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Acute Abdomen and HIV Infection

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1. Introduction

Abdominal pain in the HIV-infected patient is a common complaint which constitutes a complicated diagnostic and therapeutic problem. Even though the need for surgical intervention in the HIV/AIDS patient with abdominal complaints is low, the general surgeon will often be called upon to evaluate HIV-infected patients, as a result of the complexity in the interpretation of clinical findings. Once consulted, the surgeon's dilemma is in distinguishing conditions which do not require surgery from surgically treatable pathology and, above all, the true surgical emergencies.

Emergent abdominal operation by itself predisposes the AIDS patient to an increased mortality risk [1,2,3,4]. On the other hand, delayed diagnosis and late surgical exploration result in increased morbidity and mortality [5]. Although profound immunodeficiency is associated with poor prognosis, asymptomatic HIV-infected patients recover well from surgery and do not appear to suffer delayed healing [6,7]. Yet, with new antiviral therapy the operative mortality has dropped as much as necessary for emergency abdominal surgery and the risk-benefit analysis is now more in favour of laparotomy [5,8,9].

2. Clinical assessment

A careful medical history is the key component in the evaluation of the HIV/AIDS patient's symptoms. Attention should be directed towards identifying diarrhea, prior opportunistic infections or neoplasms.

Most patients nowadays are aware of their HIV status. However, undiagnosed HIV-related illness may be identified during evaluation of an acute abdomen [1]. A history of risk factors, including intravenous drug abuse and male homosexual practices may alert the physician for an increased possibility of HIV infection; still, the infection rate is elevated in heterosexual patients as well. Hepatitis B (HBV) and C (HCV) viruses are common coinfections [10].

A complete history of medications may lead to possible diagnosis, given that certain antiviral drugs are recognized as causes of pancreatitis (didanosine) and kidney stones (indivar) [11,12]. Patients well informed of their HIV status can relate CD4 counts, which help in the determination of the grade of immunosuppression. This is vital in estimating risks and benefits of surgery in addition to the possibility of opportunistic infections, which may not present until CD4 counts are less than 200 cells/mm^3 [13]. In general, CD4 counts are currently recognized as the main prognostic indicator of outcome in HIV patients.

Repeated physical examination is invaluable for the assessment of the pathologic process. Signs of peritoneal inflammation may well be delayed or absent even in the face of a surgical emergency.

Additionally, more than one disease may be present in the immunocompromised patient [14].

Physical examination may as well reveal the occurrence of organomegaly and lymphadenopathy, oral candidiasis, generalized lymphadenopathy, and Kaposi skin lesions, evidence associated with the stage of disease and degree of immunosuppression.

Full blood count and differential white cell count are rather unreliable, particularly in advanced HIV disease, since relative leukopaenia is usually noticed [15,16]. CD4 counts and viral loads could also be helpful since rates of morbidity and mortality are directly related to the CD4 count [13,17]. Yet, getting these results soon enough to help in establishing a management strategy is usually difficult. Thus a general rule may be remembered: The number of CD4 cells is roughly 10% of the lymphocyte count [18,19].

Laboratory investigations should be methodical and incorporate besides full blood count, serum urea and electrolytes, amylase, liver function tests, urinalysis and radiography of the abdomen as well as the chest. Plain radiographs of the abdomen may reveal extraluminal gas, indicating perforated bowel, or dilated loops of bowel, related to bowel obstruction. However, the diagnostic yield of plain abdominal radiographs remains low. Thus, abdominal computed tomography (CT) scan is used almost routinely [20]. Pneumatosis intestinalis, readily identified on CT scan, suggests bowel necrosis and impending perforation[21]. Intraperitoneal fluid collections characteristic of opportunistic infections may also be recognized only on CT scan. Fluid collections can be aspirated with ultrasound or CT scan guidance for microbiologic testing. If infected, they may be resolved with the aid of image-guided percutaneous drainage. Ultrasound is mainly useful for examination of suspected calculous disease, such as cholecystitis, cholangitis, pancreatitis, and nephrolithiasis.

3. Differential diagnosis

Before setting up a definite management plan, it should be reminded that *non-specific abdominal pain and fever are frequent among patients with AIDS who do not suffer from a surgical illness* [14,22]. The surgeon must consider that the possible causes of abdominal pain include a variety of conditions, some of which are frequent amongst the immunocompetent population, while others are directly HIV related (Tables 1,2,3, and 4), before a decision is made that the acute abdomen in the HIV patient is actually a "surgical abdomen".

Appendicitis
Peptic ulcer disease
Diverticulitis
Cholecystitis
Hepatitis
Alcohol-related
Ischemic bowel
Abdominal aortic aneurysm

Table 1. Non–HIV-related causes of abdominal pain.

Opportunistic gastrointestinal (GI) infections a) (Mycobacterium avium complex [MAC] b) cytomegalovirus [CMV] c) microsporidia
Cholecystitis (CMV)
Abscesses
Sexually transmitted disease-related
Proctitis

Table 2. HIV-related causes of abdominal pain.

