Acute Appendicitis in Patients with Acquired Immunodeficiency Syndrome

Kuo-Ying Liu¹, Jia-Fwu Shyu², Yih-Huei Uen³, Tien-Hua Chen¹,²*, Yi-Ming Shyr¹, Cheng-Hsi Su¹, Chew-Wun Wu¹, Wing-Yui Lui¹

¹Department of Surgery, Taipei Veterans General Hospital, ²Department of Anatomy, National Yang-Ming University School of Medicine, and ³Division of Surgery, Chi Mei Medical Center, Tainan, Taiwan, R.O.C.

Background: We report our experience with patients who had acquired immunodeficiency syndrome (AIDS) and who presented with signs and symptoms suggesting acute appendicitis.

Methods: Observational data are documented for 9 patients with AIDS who underwent surgery for acute appendicitis.

Results: Of the 9 patients, 6 (66.7%) had acute appendicitis without perforation, while the other 3 (33.3%) had perforated appendicitis. An elevated preoperative temperature was found in 4 patients without perforation (66.7%), and in 1 patient with perforation (33.3%). An elevated white blood cell count was found in all 6 patients without perforation (100%), but in none with perforation (0%). The mean interval from surgical referral to laparotomy was 61.1 hours, the mean hospital stay was 9.3 days, and the perioperative mortality rate was 22.2%.


Key Words: acquired immunodeficiency syndrome, AIDS, appendicitis

Introduction

Acquired immunodeficiency syndrome (AIDS), which is caused by infection with human immunodeficiency virus (HIV), may turn out to be the largest lethal epidemic of infection ever seen. In 2002, the estimated number of adults with HIV infection in Taiwan was 4,000.¹

HIV infection and AIDS are relevant to surgeons in terms of the general surgical management of AIDS patients, the increasingly long list of surgical complications specific to AIDS, and the risks of patient-to-surgeon and surgeon-to-patient HIV transmission.²⁻⁶ Some surgeons reserve the right to select patients on whom they operate, except in emergencies. Emergency operations become necessary to treat AIDS-independent conditions, such as acute cholecystitis and appendicitis, or AIDS-related life-threatening conditions; however, delays and errors in diagnosis are frequent.⁶ By applying sound judgment, and by selecting appropriate management, the surgeon has the ability to prolong life and improve quality of life for AIDS patients requiring emergency surgery.⁷⁻⁹ The current study describes our observational data from patients with AIDS who presented with signs and symptoms suggesting acute appendicitis. Preoperative evaluation, operative findings and operative course are discussed.

Methods

Study population

Records were reviewed for 9 patients with AIDS who underwent emergency appendectomy between 1996 and 2003 at Veterans General Hospital, Taiwan. Recorded patient details included age, gender, sexual orientation, duration of AIDS, presenting signs and symptoms, and operative findings. The mean age of the patients was 27.7 years (range: 20–50). The majority of the patients were male (8/9). The duration of AIDS was less than 1 year in 4 patients and more than 1 year in 5 patients. The mean duration of AIDS was 13.3 months (range: 6–24). The presenting signs and symptoms included fever, abdominal pain, and nausea. The mean interval from surgical referral to laparotomy was 61.1 hours, the mean hospital stay was 9.3 days, and the perioperative mortality rate was 22.2%.

By applying sound judgment, and by selecting appropriate management, the surgeon has the ability to prolong life and improve quality of life for AIDS patients requiring emergency surgery. The current study describes our observational data from patients with AIDS who presented with signs and symptoms suggesting acute appendicitis. Preoperative evaluation, operative findings and operative course are discussed.
symptoms, radiographic findings, laboratory data, preoperative diagnosis, operative findings, definitive diagnosis, and postoperative survival.

**Statistical analysis**

A non-parametric, Mann-Whitney test was used to compare patients with acute appendicitis and perforation with patients having acute appendicitis without perforation. A \( p \) value less than 0.05 was considered statistically significant.

**Results**

Nine patients with AIDS (8 males and 1 female) underwent emergency laparotomy during the 8-year period up to August 2003. Seven patients were homosexual men (77%), 1 was a heterosexual woman who was infected with HIV from her husband (11.1%), and 1 was a man who acquired HIV from a blood transfusion (11.1%). The mean patient age was 40.3 years (range, 32–50 years). Data on comorbid conditions, pathology, duration of hospital stay and mortality are shown in Table 1.

