

## Original Article

## Comparison of the Lower Inguinal Skin Crease and Inguinoscrotal Junction Approach for the Treatment of Inguinal Hernia in Children.

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### ABSTRACT

**BACKGROUND:** Inguinal herniotomy is the most common operation performed by Pediatric Surgeons, mostly by the lower inguinal skin crease approach. Inguinoscrotal junction approach can be used as an alternative way which avoids tampering of inguinal canal and easy access to find out the patent processus vaginalis. **OBJECTIVES:** This study was done to compare the outcome of herniotomy for inguinal hernia through lower inguinal skin crease and inguino scrotal junction approach in normal BMI children. **MATERIALS AND METHOD:** This quasi-experimental study was conducted from July, 2018 to October, 2019 in the Department of Pediatric Surgery, Mymensingh Medical College Hospital, Mymensingh among the 60 patients with inguinal hernia who fulfilled the inclusion and exclusion criterion. History was recorded in a data collection sheet after taking informed written consent from the parents/guardians. Proper clinical examinations, investigations were done. Patients were selected considering the inclusion criteria. Approximately 60 were selected for the study. Alternatively one patient through Lower inguinal skin crease and another through inguino scrotal junction approach were performed for each of the two consecutive patients and in this way one patient was selected for Group A (Lower inguinal skin crease, n=30) and other for Group B (Inguino scrotal junction, n=30). After the induction of general anesthesia, we made a transverse incision along the crease of inguino scrotal junction. This incision was depended through the layers of the scrotum down to the testis. When distal part of patent processus vaginalis was divided, the proximal stump of patent processus vaginalis fell back into the peritoneal cavity. The testis was placed into the scrotum. The skin was closed with a running subcutaneous 3-0 or 4-0 absorbable suture. Postoperative care by nothing per oral for 4-6 hours. Intravenous fluid, intravenous antibiotics parenteral analgesics. Patient was discharged on 1<sup>st</sup> POD after oral feeding. All patients were followed up at 1<sup>st</sup> post-operative day for immediate complication. eg: scrotal swelling. Also after one month for late complication. **RESULTS:** Among respondent 63.33% respondents had swelling at right side. 6.6% respondents of lower inguinal approach and 10% of inguinoscrotal junction approach showed complications. Post-operative complications were 5 scrotal swellings. In lower inguinal skin crease approach 2 scrotal swellings and in inguino scrotal junction approach 3 scrotal swellings. Statistically significant relationship was not found between overall route of surgical approach of inguinal hernia with their site and with complication. **CONCLUSION:** Inguinal herniotomy can be performed through lower inguinal skin crease or inguino scrotal junction approach without any significant difference in terms of outcome. Inguino scrotal junction approach for the treatment of inguinal hernia is well tolerated, simple, cosmetically appealing and less chance of infection due to less adipose tissue in scrotal skin.

**Key Words:** Lower Inguinal Skin Crease, Inguinoscrotal Junction, Inguinal Hearnia, Children.

### INTRODUCTION

The inguinal approach for the treatment of inguinoscrotal pathologies in children is the recommended standard surgical procedure. This surgical approach includes freeing the

spermatic cord from the attached tissue, separating and high ligating the patent processus vaginalis (PPV). It is important to prevent vas and vessels injury when high ligating the PPV. Then, the testis is fixed to the scrotum without tension.<sup>1,2</sup> Inguinal exploration with a subsequent inguinoscrotal incision is the standard for the treatment of treatment of inguinal hernia.<sup>3,4</sup>

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Recently, good success rates with minimal complications were reported when herniotomy was performed via a inguinoscrotal approach.<sup>5</sup> Other studies also demonstrated that the inguinoscrotal approach is an alternative for the correction of inguinal hernia.<sup>6</sup> The advantages of this approach include minimal postoperative scarring because the incision is small, a short operative time and elimination of any risk of ilioinguinal nerve damage because the spermatic cord is not dissected. However, the postoperative risk of persistent hernia or hydrocele when PPV high-ligation is inadequate remains of concern. Testicular ascent may also develop postoperatively when the proximal attachments are not adequately separated.<sup>7</sup>

