International Surgery Journal
Okoro PE et al. Int Surg J. 2019 Jul;6(7):2239-2242
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20192941

Original Research Article

Non routine use of alveolar incision in Von Langenbeck technique palatoplasty in children; a safe and viable technique in our centre

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Received: 14 April 2019
Revised: 12 June 2019
Accepted: 13 June 2019

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ABSTRACT

Background: Repair of the palate is among the challenging reconstructive surgeries in children. No single technique has achieved completely satisfactory results. The von Langenbeck technique (VLT) is one of the techniques in common use. We have sort to find out if the lateral alveolar incision in VLT can be safely avoided in selected cases.
Methods: This is a prospective comparative study of cases of isolated unilateral cleft palate in children 18 years and below which were repaired using the VLT with and without lateral alveolar incision in our centre between January 2013 and December 2018. Outcome parameters obtained included duration of surgery, blood loss, complication and fistula rates. Data was analyzed using SPSS 21. Statistical significance was set at $p<0.05$.
Results: Eighty four patients were included in the study; 36 were in the test group and 48 were in the control group. There was no significant difference in the age, weight and gender of the two groups. The duration of surgery was significantly shorter in the test group and fistula and complication rate was less.
Conclusions: This study has demonstrated that comparable, if not better results can be achieved in well selected patients with unilateral isolated cleft palate using only dissection along the margin of the cleft. This new technique reduces the duration of surgery and anaesthesia and may reduce blood loss and complications.

Keywords: Children, Cleft palate, Lateral incision, Outcome, Palatoplasty, von Langenbeck

INTRODUCTION

The cleft deformities are among the commonest congenital abnormalities encountered in children world-wide. These clefts most commonly affect the lips and the palates. Whereas clefts of the lip are mostly easily corrected, clefts of the palate are often tasking and adverse outcome is not uncommon. Several techniques have been proposed and used by surgeons but none has given completely satisfactory results. Hence different surgeons use different techniques based on their local experiences and results.[1] The objectives of repair, irrespective of technique, are to achieve good anatomical closure of the defect to make for normal speech development, and to minimize maxillary growth disturbances.[2] The von Langenbeck bipedicle flap technique (VLT) which is about the oldest successful technique of cleft palate repair is one of the techniques still commonly used by cleft surgeons despite some drawbacks. It is the most common technique employed in cleft palate repair in our region.[3-5] It is considered to be relatively easy, involves less dissection than many other techniques and results are comparable to other techniques.[6] However, it is criticized for inadequate velopharyngeal competence and failure of reinforcement of the soft palate with the levator palati muscle.[7,8] Many newer techniques described basically try to overcome these shortcomings.[9-12] One of these newer techniques is the Furlow double opposing Z plasty with von

Langenbeck type lateral incision described by Moores et al.[13]

Our centre is one of the sites used by the Smile Train, a non-governmental organization involved in the provision of free surgical treatment of cleft deformities for patients worldwide.[14] The free Smile Train services inspired many patients who hitherto, could not come due to financial reasons. The VLT is the commonest technique we use for repair of cleft palate in our patients. We realized that the alveolar (lateral) releasing incision in the VLT was not needed to achieve a tension free repair in some of our patients. We therefore decided to investigate if the lateral (alveolar) incision should be performed routinely in all VLT repair of cleft palate, or should it be used only when tension free repair is not attainable in our patients. We assessed outcome of treatment using von Langenbeck technique without the lateral incision and compared them to those with lateral incision in selected cases of cleft palate.

METHODS

This is a 5 year prospective study of children 18 years and below who were treated for unilateral cleft of the palate during our Smile Train sessions at our institution between January 2013 and December 2018. Approval was obtained from our institutions ethical committee and written consent was obtained from the parents, and patients (for the older children 8 years and above). Exclusion criteria: clefts of the palate associated with cleft lip, previous attempt at repair, repair technique other than the von Langenbeck, patient above 18 years and incomplete data or loss to follow up. All patients recruited into the study were subjected to similar circumstances of pre and post-operative care, medications and anaesthesia. The procedure was commenced in all cases with the incision at the cleft margin. The nasal and the buccal mucosae were carefully dissected to mobilize the mucoperiosteal flap on either side. The levator palatine fibres were carefully identified and followed to the hamulus of the pterygoid bone. Repair was then performed using vicryl 4-0 on the nasal and palatine mucosae, and the muscle in between them. The tension is assessed as repair is done from anterior towards the uvula.

The alveolar incision was only added in cases where repair was impossible or under tension. Patients were then grouped into those who had alveolar incision (AI group) and those who did not (NAI group). Data obtained included patients age,weight, gender,size of cleft at the uvula, duration of the surgery (from the first incision to the last stitch or dissection).

The blood loss assessed by number of fully soaked 4x4 gauze, the outcome during the first six months follow-up were also recorded and analyzed using the SPSS version 21.

RESULTS

A total of 476 patients with cleft lip and or palate were encountered during the period studied. One hundred and fifty eight of these had cleft palate, but 84 of these patients met the inclusion criteria. They comprised 39 males and 45 females (M:F = 1:1.2). Thirty six patients had Von Langenbeck repair of their palate without the lateral (alveolar) incision (NIA group) and 48 patients had alveolar incision to achieve a tension free palatoplasty (IA group). The age range was 6 months to 18 years. The mean age, mean body weight, and gender were not statistically different between the two groups as shown in Table 1.

Table 1: Comparison of parameters between the case and control groups.

