Università degli Studi di Ferrara

Nel futuro da sempre.

PERITONITE

LANGE 56

An 18-year-old man is seen in the emergency department complaining of a "stomachache all over" and fever. He reports that 2 days ago, he had some soreness around the umbilicus, and then yesterday, the pain seemed to go to the right lower abdomen. Today, he complains of pain throughout the abdomen with fever and chills. He is not hungry. On examination, his temperature is 102°F, heart rate is 110 beats/min, and blood pressure is 130/90 mmHg. An abdominal examination reveals a distended abdomen. There are hypoactive bowel sounds on auscultation. The patient has generalized tenderness throughout the abdomen with involuntary guarding and rebound tenderness.

- What is the most likely diagnosis?
- What is the explanation for the change in location of the pain?
- What is the mechanism for the rebound tenderness?

DISCUSSIONE:

- Uomo di 18 anni
- Lamenta un forte dolore addominale diffuso e febbre
- 2 giorni prima era comparso un dolore a livello periombelicale che sembra essere migrato a livello del quadrante inferiore destro
- Scarso appetito, temperatura corporea 38,9°C, frequenza cardiaca di 100 battiti/min e pressione arteriosa di 130/90 mmHg
- L'esame obbiettivo evidenza addome disteso e scarsi rumori addominali
- Si evidenzia un dolore diffuso addominale, atteggiamento di difesa addominale e segno di Blumberg (o segno del rimbalzo)

Segno di Blumberg:

- Con il paziente in posizione supina, il medico, esercita una pressione leggera partendo da zone non spontaneamente dolorose, alla ricerca di aree di contrattura, che talvolta è notevole (addome di legno o a tavola).
- In presenza di una zona di contrattura o dolorabilità evocata alla palpazione, solleva bruscamente le mani dall'addome: la comparsa di un dolore acuto trafittivo rappresenta la positività del segno di Blumberg, indice di una possibile peritonite.

CLINICAL CORRELATION

This young man has the typical presentation of acute appendicitis that has progressed initially from engorgement (visceral pain) to inflammation affecting the parietal peritoneum (somatic pain), and finally to frank rupture of the appendix. Pus is released into the entire peritoneal cavity, leading to generalized pain and rebound tenderness. Visceral pain is typically within the walls of hollow organs and stimulated by stretching, distension, or contractions. It is poorly localized and usually felt in the midline. In this case the distension of the appendix leads to a poorly defined periumbilical pain. Further questioning may lead to a description of deep, dull aching or cramping. When the appendix becomes inflamed and the inflammation on its surface touches the parietal peritoneum, there is more localized pain. This pain is described as sharper, aggravated by stimulation of the parietal peritoneum such as movement, coughing, or walking. In eliciting rebound tenderness, the physician presses deep on the abdomen and then quickly removes the hand (or pressure), and the patient experiences a sudden onset of pain on release of the pressure, rather than from the pressure itself. This is due to peritoneal irritation, and the pain occurs because the peritoneum rebounds back, activating sensory fibers, when the pressure is suddenly released. Other indications of peritoneal irritation include pain on percussion of the abdomen.

CORRELAZIONE CLINICA:

- Questo giovane paziente presenta i segni clinici di esordio di una comune appendicite acuta che però è evoluta coinvolgendo progressivamente anche il peritoneo parietale, innervato somaticamente. Infine si è verificata una rottura dell'appendice
- Il pus ed elementi infiammatori sono stati rilasciati all'interno del cavo peritoneale causando una irritazione diffusa, causando dolore e Blumberg positivo.
- Il dolore viscerale è solitamente proprio degli organi cavi e viene causato dallo stiramento delle pareti, distensione o contrazione. Si tratta di un dolore scarsamente localizzabile e tendenzialmente riferito a livello della linea mediana. In questo caso infatti la distensione iniziale dell'appendice veniva inizialmente riferita a livello periombelicale
- Con il progredire della patologia, il processo infiammatorio ha coinvolto anche il peritoneo parietale che è somaticamente innervato. In questa seconda fase perciò il dolore viene solitamente riferito più localizzato e acuto a livello del quadrante inferiore destro.
- Infine, si verifica la positivizzazione del segno di Blumberg: in cui il dolore si verifica maggiormente nella fase di rilascio rapido della manovra. Ciò e dovuto al ritorno elastico del peritoneo che, essendo diffusamente irritato, determina una massiva attivazione delle fibre sensoriali che lo innervano.