Protrusion of a viscus or part of a viscus through an abnormal opening in the wall of its containing cavity is called hernia. The incidence of inguinal hernia in children range from 0.8% to 4.4% and is higher in infants. Boys are affected six times more than girls

with the ratio 3:1. Predominance of right sided 60%, left sided-30% and bilateral-10%. Congenital hydrocele is nothing but accommodation of fluid as a content of hernia sac. It may be communicating or noncommunicating.<sup>8</sup>

Inguinal hernia is one of the most common conditions in pediatric age. It arises due to patent processus vaginalis. Treatment is herniotomy in order to prevent irreducibility, obstruction and strangulation.<sup>9</sup> Herniotomy for Inguinal hernia can be performed through both lower inguinal skin crease and inguino scrotal junction approach. Standard surgical approach to pediatric inguinal hernia operation is lower inguinal skin crease but inguino scrotal junction approach also gives excellent access to PPV.<sup>10</sup>

In our study we planned to find out the result of inguino scrotal junction approach herniotomy in pediatric age group.

#### MATERIALS AND METHODS

This was a Quasi experimental study conducted during July, 2018 – October, 2019 at the department of pediatric surgery, Mymensingh Medical College Hospital, Mymensingh. Patient was selected for Group A (Lower inguinal skin crease, n=30) and other for Group B (Inguino scrotal junction, n=30) (16 months duration). Sample size was estimated by following formula  $n = z^2pq/d^2$  and prevalence was unknown. So sample size was 384 but the time limitation we took only 60 sample. Data was analyzed by statistical package for social science (SPSS) version 20.

#### RESULTS

Total 60 patients were taken and they were divided according to age.

**Table I: Age distribution of inguinal hernia in male children among the study population (n=60).**

Groups	Number of patients	Percentage	Mean	SD
Neonate-1 year	4	6.67%		
1 year- 3 year	16	26.67%	4.07	1.80
3 year -6years	40	66.67%		
<b>Total</b>	<b>60</b>	<b>100.0%</b>		

Table I showed 3 years to 6 years age group of patients were the maximum and that of 1year to 3 years were the seconder with the mean age of  $4.07 \pm 1.80$ .

**Table II: Side of distribution of inguinal hernia among study population.**

Side	Number of patient	Percentage
Right	38	63.33%
Left	22	36.67%
<b>Total</b>	<b>60</b>	<b>100%</b>

Table II represents that, right sided inguinal hernia were 38(63.33%) and left sided. 22(36.67%) were

**Table III: Post-operative complications following herniotomy in children of the study population (n=60)**

Route	Complications		Total
	Present	Absent	
Lower inguinal	2(6.6%)	28(93.4%)	30
Inguino scrotal junction	3(10%)	27(90%)	30
<b>Total</b>	<b>5(8.33%)</b>	<b>55(91.67%)</b>	<b>60</b>

In table III, complications almost absent in both procedure.

## DISCUSSION

Out of 60 patients, 30 in group-A where lower inguinal skin crease and another 30 patient in group-B where inguino scrotal junction approach were performed. In this study age ranges from neonate to six years. The mean age was  $4.07 \pm 1.80$  years. A study was done by Bahaaeldin KH<sup>11</sup> showed age ranges of repair by inguino scrotal junction between 15 days to 12 years. Which is bit higher than my study which should not take consideration due to limitation of study design. In this study among the population right sided inguinal hernia

