شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

INTRODUCTION

Open abdominal surgery is associated with post-operative pain, nausea, ileus, and prolonged hospital stay with associated costs ***(White, 2002).*** While opioids have been the mainstay of peri-operative analgesia, they are significantly associated with post-operative ileus, especially when daily dosing exceeds 2 mg of intravenous (I.V.) hydromorphone equivalents ***(Barletta et al., 2011).***

This has led to the use of alternative modes of analgesia. Including epidural anesthesia and transversus abdominis plane block (TAP) ***(Barletta et al., 2011).*** Intravenous lidocaine is a less invasive and costly alternative for patients not willing, or unable to undergo these procedures ***(Sun et al., 2012).***

Suggested perioperative systemic lidocaine may promote postoperative recovery after abdominal surgery. It was considered that intravenous lidocaine infusion may attenuate IL-8, IL-6 and IL-1ra production and accelerate the recovery of bowel function following open abdominal surgery.

AIM OF THE WORK

This study aims to determine the role of intraoperative lidocaine infusion in reducing perioperative pain and analgesia requirement and enhancing the recovery of intestinal function in patients undergoing surgical appendectomy.

Chapter 1

SURGICAL ANATOMY OF THE APPENDIX

Small Intestine

It has been demonstrated that the length of the alimentary tract in humans is difficult to measure. An average length of 6 to 6.5 m for the small intestine has been widely accepted. There is some evidence that intestinal length is greater in obese individuals. Generally speaking, surgeons are more concerned with the length of the intestine before extensive resection to prevent small bowel syndrome; therefore, before any bowel resection, a precise measurement should be made ***(Chiva and Magrina., 2018).***

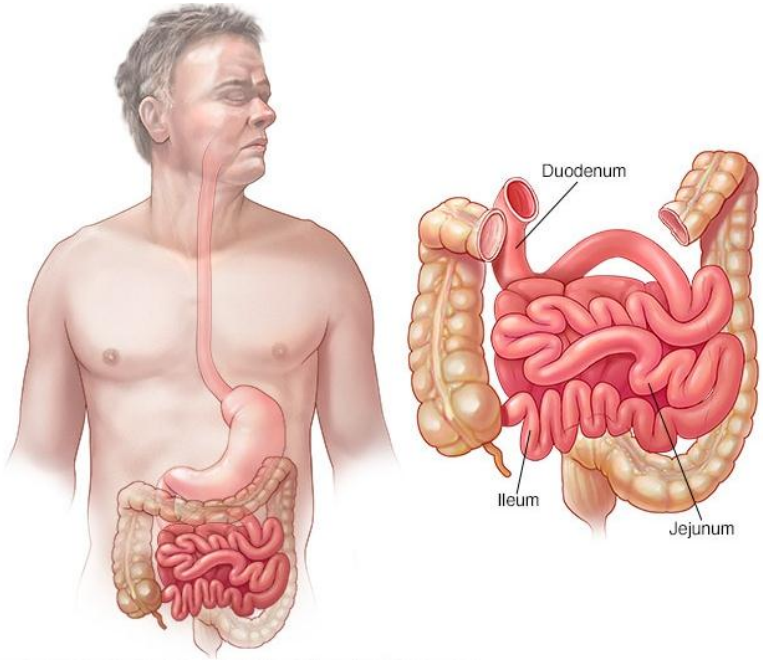

Figure (1): Small-intestine/img-20006054, Mayo clinic.

Typically a 70% to 75% loss of small bowel will result in small bowel syndrome, is a malabsorption **disorder** caused by a lack of functional **small intestine**. The primary symptom is diarrhea, which can result in dehydration, malnutrition, and weight loss. Small bowel syndrome has also been defined as a bowel length of 100 to 120 cm of small bowel without colon, or 50 cm of small bowel with colon ***(Netter, 2006).***

The mesentery of the small intestine has a length of 15 cm. It originates from the posterior abdominal wall and begins at the duodeno-jejunal junction, just to the left of the second lumbar vertebra.

