

## COMPARISON OF EFFICACY OF POLYPROPYLENE WITH CHROMIC CATGUT SUTURE IN STITCHING PAEDIATRIC FACIAL LACERATIONS

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### ABSTRACT

**Objective:** The objective of this study was to compare 5/0 polypropylene suture with 5/0 chromic catgut in small clean pediatric facial laceration repair in terms of cosmetic outcome.

**Study Design:** Randomized controlled trial.

**Place and Duration of Study:** Combined Military Hospital, Rawalpindi from 26<sup>th</sup> May 2012 to 25<sup>th</sup> Nov 2012.

**Patients and Methods:** A total of 300 patients of both gender under 12 years of age, with small clean facial lacerations were selected and divided in two equal groups using random number tables. All the patients underwent suturing in minor operating theater of trauma centre CMH Rawalpindi as day care cases, under local anesthesia and aseptic measures. In group 1, polypropylene 5/0 suture was used where as in group 2 chromic catgut 5/0 was used for suturing. Aseptic dressing was applied. All patients were reviewed on 5<sup>th</sup> day (for stitch removal in polypropylene group) and 3 months post-operatively to establish cosmetic outcome which was determined by scar visual analog score both by parents of the child and consultant surgeon.

**Results:** The mean VAS (visual analog score) as observed by Consultant surgeon was 79.14 and 78.63 for polypropylene and chromic catgut groups respectively. The mean VAS observed by the parents of the child for respective groups was 76.67 and 76.03. The significance value was 0.961 for parental VAS and 0.988 for surgeons VAS depicting insignificant difference in both suture groups.

**Conclusion:** There is no long-term difference in cosmetic outcomes of both the sutures in the repair of facial lacerations in the pediatric population. No difference in complication rate of wound was observed. In addition, the parents of the children in absorbable suture group expressed satisfaction over prevention of psychological trauma of stitch removal.

**Keywords:** Facial lacerations, Chromic catgut suture, Cosmetic outcome, Pediatric, Polypropylene suture.

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### INTRODUCTION

A cosmetically intact face is vital for sound personality development of a child. Facial laceration in pediatric population is a common presenting complaint in hospital emergency departments. Most of these are fortunately small clean lacerations. Cosmetic concerns, good blood supply of face and laxity of facial skin make facial lacerations unique. Where in other parts of body primary suturing of lacerations more than 6 hours old is not routinely recommended, facial

laceration can even be stitched even after 18 hours of impact safely<sup>1</sup>. Initial care involves through cleaning, assessment and rational debridement. Many methods ranging from suturing to tissue glues have been under trial for definitive management with aim of improving outcome<sup>2,3</sup>. Furthermore debate still continues whether to use absorbable or non absorbable suturing materials<sup>4</sup>. Both have certain advantages and disadvantages but nowadays general opinion has shifted in favor of non absorbable nylon/polypropylene sutures<sup>5</sup>. Many recent studies compared results of absorbable and non absorbable sutures. Non absorbable sutures were found to have slightly better cosmetic outcome

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and little post operative pain. Wound healing was almost similar in both the groups. However, absorbable sutures had the advantage of avoiding discomfort to the child for the second time i.e. stitches removal, were more cost effective and proved to have better cosmetic outcome in some of these studies<sup>6,7</sup>. As facial laceration is a very common problem in pediatric population, surgical research continues aiming at cosmetic intactness, decreasing operative/ post operative pain and improving wound healing. The rationale of this study was to discern the impact of suture selection in our pediatric population focusing on cosmetic outcome.

## **MATERIAL AND METHODS**

This randomized controlled trial was carried out at CMH Rawalpindi from 26 May 2012 to 25 Nov 2012. Patients belonging to both the genders under 12 years of age, meeting the inclusion criteria i.e. clean small facial lacerations less than 2 x 0.5 cm size were included in the study. Patients with wound dirt and devitalization, associated neurovascular compromise, bony injury or multiple trauma were excluded from the study. Patients with diabetes, coagulopathy, keloid and hypertrophic scarring tendency were also excluded basing upon previous history. Three hundred patients were included in study by consecutive non-probability sampling and randomly divided in two equal groups. Randomization was done by computer generated random number tables technique. After permission from the hospital ethical committee, informed consent was taken from all the patients. Hospital registration number, name, age, gender, address and phone number (optional) were noted. All patients underwent suturing in minor operating theater of trauma centre CMH Rawalpindi. Suturing was done in all patients as day care cases, under aseptic measures<sup>12,13</sup> after infiltration of local anesthesia<sup>14-16</sup>. In group 1 polypropylene 5/0 suture was used where as in group 2 chromic catgut 5/0 was utilized as suturing material. As chromic catgut is readily available in our settings, cheap and does not

require suture removal. After suturing, aseptic dressing was applied. Patients were given injection coamoxiclave 50 mg/kg body weight per operatively and syrup ibuprofen post-operatively for 5 days.

All patients were reviewed on 5<sup>th</sup> day (for stitch removal in polypropylene group) and 3 months post-operatively to establish state of wound and cosmetic outcome. Cosmetic outcome was determined after 3 months by measuring scar visual analog score (VAS) both by parents of the child and consultant surgeon<sup>6</sup>.

