by anterior oronasal fistula (C).

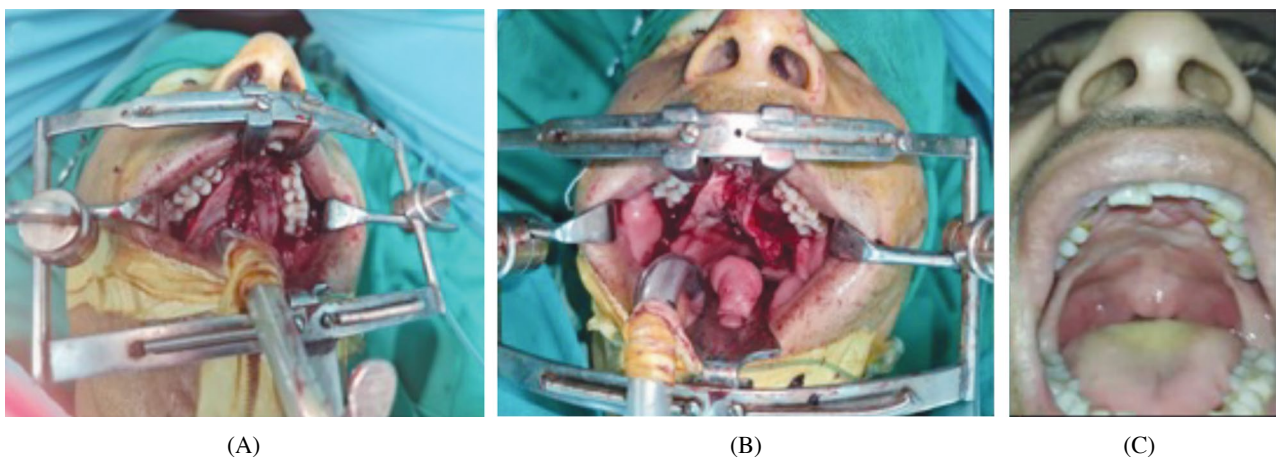


Fig. (4): Another 28 year's old male patient case presented lately with untreated cleft palate Intraoperative photos (A,B) Late follow-up after 1.5 years (C).

**Results**

A total of 24 patients with delayed presentation of untreated cleft palate between the years 2011 and 2021 were included in this work. Their age ranged from 6 to 28 (mean 12.22 years). Most of the patients (54.16%) were between 6 and 10 years, (37.5%) were between 11 and 20 years and (8.3%) were above 20 years. Most patients were females (58.3%) and 91.7% live in rural areas. The most common presentation was unilateral cleft lip and palate with repaired lip (37.5%). The most common reason for delayed presentation was lacking nearby service (37.5%) followed by family and social problems (25%) then fear of surgery mostly after bad experience after lip repair stage (20.8%) and the least reason was concomitant major comorbidity with difficult perioperative preparations (16.7%) (Table 1).

Table (1): Study Data for patients with delayed presentation of untreated cleft palate and reasons for the delay.

		No. = 24
Age (years)	Mean±SD	12.22±5.70
	Range	6.25 – 28.25
Sex	Female	14 (58.3%)
	Male	10 (41.7%)
Residence	Urban	2 (8.3%)
	Rural	22 (91.7%)
Type of cleft	Unilateral cleft lip and palate (with repaired lip)	9 (37.5%)
	Bilateral cleft lip and palate (with repaired lip)	7 (29.2%)
Reason of delay	Cleft hard and soft palate	6 (25.0%)
	Cleft soft palate	2 (8.3%)
	Lack of nearby service	9 (37.5%)
	Major co Morbidity	4 (16.7%)
	Fear of Surgery	5 (20.8%)
	Family and social problems	6 (25.0%)

Intra-operatively, there was a significant blood loss in 2 patients (8.3%) that necessitated blood transfusion. In 37.5% of patients, adjuncts intra-oral flaps were used to assist palatoplasty, commonly buccal pad of fat flap (20.8%) followed by buccinator myomucosal flaps (12.5%) but most palatoplasties (62,5%) were performed simply with two flaps palatoplasty without adding extra- flaps (Table 2).

Table (2): Surgical difficulties during palatoplasty operation for patients presented lately with cleft palate.

		No. = 24
Intraoperative blood loss	Blood transfusion	2 (8.3%)
Adjunct intraoral flaps	No	15 (62.5%)
	BMMF	3 (12.5%)
	BPPF	5 (20.8%)
	Others (tongue flap at a secondary operation)	1 (4.2%)

In the early post-operative period, there were 2 cases (8.3%) with airway compromise and desaturation that were managed with nasopharyngeal intubation, 3 cases with complete disruption (12.5%), 2 with post-operative bleeding (8.3%) with re-exploration and control of bleeding. Fistula occurred in 20.8% of the studied patients (Fig. 3). Most of the patients (70.8%) needed a secondary surgical intervention, mostly for velopharyngeal insufficiency (37.5%), followed by fistula closure (20.8%) and complete redo in (12.5%) (Table 3).

Table (3): Post-operative complications and need for secondary intervention for patients who underwent palatoplasties at older age.

		No. = 24
Post-operative complications	Bleeding	2 (8.3%)
	Airway compromise	2 (8.3%)
	Wound disruption	3 (12.5%)
	Fistula	5 (20.8%)
	Others	1 (4.2%)
Need for secondary intervention	No	11 (45.8%)
	Redo	3 (12.5%)
Need for secondary intervention	Fistula closure	5 (20.8%)
	VPI	9 (37.5%)
	No	7 (29.2%)

Nasal regurgitation was improved in 58.3% after palatoplasty only but in 33.3% of patients another intervention was needed to improve nasality (mostly sphincterpharyngoplasty) (Table 4).

