

Diseases of the right hypogastrium

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The right hypogastrium is one of the most often affected areas of the abdomen. One of the reasons is the localization of the appendix in this region. Appendicitis remains the most frequent cause of acute abdomen (9,11). Appendectomy is the fifth most common surgical procedure at all – after cataracta operation, adenotonsilectomy, hernioplasty and cholecystectomy (9).

Right hypogastrium disorders could be distinguished as acute, subacute or chronic, according to aetiology being inflammatory or non-inflammatory. The majority of right hypogastrium disorders are represented by acute abdomen (7). The patients usually come with acute painful syndrome of the right hypogastrium eventually accompanied by other symptoms. The palpable mass of the right hypogastrium may be present. In the case of inflammatory process progression to the parietal peritoneum some signs of peritoneal irritation could be present.

The appendix vermiformis is an organ in the right hypogastrium which is most frequently affected. Appendicitis is the most common surgical emergency and should always be considered in differential diagnosis if appendix vermiformis has not been removed. The age between teenage and thirty years is typical for the occurrence of appendicitis. Clinical presentation of acute appendicitis is generally known and diagnosis is easy. However sometimes, e.g. abnormal location of appendix, during pregnancy or at a high age, correct diagnosis assessment could be difficult even impossible and the diagnosis is often assessed during the operation. These cases also have a higher occurrence of complications. The unusual form of appendicitis is described in cases when an inflamed appendix is found in a right inguinal hernia – necrotising soft tissue infection or necrotising fasciitis with high morbidity and mortality – Amyand's hernia.

Appendical diverticulitis is clinically indistinguishable from acute appendicitis. Diverticulosis is defined by the presence of diverticula along any segment of

the gastrointestinal tract. Diverticulosis and its associated complications may also involve the appendix. Clinical symptoms range from chronic right lower quadrant abdominal pain to acute appendicitis and even peritonitis. Albaugh et al. (1) assessed that incidence is less than 1 % among patients under 30 years of age undergoing appendectomy. Surgery is the treatment of choice because of the high risk perforation. Cases of primary adenocarcinoma in appendical diverticulosis have been described (16).

Except primary appendicitis the cases of appendicular involvement in perforated sigmoid diseases – perforated sigmoid diverticulitis or perforated sigmoid carcinoma with secondary induced inflammation of the appendix are known (12). We have also managed a case like this in a 52-year old man. An appendectomy and temporary Hartmann's operation with terminal colostomy were performed.

Inflammation of the appendix may also be caused due to parasite irritation of the appendix – in our country this is oxyuriasis (enterobiosis) of the vermiform appendix caused by oxyuris vermicularis. In patients from tropical countries the schistosomiasis of the appendix can be found. The patients come with the abdominal pain in the right hypogastrium and with the signs of peritoneal irritation. The clean exudate in the abdominal cavity by oxyuriasis is usually found. If schistosomiasis of the processus vermiformis is present, the granulomatous inflammatory reaction with eosinophilia and fibrosis is demonstrated. An appendectomy should be performed in these cases.

Mucocele of the vermiform appendix is a rare disease. Mucocele is a cystic dilatation of the appendix that contains mucous material. It might be caused by benign or malignant diseases in the caecal region. The main clinical manifestation is abdominal pain often imitating acute appendicitis. Acute laparotomy is indicated and appendectomy is an adequate treatment for benign disease. If malignant disease is

demonstrated a right hemicolectomy should be performed.

Granulomatous appendicitis is a rare entity accounting for less than 2 % of all cases of appendectomies (2). The initial belief that it represents a manifestation of Crohn's disease is incorrect. Only 5 – 10 % of patients developed Crohn's disease elsewhere in their gastrointestinal tract. The differential diagnosis of other diseases such as sarcoidosis, foreign body reaction or infection by mycobacteria, fungi or parasites is necessary. Isolated granulomatous inflammation of the appendix is usually unknown aetiology. In 25 % of cases the infection of pathogenic *Yersinia* species is involved. The infection produces a granulomatous reaction in relation to a protracted secondary inflammatory response (2). Patients with this condition present with the typical signs and symptoms of acute or subacute appendicitis (14) with a mass palpable in the right iliac fossa. By the operation an enlarged inflamed appendix with broad base is usually noted and appendectomy is performed. Diagnosis is confirmed by a histological examination. The postoperative course is usually uneventful (5,13). However, pre-operative diagnosis and differential diagnosis of the palpable mass in the right iliac fossa can be difficult as demonstrated by Hazuková et al. in this issue of the Journal (4).

Volvulus of appendix accompanied by inflammatory changes simulates acute appendicitis and surgery is required. During the operation the aetiology of disorders is found. The appendical volvulus has been operated twice in our Department, too (17).

