Meckel’s diverticulum in the Eastern Province: A clinical study of 39 patients and a review of the literature

Dr. Saad Al-Shawan, MD, A.F.Ch. (German Board), Dr. Abdul-Mohsen Al-Mulhim, FRCSI, Dr. Esam Khatib, MD, FRCS, Dr. Ramadan Guma’a, MD, FRCS, Dr. Naif Al-Awad, Arab Boards (Surgery), Dr. Maha Abdul-Hadi, FRCS and Professor Lade Wosornu, MD, (Glasg), FRCS, FRCS

Abstract Background: Meckel’s diverticulum has protean clinical manifestations and should be borne in mind by clinicians dealing with the acute abdomen.
Setting: Three general hospitals in the Eastern Province of Saudi Arabia.
Results: A total of 39 cases were retrieved, 74% were males, 95% were emergency admissions consisting of acute abdomen and massive bleeding per rectum, 95% had laparotomies. There was one postoperative death.
Conclusions: Attention is drawn to this enigmatic condition, and clinical guidelines for its management were reiterated.

Keywords: Meckel’s diverticulum, Eastern Province

Meckel’s diverticulum, the commonest congenital anomaly of the small intestine, is uncommon so that no one surgeon or centre has a large individual collection. Recently, at King Fahd University Hospital, we have seen cases in relatively quick succession. For example, one patient presented with repeated episodes of massive rectal bleeding, another with intestinal obstruction which required emergency left hemicolecotomy, and a third with generalized peritonitis.

The aim of this paper is to document our experience and that of two other general hospitals in our region, to review the literature, and draw attention to this enigmatic condition. We have also asked the question: “Should a Meckel’s diverticulum be removed routinely when found incidentally at laparotomy?” This ancient issue acquires a renewed interest in this era of laparoscopic surgery.

Literature review The incidence of Meckel’s diverticulum (Meckel’s for short) is approximately 2-3% in the general population. It becomes the cause of complication or site of pathological change in 4-25% of individuals in whom it occurs. Kusumoto et al reported 776 cases from Japan, and Mackey and Dineen, from New York, described a 50-year experience involving 402 cases, i.e. approximately 8 cases per year. Complications include intestinal obstruction, internal herniation, as well as massive bleeding per rectum, inflammation, perforation with generalized peritonitis, sinus formation and neoplastic change, which is the least common. Perhaps more unusual even than a neoplasm is the case of double Meckel’s reported by Albu et al.

The drama of clinical presentation has been captured in articles such as “Mesodiverticular band and sudden death in children” by Pfalzgraf et al who noted the following: “Meckel’s diverticulum is occasionally associated with a fibrous band beneath which herniated loops of small bowel can incarcerate and infarct. The high mortality and suddenness of death associated with this internal hernia make it important”. Thus, the clinical course can be rapid and death expected. Earlier series had emphasized that indeed, the mortality in such cases can be as high as 50% to 100%.

From the Department of Surgery, King Fahd University Hospital, Al-Khobar (AL-SHAWAN, AL-MULHIM, AL-AWAD, ABDUL-HADI, WOSORNU), Saudi Aramco Medical Services, Dhahrani (KHATIB), Dammam Central Hospital, Dammam. (GUMA’A)

Received November 1994. Accepted for publication in final form May 1995
Address correspondence and reprint request to: Dr. Saad Shawan, PO Box 2746, Al-Khobar 31952, Saudi Arabia

Saudi Medical Journal 1996; VOL. 17 (1)
At the other end of the spectrum of clinical presentation, dual carcinoid tumours have been reported in Meckel's diverticulum as metastasis in an inguinal hernia sac in a 66-year-old man. In between these extremes come such complications as intestinal volvulus of Meckel's as a rare cause of acute abdominal pain in adults. Diamond and Russell, and Leijonmarck et al described 49 and 260 cases respectively of Meckel's in the adult. Recently, a case of incomplete intestinal obstruction caused by a giant Meckel's in a 13-year-old girl was reported. Rarer still is hemoperitoneum from perforated Meckel's. Gastrointestinal bleeding occurs in approximately 55% of patients with Meckel's. A case of bleeding from a Meckel's after the use of ibuprofen in a 27-year-old man has been reported.

Mackey and Dineen have estimated that the lifetime incidence of symptomatic Meckel's is between 4 and 80 per 10,000 population, and that the overall mortality in symptomatic cases is about 10%. As if to underline that the subject is still topical, in a weekly clinico-pathological report in the New England Journal of Medicine (NEJM) was a case of "Meckel's diverticulum with intussusception and small-bowel obstruction" in a 23-year-old man. The patient had been evaluated earlier in an emergency room where a diagnosis of constipation was offered.

