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Single-Stage Transanal Pull-Through for Hirschsprung's Disease: A 60 Cases Study in Al-Kafeel Hospital in Karbala City

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Abstract. **Background:** Hirschsprung's disease (HD) represents a congenital disorder characterized by intestinal aganglionosis, traditionally requiring multi-stage surgical interventions with significant morbidity. **Specific Background:** Single-stage transanal pull-through (TAPT) has emerged as a minimally invasive alternative, offering reduced surgical trauma and faster recovery. **Knowledge Gap:** However, comprehensive data regarding TAPT outcomes in Middle Eastern pediatric populations remain limited, particularly concerning postoperative complications and functional results. **Aims:** This study evaluated the safety, efficacy, and clinical outcomes of single-stage TAPT in 60 pediatric HD patients treated at Al-Kafeel Hospital, Karbala, Iraq, between July 2022 and November 2025. **Results:** The cohort comprised 31 males (52%) and 29 females (48%), with rectosigmoid involvement predominating (80%). Mean operative duration was 85±22 minutes without intraoperative complications. Early postoperative complications included perianal excoriation (22%), enterocolitis (15%), anastomotic edema (12%), and sphincter spasm (8%). Long-term follow-up demonstrated satisfactory bowel function with minimal intervention requirements (3%). **Novelty:** This represents one of the largest single-center Middle Eastern series documenting TAPT outcomes with comprehensive postoperative assessment. **Implications:** TAPT demonstrates excellent safety profiles and functional outcomes, supporting its adoption as the preferred surgical approach for HD in specialized pediatric centers

Highlights:

1. TAPT showed high safety with no intraoperative complications in 60 cases and 85-minute average operative time.
2. Rectosigmoid involvement occurred in 80% of cases with manageable postoperative complications like perianal excoriation (22%) and enterocolitis (15%).
3. Favorable long-term outcomes with minimal interventions support TAPT as an effective minimally invasive approach.

Keywords: Hirschsprung's Disease, Transanal Pull-Through, Pediatric Surgery, Congenital Aganglionosis, Minimally Invasive Procedure

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Introduction

Hirschsprung's disease is a disorder of congenital absence enteric innervation, and results in constant functional obstruction of the distal bowel. The disease usually presents in neonates with abdominal distention, vomiting, and delayed stooling [1]. Further advances in pediatric minimal invasive surgery gained acceptance approach leads to singl e-stage transanal pull-thr when treating forming a transition toward the management of allowing reduction in postoperative TAPT, increasing patient comfort and avoiding abdominal inte rvals without scars and incisions [2] [3] .

This study reviewed retrospectively a prospectively collected series of sixty HD patients treated by TAPT at Al-Kafeel Hospital, with particular attention paid to operative performance and postoperative outcomes.

Materials and methods

Prospective observational analysis for 60 pediatric patients with HD who underwent TAPT was done between July, 2022 and November, 2025 at Al-Kafeel Super Specialty Hospital, Karbala..

Inclusion criteria:

1. HD confirmed via rectal suction biopsy
2. Radiologic evidence of transition zone
3. Age from neonatal period to four years
4. No previous abdominal surgery

Exclusion criteria:

a. Total colonic aganglionosis beyond hepatic flexure
b. Emergency laparotomy cases
c. Severe associated anomalies

Preoperative preparation included rectal irrigations for 48–72 hours, oral antibiotics, and perioperative IV antibiotic prophylaxis.

Table 1. Clinical features and patient demographics

Parameter	Value
Total patients	60
Male	31 (52%)
Female	29 (48%)
Rectosigmoid cases	80%
Long-segment HD	17%

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Total colonic involvement	3%
Mean age at surgery	5.2 months

Surgical Technique

TAPT was performed in lithotomy or prone jackknife positions. Mucosal stay sutures were placed circumferentially 1.5 cm above the dentate line, followed by full-thickness dissection using electrocautery. Frozen-section biopsies guided identification of the transition zone. The proximal colon was mobilized and anastomosed without tension.

