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Review

Gastrointestinal surgery and the acquired immune deficiency syndrome

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HIGHLIGHTS

- Atypical conditions may be encountered.
- The best predictor of perioperative morbidity and mortality is the general health status.
- Postponing elective operations to start antiretroviral medication should be encouraged.
- Surgical intervention should be considered in life threatening surgical correctable disease.
- The risk of exposure is reduced by the growing role of minimally invasive surgery.

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ABSTRACT

Acquired immune-deficiency syndrome (AIDS) is becoming an increasing problem to the surgeon. The impact of HIV/AIDS on surgical practice include the undoubted risk to which the surgeon will expose him or herself, the atypical conditions that may be encountered and the outcome and long term benefit of the surgical treatment in view of disease progression. The two factors most associated with surgical outcome and poor wound healing were AIDS and poor performance status (ASA score). This article questions whether gastrointestinal surgical procedures can be safe and effective therapeutic measures in HIV/AIDS patients and if surgical outcome is worthy of the surgeon's ethical responsibility to treat. As HIV/AIDS patients are not a homogeneous group, with careful patient selection, emergency laparotomy for peritonitis confers worthwhile palliation. However, aggressive surgical intervention must be undertaken with caution and adequate peri-operative care is required. Symptomatic improvement of anorectal pathology may make delayed wound healing an acceptable complication. Alternatives to surgery can be contemplated for diagnosis, prophylaxis or palliation.

1. Introduction

Human immunodeficiency virus (HIV) is an RNA retrovirus that infects human T lymphocytes [1–4]. The suppressed cellular immunity manifesting as AIDS allows the development of malignancies (Kaposi's sarcoma, lymphoma) and opportunistic infections (*pneumocystis jiroveci* pneumonia, *cryptosporidium*, *cytomegalovirus* (CMV), *herpes simplex virus* (HSV), *disseminated tuberculosis* and *candida* 5–10years later [5,6]. HIV has been isolated from every body fluid including blood, urine, tears, saliva, semen and cervical secretions [7]. There is no cure but highly active anti-retroviral drugs (HAART) prolong survival in some patients [8–10].

The surgeon is perhaps more likely to see patients with complications of AIDS such as diarrhoea, wasting and dysphagia (from oesophageal candidiasis or gut lymphoma) at their primary presentation [1,11]. A prognosis in this group is clearly limited with the median survival being less than 2 years; only very rare patients survive 4 years or more despite HAART [1,4]. Surgical presentation in HIV/AIDS is with anorectal complaints (40%), request for venous access (20%), cutaneous manifestations (20%), abdominal pain, requests for biopsy and others (20%) [1]. Symptoms arise from several causes but the most likely within the context of HIV infection

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include kaposi's sarcoma, bacterial diarrhoea, cytomegalovirus (CMV) infection and lymphoma. The question of whether to do a laparotomy in AIDS patients is of major importance to general surgeons because of the undoubted risk to which the surgeon will expose himself or herself, the atypical conditions that may be encountered, and doubt on the outcome and long term benefit of the surgical treatment in view of disease progression. Fortunately, the risk of seroconversion is small following a needle-stick injury although it can be greater in areas of high prevalence [12,18,19].

2. The heterogeneity of HIV/AIDS patients

HIV/AIDS patients are not homogeneous. Those with HIV infection only (A1, B1, A2, B2) have a lower operative risk and are less contagious than those with AIDS (C1, C2, C3, A3, B3) [4,12]. HIV/AIDS patients presenting with surgical disease may be divided into two clinical categories: (a) life-threatening surgical correctable disease and, (b) surgical interventions intended for diagnosis, prophylaxis, or palliation. The consensus is that in the first instance surgical intervention is obligatory but in the second instance alternatives to surgery can be contemplated [1,4]. Pathology occurring in HIV/AIDS patients can also be classified into two groups: (a) diseases with a definitive association with HIV and (b) coincidental diseases seen in the general population especially as HIV/AIDS patients on HAART are living longer. Increasingly, newly discovered diseases associated with HIV including disintegrating perineum syndrome and diffuse infiltrative lymphocytosis syndrome (DILS) affecting the parotid gland have come to the forefront [4].

