MECKEL'S DIVERTICULUM - REVISITED

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ABSTRACT

Twenty five cases of Meckel's diverticulum were studied between 1985-1995. Eight of these were symptomatic and in the remaining 17 it was an incidental finding. The symptomatic patients presented with intestinal obstruction (5 cases), perforated peritonitis (2 cases) and intussusception (1 case). All cases of acute appendicitis were also subjected to a search for Meckel's diverticulum. Of the 25 Meckel's diverticuli encountered, 22 were resected and in 3 patients it was left *in situ*. Both the patients with perforated Meckel's diverticulum showed ectopic gastric mucosa. Complications occurred only after surgery for symptomatic Meckel's diverticulum. All patients undergoing incidental diverticulectomy had a smooth and uncomplicated recovery.

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KEYWORDS: Incidental diverticulectomy; Meckel's diverticulum.

Introduction

The incidence of Meckel's diverticulum is around 2 per cent. In 1933, Mayo stated that Meckel's diverticulum, the commonest congenital anomaly of the gastrointestinal tract, is "frequently suspected, often overlooked and seldom found" [1]. In a majority of cases Meckel's diverticulum is an incidental finding at laparotomy. The complications of Meckel's diverticulum are more common in children and young adults. The rationale of incidental diverticulectomy is being questioned over the last 2 decades. Many reports for and against incidental diverticulectomy are available in literature [2-11]. Incidental diverticulectomy, if done properly, does not have any complications [5,7] and our study highlights the same.

Material and Methods

A prospective study was conducted between August 1985 and December 1995, and 25 patients with Meckel's diverticulum were encountered. The presenting symptoms, investigations ordered, operative findings, surgical procedure followed, complications after surgery, histopathological findings and number of days in the hospital were recorded in detail in each case. Special emphasis

was laid on post-operative complications after incidental diverticulectomy. Patients were divided into two groups. Group 1 consisted of 8 patients in whom Meckel's diverticulum was primarily responsible for the symptoms, that is, those in whom Meckel's diverticulum was either diseased or caused symptoms due to its presence. Group 2 consisted of 17 patients in whom Meckel's diverticulum was an incidental finding during exploration of the abdomen for some other condition. Mean duration of follow-up of patients was between 6 months to 2 years.

Results

There were 18 males and 7 females. The youngest patient was 6 years old and the oldest 69 years. Sixteen of the 25 (64%) patients were between 10 to 29 years of age.

Table 1 shows the conditions, in Group 1 patients, for which laparotomy was performed. There were 8 patients in this group. Of the 5 cases of intestinal obstruction, 3 cases were due to compression and twisting of ileal loop around the omphalodiverticular band, 1 case was of gangrene of ileum due to volvulus around the omphalodiverticular band and 1 case was of strangulated inguinal hernia, having Meckel's diverticulum in its

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TABLE 1

Clinical presentation and associated conditions in 25 patients with Meckel's diverticulum

Group 1	
<i>Presentation in symptomatic cases (n=8)</i>	
Condition	No of cases
Intestinal obstruction	5
Perforated peritonitis	2
Intussusception	1
Group 2	
<i>Associated conditions in which incidental Meckel's diverticulum was encountered (n=17)</i>	
Condition	No of cases
Acute appendicitis	7
Intestinal obstruction	3
Enteric perforation	2
Blunt injury of the abdomen	1
Peptic ulcer perforation	1+1
Ca colon with secondaries	1
Incisional hernia	1

sac. One case presented with intussusception.

Group 2 comprised of 17 patients in whom Meckel's diverticulum was a chance encounter during laparotomy for some other condition. During 211 appendectomies, 7 cases of Meckel's diverticulum were encountered.

Diverticulectomy was not done in 3 of the 17 cases of incidental encounter of Meckel's diverticulum. In the first case, where mesh repair of a large incisional hernia was being done, diverticulectomy had a major chance of contamination. The second patient was an elderly male with obstructive carcinoma of the descending colon with secondaries. The diverticulectomy in this case would have been a pointless exercise. The third patient had a 4-day-old peptic ulcer perforation with gross peritonitis and septicaemia and was an elderly individual with poor general condition. Hence diverticulectomy was not done.

All Meckel's diverticuli were found within 100 cm of the ileocaecal junction. The length of the diverticulum varied between 1 and 7 cm. Diameter could not be accurately measured. Obliterated omphalomesenteric duct was seen in 7 cases. No patient presented with faecal discharge from the umbilicus or as a case of haematemesis.