Lymphomas (GI)
Kaposi's sarcoma (KS)
Cancer-related obstructions
Other cancers/metastatic disease

Table 3. Immunosurveillance-related.

Perforations secondary to procedures (upper/lower GI tract)
GI upset/GI reflux/gastritis
Kidney stones—indinavir
Pancreatitis

Table 4. Medication-related/iatrogenic.

Finally there are non-specific causes of abdominal pain, i.e. no specific diagnosis is reached and the symptoms finally resolve [1,21,23].

Differentiating surgically treatable conditions from atypical HIV-related diseases, a number of which do not require surgery, may prove rather difficult. In fact, HIV-AIDS patients undergo emergency abdominal procedures more often than the age-matched non-AIDS population, since they present the anticipated rates of operation for commonly observed indications, e.g. appendicitis but also have additional indications specific for AIDS [24,25].

4. Therapy

When a decision is made that the abdominal symptoms require emergency surgery, appropriate resuscitation is initiated, such as fluid replacement, antibiotic administration, nasogastric decompression, transfusion of blood products, and (if not already started) consultation for antiviral therapy.

Early surgery should allow for rapid recovery, similar to immunocompetent surgical patients [1,26,27]. Even patients with restricted lifespan may find some profit in palliative surgery, which may offer relief from severe problems and improve the quality of life considerably.

The current experience with abdominal surgery points out that patients with HIV infection tolerate surgical procedures well and do not have an extremely high frequency of postoperative complications.

4.1 Most common indications for surgery

4.1.1 Acute appendicitis

Acute appendicitis in the AIDS patient may occur due to the conventional obstruction of the appendiceal orifice by a fecalith, a lymphoid hyperplasia, Kaposi's sarcoma lesions, acute CMV infection, and mycobacterial infection [5,28,29,30,31,32]. Reports of cases among AIDS patients reveal accumulated cases of appendicitis in aged patients, which indicates that it is caused by complications of AIDS-related conditions [14]. The clinical presentation is with characteristic right lower quandrant pain, frequently associated with a low to normal white blood cell count [33]. Most patients have fever, but *non-specific abdominal pain and fever are frequent among patients with AIDS who do not suffer from a surgical illness.*

Patients with AIDS may have an opportunistic infection mimicking acute appendicitis. In that case, an operation may be carried out, leading to increased morbidity postoperatively [17,33]. For instance, typhlitis may well mimic appendicitis [34]. This infection originates from normal gut flora, possibly as a result of immunosuppression or cytotoxic drugs during chemotherapy. Medical management with broad-spectrum intravenous antibiotics is the treatment of choice [34]. Consequently, CT scan or even laparoscopy should be considered before surgical intervention [14,17].

Nevertheless, there seems to be an increased rate of perforation, gangrenous appendicitis, and early appendiceal abscess among patients with AIDS [14]. This observation may be the result of delay in patient presentation, as well as delay by the physician owing to a normal or low white blood cell count, which is in fact elevated over the chronically low white blood cell count, or to the erroneous assumption that the cause of the abdominal pain is not surgical [35].

4.1.2 Bowel perforation

The previously high incidence of perforation of the gastrointestinal tract resulting from CMV infections and Kaposi sarcoma has been reduced with new retroviral drug therapy [1,2,36]. Currently, perforations are usually the result of lymphomas or disseminated mycobacterial disease [25,37]. Still, in case of acute bowel perforation, a high suspicion for underlying opportunistic infections is necessary [38]. Biopsies of the perforation site are required in order to ascertain the cause [39].

Management of the perforation site includes suture plication of gastroduodenal perforations, resection and anastomosis of small-bowel perforations, and colostomy for colonic perforations. Cytomegalovirus infection involves the arterioles of long segments of bowel; thus, perforations are ischemic lesions [38]. Consequently, healing of bowel anastomoses may be hindered, and performing a diverting stoma must be considered in selected patients. Antiviral chemotherapy should be initiated if not already established.

Acute bowel perforation in general carries a grave prognosis because it indicates advanced HIV disease [4,5,14].

4.1.3 Gastrointestinal *obstruction*

Gastric outlet obstruction will take place due to lymphoma, small bowel obstruction secondary to mycobacterial disease, intussusception owing to Kaposi's sarcoma, and an

Ogilvie-like syndrome progressing to toxic megacolon as a result of CMV infection. Differential diagnosis must include more usual causes of obstruction. Yet, in the typical young patients with AIDS, especially when there is not a history of prior abdominal operation and the risk of obstruction caused by adhesions is eliminated, most cases will be related to AIDS.

Bowel obstruction and intussusception owing to Kaposi's sarcoma, lymphoma, and opportunistic infections may possibly be the result of multifocal disease or widespread dissemination. Thus, the prognosis is unfortunate[40,41,42]. Surgery will offer no more than palliation of the acute problem with slight advantage in prognosis [4,8,14,42]. Small-bowel resection can be carried out with primary anastomoses, whereas large bowel resection may call for fecal diversion [38].