2.1. The $CD4^+$ T-lymphocyte count

In trying to assess the prognosis in patients who are asymptomatic or have only minor symptoms of HIV infection the most important single laboratory prognostic marker is the CD4 count [13,14]. The decision to undertake surgery is aided by staging patients according to their level of general immunity (CDC stages 1-IV). A CD4 level of greater than 500 indicates mild disease and implies that appropriate operative treatment should not be withheld. A CD4 level of less than 500 indicates advanced disease and exceedingly poor outcome [14]. If possible, postponing elective operations with the aim of starting the patient on antiretroviral medication should be encouraged: operating on a healthier patient with a lower viral load and higher CD4 count is advantageous for both patient and surgeon (Table 1) [4,9]. However, CD4 studies of the value of viral loads and CD4 counts (alone or in combination) in predicting operative morbidity and mortality did not produce conclusive results and these tests are not ideal for every day practical use [4]. The four factors that have been found to increase operative morbidity and mortality in HIV/AIDS patients are (a) a compromised physiological state-as in general surgery the best predictors of perioperative morbidity and mortality appear to be scores that measure general health such as ASA (American Society of Anaesthesiology) risk classes or the Korsakoff's performance scale; (b) physiologically demanding surgery; (c) emergency surgery as opposed to elective procedures and (d) operations in contaminated fields, such as anorectum or oral cavity [1–4]. Patients with early HIV infection have an operative risk almost equal to HIV-negative patients and can therefore be subjected to any major surgery that is required [1,4]. The pathophysiological consequences of advanced disease (e.g. immunosuppression, malnutrition, infections and neoplasms) could dictate the scaling down of the magnitude of surgery to an acceptable and safe level. When assessing the suitability of an HIV positive patient for surgery, it is obviously useful to be able to estimate how long they are likely to survive [13]. Certain factors do predict the length of survival once AIDS has occurred. These include age and sex. Young people survive longer than older patients and the average survival of women is only half as long as that for men [13]. Perhaps the most important prognosis for the survival of an AIDS patient is the presenting AIDS diagnosis. Thus, patients with Kaposi's sarcoma survive longer than those with pneumocystis pneumonia who do better than those with *mycobacterium avium intracellulare* (MAI) infection or *cytomegalovirus* infections (CMV). The reason for this is that Kaposi's sarcoma and the various opportunistic infections occur at different degree of immunosuppression [10].

Table 1
Centre for disease control- 1993 revised classification system for HIV infection [12].

	Asymptomatic primary infection or PGL	Symptomatic (not A or C) conditions	AIDS, i.e. indicator conditions present
1. >500 CD4 cells/ul	A1	B1	C1
2. 200–499 CD4 cells/ul	A2	B2	C2
3. <200 CD4 cells/ul	A3	B3	C3

3. Abdominal pain in HIV/AIDS

Abdominal pain is common and is caused by gastrointestinal malignancies and opportunistic infections. CMV is the commonest cause resulting in a wide range of conditions oesophagitis, acalculous cholecystitis, sclerosing cholangitis, small bowel perforation, toxic megacolon, colonic perforation and haemorrhage, and spontaneous rupture of the spleen [15]. Patients may also present to the surgeon with less severe abdominal pain that does not amount to an emergency. Infectious causes are particularly common and many cases are associated with cryptosporidial infection of the gut and a few with CMV, but there remain up to one-third of patients in whom no associated infections are uncovered [1–4]. AIDS related sclerosing cholangitis is associated with marked abnormal liver function tests (alkaline phosphatase of over 400 iu/l) and abdominal pain. Endoscopic retrograde cholangiopancreatography (ERCP) is the only reliable diagnostic test [1]. Gastrointestinal Kaposi's Sarcoma or lymphoma may present with unremitting haemorrhage, small bowel obstruction, intussusception, or perforation [1,3,16]. Cutaneous Kaposi's sarcoma is usually asymptomatic and inspite of widespread cutaneous involvement is rarely the cause of abdominal symptoms [17]. Lymphadenopathy from *myocobacterium avium interacellulare* or lymphoma can result in appendicitis or jaundice by obstructing the appendiceal ostium or porta hepatis, respectively. These patients are difficult to manage as it is often unclear whether they need an immediate laparotomy [3]. It is crucial to have close liason between AIDS physicians and AIDS surgeons to exclude preterminal cases and keep down negative laparotomies to acceptable rate [4,11]. Negative laparotomy is not too infrequent an event for a patient with undiagnosed abdominal pain. These factors have led to an increased indication for diagnostic laparoscopy. Care should be taken, however, during laparoscopy by insisting upon using disposable ports with a vestibular flange to prevent splash back, and by deflating the abdomen prior to port withdrawal because any aerosol emanating from the port entry wound will harbour HIV [1–4].

3.1. Emergency laparotomy problems in AIDS patients

Abdominal pain is common in patients with AIDS, but less than 1% of patients with AIDS will need an emergency laparotomy [1]. Some patients (and their families) refuse surgery in desperate situations (such as bowel perforation) as they want an end to the