The mesentery passes downward toward the right sacroiliac joint. The mesentery contains the superior mesenteric vessels, along with lymphatics and lymph nodes. These drain the small intestine ***(Tirkes et al., 2012).***

There are a number of autonomic nerve fibers within the mesentery. The small bowel is divided into three sections. The first section is the duodenum, which is approximately 25 cm in length and extends from the pylorus to the duodenojejunal flexure; this point is marked by the ligament of Treitz.

The duodenum is anatomically divided into four parts; it curves in the shape of the letter C around the head of the pancreas. At its origin the duodenum is covered with

peritoneum for about 2.5 cm, after which it becomes a retroperitoneal organ.

The upper half of the small intestine is called the jejunum and the remainder is the ileum. There is no obvious distinction between the two parts, and the division is one of convention only. However, the character of the small intestine does change as it courses distally toward the cecum ***(Netter, 2006).***

The jejunum has a thicker wall as the valvulae conniventes become larger and thicker. The proximal small bowel shows a greater diameter than the distal small bowel. Furthermore, the jejunum typically lies toward the umbilical region of the abdomen and the ileum toward the hypogastrium and pelvis.

Mesenteric vessels tend to form fewer arcades in the jejunum, with long and relatively infrequent terminal branches passing to the intestinal wall. However, the ileum tends to be supplied by shorter and more numerous vessels that arise from a number of complete arcades ***(Chiva and Magrina., 2018).***

Blood Supply and Lymphatics of the Small Intestine:

The small intestine develops from the midgut and extends from the mid-duodenum to the distal transverse colon. It is supplied by the SMA, which arises from the aorta at the level of L1. The branches of the SMA include the following:

- The inferior pancreatico-duodenal artery, which supplies the pancreas and duodenum.
- Jejunal and ileal branches of the SMA; these give the blood supply to the bulk of the small intestine.
- The ileocolic artery, which supplies the terminal ileum, the cecum, and the proximal part of the ascending colon. This also provides an appendicular branch to the appendix.
- The right colic artery, which supplies the ascending colon.
- The middle colic artery, which supplies the transverse colon to approximately two-thirds along its length. This vessel creates a division between the SMA and the IMA ***(Uflacker, 2007).***

The small intestine drains via the superior mesenteric vein and forms a confluence with the splenic vein to form the portal vein. This runs through the free edge of the lesser omentum and forms part of the superior border to the gastroepiploic foramen, before the portal vein continues to the liver ***(Uflacker, 2007).***

The path of the lymph in the small bowel follows the vessels of the involved segment to the root of the superior mesentery artery (SMA) near the head of the pancreas and to the extra peritoneum ***(Uflacker, 2007).***

Cecum and Appendix:

The cecum measures approximately 5 to 7 cm in length and directly communicates with the terminal ileum at the ileocecal valve. The cecum can be partly or completely mobile along its mesentery, sometimes resulting in cecal volvulus.

It is enveloped by peritoneum, but part of the posterior surface is connected to the iliac fascia via connective tissues and peritoneal folds along its medial and lateral aspects, forming the retrocecal fossa ***(Jung., 2010).***

The cecum does not have a separate mesocolon but shares the ileocolic mesentery that follows the course of the ileocolic vessels and lymph chain. The ileocecal valve enters the cecum as a linear protuberance typically arising from the posteromedial wall of the cecum.