Parameters	NIA Group (No lateral incision) n=36	IA Group (Lateral incision) n=48	P value
Mean age	6 years (SD±2.3)	7.5 years (SD±2.2)	<0.1
Mean body weight	12.2 years (SD±3.1)	14.1 years (SD±2.8)	<0.60
Male Female Ratio	1:1	1:1.3	<0.16
Mean size of defect	12mm (SD±2.3)	21 mm (SD±5.2)	<0.05
Mean duration of surgery	68 minutes (SD± 12)	90 minutes (SD± 14.2)	<0.02
Blood loss (fully soaked 4x4 gauze)	7 (pieces)	11 (pieces)	<0.08

Table 2: Distribution of complications between the case and control groups.

Complications	NIA Group (No lateral incision) n=36	IA Group (Lateral incision) n=48	P value Significant level<0.05
	N (%)	N (%)	
Oronasal fistula	3 (8.3)	7 (14.6)	<0.09
Wound break down	-	2 (4.2)	<0.20
Velopharyngeal incompetence	2 (5.6)	6 (12.5)	<0.08
Total	5 (13.9)	15 (31.3)	<0.05

Conversely, there was statistically significant difference in the size of the defect, and the duration of the surgery between the two groups. The defect was wider and the duration of surgery was longer in the IA group. The average number of fully soaked 4x4 gauze used from beginning of dissection to the stoppage of obvious bleeding at the end of surgery was more in the IA group but the difference was not statistically significant. All patients were followed up at the outpatient clinic for an

average period of six months. Of the 84 patients who were operated on, we recorded complications in 20 cases, giving a general complication rate of 23.8%. Oronasal fistulation was the most common complication and was recorded in 10 cases giving a fistula rate of 11.9%. The distribution of these complications between the two groups are shown in Table 2. The occurrence of complications was significantly higher in the IA (Control) group.

DISCUSSION

Cleft palate is among the common forms of cleft deformity we encountered in our series. There was a wide variation of the structural anomaly among the patients with cleft palate; from the isolated unilateral incomplete to the bilateral complete cleft palates, as well as those with associated cleft lip. This is also the pattern in reports from other centres.[4,5] This study focused on the repair of isolated unilateral cleft palate. By our technique of starting the palate repair with only incision and flap mobilization at the margin of the cleft, the surgeon allows the option of leaving out a lateral incision, if in the course of the repair, the edges can be brought together safely without tension. This modification is akin to the Furlow double Z plasty but avoids the non anatomic placement of the levator palati muscle. There have also been other descriptions of similar modifications of the von Langenbeck technique (VLT) mostly in the Caucasian populations.[15,16] This present study however assesses this modification of the VLT in blacks in our region and it has shown that VLT without the lateral incision in selected cases can achieve satisfactory results. This study shows that our modification of the VLT takes less time because of the lesser dissection required. The blood loss was also less in this study but the difference was not statistically significant when compared with the controls. These qualities of this technique of palate repair without lateral incision makes it attractive whenever it is considered safe. Additionally, lesser complications were recorded among the patients who had no lateral incision. However, these apparent advantages or superior results over the conventional VLT must be viewed against the background that patients recruited into the test group had narrower and shorter defects than their counterparts in the control group. Therefore, the control group comprised those who were more likely to have poorer outcome because they had wider clefts. Never the less, this study has demonstrated that our technique can be applied in some patients safely and lateral alveolar release incision does not need to be applied routinely in all von Langenbeck palate repairs. In addition, the lesser blood loss we observed here and the complete avoidance of the risk of injury to the greater palatine artery, makes us favour this technique whenever it is possible. The lesser dissection involved in this technique also, leaves less scar tissue and more vascular flaps in the event that there is need to repair an oronasal fistula later. A previous study has also indicated that minimal dissection and avoidance of the alveolar release incision reduces the risk of impairment of maxillary growth in these patients.[17] It is however important not to be over enthusiastic to achieve repair without the lateral incision as the consequence of fistula formation or even complete breakdown due to repair under tension is serious on the patient. Moreso, another report suggests that there may not be any significant relationship between maxillary growth and palate repair.[18] The fistula rate among the patients in our test group is 8.3% which is within the range of 2-40% reported by cleft surgeons in various studies.[19-21] We recognize the small size of the study population as a shortcoming of this study. We also did not follow up on speech development as well as otological functions and maxillary growth for a reasonable length of time. We could also have attempted to predict the chances of velopharyngeal incompetence in future using the predictive formula described by Leclerc et al as this will give more credence or otherwise to our technique modification.[22] A longer period of follow up would have given more information about the incidence of otitis media and hearing disturbances in this repair technique as it is still argued whether or not the technique of palatoplasty has a bearing with the development of such complications.[23,24] These parameters would have given further insight into the benefit or otherwise of our technique modification.

CONCLUSION

Despite the aforementioned drawbacks, this study has demonstrated that comparable, if not better results, can be achieved in well selected patients with unilateral isolated cleft palate using only dissection along the margin of the cleft. The lateral alveolar release incision does not have to be routine in all cases of repair of the cleft palate in our patients. This technique reduces the duration of surgery and anaesthesia, and may reduce blood loss and complications in well selected patients. These findings form a good pedestal for further larger scale studies on this subject.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Okoro PE, Kejeh BM. Non routine use of alveolar incision in Von Langenbeck technique palatoplasty in children; a safe and viable technique in our centre. Int Surg J 2019;6:2239-42.