Case Report

SURGERY

A case of Fitz Hugh Curtis syndrome mimicking an acute abdomen

Alin Mihetiu[1,2], Dan Bratu[1,2], Oana Popescu[2], Alina Catana[3]

1) Second Surgical Department, Academic Emergency Hospital, Sibiu, Romania

2) Lucian Blaga University of Sibiu, Romania

3) Hematology Department, Academic Emergency Hospital, Sibiu, Romania

Abstract

Fitz Hugh Curtis syndrome, also known as acute perihepatitis, associates pelvic inflammatory disease with the presence of *Chlamydia trachomatis* or *Neisseria gonorrhoeae* as the main causative pathogens.

Symptomatology is a nonspecific one. Right upper quadrant pain, fever, nausea and vomiting are the most commonly encountered symptoms.

Imaging data are also nonspecific and often show intra-abdominal changes with no particularity.

As it is difficult to suspect Fitz Hugh Curtis syndrome upon first impression, laparoscopy and direct visualization of the peritoneum and liver adhesions are needed in the diagnostic process. The specific aspect of the fibrinous strands can raise the suspicion of this disease and guide the subsequent treatment.

We present the case of a 19-year-old patient with abdominal pain observed in the right upper quadrant and moderate anemia for which she was investigated in the hematology ward. The unfavorable evolution with the appearance of anemia and peritonitic acute abdomen signs required a surgical approach. The intraoperative aspects raised the suspicion of Fitz Hugh Curtis syndrome.

Because of the nonspecific clinical picture as well as the insignificant imaging features, this condition can be a diagnostic and therapeutic challenge.

Keywords: Fitz-Hugh-Curtis syndrome, acute abdomen, liver adhesion, perihepatitis, pelvic inflammatory disease, *Chlamydia trachomatis*

Introduction

The adhesions between the liver capsule and the anterior parietal peritoneum were first described by Carlos Stajano in 1920. Later, Curtis linked the adhesion syndrome and the pain in the right upper quadrant with salpinx disorder. All of these were included into a unitary syndrome by Fitz Hugh in 1934, when the presence of *Neisseria gonorrhae* at the level of hepato-peritoneal adhesions was identified, linking genital infection with extragenital manifestations.

Although it was initially considered that *Neisseria gonorrhae* was the unique etiological agent of this condition, it was subsequently shown that *Chlamydia trachomatis* may also be involved in the development of this type of disease.

Often this condition occurs in young, sexually active women and it is associated with pelvic inflammatory disease, but since 1970 there have been described cases of Fitz-Hugh-Curtis syndrome in males, while other etiological agents were identified: *Mycoplasma genitalium*, *Bacteriodes*, *Gardanella*, *Escherichia coli* or *Streptococcus*.

Establishing a correct diagnosis may be difficult, but it is the first outcome that must be considered in the healthcare process. Due to clinical manifestations and imaging features, this condition can be mistaken for other similar pathologies and this is why sometimes, surgery is required, in order to confirm the specific lesions.

DOI: 10.15386/mpr-1890

Manuscript received: 02.09.2020
Received in revised form: 18.01.2021
Accepted: 05.03.2021

Address for correspondence:
alin_mihetiu@yahoo.com

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Case report

We present the case of a 19-year-old patient who was admitted to the hematology ward for pain in the right upper quadrant with slow onset (24 h before presentation), and anemia (hemoglobin = 9.6 g/dl). The patient had no history of abdominal pain in the right hypochondrium and did not receive treatment for other conditions. Dynamics of some erythrocytic indices such as the values of hemoglobin that varied between 8.4 g/dl and 12.1 g/dl on the fourth and eighth day of hospitalization respectively, , mean corpuscular volume (MCV)= 80 fL and mean corpuscular hemoglobin concentration (MCHC)= 30 g/dL indicated a microcytic, hypochromic anemia. This fact was also supported by the low serum iron level = 44.6 µg/dL, while the range of normal is between 50 – 170 µg/dl. The rest of the blood tests were within normal range, with no relevance to the matter in discussion.

Computed tomography showed bilateral nephrocalcinosis and nonspecific abdominal changes (slightly enlarged gallbladder, aerocolia of the transverse colon). Nephrological and urological consultations recommended dynamic evaluation.

Bacteriological samples were collected. Nasopharyngeal exudate, sputum examination, stool culture were all negative. Markers for hepatitis B, C, human immunodeficiency virus (HIV) and syphilis were also negative.

Among the tumor markers that were evaluated, CA 19.9, CEA, AFP had normal values, while CA 125 values =134.7 u/ml were elevated (normal values range from 0-30.2). Anemia due to upper gastrointestinal bleeding was dismissed, when upper digestive endoscopy showed minimal axial hiatal hernia, without other changes.