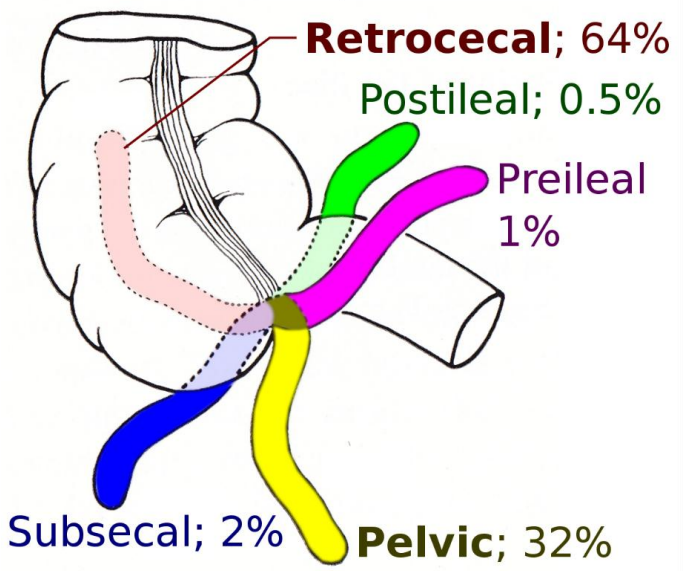

Figure (2): Normal variants of appendix position, (Wikipedia, appendix anatomy 30 December 2020).

It delineates the junction between the cecum and ascending colon. The ileocecal valve has poorly developed musculature and consequently has deficient sphincteric function ***(Netter, 2006).***

The appendix is a vestigial vermiform structure that can range from 2 to 20 cm in length and up to 6 mm in diameter. The appendix lies typically under the McBurney point, which can be defined along the caudal one-third of an oblique line joining the right anterior superior iliac spine and umbilicus. Its orifice lies at the cecal apex approximately 2 cm below the ileocecal valve ***(Xiang et al., 2018).***

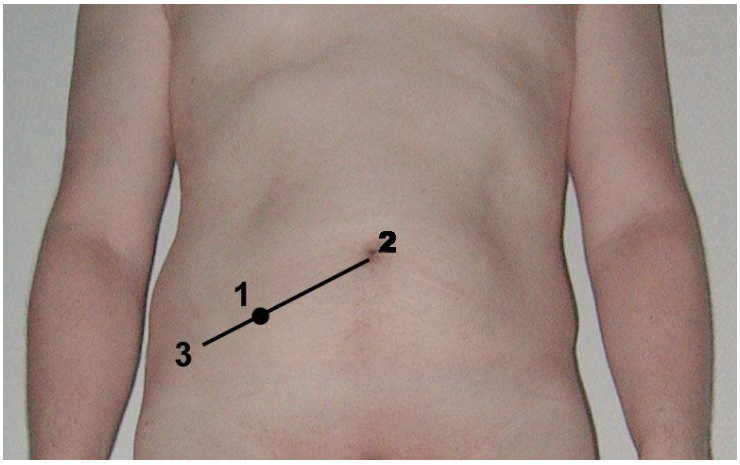

Figure (3): McBurney's point (1), located two thirds the distance from the umbilicus (2) to the right anterior superior iliac spine (3),Wikipedia author: Steven Fruitsmaak 24 September 2006.

The position of the appendix can vary among individuals and may be retrocecal, or it may lie within the pelvic peritoneum. The appendix lies within its own short

triangular mesocolon, denominated by the mesoappendix. The mesoappendix contains lymph nodes, arteries, and veins that supply and drain the appendix. The appendiceal orifice is typically visible at the coalescence of three longitudinal taeniae coli in the cecal tip ***(Jung et al., 2010).***

Blood Supply:

The appendicular artery, a terminal branch of the ileocecal artery, supplies blood to the appendix. This artery is a branch of the superior mesenteric artery, coinciding with its origin as a midgut derivative. Lymph from both the appendix and cecum drain into the ileocolic lymph nodes. However, while drainage from the cecum is via several intermediate mesenteric lymph nodes, the appendix drains through a single intermediate node. From the ileocolic lymph nodes, drainage proceeds to the superior mesenteric nodes ***(Kahai et al., 2020).***

Nerve supply:

The autonomic innervation of the appendix arises from the superior mesenteric plexus. Afferent sensory fibers from the appendix are carried on the sympathetic nerve fibers to enter the spinal cord at T10 which corresponds to the umbilical dermatome ***(Xiang et al., 2018).***

Surgical considerations:

Appendectomy for acute appendicitis is one of the most frequent indications for emergent abdominal surgery. An important anatomical landmark for surgeons performing appendectomy is the convergence of the taeniae coli which marks the base of the appendix. By following them inferiorly, the appendix can be located and resected ***(Kahai et al., 2020).***

Acute appendicitis:

