



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Surgically inverting an incidentally detected Meckel's diverticulum – Wrong method



Ketul Shah*, Lakhsman Khiria, Premal Desai, Hasmukh Vora, Mehendra Bhavsar

Ahmedabad 380006, Gujarat, India

ARTICLE INFO

Article history:

Received 13 May 2014

Accepted 10 July 2014

Available online 11 December 2014

Keywords:

Meckel's diverticulum

Inverting

Intussusception

ABSTRACT

INTRODUCTION: Intussusception leading to intestinal obstruction is a known complication of Meckel's diverticulum. Inverting of Meckel's acts as a lead point for intussusception. Causes of inversion are many but surgical inversion leading to intussusception is extremely rare.

PRESENTATION OF CASE: We hereby report a case of a 14 year adolescent boy operated previously for open appendicectomy presenting to us with intestinal obstruction who on exploration was found to have an surgically inverted Meckel's diverticulum acting as a lead point for ileo-colic intussusception.

DISCUSSION: To the best of our knowledge, surgically inverting any Meckel's diverticulum is never a treatment option even when the diverticulum is incidentally detected. Diverticulectomy or segmental resection is the procedure of choice for Meckel's diverticulum.

CONCLUSION: Meckel's diverticulum should never be inverted surgically. Not only it is a wrong method but also increases the risk of complications.

© 2014 The Authors. Published by Elsevier Ltd. on behalf of Surgical Associates Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

1. Introduction

Meckel's diverticulum accounts for 90% of all omphalo-mesenteric (vitelline) duct anomalies and is the most common congenital abnormality of the gastrointestinal tract. It is reported to occur in 1–3% of the general population and autopsy series.^{1,2} However, the lifetime risk of developing complications in patients with Meckel's diverticulum is believed to be less than 5%.³ These complications included intestinal obstruction, intussusception, inflammation, perforation and bleeding.

Infrequently, Meckel's diverticulum can invert and invaginate into the ileal lumen and can be the leading point of the intussusception (Figs. 1 and 2).

The incidence of intussusception attributed to an inversion of Meckel's diverticulum accounts for 4% of all cases presenting with intestinal obstruction due to intussusception.⁴

It occurs when the Meckel's diverticulum sags into the bowel lumen and then serves as a lead point to allow telescoping of the small intestine, first into the distal ileum and then in to the large intestine, causing ileo-ileal and ileo-colic type of intussusceptions.

We hereby report a case where surgical inversion was done as a treatment for Meckel's diverticulum which lead to intussusception and intestinal obstruction.

2. Case report

A 14-year-old boy presented with colicky abdominal pain and distention of abdomen with bilious vomiting. He had undergone open appendicectomy through McBurney's incision 5 days back at a peripheral rural setup.

On presentation he had tachycardia and fever. Abdomen was distended and tenderness was present all over. Bowel movements were hyper peristaltic and per rectal ballooning was present.

Erect abdominal X-ray showed dilated small bowel loops with multiple air fluid levels. Ultrasonography of abdomen showed multiple fluid filled dilated small bowel loops suggestive of small bowel obstruction. His hematological investigations were within normal limits.

Naso-gastric decompression was done and he was started on IV fluids, anti-spasmodics and antibiotics. He was explored in view of presence of persistent signs of small bowel obstruction.

* Corresponding author at: 'B' Block, Room No. 7, Doctors Quarters, V.S. Hospital Campus, Vadilal Sarabhai Hospital, Ahmedabad 380006, Gujarat, India. Tel.: +91 9825969152.

E-mail addresses: shahketul11@gmail.com (K. Shah), lkhiria@yahoo.com (L. Khiria), premalrdesai@yahoo.com (P. Desai), hbvora@yahoo.com (H. Vora), drmsbhavsar@yahoo.com (M. Bhavsar).



Fig. 1. Intra operative picture showing reduced Meckel's diverticulum.



Fig. 2. After segmental resection.

Midline laparotomy incision was taken and ileo-colic intussusceptions were identified as the cause of small bowel obstruction. Intussusceptions could be reduced and surgically inverted Meckel's diverticulum (done probably at the time of open appendicectomy) was identified as the lead point for intussusception. At about 50 cm from IC junction non-absorbable silk sutures were identified which were invaginating 2 cm × 1 cm of Meckel's diverticulum into the ileal lumen. As rest of the bowel was viable and healthy, segmental resection of Meckel's diverticulum with ileo-ileal anastomosis was done. Patient recovered well in the post-operative period. Histopathology confirmed the diagnosis of Meckel's diverticulum.

