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Original Article

Comparison of post-urethroplasty complication rates in pediatric cases with hypospadias using Vicryl or polydioxanone sutures

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Abstract *Objective:* Hypospadias is a common congenital problem among male newborns. Both rapid absorbable sutures (polyglactin, Vicryl) and delayed absorbable sutures (polydioxanone, PDO) are used in hypospadias repair based on the surgeon's preference. This study was conducted to compare post-urethroplasty complication rates in pediatric patients with hypospadias using Vicryl or PDO sutures.
Methods: This is a retrospective study which was designed and performed on 583 children aged 1–7 years old who had undergone hypospadias repair from January 2012 to December 2018. Required data were obtained from the patients' medical records.
Results: Overall, post-surgical complications were observed in 60 (10.3%) patients comprising urethro-cutaneous fistula ($n=39$, 6.7%), meatal stenosis ($n=10$, 1.7%), urethral stricture ($n=7$, 1.2%), and glans dehiscence ($n=4$, 0.7%). The mean age of the children with complications was 3.0±1.3 years. According to Kaplan-Meier estimate, the interval between surgery and development of complications was significantly shorter in the Vicryl group ($p=0.037$). Overall, complications were more prevalent in Vicryl suture than PDO suture (15.1% *vs.* 5.3%, $p<0.001$). Regression model revealed that in comparison to the distal type, proximal hypospadias (odds ratio [OR]:103.9, 95% confidence interval [CI]: 32.2–334.9, $p<0.001$) and mid-shaft hypospadias (OR: 82.9, 95% CI: 25.9–264.6, $p<0.001$) while using Vicryl suture instead of PDO suture (OR: 62.4, 95% CI: 21.2–183.8, $p<0.001$) increased the odds of developing post-urethroplasty complications.

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proximal types than the distal ones. All the aforementioned points can jeopardize the outcome of the surgery.

Suture composition is an important factor in the outcome of the hypospadias repair. Based on the surgeon's preference, any kind of absorbable suture with enough tensile strength can be used for hypospadias repair. Urethral stricture, meatal stenosis, urethro-cutaneous fistula, and glans dehiscence were more prevalent in the Vicryl group; however, the differences were not statistically significant. In contrast to our result, Cimador et al. [20] and Chung et al. [16] stated that suture material did not affect the outcome of hypospadias repair.

DiSandro and Palmer [5] compared rapidly absorbable sutures with PDO suture and showed a higher incidence rate of urethral stricture in the latter group. However, they did not find any significant difference in postoperative fistula formations based on the suture material [5]. In their study, different surgical methods were used, while we used the same surgical method for all patients. This may be the reason for the discrepancy.

Another study performed by Guarino et al. [21] revealed no association between the suture material and development of post-urethroplasty fistula, wound dehiscence, and infection in children with distal hypospadias. The reason for the difference may be that they only investigated the patients with distal hypospadias which is known for the least post-operative complication formation of another hypospadias type.

Shirazi et al. [22] investigated the outcome of hypospadias repair based on the suture materials in a study conducted on animals. They found better outcomes in the Monocryl and PDO groups. A higher percentage of vessel density and a higher volume of the urethral lumen in the PDO group may explain lower complications in their study. This is in line with results of the present study. The nature of PDO suture which is a long-term absorbable suture with a less inflammatory response in comparison to the Vicryl suture can explain this significant difference.

Similar to the result of the present study, Ulman et al. [4] reported that using Vicryl suture caused more urethro-cutaneous fistula in children who had undergone perimeatal-based flap urethroplasty (Mathieu procedure) for distal hypospadias than PDO suture (16.0% *vs.* 4.9%, $p<0.001$).

There are two limitations in our study. This study is a one center case-control study, and we believe that multicenter studies might be more conclusive. In addition, regarding the method, we suggest randomized control trial studies with enough sample size.

5. Conclusion

We suggest PDO suture in the repair of hypospadias due to lower complication rate, especially in the cases of proximal and mid-shaft hypospadias repair; however, multicenter randomized control trial studies with enough sample size are necessary to support our results.

Author contributions

Study concept and design: Mehdi Shirazi, Abdolreza Haghpanah.
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Critical revision of the manuscript: Abdolreza Haghpanah, Mehdi Shirazi.

Conflicts of interest

The authors declare no conflict of interest.

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