Venofer (20 mg/ml) correction of iron deficiency was started in the hematology ward and proved to be effective. It was administered in 12 divided doses by slow intravenous infusion, until normal values of hemoglobin were obtained on the eighth day of hospitalization (12.1 g/dl).

The evolution of the patient was progressively unfavorable with persistent abdominal pain which increased in intensity towards the end of the seventh day of hospital stay, being accompanied by loss of appetite, nausea and vomiting. She also developed an important inflammatory syndrome (C reactive protein -CRP 379 mg/L, leucocytes 18.150/mm^3).

An abdominal ultrasound was performed and evidenced fluid accumulation in the abdominal cavity and right pleural effusion. A gynecological examination was requested which did not show any changes in the genital area.

The CT scan was repeated on the 8th day of hospitalization, with the evidence of bilateral basal pleural collection in small quantity, intra-abdominal fluid collections in pelvis, right and left subphrenic space and in Morrison's space (Figure 1, Figure 2).

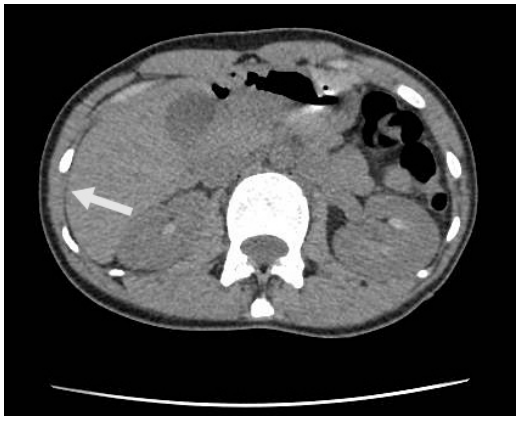

Figure 1. Thickening of the liver capsule.

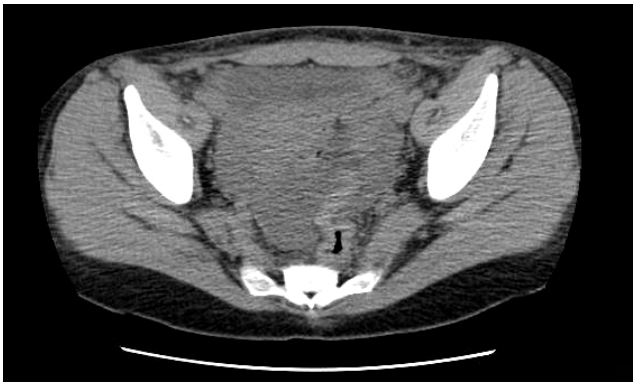

Figure 2. Pelvic fluid collections.

Due to generalized signs of acute surgical abdomen (diffuse abdominal rebound tenderness and guarding) and imaging data, surgery was performed. Laparoscopy evidenced the presence of serohematic fluid in the Douglas pouch and in the right and left subphrenic spaces. The uterus, ovaries and salpinx appeared enlarged with edema. The liver was enlarged, Glisson capsule inflamed. Hepatomegaly with multiple liver nodules and inflammation of Glisson's capsule was observed. Numerous fibrous bands (like violin strings) stretched from the liver to the parietal peritoneum. (Figure 3, Figure 4, Figure 5).

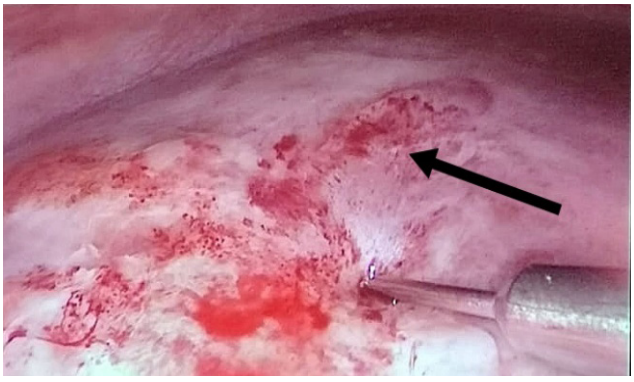

Figure 3. Glisson capsule - intraoperative aspect.

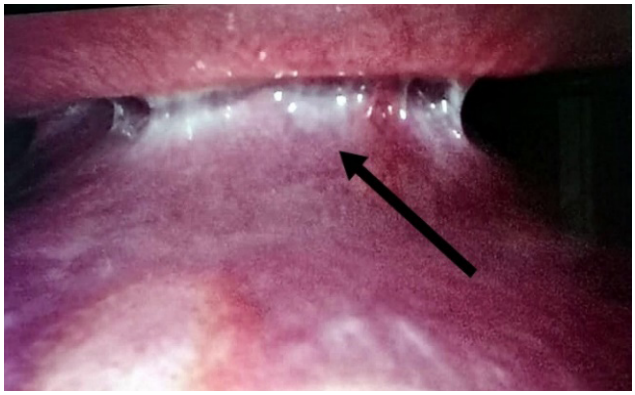

Figure 4. Viloin string adhesion.

