

Comparison of Scar Assessment Score Between Skin Closure with Vicryl Rapide 6/0 and Prolene 6/0 in Cleft Lip Repair

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ABSTRACT

Objective: To compare the scar outcomes following cleft lip repair using Vicryl Rapide 6/0 and Prolene 6/0 sutures, using the Vancouver scar scale and to determine which suture type provides superior aesthetic and functional results.

Study Design: Case series.

Place and Duration of Study: Combined Military Hospital, Lahore Pakistan, from Jan-Dec 2023.

Methodology: Twenty patients aged 3 months to 1 year with cleft lips were recruited Over one year using a convenient sampling method. The patients were randomly assigned into two groups: Group A cleft lip repair with Vicryl rapide 6/0, and Group B with Prolene 6/0 suture. The same surgeon performed all procedures. Scar outcomes were assessed at the 1st, 3rd, and 6th months post-surgery using the Vancouver Scar Scale, which evaluated pliability, vascularity, pigmentation, and scar height.

Results: Of 20 patients, 45% (n=9) were male and 55% (n=11) were female, with a mean age of 6.40 ± 2.30 months. The suture materials were equally distributed and on a 6-month follow-up for Group-A, had 60% while Group-B had 10% normal Pliability. Vascularity was normal in 60% of Group-A, but only 0% in Group-B. Group-A showed 80% normal pigmentation and Group-B up to 50%. For scar height, 60% of Group-A scars were flat, compared to only 0% in Group-B.

Conclusion: In cleft lip repair, Group-A Vicryl Rapide 6/0 provided better pliability, vascularity and height than Group-B Prolene 6/0, and overall scar appearance however there was no significant difference in pigmentation while reducing the need for suture removal and postoperative complications.

Keywords: Cleft Lip; Prolene 6/0; Scars; Vicryl Rapide 6/0.

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INTRODUCTION

Each year, 1 in 700 newborns are born with a cleft lip, cleft palate only, or cleft lip & palate. The prevalence rates differ by region and ethnic group. Cleft lip occurs during the 5th and 6th week of gestation when the medial nasal prominence and the maxillary prominence fail to fuse in the midline, they are diagnosed by ultrasound (USG) and magnetic resonance imaging (MRI).^{1,2} These Congenital cleft lips are associated with difficulty swallowing, physical deformity, and psychological effects on patients and their parents.³ The goal of any surgical intervention is to improve functionality by repairing the underlying muscular structure and aesthetic appearance by creating a continuous and proportionately sized upper lip to raise the level of living.⁴

The scar formation following cleft correction is another important factor and has significant

psychosocial impacts on patient and their parents. The type of material used for the repair is essential.⁵ Among various types of sutures, Prolene 6/0, a non-absorbable suture, is widely used for its high tensile strength and low tissue reactivity, however, it requires removal to avoid "train track" scarring, which can cause discomfort and additional trauma potentially affecting the final scar appearance. On the other hand, vicryl rapide 6/0, an absorbable suture is valued for its biodegradability and easy handling, making it especially effective for paediatric patients in reducing psychosocial stress and anxiety of suture removal.^{6,7}

Despite using different scar assessment tools for various types of suture materials and adhesives, minimal comparative research is available for Vicryl Rapide 6/0 and Prolene 6/0 for their effect on the scar quality in cleft lip repair. This study aims to fill the gap by comparing the scar assessment scores of these two sutures using the Vancouver scar scale offering insight into their effectiveness and assisting surgeons in making evidence-based decisions to improve patient outcomes.

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METHODOLOGY

The case series was carried out at the Combined Military Hospital in Lahore over one year, from Jan-Dec 2023. Ethical approval was obtained from the Institutional Review Board with a reference number of 503/2024. Twenty patients aged 3 months to 1 year with cleft lips were recruited Over one year using a convenient sampling method. The patients were randomly assigned into two groups according to inclusion criteria.

Inclusion Criteria: both genders, age from 3 months to 1 year, complete and incomplete, unilateral and bilateral cleft lip.

Exclusion Criteria: orofacial clefts according to Tessier's classification, syndromic cleft lips. Patients were randomly assigned into two groups: Group-A cleft lip repair with Vicryl rapide 6/0, and Group-B with Prolene 6/0 suture. The operations were performed under general anaesthesia by a single surgeon using non-absorbable and absorbable sutures, via either a Millard or Fisher cleft lip surgical procedure.⁸ Follow-up assessment done at 1st,3rd and 6th months duration. Final results at 6th month assessment in (Figure-1).



