

## Case Report

# Meckel's diverticulum: a cadaveric case report

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### ABSTRACT

Meckel's diverticulum is the common congenital anomaly of the gastrointestinal tract, caused due to failure of involution of vitelline duct after seventh or eighth week of intra-uterine life. It is usually present within the last 90cm of terminal ileum. Histologically, Meckel's diverticulum consists of all layers of small intestine. Rarely, heterotopic tissue is present derived from gastric or pancreatic tissue. In the case presented here, Meckel's diverticulum was found on the ante mesenteric border of the ileum with no peritoneal attachment during routine Anatomy cadaveric dissection. It was present 26cm proximal to the ileocecal junction, with no attachment to umbilicus. Its blood supply was derived from the vitelline artery. Histological examination revealed the presence of 3 layers: mucosa, submucosa and muscularis propria with no heterotopic tissue.

**Keywords:** Congenital anomalies, Diverticulum ilea, Meckel's diverticulum, Mesentery

### INTRODUCTION

The most common congenital anomaly of the gastrointestinal tract is the Meckel's diverticulum or diverticulum ilea. First described in 1809, Meckel's diverticulum is basically a remnant of the vitelline duct or omphalomesenteric duct, which usually disappears by the seventh week of Intra-Uterine life.<sup>1-3</sup> In general population, the incidence of Meckel's Diverticulum has been estimated to be around 2%.<sup>4</sup> However, according to the autopsy reports and retrospective studies it can range from 0.14-4.5%.<sup>5,6</sup>

Anatomically, Meckel's diverticulum is a true diverticulum since it contains all layers of small intestine. It arises from the ante mesenteric border of the ileum, up to 100cm from the ileocecal valve and receives its blood supply from the remnant of vitelline artery.<sup>7</sup> Although found in both sexes, Meckel's diverticulum causes complications in males more frequently as compared to females and is therefore more often diagnosed in males.<sup>8-10</sup>

Diverticulum related symptoms occur in 16.9% cases. small intestine obstruction, inflammation and bleeding of lower gastrointestinal tract accounts for 90% of the symptoms.<sup>9</sup> When symptomatic, Meckel's diverticulum may also cause intestinal bleeding, intussusception, bowel obstruction, or abdominal pain with vomiting and/or nausea.<sup>11-17</sup> Mackey WC et al reported a 10.3% mortality and 17.6% morbidity rate in case of symptomatic diverticuli.<sup>9</sup>

Histologically, Meckel's diverticulum consists of the normal Small Intestine tissue consisting of three layers: mucosa, submucosa and muscularis propria. Mostly gastric or pancreatic, but sometimes also colic heterotopic mucosa is present in 20%-30% of cases.<sup>14</sup>

Some cases may present appendicitis like inflammation of all the three layers of intestinal wall along with associated vasculature of the diverticulum, which may cause acute or sub-acute intestinal obstruction.<sup>13</sup>

## CASE REPORT

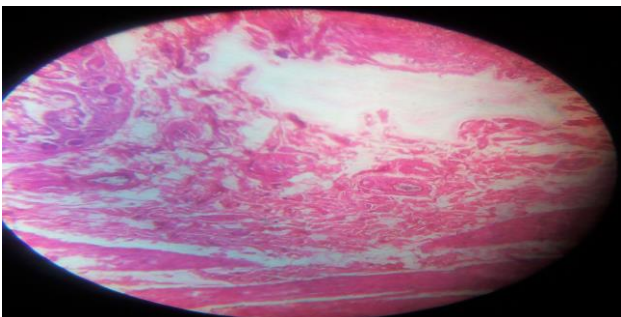
The variation was found during routine dissection on an adult male cadaver preserved in 10% formalin in dissection hall of Department of Anatomy, Sawai Man Singh Medical College, Jaipur Rajasthan, India. The medical history and cause of death of the patient is unknown.

The findings were noted and a portion of the wall of diverticulum was processed for histological study by staining with hematoxylin and eosin. The following features were noted:

- The diverticulum was present about 26cm proximal to ileocecal junction.
- It was 3.8cm in length and 1.6cm in diameter.
- Meckel's diverticulum was present at the ante mesenteric border with no peritoneal attachments to the mesentery.
- The tip of the diverticulum was not attached to the umbilicus or any other part of the intestine.
- Upon histological examination, the mucus membrane showed villi lined by simple columnar epithelium, consisting of a few goblet cells. Glands were present in lamina propria. Submucosa was seen, containing lymphatic follicles. No ectopic tissue, either gastric or colic was identified.



**Figure 1: Meckel's diverticulum present on the ante-mesenteric border of the small intestine in situ.**



**Figure 2: Histological preparation of the tissue: three layers can be seen namely mucosa, submucosa and muscularis propria. the mucosa is lined by simple columnar epithelium, glandular tissue can be found in lamina propria and lymphatic aggregate can be seen in submucosa. no heterotopic tissue can be seen.**

## DISCUSSION

The embryological origin of Meckel's diverticulum can be explained by development of the midgut. The embryonic mid gut is connected with the yolk sac ventrally, so as to provide nutrition to the mid gut via the omphalomesenteric duct (vitelline duct, omphalocentric duct or yolk stalk). This omphalomesenteric duct narrows progressively and completely disappears between 5<sup>th</sup> to 8<sup>th</sup> week of gestation period. The proximal part of omphalomesenteric duct fails to regress sometimes and persists as a remnant forming the Meckel's diverticulum.<sup>18</sup>

Furthermore, the diverticulum may be attached to the umbilicus via vitelline ligament. Torsion of the intestine may occur around this intestinal stalk, thus causing obstruction, ischemia and necrosis.

Meckel's diverticulum consists of all the three coats of intestinal wall, that is mucosa, submucosa and muscularis propria. It has its own blood supply and is vulnerable to intussusception, obstruction and infection. In about 55% of the cases of Meckel's diverticulum, ectopic tissue is found.<sup>19</sup> Gastric and pancreatic tissues are found predominantly, with an incidence rate of 60-85% and 5-16% respectively.<sup>9</sup>

About 2% of the population is affected by Meckel's diverticulum, making it the most common congenital anomaly of the gut. It is usually present on the ante mesenteric border- that is the border lying opposite to the mesentery, as an out pouching of the ileum. In 90% of the cases, diverticula have been reported to be within a distance of 90cm from the ileocecal valve. However, its presence has been reported to be up to 180cm from the ileocecal valve.<sup>20</sup>

Meckel's diverticulum has been reported to be more common among individuals who are born with other congenital malformation, like exomphalos, anorectal atresia, oesophageal atresia and gross malformation of the central nervous system and cardiovascular system.<sup>3</sup>

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