Circumumbilicus Incision for Bleeding Meckel's Diverticulectomy

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Background/Objective: *With regard to the recent interest in minimally invasive surgery, the authors report on a technique of transumbilical incision for Meckel's diverticulum and appendectomy, which provides better cosmetic results and no increase in complications.*
Material and Method: *The case records of 18 consecutive Meckel's diverticulum (MD) patients who were treated at Songklanagarind Hospital in Thailand between 1996 and 2005 were reviewed.*
Results: *The male-female ratio was 14-4 (3.5:1). Of the 15/18 (83.3%) symptomatic cases, presenting symptoms were bleeding 10/15 (66.7%), gut obstruction 2/15 (13.3%), peritonitis 2/15 (13.3%), and intussusception 1/15 (6.7%). All bleeding patients were children (age 1-15 years), 9/10 (90%) Meckel scan positive and 10/10 (100%) ectopic-gastic tissue. Four children underwent a circumumbilical incision. There were no perioperative or long-term complications related to the transumbilical approach.*
Conclusion: *The umbilical incision has all the benefits of a minimal access approach. Umbilical incision is a safe, inexpensive, cosmetically pleasing, and easy technique. This minimally invasive surgery does not require long-term specialized training or special equipment.*

Keywords: *Meckel's diverticulum, Umbilical incision, Minimally invasive surgery*

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Meckel's diverticulum results from failure of complete obliteration of the vitelline duct. Most cases of Meckel's diverticulum are asymptomatic (56%-77.5%). Of the symptomatic cases, the most common presentations are rectal bleeding (43%-80%), intussusception, intestinal obstruction (23%-42%), diverticulitis, and peritonitis (14%-24%)[1,2].

The umbilical incision has been described for pylomyotomy[3-7] and for a number of other procedures [8-10]. More recently, a number of investigators have advocated using a minimally invasive laparoscopic technique[11-14].The umbilical incision can be used to perform an appendectomy, bowel resection, bowel anastomosis, and diverticulectomy. The authors describe how the umbilical incision for Meckel's diverticulum provides a quick and safe alternative to laparoscopy or other abdominal incisions.

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Material and Method

A retrospective analysis of all patients with Meckel's diverticulum (MD) at Songklanagarind Hospital, Hat Yai, Thailand, who were treated between January 1996 and December 2005, was performed. Patient demographics, age at diagnosis, and symptoms at presentation were recorded. Retrieval of medical records was approved by Research Ethical Committee, Faculty of Medicine, Prince of Songkla University (SUB.C 49/368-008).

Surgical technique for circumumbilical incision

In all cases, after the diagnosis of bleeding Meckel's diverticulum was made, based on clinical presentation, surgery was planned. At the time of surgery, each patient received antibiotic prophylaxis. The patient was placed in the supine position, and the

abdomen prepped. A small curvilinear incision was made in the lower part of the umbilicus, and the abdomen was entered through a midline fascial incision (Fig. 1). The appendectomy and diverticulectomy or segmental resection was performed (Fig. 2). The wound was closed in layers (Fig. 3).

Data analysis

Data were analyzed using STATA for Windows (v8.1). Parametric data are presented as mean and SD unless otherwise stated. Nonparametric variables were compared by the Mann-Whitney U test and Fisher's exact tests.

Results

The retrospective search located 18 patients with Meckel's diverticulum. The male-female ratio was 14-4 (3.5:1). 3/18 (16.7%) were asymptomatic, with the remainder (15/18, 83.3%) presenting with bleeding 10/15 (66.7%), gut obstruction 2/15 (13.3%), peritonitis 2/15 (13.3%), and intussusception 1/15 (6.7%). All of the bleeding patients were children (age 1-15 years), 9/10 (90%) with the Meckel scan positive and 10/10 (100%) ectopic-gastric tissue.

In the years 2004-2005, four children underwent a circumumbilical incision. Three boys presented with lower gastrointestinal bleeding and painless abdomen.

Fig. 1 A small curvilinear incision was made in the lower part of the umbilicus, and the abdomen was entered through a midline fascial incision

A **B** **C**

Fig. 2 The appendix and Meckel's diverticulum were identified and removed
A = Appendix
B, C = Meckel's diverticulum

Fig. 3 The wound was closed

One 10-year-old girl had gut obstruction with intussusception. The mean duration of the surgical intervention was 75 min (SD = 5) and the average time of hospital stay was 4 days (SD = 1). There were no perioperative or long-term complications related to the umbilical approach.