Figure 1: cleft lip scar at six months follow. (a) bilateral complete cleft lip repaired with Vicryl Rapide 6/0. (b) right unilateral complete cleft lip repaired with Prolene 6/0

The Vancouver scar scale evaluates the scars based on their pliability, vascularity, pigmentation and height.⁷ These parameters are scored using standardized methods, including pliability testing for functional mobility of the lip, the blanching technique for vascularity and pigmentation and Castro Viejo calliper measurements for scar height (Table-I).

Demographic data were statistically described in terms of mean and SD, frequency and percentage

when appropriate. An Independent t-test was applied to compare the statistically significant difference between the two groups. The p value of ≤ 0.05 was considered significant. All statistically significant calculations were performed using Statistical Package for Social Sciences 20.

Table-I: Vancouver Scar Scale 7

Pigmentation	Vascularity	Pliability	Height	Scores
Normal	Normal	Normal	Flat	0
Hypo pigmented	Pink	Supple	1-2 mm	1
Hyperpigmented	Red	Yielding	3-4 mm	2
Mixed	Purple	Firm	5-6mm	3
		Adherent	>6mm	4

RESULTS

The study included 20 patients, ages ranging from 3 to 9 months and a Mean \pm SD of 6.40 ± 2.30 months. Gender distribution was almost equal, with 45% male (9) and 55% female (11). Suture materials used were equally divided, with 50% (10) sutured with vicryl rapide 6/0 (Group-A) and the other 50% (10) with Prolene 6/0 (Group-B)

Follow-up assessment at the 1st, 3rd and 6th months revealed significant differences between both groups. At the end of the 6th month, 60 % of the patients had normal pliability and vascularity compared to the 10% pliability and 0% vascularity in Group B. Additionally, 80% of Group A patients had normal pigmentation, and 60% had flat scars, compared to 50% and 0%, in Group B. These results suggest vicryl rapide 6/0 leads to superior scar outcomes than Prolene 6/0 suture. In terms of pliability, vascularity and height showing $p < 0.05$ but regarding pigmentation, the statistical difference was not significant making $p > 0.05$ (Table-II).

DISCUSSION

This study aimed to compare the Vicryl Rapide 6-0 and Prolene 6-0 sutures results in cleft lip repair using the Vancouver Scar Scale (VSS). In comparison to the Prolene 6/0 patients (Group B), our results at the 6-month follow-up indicate that the Vicryl Rapide 6-0 patients (Group A) had better scar outcomes than Group B. Ramly et al. used the Manchester scar scale (MSS), the Modified scar rating scale (MSRS), and the Stony Brook scar evaluation scale for assessment of the lip and nose scars in unilateral cleft lip and nose deformity repair.⁹ In our study, the Vancouver scar scale was applied for the first time for cleft lip repairs scar assessment. It was previously used by Finlay et al.

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as the Modified Vancouver scar scale for evaluation of the scars and the quality of life in burn patients.¹⁰

rapide dissolves in 7 to 14 days without causing significant tissue reaction due to less recruitment of

Table-II: Comparison of VSS variable between Vicryl Rapide 6/0 and Prolene 6/0 at 1st , 3rd and 6th Months Follow-Ups (n=20)

Study Parameters	1st Month Follow-Up		3rd Month Follow-Up		6th Month Follow-Up	
	Vicryl rapide 6/0 n=10 (Group-A) n(%)	Prolene 6/0 n=10 (Group-B) n(%)	Vicryl rapide 6/0 n=10 (Group-A) n(%)	Prolene 6/0 n=10 (Group-B) n(%)	Vicryl rapide 6/0 n=10 (Group-A) n(%)	Prolene 6/0 n=10 (Group-B) n(%)
Pliability						
Normal	3(30%)	0(0%)	4(40%)	0(0%)	6 (60%)	1(10%)
Supple	5(50%)	2(20%)	4(40%)	4(40%)	3(30%)	3(30%)
Yielding	2(20%)	6(60%)	2(20%)	5(50%)	1(10%)	5(50%)
Firm	0(0%)	2(20%)	0(0%)	1(10%)	0(0%)	1(10%)
p Value	0.003		0.005		0.001	
Vascularity						
Normal	4(40%)	0(0%)	4(40%)	0(0%)	6(60%)	0(0%)
Pink	5(50%)	5(50%)	6(60%)	5(50%)	4(40%)	6(60%)
Red	1(10%)	3(30%)	0(0%)	2(20%)	0(0%)	2(20%)
purple	0(0%)	2(20%)	0(0%)	3(30%)	0(0%)	2(20%)
p Value	0.008		0.003		0.002	
Pigmentation						
Normal	5(50%)	3(30%)	7(70%)	4(40%)	8(80%)	5(50%)
hypopigmentation	1(10%)	0(0%)	0(0%)	1(10%)	0(0%)	2(20%)
Hyperpigmented	4(40%)	4(40%)	3(30%)	4(40%)	2(20%)	1(10%)
mixed	0(0%)	3(30%)	0(0%)	1(10%)	0(0%)	2(20%)
p Value	0.13		0.22		0.22	
Height						
Flat	3(30%)	0(0%)	5(50%)	0(0%)	6(60%)	0(0%)
1-2 mm	4(40%)	4(40%)	3(30%)	5(50%)	3(30%)	6(60%)
3-4 mm	2(20%)	5(50%)	2(20%)	3(30%)	1(10%)	1(10%)
5-6mm	0(0%)	1(10%)	0(0%)	2(20%)	0(0%)	3(30%)
p Value	0.01		0.01		0.005	