Acute appendicitis follows pathogenesis similar to that of other hollow viscous organs and is thought to be most often caused by obstruction leading to increased intraluminal pressure and compromised venous outflow. In the young, obstruction is more often caused by lymphoid hyperplasia. The appendix receives its blood supply from the appendicular artery, which is an end artery. As intraluminal pressure exceeds the perfusion pressure, ischemic injury results, encouraging bacterial overgrowth and triggering an inflammatory response. This becomes a surgical emergency because perforation of the inflamed appendix can leak bacterial contents into the abdominal cavity ***(Deshmukh et al., 2014).***

As the appendicular wall becomes inflamed, visceral afferent fibers are stimulated. These fibers enter the spinal cord at T8-T10, producing the classic diffuse peri umbilical pain and nausea seen at the onset of appendicitis. As inflammation progresses, the parietal peritoneum is irritated, stimulating

somatic nerve fibers and producing more localized pain ***(Deshmukh et al., 2014).***

The localization depends on the position of the tip of the appendix. For example, a retrocecal appendix can produce right flank pain. Extending the patient's right hip can elicit this pain. Pain produced by stretching the iliopsoas muscle due to hip extension with the patient in the left lateral decubitus position is known as "psoas sign" ***(Kahai et al., 2020)***

Another classic finding in acute appendicitis is McBurney's sign. This is elicited by palpation of the abdominal wall at the McBurney's point, when pain is elicited. The clinical picture often includes nausea, vomiting, low-grade fever, and a slightly elevated white count ***(Childers et al., 2019).***

Surgical anatomy:

On the basis of the anatomy of the anterior abdominal wall, the following three distinct incisions can be employed in performing an open appendectomy:

- McBurney-McArthur incision
- Lanz incision
- Pararectus incision

McBurney's incision is the most commonly used approach. The position of the incision is based upon the

location of the McBurney point, which is a point one third of the distance from the anterior superior iliac spine (ASIS) to the umbilicus. Place the incision (1.5-5.0 cm in length, depending on the patient's age) between the first third and the second third of the distance from the ASIS to the umbilicus, respecting the directions of the Langer skin lines ***(Childers et al., 2019).***

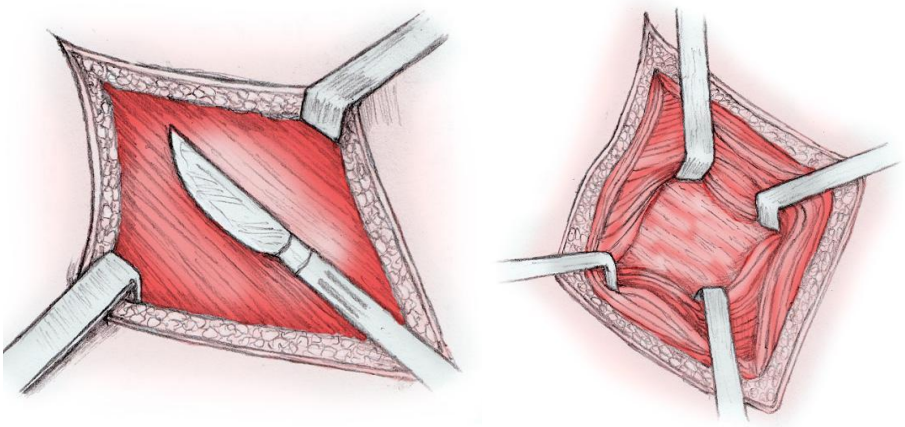

Figure (4): Dissection through both superficial and deep fascia. Sequence of muscle splitting and retraction is repeated with fascia of both internal oblique muscle and transversus abdominis to expose transversalis fascia and peritoneum, Medscape , Author: Umashankar K Ballehaninna, MD, MS Resident Physician, Department of General Surgery, Maimonides Medical Center june,2019.

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The appendix can be removed through either an antegrade or a retrograde technique. In performing the antegrade approach, identify the ascending colon and its taeniae coli, and use a series of Babcock surgical clamps to follow them to their convergence, identifying the base of the appendix ***(Childers et al., 2019).***