



Single Port Access Laparoscopic Right Hemicolectomy in Children: Treatment of Chronic Intussusception Caused by Ileocecal Burkitt Lymphoma

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Abstract

Background: The umbilical laparo-endoscopic single-site surgery (LESS) is to minimize the unnecessary trauma and achieve the combination of minimally invasion with cosmetic advantage for scarless surgery. We report in this paper a new technique of umbilical single port access (SPA) laparoscopic right hemicolectomy complying with conventional surgical oncologic principle and technique of minimally invasive colectomy in children.

Methods: Preliminary experience with umbilical SPA right hemicolectomy in a 5-year-old child with chronic intussusception caused by ileocecal Burkitt lymphoma.

Results: Umbilical SPA laparoscopic right hemicolectomy was performed successfully with conventional laparoscopic instruments. Operative time was 90 min and the volume of hemorrhage was 20 ml. No intraoperative and postoperative complications were recorded. Diet recovered at the fourth day after operation.

Conclusion: With the plastic cannulas and semi-rigid flexible instruments, umbilical SPA laparoscopic right hemicolectomy can be performed successfully through the paraumbilical hidden incision for children colorectal disease, not only follow the traditional surgical principle but also achieve minimally invasive cosmetic results.

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Keywords: Single port access (SPA); Colectomy; Laparoscopy; Minimally invasive surgery; Technique; Scarless surgery; Children

Introduction

The aim of minimally invasive surgical techniques is to minimize the unnecessary trauma and pain of the operation and achieve the combination of minimally invasion with cosmetic advantage for scarless surgery. Under the guidance of this concept in recent years, the umbilical lapro-endoscopic single-site surgery (LESS) came into being [1].

In this paper, we reported the first cases umbilical SPA laparoscopic right hemicolectomy in the treatment of children chronic intussusception caused by ileocecal Burkitt lymphoma complying with conventional surgical oncological principle and technique of minimally invasive colectomy.

Materials and Methods

Case report

A five-year-old male child hospitalized because of an intermittent abdominal pain accompany with hematochezia for more than one month. During physical examination, there were no abnormal symptoms on heart and lung, but a mass with ill-defined boundary was touched in the right belly with pressing pain, but without obvious rebound tenderness and muscle tension. Abdominal CT examination showed a ileum-ascending colon intussusception, and a mass in anteromedial aspect of ascending colon. Abdominal ultrasound examination revealed right upper abdominal mass, multiple solid hypoechoic nodules in the right abdomen and a small amount of effusion in intestinal interval. The diagnosis of chronic intussusception was definitely established.

Surgical technique

The patient was offered this approach after having given informed consent of his parents. With a thorough preoperative preparation, laparoscopic exploratory operation was performed under

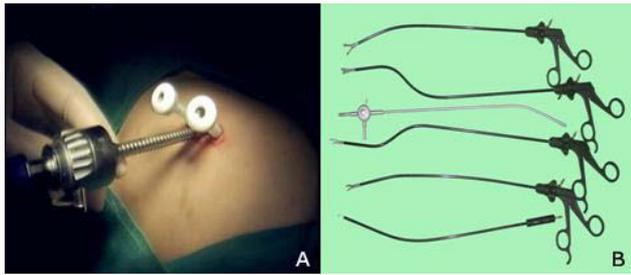


Figure 1: (A) A 5 mm trocar was placed in the middle of umbilicus and artificial CO₂ pneumoperitoneum was established, thereafter, two plastic 5 mm trocars were placed up and down side of the incision. (B) Therefore, the semi-rigid flexible instruments were put into abdominal cavity through plastic cannulas and "chopstick effect" was overcome in spite of collisions between the instruments and small space in children abdominal cavity.

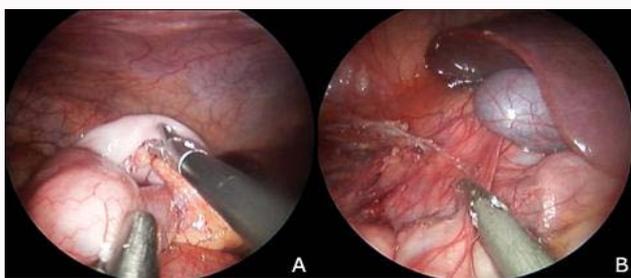


Figure 2: (A) Ileum-colon-colonic type of intussusception, with nested appendix and lots of swelling mesenteric lymph nodes, was confirmed and restored. (B) The right half colon was dissociated by resecting the lateral peritoneum of ascending colon and gastrocolic ligament in liver area with ultrasonic knife.