In the elective case, some special investigations

were undertaken. These were barium meal (1 patient), barium meal and follow through (1 patient), barium enema (2 patients), ultrasonography (5 patients), and upper gastrointestinal endoscopy (3 patients). Conclusive preoperative diagnosis could not be made in any patient except in one patient who had undergone appendectomy 1 year back. The patient had recurrent pain abdomen, usually around the umbilicus and on the right side of the abdomen. A high level of suspicion clinched the diagnosis. Of the two cases who presented with a perforated diverticulum, one had already undergone appendectomy at another hospital.

In Group 1, one case of right basal atelectasis, two cases of wound infection, one case of prolonged paralytic ileus were seen. In Group 2, two cases of stitch abscess were seen. In both the groups no case of burst abdomen or incisional hernia was seen.

All operative specimens were examined histopathologically. Ectopic gastric tissue was found in 2 of the specimens. Both these cases were of perforated Meckel's diverticulum. Malignant or premalignant changes were not found in any of the specimens. Average stay in the hospital in both groups was almost equal being approximately 10 days. There was no mortality in our series.

Discussion

Meckel's diverticulum, the most common congenital abnormality of the small intestine, represents the unobliterated part of the omphalomesenteric duct. Its embryological and pathological features were first described by Johann Freidrich Meckel in 1808. Incidence varies from 1-4 per cent. In 90 per cent of the cases Meckel's diverticulum is located in the last 90 cm of the terminal ileum. It is a true diverticulum having all the layers of small intestine with an independent vascular supply from superior mesenteric artery which crosses the ileum to supply the diverticulum. The diverticulum arises from the antimesenteric border of the ileum. It contains little or no lymphoid tissue and is self-emptying. Meckel's diverticulum is sometimes attached to the umbilicus by a fibrovascular band called omphalodiverticular band or to the ileal mesentery by mesodiverticular band, which is often the cause of intestinal obstruction [6].

It is very difficult to establish a clinical diagnosis since the presentation is often indistinguishable from other intra-abdominal conditions. Symptoms and signs of Meckel's diverticulum may be mimicked by acute appendicitis, peptic ulcer, diverticulitis coli, cholecystitis, ureteric colic or amoebic typhilitis [7]. Other congenital anomalies associated are agenesis of gall bladder, polyposis of colon, malrotation of bowel, omental cyst and floating kidney [5,7]. Seven cases of Meckel's diverticulum were encountered in 211 patients undergoing appendectomy (3.3%). This incidence is consistent with many studies conducted earlier [1,5].

Root and Baker have classified Meckel's diverticuli in to 2 groups on the basis of presentation. Group 1 includes those cases where Meckel's diverticulum is directly involved as a simple pouch and includes diverticulitis with or without perforation and peritonitis. Group 2 includes cases with ectopic tissue, ulcer formation with or without perforation or with or without bleeding [8]. In our study we followed the same classification. Other presentations of Meckel's diverticulum may be due to calcification, enterolith formation, round worm impaction or Littre's hernia [2-8].

A significant contribution to the study of Meckel's diverticuli was made by Soltero and Bill. Using a "life-risk-table", they estimated the lifetime risk of a complication developing in a Meckel's diverticulum. Their results showed a 4.2 per cent risk rate at infancy coming progressively down to 0.3 per cent in the 7th decade, again rising to 2.1 per cent in the 8th decade [9]. Meckel's diverticulum has less and less chances of developing complications as age advances. However, once complications develop, the morbidity is high [7,9].

Preoperative diagnosis of Meckel's diverticulum is difficult. Various investigations such as barium studies, ^{99m}Tc-sodium pertechnetate using 5 mCi (2 mCi in children) and mesenteric angiography has been suggested. However, all of them have certain limitations. Surgery is another modality where a certain diagnosis can be made [7,10].

Three methods of surgical removal of the Meckel's diverticulum are suggested, namely simple excision, diverticulectomy, and resection-anastomosis of ileum (specially when an ulcer is situ-

ated in the adjacent ileum, or when the base of the diverticulum is oedematous, inflamed, perforated or when a tumour is suspected) [2,11]. In our study we had 5 cases of ileal resection and 17 cases of diverticulectomy.

The status of incidental diverticulectomy is controversial. A few studies highlighting low [3,4] and others stressing upon high morbidity and mortality [2,9] have been reported. In cases with gross and generalised peritonitis, chronic Crohn's disease and especially in very ill patients, an incidental Meckel's diverticulum can be left alone [5].

Proponents of incidental diverticulectomy advocate it on the basis of morbidity being high in cases of complicated Meckel's diverticulum. Comparatively, incidental diverticulectomy is quite safe. As preoperative diagnosis is seldom possible, the resection of incidental Meckel's diverticulum protects the patient from re-operation due to its complications in the future [5,7,11].

The results of our study draws attention to the fact that regardless of the patients age, the resection of incidental Meckel's diverticulum can be performed safely with a low complication rate, and is performed under better circumstances during the first operation. Hence an incidental Meckel's diverticulum should be resected.

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