Six of 9 patients (66.7%) had acute suppurative appendicitis, and 3 (33.3%) had perforated appendicitis. One patient with acute appendicitis also had a typhoid infection. The mean hospital stay was 9.3 days (range, 7–12 days). Two deaths occurred in 3 patients with perforated appendicitis (Table 1).

The initial presenting symptom was lower abdominal pain in all patients. Pain was localized in the right lower quadrant in 4 patients, and became diffuse abdominal peritonitis in 2. Of the remaining 3 patients, all developed nausea and vomiting; 1 also had diarrhea. All patients were diagnosed by computed tomography (CT) scans of the abdomen. Fever (temperature \( \geq 38.0^\circ \text{C} \)) was noted in 5 patients (55.5%), and a raised preoperative temperature was noted in 66.7% of patients with acute appendicitis and 33.3% of those with perforated appendicitis. An elevated white blood cell count (WBC \( \geq 10,000/\text{mm}^3 \)) was found in 6 patients (66.7%), all of whom had acute appendicitis without perforation (Figure 1).

The mean interval from surgical referral to laparotomy was 61.1 hours (range, 10 hours to 12 days). Patients with acute appendicitis were operated on within 10–24 hours (mean, 17.1 hours), whereas patients with perforated appendicitis were operated on

**Table 1. Clinical data for 9 patients with AIDS who underwent emergency appendectomy**

<table>
<thead>
<tr>
<th>Patient number</th>
<th>Critical comorbidity</th>
<th>Preoperative diagnosis</th>
<th>Pathology</th>
<th>Hospital LOS (d)</th>
<th>Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>None</td>
<td>Ruptured appendicitis</td>
<td>Ruptured appendicitis</td>
<td>12</td>
<td>Alive</td>
</tr>
<tr>
<td>2</td>
<td>None</td>
<td>Acute appendicitis</td>
<td>Suppurative appendicitis</td>
<td>7</td>
<td>Alive</td>
</tr>
<tr>
<td>3</td>
<td>PCP; CMV infection</td>
<td>Acute appendicitis</td>
<td>Suppurative appendicitis</td>
<td>11</td>
<td>Alive</td>
</tr>
<tr>
<td>4</td>
<td>Disseminated tuberculosis lymphadenitis</td>
<td>Ruptured appendicitis</td>
<td>Acute appendicitis</td>
<td>7</td>
<td>Alive</td>
</tr>
<tr>
<td>5</td>
<td>None</td>
<td>Acute appendicitis</td>
<td>Suppurative appendicitis</td>
<td>7</td>
<td>Alive</td>
</tr>
<tr>
<td>6</td>
<td>None</td>
<td>Acute appendicitis</td>
<td>Suppurative appendicitis</td>
<td>9</td>
<td>Alive</td>
</tr>
<tr>
<td>7</td>
<td>Tuberculosis; PCP; CMV retinitis; herpes zoster</td>
<td>Ruptured appendicitis with SMV thrombosis and liver abscess</td>
<td>Ruptured appendicitis</td>
<td>–</td>
<td>Dead</td>
</tr>
<tr>
<td>8</td>
<td>Tuberculosis; CMV retinitis; interstitial pneumonia</td>
<td>Ruptured appendicitis with abscess formation</td>
<td>Ruptured appendicitis</td>
<td>–</td>
<td>Dead</td>
</tr>
<tr>
<td>9</td>
<td>None</td>
<td>Ruptured appendicitis</td>
<td>Typhilitic appendicitis</td>
<td>12</td>
<td>Alive</td>
</tr>
</tbody>
</table>

CMV = cytomegalovirus; LOS = length of stay; PCP = Pneumocystis carinii pneumonia; SMV = superior mesenteric vein.

![Figure 1. Body temperature and white blood cell count (WBC) in 9 patients with AIDS who underwent appendectomy.](image-url)
within 16 hours to 12 days (mean, 181 hours/7.5 days). Delayed diagnosis and exploratory surgery occurred in 2 patients with perforated appendicitis after a mean of 9 days. Two of the 3 patients with perforated appendicitis died perioperatively. After the first postoperative day, WBC and temperature became normal in all 6 patients with acute appendicitis. However, 2 of 3 patients (66.7%) with perforated appendicitis had fever, which persisted for up to 12 days postoperatively, accompanied by leukocytopenia (Figures 2 and 3).