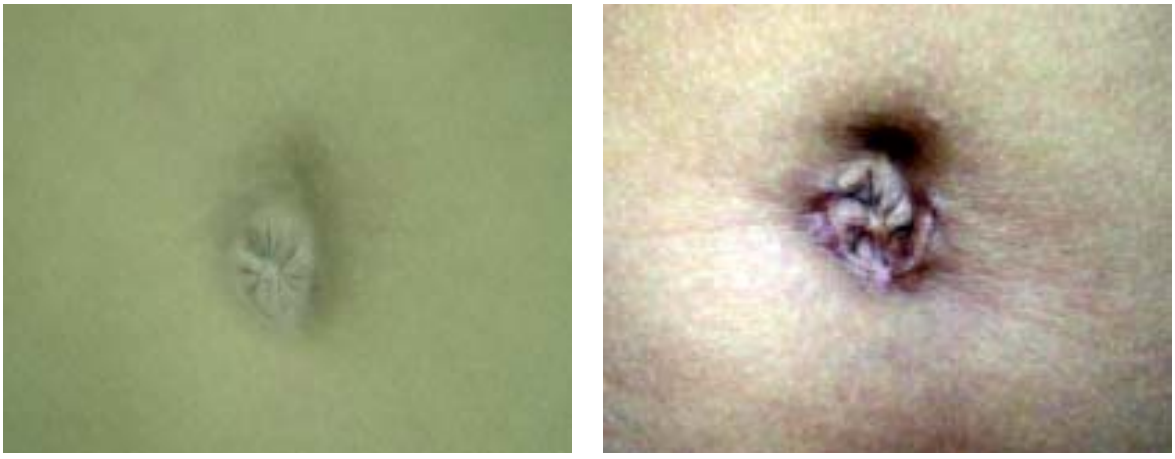
These patients are currently in good medical condition and have required no further surgical procedures. There were no complications related to the umbilical incision. At follow-up, the parents, like the surgeon, found that the results were very cosmetically acceptable (Fig. 4).

Discussion

Meckel's diverticulum occurs in approximately 1 to 2% of the population[15]. A Meckel's diverticulum represents persistence and patency of the inner or intestinal component of the vitellointestinal tract. Bleeding Meckel's diverticulum is the most common clinical presentation of Meckel's diverticulum, and results from the presence of ectopic gastric mucosa in the lining of the diverticulum. Surgery is indicated where the clinical presentation of major and painless intestinal hemorrhage is consistent with a bleeding Meckel's diverticulum, irrespective of the results of a technetium scan.

A recent study noted that the incidence of heterotopic mucosa in Meckel's diverticulum is 43.3%, with an incidence of heterotopic gastric mucosa in symptomatic patients of 77.8%[11]. The incidence of heterotopic gastric mucosa in bleeding Meckel's varies from 80% to 100%. In our cases, all bleeding Meckel's diverticulum showed ectopic gastric mucosa.

Tan and Bianchi[3] reported the use of the umbilical incision for pyloromyotomy in 1986, and many pediatric surgeons have accepted this approach for treating hypertrophic pyloric stenosis[3-7]. In 2003, Soutter and Askew[16] reported on the use of transumbilical laparotomy in infants for a wide variety of surgical problems, such as malrotation, intussusception, intestinal atresia, and some other conditions. In 2005, Sauer et al[17] described the versatility of the umbilical incision in the management of Hirschsprung's disease. With time, indications have increased and some technical modifications have been reported. Different



A **B**

Fig. 4 Showing the umbilicus (A) before the operation and (B) 1 month after the operation

patterns of incision are used but all are performed through the umbilicus[16].

Different studies have found no increased risk of infection when performing an umbilical incision in abdominal surgery. Paes et al showed that avoidance of the umbilicus offers no benefit with regard to wound infection, dehiscence or incisional hernia compared with a transumbilical incision[18].

Laparoscopic surgery has rapidly become widely used[12-14], and its indications for pediatric disease are expanding. However, a highly advanced technique and prolonged maintenance of the pneumoperitoneum with carbon dioxide are required for major laparoscopic operations. This minimally invasive approach should present in the future the same advantages as described for laparoscopy versus laparotomy in abdominal surgery: reduction in postoperative pain, wound complications, and hospital stay, together with better cosmetic results.

Treatment of Meckel's diverticulum is now well codified. The transumbilical incision is, in the authors' opinion, very effective, and an excellent, safe, and versatile alternative to laparoscopy or other open abdominal incisions, with the added attraction that, although no more difficult than other techniques, it provides superior cosmetic results because, as a form of abdominal surgery, it leaves no scars.

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การผ่าตัดโรคติ่งลำไส้ผ่านทางสะดือ

ปิยวรรณ เชียงไกรเวช, ศักดา ภัทรภิญโญกุล, สุรศักดิ์ สังขทัต ณ อยุธยา, วรพงศ์ เชาว์ชูเวชช

รายงานการผ่าตัดโรคติ่งลำไส้ผ่านทางสะดือ ทบทวนและติดตามผู้ป่วยที่ได้รับการผ่าตัดโรคติ่งลำไส้ ในระหว่างปี พ.ศ. 2539 - พ.ศ. 2548 มีจำนวน 18 คน อัตราส่วนชายและหญิงเป็น 3.5:1 กรณีที่มีอาการทั้งหมด 15 คน (83.3%) พบว่าเลือดออกมากที่สุด (66.7%) ตามมาด้วยอาการลำไส้อุดตัน (13.3%) เยื่อบุช่องท้องอักเสบ (13.3%) และลำไส้กลืนกัน(6.7%) ผู้ป่วยเลือดออกมีอายุระหว่าง 1-15 ปี ทุกรายมีเนื้อเยื่อกระเพาะอาหารในติ่งลำไส้ โดยตรวจ Meckel scan พบ 9 ใน 10 ราย(90%) มีผู้ป่วยสี่รายได้รับการผ่าตัดโรคติ่งลำไส้ผ่านทางสะดือ จากการติดตามระยะยาวหลังผ่าตัดไม่พบภาวะแทรกซ้อน ผู้ป่วยและผู้ปกครองพึงพอใจแผลเป็นในบริเวณสะดือ การผ่าตัดโรคติ่งลำไส้ผ่านทางสะดือเป็นอีกหนึ่งทางเลือกสำหรับ minimal invasive surgery ซึ่งไม่ต้องใช้เครื่องมือซับซ้อน