Recently, Nicol and MacKinlay reviewed 54 cases of exomphalos and observed that: "The high incidence of Meckel's diverticulum in exomphalos minor highlights the importance of surgical rather than manual reduction of the sac in order to exclude the presence of viscerum from the sac before division. Also, the raised incidence of Meckel's diverticulum in general may well be due to a raised incidence of exomphalos minor in particular." At the end of a 20-year retrospective review of 91 cases from Switzerland in 1992, Dermarti et al concluded: "We recommend the resection of an incidentally discovered Meckel's diverticulum."

**Materials and methods** The study was done at 3 general hospitals in the Eastern Province of Saudi Arabia, viz, King Fahd University Hospital, Al-Khobar, Saudi Aramco Medical Services, Dhahran, and the Central Hospital, Dammam. The operating room register and specimen log book in the Department of Pathology and Ward Admissions were scanned for cases of Meckel's. The medical records of all patients identified were reviewed retrospectively. In addition to patients' biodata, data on clinical presentation, operative findings, operations performed, and peri-operative mortality were collected. Data were analyzed using the SPSS PC plus statistical package.

**Results** A total of 39 cases were retrieved during the 10-year period of 1982 to 1991 inclusive. There were 29 males; patients' ages ranged from 1 day to over 80-years of age (Fig. 1). Of the 39 cases, 37 (95%) were emergency admissions. Their clinical presentation and status of Meckel's are summarized in the table.

The distribution of clinical presentation was as follows: "Acute Abdomen?: Appendicitis, 18"
"intestinal obstruction." and massive bleeding per rectum. In 2, the main presentation was unspecified. The 2 elective admissions were a boy aged 18 months who had cryptorchidism and umbilical hernia, and a 53-year-old man with a colonic mass.

The table also summarizes the operative and histologic findings in relation to clinical presentation. Thus, Meckel’s was normal in 14 cases and diseased in the remaining 23 (62%). Salient features in the 5 cases of massive bleeding per rectum were as follows: 4 were males; patients’ ages were 10 weeks, 1, 15, 29 and 39 years, and histology showed gastric mucosa in all five.

There was one post-operative death: a 50-year-old female who presented with an incarcerated incisional hernia and cellulitis of the anterior abdominal wall. A perforated Meckel’s was found in the hernia sac. She died of cardiac arrest due to suspected massive pulmonary embolism or acute myocardial infarction.

Discussion In this retrospective study of 39 patients with Meckel’s diverticulum, 95% were emergency admissions. The male preponderance by a factor of 3 cannot be explained. No age was exempt: neonates and 80-year-olds alike were seen. Nicol and MacKinlay have drawn attention to the high incidence of Meckel’s in exomphalos minor. In our series, though, the age distribution was basically bimodal: the main peak occurred in the 2-10 year olds (Fig. 1).

Three modes of emergency presentation were observed: “acute abdomen to rule out appendicitis” was the commonest, followed by intestinal obstruction; massive bleeding per rectum was third. These are expected complications of Meckel’s but they tend to be forgotten. A salutary lesson is the case misdiagnosed as “constipation” which evoked a clinico-pathological conference in the NEJM.

Similarly, if an otherwise healthy young male presents with massive bleeding per rectum, and, an experienced endoscopist has categorically ruled out the esophagus, stomach, duodenum, as well as the anal canal, rectum and colon as the site of the current episode of bleeding, then, Meckel’s diverticulum is the single most likely site.

Without consuming anymore time and resources on other investigations, the clinician can request scintigraphy of the abdomen. If the result suggests a “hot spot” laparotomy should be performed and Meckel’s specifically looked for. Resection should be curative.

Finally, should a Meckel’s be removed routinely when found incidentally at laparotomy? We would like to reiterate the guidelines set out in an editorial in the Lancet.

1. In the presence of acute appendicitis do not search for a Meckel’s diverticulum.
2. If during an operation for abdominal pain a normal appendix is found, look for diverticulum and remove both.
3. In a child or young adult, if you find a diverticulum during a non-acute operation, remove it, if the patient’s condition can tolerate it.
4. If you find an adhesive band to the umbilicus at any age, during a laparotomy, divide it between ligatures and resect the diverticulum.
5. If the patient is over 40 and the Meckel’s is an incidental finding and non-adherent, leave it alone.

Acknowledgment We thank Mr. Fernando B. Gabson for typing the manuscript and Mr. Gordon Ntow for the illustration.

References
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