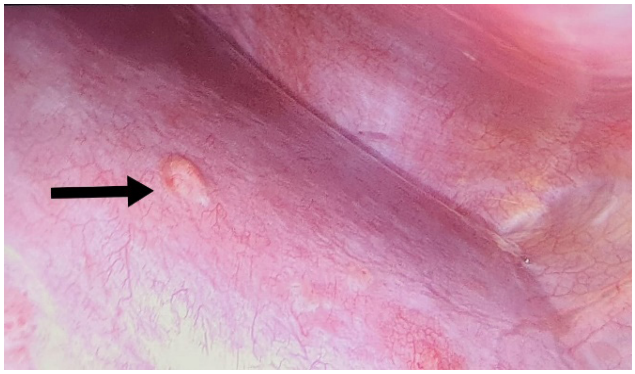

Figure 5. Liver nodules – tuberculosis suspicion.

Suspicion of Fitz Hugh Curtis syndrome was raised, assuming an infection with *Chlamydia trachomatis* or *Neisseria gonorrhoeae*. Abundant lavage and drainage of the peritoneal cavity were performed. Treatment with intravenous Ceftriaxone was started. The evolution had an uneventful course with the suppression of drainage, remission of abdominal pain and of the other preoperative symptoms. A postoperative re-examination of the imaging data showed a slight thickening of the liver capsule.

The cytological examination of the peritoneal fluid revealed high cellularity (40% mononuclear, 60% granulocytes, neutrophils, rare mesothelial cells). The bacteriological examination did not reveal any germ development. Microscopic examination of hepatic capsule fragments showed rich, non-specific inflammatory infiltration. Gene Xpert test was negative (suspicion that was primarily set by the nodules on the liver capsule) which permitted the exclusion of tuberculosis.

IgG antibody test result for *Chlamydia trachomatis* was 23.49 NTU (Novatec Units), normal values being below 11 NTU.

Thus, the suspicion of Fitz-Hugh-Curtis syndrome was confirmed and the patient was discharged with oral Doxycycline 100 mg, one every 12 hours, for 2 weeks. A gynecological and surgical reassessment showed normal relationships at 2 weeks and afterwards at 3 months follow-up.

Discussion

Fitz Hugh Curtis syndrome refers to perihepatitis and pelvic inflammatory disease, the association being found in 5-15% of cases with pelvic inflammatory disease. Although initially the incriminating etiologic agent was *Neiserria gonorrhoeae*, in the 1970s *Chlamydia trachomatis* involvement was also proven, meanwhile resulting to be the main etiological agent (86-89% of cases) [1,2].

The condition is found almost exclusively in females, the women at risk being considered those under the age of 25 years. Other elements to consider in the evaluative process include the presence of a history of intrauterine devices placement, contraceptive treatments and first sexual intercourse by age 15.

When compared to adults, adolescents are considered to be more frequently affected, due to particular features in the cervix and endometrium [3].

The main manifestation is pain in the upper right quadrant, sharp, pleuritic, which becomes stronger upon deep breathing and during palpation. The pain may radiate to the lower thorax and it may be localized in the lower abdomen or even generalized to the whole abdomen.

Laboratory findings may include mild to moderate anemia, leukocytosis with lymphocytosis, elevations of CA 125 antigen or increased transaminases.

Anemia is explained by the use of iron as a growth factor by *Chlamydia trachomatis*. The elevated CA 125 values raise the suspicion of neoplasia and it can be easily explained by the fact that physiologically CA 125 antigen is normally found in the fallopian tubes epithelium, a local inflammation causing a marked expression of it.

Some studies have also shown a much higher CA 125 antigenic response with implicitly higher values in women with *Chlamydia*, compared to those cases with pelvic inflammatory disease of another cause [4-6].

The condition usually develops in two phases - acute and chronic. In the acute phase, the localized, sharp, pleuritic pain in the right upper quadrant, radiating to the right shoulder or arm. These manifestations are the expression of Glisson's capsule inflammation with micro-hemorrhages of the capsule and abdominal wall adjacent to the liver [7,8].

In the chronic phase, specific violin strings like adhesions most commonly appear between the hepatic capsule and the parietal peritoneum, but also between the hepatic capsule and diaphragm.

The pathogenic mechanism of this syndrome is not fully elucidated, with three theories being discussed:

• The hematogenetic theory - assumes bacterial spread through the bloodstream and may explain the good

response to antibiotic therapy.

• The theory of lymphatic dispersion - would explain the absence in some cases of dissemination of the infection at intraperitoneal or blood level but does not explain the subdiaphragmatic drainage, considering that the lymphatic system corresponding to the genital tract has retroperitoneal disposition [7,9,10].