38(63.33%) and left sided inguinal hernia 22(36.67%) also this study showed right sided inguinal hernia 61.53% (n=64) left sided hernia 23.07% (n=24). Majority occurred right side which is also consistent with my study. In present study showed maximum patients 42 (70.0%) were normal weight. Post-operative complications were 5 scrotal swellings. In lower inguinal skin crease approach 2 scrotal swellings and In inguino scrotal junction approach 3 scrotal swellings. In both cases there was no wound infection. Another study done by Alp et al,<sup>1</sup> also revealed that 4 scrotal swellings and 2 hematoma which is

consistence with my study. Iyer et al<sup>18</sup> study also showed 2 scrotal hematoma but no wound infection. So this study is some extent superior than other study. But Bahaaeldin K.<sup>11</sup> study showed 1 case developed wound infection, Which is consistence with this study. Iyer et al<sup>18</sup> study showed 4 recurrence, Bahaaeldin KH<sup>11</sup> study showed no recurrence. But recurrence of hernia and Testicular atrophy did not show so far we cited in this study. The incision for surgical approach to pediatric inguinal pathologies including inguinal hernias has been supra pubic transverse inguinal incision. Yet alternative incision may be considered. Bianchi and squire first introduced inguino scrotal crease incision. The primary goal of the surgical treatment of communicating hydrocele in children is to ligate the PPV as cranially as possible, with no iatrogenic injury and postoperative recurrence. Inguinal incision has been accepted as a standard route in the pediatric population for the treatment of communicating hydrocele and indirect inguinal hernia<sup>12</sup> since the late 1980s, the inguino scrotal junction approach has been used as an alternative for the management of hernia or other inguinoscrotal pathologies.<sup>13</sup>

Recently published studies on scrotal orchiopexy reported that PPV could be dissected from the cord structures through the inguinal canal with the aid of the traction of the sac, and after the division, the proximal aspect of PPV invariably retracted to the internal inguinal ring.<sup>4,7,14-16</sup>

The inguino scrotal junction approach avoids tampering with the inguinal canal and offers an excellent access to the PPV with minimal dissection and morbidity. Additionally, this approach eliminates the risk of damage to the ilioinguinal and genitofemoral nerves.<sup>17</sup>

All of these factors provide less postoperative pain, shorter hospital stay and faster healing compared to the inguinal approach. Another obvious advantage of the inguino scrotal

junction approach is the excellent cosmesis. In most cases, the scar is nearly invisible.<sup>18-21</sup>

Koyle et al<sup>20</sup> al noted another advantage of the inguino scrotal junction approach, in that it allows access to the scrotal contents and removal of the distal portion of tunica vaginalis. Using inguino scrotal junction incision resulted in shorter operative times, decreased pain and improved cosmesis in our patients. To our knowledge, there are three reasonably different scrotal locations to incise the scrotum: the inguino scrotal crease, midline scrotal and transverse to rugae of scrotum.

## CONCLUSION

Inguinal hernia are very common in case of children. Which need urgent attention, Evaluation and time honoured management. Immediate surgical intervention in case of hernia showed very good result with reasonable morbidity. It can be performed through lower inguinal skin crease or inguino scrotal junction approach without any significant difference in terms of outcome.

## REFERENCES

1. Alp BF, Irkilata HC, Kibar Y, Zorba U, Sancaktular AA, Kaya E, Dayanc M, 2014. Comparison of the inguinal and scrotal approaches for the treatment of communicating hydrocele in children. *Kaohsiung journal of medical science* 30; 200-05.
2. Hutcheson, J.C. Cooper, C.S. and Snyder, H.M. The anatomical approach to inguinal orchiopexy. *The Journal of urology* 2000; 164(5): 1702-1704.
3. Cloutier, J., Moore, K., Nadeau, G. and Bolduc, S, . Modified scrotal (Bianchi) mid raphe single incision orchiopexy for low palpable undescended testis: early outcomes. *The Journal of urology*. 2011; 185(3): 1088-1092.
4. Yucel, S., Celik, O., Kol, A., Baykara, M. and Guntekin, E . Initial pre-scrotal approach for