Discussion

A recent report by the Taiwan AIDS Society stated that, although the total number of known AIDS cases in Taiwan in 2002 was 4,000, the number is expected to increase rapidly in the near future. Thus, surgeons are likely to increasingly encounter patients with AIDS.

The presentation of right lower quadrant abdominal pain in patients with HIV/AIDS poses a difficult diagnostic dilemma because the differential diagnosis must include surgical conditions, such as acute appendicitis, and gastrointestinal opportunistic infections. Clinical history, symptoms and physical findings suggestive of acute appendicitis may also be produced by cytomegalovirus (CMV) enterocolitis or acute typhlitis, both of which are common enteric infections in AIDS patients. Acute appendicitis affects 0.1–0.2% of the population, but the rate is probably higher in HIV-infected patients. A study of 36 AIDS patients requiring emergency laparotomy reported that 6 (16.7%) had appendicitis. Another study involving 1,725 consecutive hospitalized HIV-infected patients reported 9 cases (0.5%) of acute appendicitis. The causes of acute appendicitis in most HIV/AIDS patients are similar to those in the general population. However, in some HIV/AIDS patients, the cause of appendicitis is an underlying opportunistic infection, particularly CMV infection or neoplastic obstruction of the base of the appendix by Kaposi’s sarcoma. In our patients, no CMV infection of the appendix was found, but one patient had typhoid appendicitis.

Diagnostic laparoscopy, CT scans and ultrasonography are advocated by many surgeons for a more accurate diagnosis of appendicitis. In our study, all patients had diagnosis confirmed by CT scan. Although it is important to avoid unnecessary surgery in patients with AIDS, such a conservative strategy may delay a diagnosis of appendicitis until a more advanced stage of the condition has developed. In our study, the 2 deaths that occurred were both attributable to delays in the diagnosis and treatment of appendicitis.

Our data reveal very few differences between AIDS patients and general patients with acute appendicitis. Our AIDS patients were significantly older (mean age, 40.3 years) than patients in the general population (mean age, 25.5 years in 1 study), most probably because of the age distribution of HIV infection. Pre-operative WBC is usually not elevated in the presence of acute inflammation in AIDS patients, probably because of an impaired immune response. In the general population, however, 90% of patients with
Appendicitis (acute or perforated) have an elevated preoperative leukocyte count. In our study, all patients with acute appendicitis had an elevated preoperative WBC, whereas none with perforated appendicitis did. In the general population, patients with appendicitis (acute or perforated) typically present with an elevated body temperature (15% or 40% of cases, respectively). In our series, 66.7% of patients with acute appendicitis had an elevated preoperative temperature, whereas only 33.3% of patients with perforated appendicitis had a fever. Further, the proportions of patients with an elevated WBC or fever were significantly greater in patients with acute rather than perforated appendicitis. Postoperatively, a marked decrease in WBC and absence of fever was often observed in patients with AIDS.

Compared with other patients, HIV-infected patients have a clinically different presentation of perforated appendicitis because of underlying opportunistic infection of other organs and a weak intensity of the disease ascribed to ongoing AIDS or antiretroviral drug therapy. In the general population, the incidence of normal, acute and perforated appendicitis is 13%, 63% and 24%, respectively, based on surgical findings. In our series of 9 AIDS patients with acute appendicitis, 6 had acute appendicitis without perforation (66.7%) and 3 had perforated appendicitis (33.3%).

A conservative approach to lower abdominal pain in AIDS patients may result in surgery at a more advanced stage of acute appendicitis, a higher incidence of perforated appendicitis, and subsequently, an increased rate of complications. Indeed, the 2 deaths in our study occurred among the 3 patients with perforated appendicitis. One of the 2 patients who died had a history of tuberculosis infection, Pneumocystis carinii pneumonia, CMV infection, and herpes zoster, and died on the 15th postoperative day; the other had a history of tubercular infection, CMV infection, and interstitial pneumonia, and died of septic shock 56 days after surgery. Thus, in the absence of typical characteristics, preoperative diagnosis of appendicitis in HIV/AIDS patients should be based on clinical judgment, low WBC or low-grade fever. It is our impression that a significant delay in diagnosis can be avoided with a more deliberate laparoscopic examination under general anesthesia.

In conclusion, we emphasize the need for prompt exploration and early removal of the infected appendix when acute appendicitis is suspected in a patient with AIDS.

References