• The oldest and most accepted theory is the spread of the pathogenic organism through the peritoneal fluid from the pelvis to the the subphrenic space. The peritoneal cavity is devoid of communication with the outside, except for the female sex – where there is communication at the fallopian tubes level. Thereby, it is considered that this level is the gateway of penetration of the pathogen into the peritoneal cavity. It is known that the peritoneum has a peritoneal fluid residue of approximately 100 ml and that the genital inflammatory reaction produces exudation with increased peritoneal fluid secretion [11-13].

Bacterial contaminated peritoneal fluid circulates in the peritoneal cavity through anatomical spaces defined under the action of gravity and pressure variations caused by respiration through the right paracolic gutter more frequently than through the left paracolic gutter. In this way, the supramesocolic drainage is obstructed to the left by the splenocolic ligament, Hensing's ligament. This explains the increased frequency of collections at the right subphrenic level and also explains the existence of typical adhesions between the liver capsule and the abdominal wall, due to local inflammation and fibrin aggregation.

About 90% of the peritoneal fluid is cleared at the subphrenic level by the submesothelial lymphatics that are connected with the lymphatics from the other side of the diaphragm. This explains the appearance of pleural effusions in any intra-abdominal bacteremia [13-16].

In recent years, researchers have raised the issue of a hyper immune response to *Chlamydia trachomatis* as a pathogenic mechanism in Fitz-Hugh-Curtis syndrome. Thus, it has been shown that patients with perihepatitis and salpingitis have higher IgG titres compared to those presenting only perihepatitis, with the highlight of elevated levels of CHSP60's antibodies [17].

This condition may represent a diagnostic challenge mimicking multiple other pathologies such as cholecystitis, pancreatitis, pleurisy, pneumonia, appendicitis, herpes zoster with thorax-abdominal localization, subphrenic abscesses, pulmonary embolism, renal colic, costal fractures, Bornholm disease, hepatitis or perforated ulcer [18,19].

Blood test mostly shows altered inflammatory markers, mild to moderate anemia, leukocytosis with lymphocytosis, elevations of CA 125 antigen, transaminase elevations. The diagnosis of certainty can only be made by detecting CRP or gene amplification. IgG or IgM antibodies, more commonly anti-chlamydia IgG and results from endocervical cultures are frequently used for a definite diagnosis.

Regarding the imaging diagnosis, the ultrasound has the role of excluding other pathologies such as cholecystitis. CT scans reveal increased enhancement along the hepatic surface on the anterior face and it is the most commonly used noninvasive diagnostic method [2,18,20,21].

Often a laparoscopy that highlights the specific features of the disease is the procedure that guides the final diagnosis. We consider that laparoscopy, as a primary investigatory tool, is warranted and also the most suitable surgical option, if signs and symptoms of uncertain etiology indicate an acute abdomen. Such an approach saves the patient from immediate and distant complications of laparotomy allowing a shorter recovery time and reduced length of hospital stay.

The treatment recommended by the Center for Disease Control is Cefotetan 2 g intravenous every 12 h or Cefoxitin 2 g intravenous every 6 h with Doxycycline 100mg orally every 12 h for 7-14 days. If cephalosporin treatment is not feasible, usage of fluoroquinolones (Levofloxacin 500 mg PO every 24 h) is recommended. The treatment of the sexual partner must be taken into consideration [22-24].

Laparoscopic approach is indicated as a therapeutic method, followed by simple viscerolysis, lavage and drainage of the peritoneum. These are sufficient for the improvement of the symptomatology. Moreover, laparotomy finds its place in Fitz-Hugh-Curtis syndrome only as a diagnostic method and when surgery is performed for a completely different diagnosis [25].

Our patient showed the typical symptomatology, blood tests and imaging features associated with Fitz Hugh Curtis syndrome, but in view of the rarity of this condition, only a laparoscopic approach allowed the establishment of a correct diagnosis. This situation is encountered in most cases described in the literature. The most representative feature consisted of the characteristic adhesions. The diagnosis is confirmed by positive chlamydial serology and bacteriological examination.

A particular instance of this case was given by the insidious onset and the initially low intensity of right upper quadrant pain. This was the reason why the patient was initially hospitalized in a medical department, instead of a surgical one. Clinical progression to acute abdomen and CT findings required surgical treatment shortly afterwards.

Conclusion

Noteworthy, Fitz-Hugh-Curtis syndrome can be considered a puzzle disorder due to the non-specificity of symptoms, clinical and differential diagnosis and not always revealing imaging. It should be considered after excluding other pathologies in patients of childbearing age and with right upper quadrant pain. In the absence of a definite diagnosis for the cause of an acute abdomen, the laparoscopic approach is preferable as first intention for both diagnosis and treatment.

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