4.1.4 Toxic megacolon

Toxic megacolon may be the result of CMV opportunistic infections, as already mentioned, or Clostridium difficile colitis. Clostridium difficile infection is predisposed by use of antibiotics and numerous hospitalizations or chemotherapeutic agents [43]. Megacolon is a sign of advanced disease and unfortunate prognosis because of the possibility of peritonitis [1,44]. Medical management including colonoscopic decompression of the dilated colon appears to have a favourable short-term outcome [44]. Nevertheless, emergent colectomies performed early, when peritoneal contamination is not extensive, may be successful in carefully selected patients who are able to sustain bowel resection [5].

4.1.5 Cholecystitis

Although occurrence of gallstone cholecystitis is the same in HIV patients and the general population, acute acalculous cholecystitis arises more often in HIV/AIDS patients [45]. Cholecystectomy is usually warranted. The outcome is favourable even in immunosuppressed patients and the mean survival period is more than 2 years [46].

4.1.6 Splenomegaly

Emergent splenectomy is usually necessary in the HIV-AIDS population on account of spontaneous rupture of an enlarged spleen (splenomegaly is common in patients with AIDS), traumatic rupture, or hemorrhagic rupture from splenic abscess [37,47,48].

5. Occupational risk of infection

A main surgical concern has been the possibility of accidental exposure and infection occupationally acquired while providing care for HIV-infected patients. Knowledge about the risk of transmission has reduced hesitation but should not decrease carefulness in the operating room.

The risk of occupational transmission of HIV disease is low, but not zero. Blood or bloody body fluids are the source of infection. The risk of HIV infection after percutaneous exposure is 0.3% [49,50]. Major percutaneous needle-stick injury with a hollow-bore needle is the major cause of occupational HIV infection. The possibility of transmission depends on the volume of the inoculum, the quantity of virus, the depth of penetration, and the type of needle; a hollow-bore needle, a device evidently contaminated with blood, a needle placed

directly in a vein or artery, or a deep injury is associated with a higher risk than that of suture, solid needle [51].

The risk of transmission is higher if the patient suffers from terminal disease. Minor viral load is a sign of a lower titer exposure, but it does not eliminate the risk of transmission completely [51]. Although transmission by mucocutaneous exposure has been reported, it seems to be too low to calculate accurately (approximately 0.09%) [49,50]. Transmission after nonintact skin exposure has been documented. This risk is estimated to be less than the risk after mucous membrane exposure [52,53].

The risk after exposure to fluids or tissues other than blood has not been calculated but is most likely significantly lower than after blood exposure [54].

Transmission by usual contact or aerosols has not been documented.

Consequently, surgeons should feel secure in providing care for HIV-infected patients but all surgical team members must routinely practice standardized techniques to avoid blood-borne viral infection.

6. Role of laparoscopic surgery

Emergency laparoscopy for acute abdomen in patients infected with HIV has not been advocated widely. It appears that the rate of conversion to laparotomy is high (40%-60%) (55,56). Nenertheless a laparoscopic approach, when feasible, may be applicated as an initial step in the diagnosis and treatment of AIDS patients with acute abdominal complaints.

7. Conclusion

Acute abdomen in the HIV-AIDS patients involves abnormal presentation of common diseases as well as problems unique to this population, which are results of the immunosuppression. There is an increased probability of emergent abdominal operations in addition to a considerable possibility of non-surgical causes of abdominal pain, demanding a judicious differentiating assessment. Operative results are now favourable, reaching mortality and morbidity rates similar to patients without HIV infection. Care of these patients is best provided by surgeons with experience and interest in AIDS, together with infectious diseases physicians.

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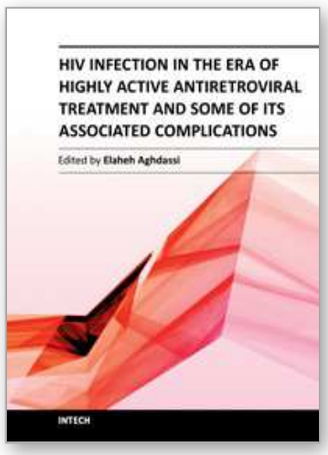

HIV Infection in the Era of Highly Active Antiretroviral Treatment and Some of Its Associated Complications

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Human immunodeficiency virus (HIV) infection is a complex illness affecting the immune system. Acquired immunodeficiency syndrome (AIDS) is an advanced form of HIV infection in which the patient has developed opportunistic infections or certain types of cancer and/or the CD4+ T cell count has dropped below 200/µL. More than 40 million persons around the world are infected with HIV, with approximately 14,000 new infections every day. The disease causes 3 million deaths worldwide each year, 95% of them in developing countries. Optimal management of human immunodeficiency virus requires strict adherence to highly active antiretroviral treatment (HAART) regimens, but the complexity of these regimens (e.g., pill burden, food requirements, drug interactions, and severe adverse effects) limits effective treatment. However, more patients with HIV are surviving longer today because of these drugs. This allows further study of commonly associated adverse effects. These may affect all body systems and range from serious toxicities to uncomfortable but manageable events. This book reviews some of HAART-related metabolic and neurological complications.

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