Also benign and malignant tumours of the appendix (carcinoid, carcinoma) may cause an acute abdominal disorder with pain and a palpable mass in the right hypogastrium. If a malignant tumour of the caecum or appendix vermiformis is suspected, right hemicolectomy should be performed (16) and postoperative oncologic treatment is necessary.

From among the specific inflammations it is necessary to mention actinomycosis in the right iliac fossa. Appendix and ileofemoral region have been recognized as the most commonly involved sites. Actinomycosis of the appendix vermiformis is generally acute in presentation, mimicking common acute appendicitis. With the rising migration of people we can again expect the occurrence of tuberculosis of the ileocaecal region. We have no experience ourselves with this disorder.

Acute diverticulitis and perforated acute diverticulitis of the caecum can be rarely found as solitary lesions in patients with acute symptomatology of right hypogastrium. Abdominal pain, tenderness and signs of peritoneal irritation are present. Surgical treatment is necessary.

Torsion, necrosis and inflammation of an epiploic appendix of the right colon (epiploic appendagitis) are characterized by a non-specific focal abdominal pain with leukocytosis. Clinical presentation of appendagitis can mimic diverticulitis or appendicitis.

Abdominal pain is also a basic symptom of Crohn's disease. The inflammation is most frequently in the terminal ileum and in the ileocaecal region – in the right hypogastrium. The course can be subacute or chronic. Diagnosis is assessed by gastroenterological examination. In the case of acute course a correct preoperative diagnosis is rarely made and the usual diagnosis is that of acute appendicitis or appendical abscess. Correct diagnosis is assessed in these cases at laparotomy. Different diseases of the Meckel's diverticulum have also localized their symptomatology into the right hypogastrium. In some cases they can mimic acute appendicitis.

Endometriosis of the caecum was described as a very rare cause of difficulties in the right hypogastrium. Endometriosis may mimic other abdominal pathologies. Veneziano et al. (15) described a case of acute bowel obstruction due to caecal endometriosis. This disease occurs by women in reproductive age with acute bowel obstruction, associated with an accurate anamnesis of menstrual history.

Psoas abscess is an infrequent clinical entity with pain, fever and palpable mass in the right hypogastrium. The primary abscess has no definite aetiology. The psoas abscess can also be secondary to gastrointestinal pathology through infection of adjacent structures. The percutaneous drainage should be performed whenever possible. Surgical operation should be practiced as well as intestinal resection whenever indicated.

Mesenteric lymphadenitis is often the cause of pain in the right hypogastrium. It occurs predominantly in children and young adults. The disease is often parainfectious. Differential diagnosis between acute appendicitis and mesenteric lymphadenitis can be difficult.

Omental infarction, strangulation of the small bowel through a defect in the greater omentum or Spigelian hernia have also clinical pain and palpable mass in

the hypogastrium and their diagnosis can be difficult. Surgical correction is usually necessary to prevent complications of acute abdomen with strangulation or incarceration (3).

Small intestinal (ileal) perforation caused by a sharp or pointed foreign body can cause pain, palpable mass and/or peritoneal irritation in right hypogastrium. The correct diagnosis is rarely made preoperatively because clinical symptoms are usually non-specific and can mimic other surgical conditions, e.g. appendicitis, periappendicular abscess or diverticulitis. In literature small bowel perforation caused by fishbone has been published (6). We have operated on a similar disease, caused by tooth prosthesis and a toothpick. Surgery is necessary in such cases.

The following diseases may also have right hypogastrium symptomatology – acute cholecystitis, empyema of the gall bladder, perforation of gastroduodenal ulcer, when the content of the stomach is leaking along the radix of mesenterium into the right iliac fossa, further diseases of iliac vessels, rare affec-

tion of the retroperitoneum (e.g. retroperitoneal cystic haemangioma, Ormond's disease – retroperitoneal fibrosis, omental mesenteric myxoid hamartoma). Some urologic diseases, like obstructive uropathy, or gynaecologic disorders, e.g. ectopic pregnancy, salpingitis, haemorrhagic ovarian cysts, can also manifest in the right lower quadrant.

It is not possible to mention all entities which may cause clinical right hypogastrium symptomatology in this article. Correct diagnosis assessment for disorders of the right lower quadrant may be very difficult.

Some clinical examinations and imaging methods such as ultrasonography, CT scan or MRI may be very helpful. From clinical experience an ultrasound examination is sensitive up to 90 % and specific up to 95 % (8). Similar data were described by Pichler & Meiser (10). Some other laboratory examinations may be of diagnostic value (e.g. interleukin-6 assessment, 99m-Tc-labelled leukocytes scintigraphy). In cases of diagnostic uncertainty it is necessary to perform diagnostic laparoscopy or laparotomy.

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