Subjective assessment of hyper nasality was done by special speech pathologist using Auditory-perceptual assessment of nasality. Improvement of hyper nasality was extremely linked to the patient's age. In age group (6-10 years), 46.2% of patients were improved from severe to moderate degree which is a statistically and clinically significant result. This in contrary to the older patients where the improvement was 33.3% in age group (11-20) which was insignificant and no improvement in patients older than 20 years of age (Table 4).



Table (4): The post-operative improvement in nasal regurgitation and degree of nasality compared to the preoperative presentation.

Degree of hypernasality	Age (6-10)Years		Age (11-20) Years		Age >20 Years		Test value*	p-value	Sig.
	No.	%	No.	%	No.	%			
<i>Pre:</i>									
Moderate	0	0.0	0	0.0	0	0.0	NA	NA	NA
Severe	13	100.0	9	100.0	2	100.0			
<i>Post:</i>									
Moderate	6	46.2	3	33.3	0	0.0	1.682	0.431	NS
Severe	7	53.8	6	66.7	2	100.0			
Chi-square test	7.800		3.600		0.000				
p-value	0.005 (HS)		0.058 (NS)		1.000 (NS)				
Nasal regurgitation	Improved after one palatal surgery					14 (58.3%)			
	Improved after ≥ one palatal surgery					8 (33.3%)			
	Not improved					2 (8.3%)			

p-value >0.05: Non-significant (NS).

p-value <0.05: Significant (S).

p-value <0.01: highly significant (HS).

\*: Chi-square test.

## Discussion

Despite the advances in cleft care treatment and availability of multidisciplinary teams, many patients with delayed presentation of untouched cleft palate still faced. This situation is dilemmatic at many aspects and needs a thorough analysis about the patients' expectations mainly regarding improvements of symptoms, the reasons for delay, how to prevent it and lastly the decision to intervene or not.

Nasal regurgitation is very annoying to patients with cleft palate and considered as a social stigma with a major psychological impact and a major concern for the patients. In this study, it was improved in 91.6% (58.3% improved after one surgery and 33.3% after more than one intervention) and this is considered as a major promotor for intervention in late presenting patients.

Regarding speech improvement, it is extremely age dependent, as concluded in the results of this study. In the younger age group (6-10 years), the nasality was improved by 46.2% which is a highly significant result. But in the age group from 11-20 years the improvement was only 33.3%. On the other hand, there was no improvement in nasality in patients operated after age of 20 years. This result is consistent with results of Rohrich and his peers who stressed that delayed palatoplasty is not sufficient alone to improve speech outcome including hypernasality [8].

Palatoplasty in older ages had higher surgical difficulties with increased intraoperative blood loss, need for intra-oral flaps, secondary interventions and increased post-operative complications as airway compromise, bleeding, wound disruption and fistula.

In this study we found that the most common reason for delayed presentation of untreated cleft palate is the lack of nearby service (37.5%). This result reflected the unequal distribution of cleft care between central and peripheral governorates in spite of the availability of free service. This issue is quietly preventable unlike other countries where the main cause is the lack of money as in the study of Adeyemo and his colleagues in Nigeria [9].

So, at the end of this work, we recommend intervention for lately presenting patients with cleft palate even adults as benefits are much more than drawbacks.

### Recommendations:

Prolonged follow-up of our patients will be done in order to assess long term results of these specific age group. Also, we will perform endoscopic assessment of Velo-Pharyngeal Incompetence to objectively assess patient's speech. As well as long term follow up for those patients by functional MRI to discover more detailed anatomical aberration in such cases.

### References

- 1- Aziz S.R. and Rhee S.T.: Redai, Cleft surgery in rural Bangladesh: Reflections and experiences. *J. Oral Maxillofac. Surg.*, 67: 1581-1588, 2009.
- 2- Southby L., Harding S., Phillips V., Wren Y. and Joinson C.: Speech input processing in children born with cleft palate: A systematic literature review with narrative synthesis. *International Journal of Language & Communication Disorders*, 56: 668-693, 2021.
- 3- Schwarz R. and Khadka S.B.: Reasons for late presentation of cleft deformity in Nepal. *Cleft Palate Craniofac J.*, 41: 199-201, 2004.
- 4- Sell D.A. and Grunwell P.: Speech results following late palatal surgery in previously unoperated Sri Lankan adolescents with cleft palates. *Cleft Palate J.*, 27: 162-168, 1990.
- 5- Carroll D.J., Padgitt N.R., Liu M., Lander T.A., Tibesar R.J. and Sidman J.D.: The effect of cleft palate repair technique on hearing outcomes in children. *Int. J. Pediatr. Otorhinolaryngol.*, 77: 1518-1522, 2013.
- 6- Pelchat D., Bisson J., Richard N., Perreault M. and Bouchard J.M.: Longitudinal effects of an early family intervention programme on the adaptation of parents of children with a disability. *Int. J. Nurs. Stud.*, 36: 465-477, 1999.
- 7- Bardach J.: Two-flap palatoplasty: Bardach's technique. *Oper. Tech. Plast. Reconstr. Surg.*, 2: 211-4, 1995.
- 8- Rohrich R.J., Love E.J., Byrd H.S. and Johns D.F.: Optimal timing of cleft palate closure. *Plast. Reconstr. Surg.*, 21: 106-413, discussion 423-5, quiz 422, 2000.
- 9- Adeyemo W.L., Ogunlewe M.O., Desalu I., Ladeinde A.L., Mofikoya B.O., Adeyemi M.O., Adepoju A.A. and Hassan O.O.: Cleft deformities in adults and children aged over six years in Nigeria: Reasons for late presentation and management challenges. *Clin. Cosmet Investig. Dent*, Nov. 30 (1): 63-9, 2009.