general anesthesia. Firstly, a 5 mm trocar was placed in the middle of umbilicus after a two-centimeter-incision was cut along the right edge of umbilical ring and artificial CO₂ pneumoperitoneum was established with a 9 mmHg. Thereafter, two plastic 5 mm trocars were placed up and down side of the incision respectively (Figure 1A and 1B). Through laparoscopy, one mass of 6 cm × 5 cm × 4 cm size was confirmed ileum-colon-colonic type of intussusception, with nested appendix and lots of swelling mesenteric lymph nodes. After restoring intussusception, we found a tumor with 3 cm × 2 cm × 2 cm size beside the ileocecus, then resected lateral peritoneum of ascending colon and gastrocolic ligament in liver area by ultrasonic knife (Figure 2A and 2B), freed and extracted ileocecus and right hemicolon outside the abdominal cavity through expanding umbilical incision up to 3 cm (Figure 3A and 3B). Surgical dressings were placed around the umbilical incision, then resection of terminal ileal and right colon and ileum-transverse colon anastomosis were performed *in vitro* according to the results of frozen biopsy, malignant lymphoma and reactive proliferative lymph nodes. Moreover, the anastomotic intestine was returned into peritoneal cavity and umbilical incision was sutured layer by layer (Figure 4A and 4B).

Results

The operation had been lasted for ninety minutes with a twenty milliliters hemorrhage. The duration of hospital stay was six days. Diet recovered at the fourth day after operation. No intraoperative and postoperative complications occurred. The immune histopathologic diagnosis of the resected specimen was ileocecal Burkitt lymphoma. This children was then transferred to the department of pediatrics for continue chemotherapy. With a 9 month postoperative follow-up, no

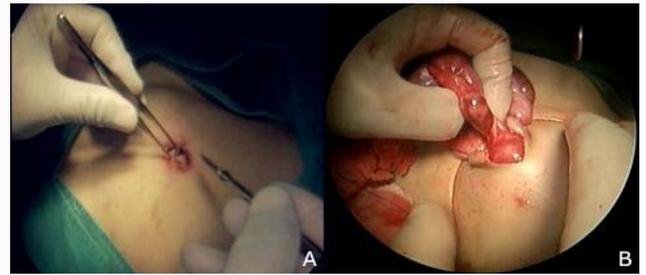


Figure 3: The ileocecus and right hemicolon were freed and extracted outside the abdominal cavity through expanding umbilical incision up to 3 cm.

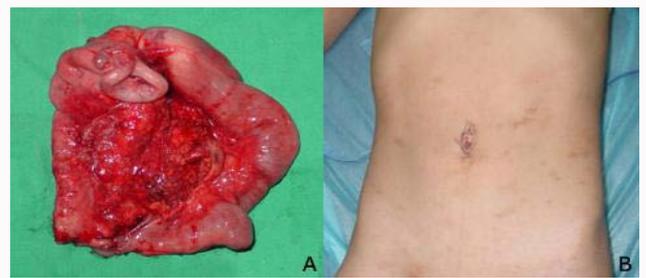


Figure 4: (A) Specimen of the resected right half colon was shown. (B) Moreover, the anastomotic intestine was returned into peritoneal cavity and umbilical incision was sutured layer by layer, achieving minimally invasive cosmetic results.

tumor recurred by CT review.

Discussion

As a special type of non-Hodgkin's disease, Burkitt's lymphoma was scattered reported in China, with high grade malignancy, rapid progress and poor prognosis [2]. Clinical manifestations of Burkitt's lymphoma varied very much due to a different position of its lesion; however, ileocecal tumor combined with intussusception was rarely reported in previous literature. In present study, the diagnosis of chronic ileocecal intussusception was delayed because the ileocecal tumor only results in the symptoms of incomplete intestinal obstruction.

With the development of minimally invasive surgical techniques, laparoscopic right hemicolectomy has become the first choice for treatment of ileocecal tumor disease, but single-incision access laparoscopic right hemicolectomy can only be seen in few case reports [3,4], particularly has not been reported in children. To ileocecal malignant lymphoma, pediatric surgeons preferred to early perform laparoscopy exploratory operation because of its earlier metastasis and poorer life quality for children. In adults, the glove-port technique was often regarded as a simple, low-cost, reproducible, and sure method to perform single-incision laparoscopic surgery (SILS) in some high-experienced laparoscopic surgical centres [5-7]. But in this LESS, the plastic cannulas, with a more simple, safe and inexpensive superiority, were successfully placed in the paraumbilical hidden incision. The semi-rigid flexible instruments were put into abdominal cavity through plastic cannulas placed on both sides of umbilicus and "chopstick effect" was overcome in spite of collisions between the instruments and small space in children abdominal cavity. After dissociation of the right peritoneum and gastrocolic ligament in liver area by 5 mm ultrasonic knife, the right colon can be dragged out and resected easily through the slightly expanded umbilical incision.

The following operation of right colon outside abdominal cavity and dressings setting around the umbilical incision not only make operation more easily but also prevent the implantation metastasis of intra-abdominal tumor cells and possible intestinal contents leaking.

Thus, umbilical SPA laparoscopic right hemicolectomy can not only follow the traditional surgical principle but also achieve minimally invasive cosmetic results may have the advantage over NOTES approach to offer the safety of laparoscopic colectomy especially for children colorectal disease.

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