Operative Figures

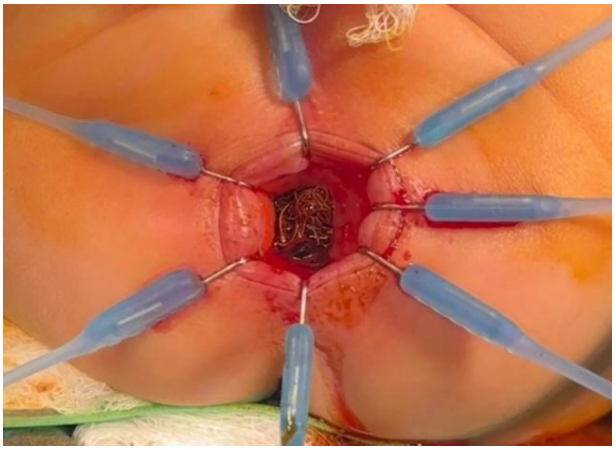

Figure 1: Operative step.

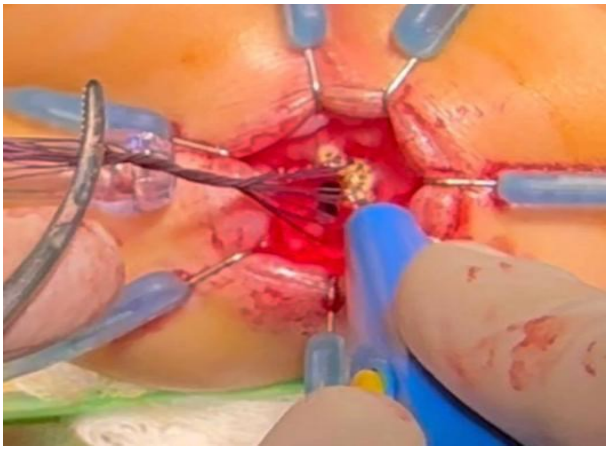

Figure 2: Operative step.

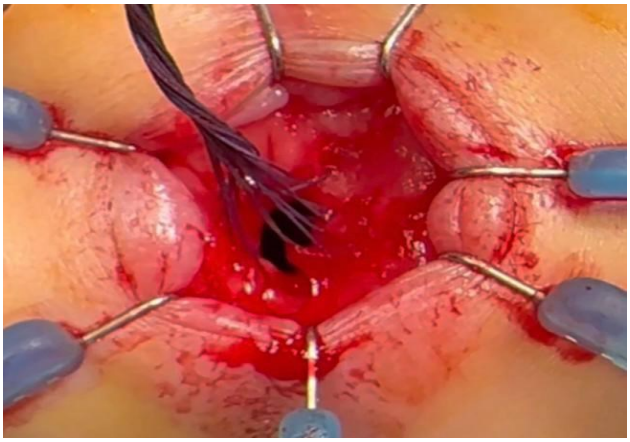

Figure 3: Operative step.

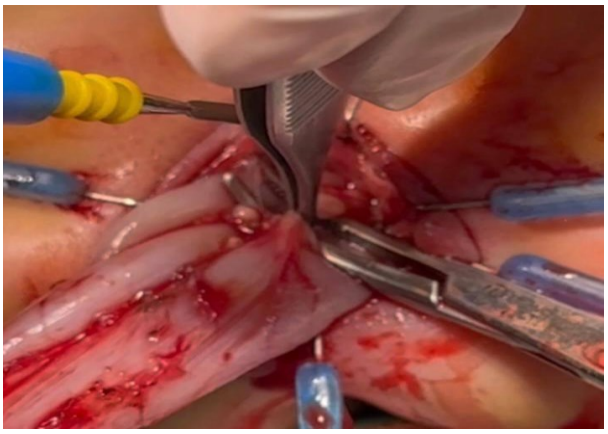

Figure 4: Operative step.