Rao *et al* compared the aesthetic outcomes of scars in congenital unilateral cleft lip repair using Vicryl Rapide 6/0 and nylon 6/0 and reported better outcomes from the nylon than Vicryl Rapide in terms of pigmentation, pliability and scar height but the results of the vascularity were statistically non-significant.while in our study where vicryl rapide 6/0 was compared with Prolene 6/0 and at the end of the 6th month showed a 60% outcome of the Vicryl Rapide 6/0 in terms of normal pliability, normal vascularity and flat scars. The results of the pigmentations though show 80 % of normal pigmentation but there was no statistically significant difference with Group B over the whole 6 months($p=0.22$).^{11,12}

Different kinds of studies in the past reported the superior outcomes of the absorbable suture over non-absorbable suture supporting the fact that vicryl

the macrophages, the presence of which enhances the release of transforming growth fact beta leading to hypertrophic scars).in our results Group A (Vicryl rapide 6/0) presented 60% of the patient showing the flat scars while in Group B showed 60 % of the scar with 1-2mm of height.¹³

Keeping a suture for a prolonged time can lead to the formation of train track scars for which it is vital to remove the non-absorbable suture at an appropriate time, removal of the suture in paediatric patients is an event associated with traumatic memory, as they are mostly non-cooperative.¹⁴ Arranging sedation for removing the suture is another procedure requiring the involvement of many team members. Previously comparisons of the non-absorbable sutures with tissue adhesive were done to avoid the frequent visits and cost of the patients. Tissue adhesives proved to be better in many ways than the non-absorbable and

absorbable suture but they do not provide adequate tensile strength. In our study, we used Vicryl Rapide 6/0 to fill the gaps as Vicryl Rapide 6/0 is absorbable and there is no need to bring the patient back to the operation theatre. To compensate for the tensile strength of the Prolene, the buried sutures used to close the underlying muscle provide enough tensile strength to hold the tissue until the suture dissolves and healing occurs.^{15,16}

Some studies compared absorbable and non-absorbable sutures in unilateral cleft lip closure, by using Visual analogue scale and found no difference between the cosmetic and functional outcome. Our study showed better outcomes with Vicryl Rapide 6/0 than the Prolene 6/0 using the VSS, supporting that the VSS can be used in future studies with large study samples.¹⁷

Frans *et al* did scar assessment after cleft lip closure with patient and observer scar assessment scale (POSAS) in which in addition to pliability, vascularity, pigmentation and height also included the pain and itching assessment by both patient and observer and found that the patient was much satisfied with the scar results than the observers. In our study, the scar assessment was done in patients less than 1 year using the most common and easily available sutures including variables where patients' cooperation was not required due to their small age. Both of the sutures showed better results but vicryl 6/0 showed better and earlier outcomes than Prolene 6/0.¹⁸

Even when this study's findings provide insightful information about the relative effectiveness of absorbable and non-absorbable sutures, a few limitations should be noticed. One of which is the comparatively small sample size of 20 patients for the generality of the results. Large and multicentre investigations using the VSS tool are required to confirm these findings and provide more robust evidence.

CONCLUSION

In cleft lip repair, Group-A Vicryl Rapide 6/0 provided better pliability, vascularity and height than Group-B Prolene 6/0, and overall scar appearance however there was no significant difference in pigmentation while reducing the need for suture removal and postoperative complications.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

SA & RSA: Data acquisition, data analysis, critical review, approval of the final version to be published.

MAA & MHTK: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

NJ & MA: Conception, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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