The data was analyzed using SPSS version 12. Mean and standard deviation (SD) for the Quantitative Variable i.e. Age and VAS was calculated. Frequency and Percentages were presented for qualitative Variables such as gender. Chi-square test was used to compare the gender in two groups. Independent sample t-test was used to compare age and VAS between the two groups,  $p$ -value  $<0.05$  was considered as significant.

## **RESULTS**

Out of 300 patients in the study, both groups i.e. Group 1 and Group 2 had 150 patients each. Mean age in Group 1 was  $7.209 \pm 2.688$  years and in Group 2 was  $7.042 \pm 2.667$  years. This implied negligible difference in terms of age in both groups involved in the study ( $p=0.783$ ). Gender distribution was 79 (52.6%) in Group-1. Whereas Group 2 had 80 (53.3%) male patients. There was insignificant difference in gender distribution of both the groups ( $p=0.908$ ). The mean VAS as observed by Consultant surgeon was  $79.14 \pm 8.274$  and  $78.63 \pm 8.196$  for Group-1 and Group-2 respectively. The mean VAS observed by the parents of the child at 3 months was  $76.67 \pm 8.641$  for Group 1 and  $76.03 \pm 8.560$  for Group-2. The difference was insignificant in parental VAS ( $p=0.524$ ) and surgeon's VAS ( $p=0.595$ ).

## **DISCUSSION**

The art of suturing wounds had been described in the Egyptian scrolls as early as

3500BC. Even suturing of wounds have been reported by Indian surgeons as early as 5000BC. Suture materials used in the past centuries consisted of animal tendons, horsehair, leather strips, vegetable fibers, and human hair. In 1806 Mr. Philip Physick, the so called father of modern surgery, developed a sturdier absorbable suture made from buck skin. Catgut, derived from processed sheep or cattle was first utilized for use in suturing in the 1870s. Because non absorbable sutures on the face need to be removed between 3 and 7 days, we hypothesized that catgut would be the ideal suture for pediatric facial lacerations as it doesn't require removal. Our results showed that there were no clinically significant differences in cosmetic appearance between absorbable and non absorbable sutures at 3 months. We used the validated VAS scoring system to grade the wounds because this scale has been shown to be user friendly and is reproducible<sup>6,11</sup>. We found the difference between treatment groups on the VAS to be around 5 mm, Ruck P<sup>6</sup> found it to be 15 mm, whereas Singer et al<sup>11</sup> found this to be 10 mm and. In our study, the differences between the mean VAS scores in the catgut and polypropylene groups, for both surgeon and parents, did not even reach the accepted mean confidence interval difference (MCID) of either 10 or 15 mm. The study had adequate sample size to provide a power greater than 90% to detect this difference.

The cosmetic outcome results of our study were also consistent with previously published reports evaluating the use of absorbable sutures in laceration repair. Holger<sup>10</sup> et al, using VAS scores, compared the cosmetic outcomes at 9 to 12 months of adult and pediatric patients with facial lacerations repaired using nylon, FAC, and octylcyanoacrylate. Their results also showed no clinically important differences in VAS scores between the 3 groups. Karounis<sup>8</sup> et al also did not detect any clinical difference in cosmetic scores between plain catgut versus nylon sutures in pediatric lacerations at 4 to 5 months. Our surgeon's VAS scores were only slightly different from those recorded by the parents. This

is almost similar to the findings of Singer et al<sup>11</sup> where lacerations considered to be having optimal outcomes by practitioners also received higher patient satisfaction scores.

We chose to assess wounds at 5<sup>th</sup> day to assess wound and remove stitches, rather than for cosmetic results. Multiple studies have shown poor correlation between early and long-term wound appearances. The decision to follow up at 3 months, instead of 6, 9, 12 months or 2 year came from the fact that the 3-month cosmetic outcome is generally the standard for evaluating success of laceration. Quinn et al<sup>9</sup> also found a strong correlation in the cosmetic outcomes on wounds assessed at 3 months. Biologically, a wound reaches 10% of its original tensile strength at 10 days, 80% at 3 months, and 100% at 1 year. Because very little inflammatory tissue reaction and collagen remodeling takes place between 3 months and 1 year, no significant changes in cosmetic outcome occur during this time.

During the study we observed a trend in parents of the patients preferring absorbable sutures to avoid anxiety of their child during stitch removal in polypropylene group. We safely speculate, that some parents may have preferred absorbable suture compared with polypropylene because of the ease with which the absorbable sutures were removed. On the other hand, it can be concluded based on the excellent parental VAS scores in both the groups, that parents seemed satisfied with cosmetic outcome of in both groups the use of absorbable sutures in their children.

## CONCLUSION

On the basis of the results obtained in the study, it can be concluded that there is no long-term difference in cosmetic outcomes between absorbable chromic catgut sutures and traditional polypropylene sutures in the repair of facial lacerations in the pediatric population. Based on above conclusion we recommend use of absorbable sutures in paediatric group for laceration repair as it is cheaper, readily available in our emergency settings and gives a choice to

the parents to prevent their child from psychological trauma of removal of stitches.

### CONFLICT OF INTEREST

The authors of this study reported no conflict of interest.

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