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Result

Sixty pediatric patients were included. The operative duration averaged 85 ± 22 minutes with minimal blood loss and no intraoperative complications. Early postoperative events included:

a. Perianal excoriation: 22%
b. Enterocolitis: 15%
c. Anastomotic edema: 12%
d. Sphincter spasm: 8%

Subsequent follow-up revealed occasional having bowel movements in 10% and requests for corrective intervention (n = 3%.

Histopathology Figures

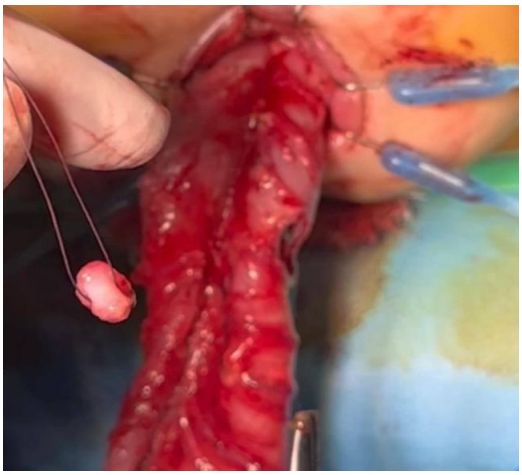

Figure 5: Histopathology image.

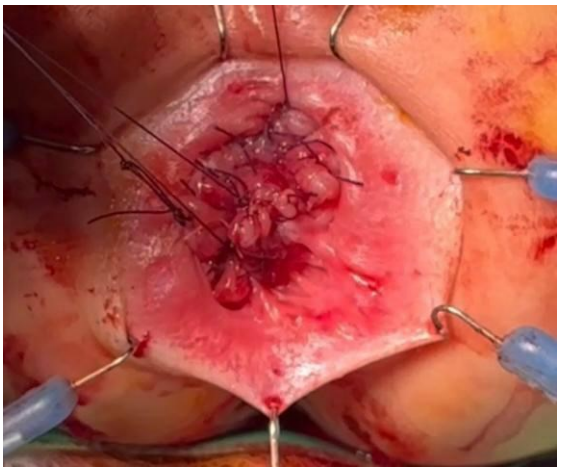

Figure 6: Histopathology image.

Outcome Figure

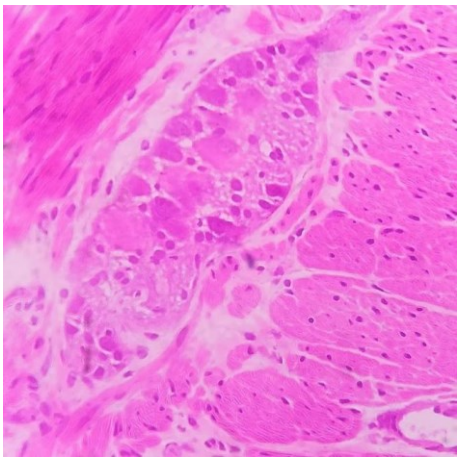

Figure 7: Postoperative finding.

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Discussion

The analysis supports the TAPT as a viable approach for HD treatment. The sex ratio in this population is not equal, which contrasts to what it is usually reported internationally and could be due to regional differences. The predominance of rectosigmoid aganglionosis is in accordance with worldwide statistics [4] [5]

Intraoperative complications did not occur, indicating the safety of this technique, and early postoperative occurrences were medically treatable. Bowel function was good at long-term follow-up and only minimal supportive measures were required. The major limitations are the single-center and relatively small sample size. [6] [7]

Conclusion

TAPT continues to be an alternative method to treat Hirschsprung's disease with good and minimal invasiveness. Its low morbidity and favorable outcomes suggest this approach may continue to be implemented in the subspecialized pediatric centers

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