DISCUSSION

The **peritoneum** consists of a thin serous membrane composed of a simple squamous epithelium called **mesothelium**, and a thin layer of loose connective tissue, rich in elastic fibers. The peritoneum is divided into a portion that lines the inferior surface of the diaphragm and the abdominal and pelvic walls, the **parietal peritoneum**, and the portion that covers all or a part of the abdominopelvic viscera, the **visceral peritoneum** (see Figure 56-1).

Another peritoneal structure is a double-peritoneal sheet with a connective core, called a **mesentery**. The connective tissue core may contain a large amount of fat, serving the body as a major storage site for fat. Blood vessels and nerves passing to and from the viscera and the posterior body region are also located within the connective tissue core. These double-peritoneal sheets are sometimes termed **ligament** or **omentum**.

The space between the parietal and visceral peritoneum is called the **peritoneal cavity**. The peritoneum produces a small amount of serous fluid called **peritoneal fluid**, which lubricates movement of the viscera suspended in the peritoneal cavity. The peritoneal cavity in subdivided into the large **greater sac** extending from the diaphragm superiorly, to the pelvic cavity inferiorly. A smaller **lesser sac** or **omental bursa** is found posterior to the liver and stomach. It communicates with the greater sac via the **omental foramen** (epiploic foramen of Winslow). The peritoneal cavity of the male is closed, but that of the female is open to the outside via the uterine tubes, uterus, and vagina.

The sensory innervation of the peritoneum is important clinically. The parietal peritoneum of the central underside of the diaphragm (derived from the septum transversum) receives its sensory innervation from the **phrenic nerve (C3–C5)**. Innervation of the peritoneum on the underside of the diaphragm's periphery is provided by **spinal nerves T6 through T12**. Innervation of the peritoneum lining the

abdominal wall is provided by **spinal nerve T6 through T12 and L1**, while the peritoneum lining the pelvic wall is innervated by the **obturator nerve (L2–L4)**. These somatic nerves providing sensory innervation to the parietal peritoneum are essentially sensitive to pain, touch, temperature, and pressure. This latter sensation is the basis of **rebound tenderness** from an already irritated peritoneum. These somatic nerves from the parietal peritoneum provide an intense, well-localized sensation. Sensory innervation from the visceral peritoneum covering most of the abdominopelvic organs, as well as their mesenteries, are not sensitive to touch, temperature, or pressure, but are sensitive to ischemia, stretching, or tearing, such as from a swollen or distended organ. These visceral afferent nerves are described as being part of the autonomic nervous system (ANS), and travel back to the spinal cord via the sympathetic portion of the ANS. They convey a dull, poorly localized sensation.

Referred pain means the sensation of pain at a site different from its original source. Pain sensation originating from a gastrointestinal organ is often perceived at or near the midline. This is attributed to the fact that these organs are midline in origin. The clinically important referred pain involves both the visceral and somatic sensory nerves. For example, the visceral afferent fibers from the stomach travel to the spinal cord via the greater splanchnic nerves to reach the T5 through T9 levels of the spinal cord. Pain from the stomach is often perceived initially and somewhat vaguely at the epigastric midline, which, in turn, is supplied by spinal nerves T5 through T9. Visceral afferent fibers from the appendix enter the spinal cord at approximately the T10 level, and pain from a distended appendix is initially perceived at the periumbilical region which is typically supplied by the T10 spinal nerve. If the organ is inflamed and becomes distended, as is often the case, the adjacent parietal peritoneum may also became irritated. In such instances, the initially vague periumbilical discomfort can shift to a well-localized, intense right lower quadrant pain from the appendix itself. This well-localized pain may be accompanied by **muscular rigidity** or "guarding," which is a body reflex, while attempting to reduce peritoneal movement, which, in turn, may produce pain.

The mechanism for referred pain is not fully understood. It may be more complex than entry of sensory nerve fibers into the central nervous system (CNS) at a common spinal cord level (e.g., T10 for the periumbilical region and the appendix itself). For example, a common pathway that courses superiorly to the brain from the spinal cord may also be involved in the conscious perception of pain.

Domanda 1: durante una procedura di dissezione si osserva il colon. Quale struttura è immediatamente visibile?

A. Pleura viscerale
B. Pleura parietale
C. Mesentere
D. Peritoneo parietale
E. Peritoneo viscerale

Domanda 2: quale nervo spinale si occupa dell'innervazione del porzione inferiore centrale del diaframma?

A. Da C3 a C5
B. Da T5 a C9
C. Da T6 a T12
D. T10
E. Da L2 a L4

Domanda 2:quale nervo è responsabile dell'innervazione dei visceri addominali?

A. Da T_4 a T6
B. T8
C. T10
D. Nervo vago
E. L1