3. Discussion

In children less than 3 years, lead points for 90–95% of the intussusceptions are idiopathic. Where as Meckel's diverticulum is the most common cause of non-idiopathic intussusception, especially in older children. There are various mechanisms by which it can cause intestinal obstruction like (a) Volvulus of small intestine around a fibrous band extending from Meckel's diverticulum

to umbilicus. (b) Intussusception – in which Meckel's diverticulum sags into the bowel lumen and then serves as a lead point to allow telescoping of the small intestine into first the distal ileum and then in to the large intestine causing ileo-ileal and ileocolic type of intussusception. (c) Littre's hernia – incarceration of the diverticulum in hernia, (inguinal or femoral) causing intestinal obstruction. (d) Entrapment of small bowel beneath the blood supply of the diverticulum, also known as a meso-diverticular band. (e) Stricture secondary to chronic diverticulitis. (f) Meckel's diverticulum lithiasis. (g) Band extending between the diverticulum and the base of the mesentery, forming a loop in which a part of ileum may get stuck causing obstruction.

Symptoms caused by Meckel's diverticulum are abdominal pain, malena and vomiting.

More often patients present with features of small bowel obstruction. Radiological investigations help diagnose the case and Ultrasonography shows classical appearance of 'target' or 'doughnut sign'. CECT abdomen is the most sensitive imaging modality with reported accuracy of 58–100%⁵ and it characteristically shows the inverted diverticulum as a central core of fat attenuation surrounded by a collar of multiple concentric rings of soft-tissue attenuation.

Treatment of Meckel's diverticulum depends on the location of diverticulum and the progression and the severity of the disease. Simple diverticulectomy or segmental resection is preferred since the malignancy rate is low (17%).^{6–8} Diverticulectomy is predicted as a simple, minimal and cost effective technique which can resolve the disease.⁹

Resection with anastomosis is clearly indicated in cases of inflammation and ischemia of ileum and is also recommended in oedematous, inflamed or perforated base of Meckel's diverticulum. Laparoscopy represents an alternative method of treatment with techniques varied from segmental resection of Meckel's diverticulum¹⁰ to reduction of intussusception, diverticulectomy and intracorporeal anastomosis.¹¹

In asymptomatic or incidentally detected Meckel's diverticulum, it is advocated that prophylactic resection of the diverticulum be done when it has an umbilical connection, mesodiverticular band or is heterogeneous on palpation and there is no contraindication for diverticulectomy.¹² Literature does not support surgically inverting a Meckel's diverticulum as a treatment modality.

4. Conclusion

Thus we conclude, there is no role for surgical inversion of diverticulum even in patients with incidentally detected Meckel's diverticulum.

Conflict of interest

None.

Funding

Nil.

Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Key learning points

- Surgically inverting Meckel's diverticulum is not a treatment option.
- Instead of curing it predisposes to further complications.

References

1. Soderlund S, et al. Meckel's diverticulum. A clinical and histologic study. *Acta Chir Scand Suppl* 1959;**248**:1–233. PMID: 13832430.
2. Yahchouchy EK, Marano AF, Etienne JC, Fingerhut AL. Meckel's diverticulum. *J Am Coll Surg* 2001;**192**(5):658–62. PMID: 11333103.
3. Soltero MJ, Bill AH. The natural history of Meckel's diverticulum and its relation to incidental removal. *Am J Surg* 1976;**32**:168–73.
4. Mahdi B, et al. Intussusception caused by an inverted Meckel's diverticulum: a rare cause of small bowel obstruction in adults. *Pan Afr Med J* 2011;**10**:57. PMID: 3290887.
5. Marinis A, Yiallourou A, Samanides L, Dafnios N. Intussusception of the bowel in adults: a review. *World J Gastroenterol* 2009;**15**:407–11. PMID: PMC2653360.
6. Weilbaecher D, Bolin JA, Hearn D, Ogden W. Intussusception in adults. Review of 160 cases. *Am J Surg* 1971;**121**:531–5. PMID: 5557762.
7. Felix EL, Cohen MH, Bernstein AD, Schwartz JH. Adult intussusception: case report of recurrent intussusception and review of the literature. *Am J Surg* 1976;**131**:758–61. PMID: 937658.
8. Nagorney DM, Sarr MG, McIlrath DC. Surgical management of intussusception in the adult. *Ann Surg* 1981;**193**:230–6. PMID: 7469558.
9. Martín-Lorenzo JG, Torralba-Martínez A, Lirón-Ruiz R, Flores-Pastor B, Miguel-Perelló J, Aguilar-Jiménez J, Aguayo-Albasini JL. Intestinal invagination in adults: preoperative diagnosis and management. *Int J Colorectal Dis* 2004;**19**:68–72. PMID: 12838363.
10. Karahasanoglu T, Memisoglu K, Korman U, Tunckale A, Curgunlu A, Karter Y. Adult intussusception due to inverted Meckel's diverticulum: laparoscopic approach. *Surg Laparosc Endosc Percutaneous Tech* 2003;**13**:39–41. PMID: 12598757.
11. El-Dhuwaib Y, O'Shea S, Ammori BJ. Laparoscopic reduction of an ileoileal intussusception and resection of an inverted Meckel's diverticulum in an adult. *Surg Endosc* 2003;**17**:1157. PMID: 12728389.
12. Karaman A, Karaman I, Hakan Y, Mustafa KA, et al. Management of asymptomatic or incidental Meckel's diverticulum. *Indian Pediatr* 2010;**47**(12):1055–7.

Open Access

This article is published Open Access at scimedirect.com. It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.