- palpable cryptorchid testis: results during a 3-year period. *The Journal of urology*. 2011; 185(2): 669-672.
5. Oh, J.H., Chung, H.S., Yu, H.S., Kang, T.W., Kwon, D. and Kim, S.O. Hydrocelectomy via scrotal incision is a valuable alternative to the traditional inguinal approach for hydrocele treatment in boys. *Investigative and clinical urology*. 2018; 59(6): 416-421.
  6. Soualili, Z., Achouri, D., Haif, A., Touabti, S., Yahia, S.A., Benmahmoud, M., Choutri, H., Nedjar, S., Mimoune, M. and Chouaib, S. The interscrotal approach to inguinoscrotal pathologies. *Arab journal of urology*. 2015; 13(3): 176-178.
  7. Dayanc, M., Kibar, Y., Irkilata, H.C., Demir, E., Tahmaz, L. and Peker, A.F. Long-term outcome of scrotal incision orchiopexy for undescended testis. *Urology*. 2007; 70(4): 786-788.
  8. Philip L. Glick, Scoot, C. Boutamyer, 'Inguinal Hernias and Hydrocoeles', *Pediatric surgery*, 7th editions, Mosby Elsevier, Philadelphia, 2012; 2: 1172-89.
  9. Mohta A, Jain N, Frmiraya KP, Saluja SS, Sharma S, Gupta A. Non ligation of the hernial sac during herniotomy: a prospective study. *Pediatr Surg Int*. 2003; 19: 451-62.
  10. Ibrahim, M., Ladan, M. A., Abdussalam, U. S., Getso, K. I., Mohammad, M. A., Chukwuemeka, A. L., Owolabi, F. L., Akhparov, N. N., & Aipov, R. R. Open inguinal herniotomy: Analysis of variations. *African journal of paediatric surgery: AJPS*, 2015; 12(2): 131-135. <https://doi.org/10.4103/0189-6725.160361>
  11. Bahaeldin HK, Yassin T, Abdelaziz, El-Kotby M. Scrotal Crease incision for inguinal Hernia in children, *Kasr El Aini Journal of Surgery*. 2011; 12: 57, faculty of medicine, Cairo University, Benisuef University
  12. Lau ST, Lee YH, Caty MG. Current Management of hernias and hydroceles. *Semin Pediatr Surg*. 2007; 16: 50-7.
  13. Misra D, Dias R, Kapila L. Scrotal fixation: a different surgical approach in the management of the low undescended testes. *Urology*. 1997; 49: 762-75.
  14. Bassel YS, Scherz HC, Kirsch AJ. Scrotal incision orchiopexy for undescended testes with or without a patent processus vaginalis. *J Urol*. 2007; 177: 1516-18.
  15. Al-Mandil M, Khaury AE, El-Hout Y, Kogon M, Dave S, Farhat WA. Potential complications with the prescrotal approach for the palpable undescended testis? A comparison of single prescrotal incision to the traditional inguinal approach. *J Urol*. 2008; 180: 686-90.
  16. Callewaert PR, Rahnema' MS, Biallostowski BT, van Kerrebroeck PE. Scrotal approach to both palpable and impalpable undescended testes: should it become our first choice? *Urology*. 2010; 76: 73-6.
  17. Fearne C, Abela M, Aquillina D: Scrotal approach for inguinal hernia and hydrocele repair in boys. *Eur J Pediatr Surg*. 2002; 12(2): 116-17.
  18. Iyer KR, Kumar V, Huddart SN, Bianchi A. The scrotal approach. *Pediatr Surg Int*; 10:58-60. Gokcora IH, Yagmurlu A. (2003) A longitudinal follow-up using the high trans-scrotal approach for inguinal and scrotal abnormalities in boys. *Hernia*. 1995; 7: 181-84.
  19. Lais A, Ferro F. Trans-scrotal approach for surgical correction of cryptorchidism and congenital anomalies of the processus vaginalis. *Eur Ruol*. 1996; 29: 235.
  20. Koyle MA, Walsh R, Caruso A, Wilson E. Scrotal (Bianchi) approach to patiet Processus vaginalis in children. *Tech Urol*. 1999; 5(2): 95-9
  21. Gokcora IH, Yagmurlu A. A longitudinal follow-up using the high trans-scrotal approach for inguinal and scrotal abnormalities in boys. *Hernia*. 2003; 7: 181-84.