

Abdominal Surgery in Human Immunodeficiency Virus (HIV) Infected Patients—Early Local Experience

E Foo,**FRCS (Glas)*, R Sim,***FRCS (Glas), FRCS (Edin), M Med (Surg)*, H Y Lim,****MBBS*, S T F Chan,*****FRCS, FRACS, PhD*, Y S Leo,⁺*FAMS, MRCP, M Med (Int Med)*, S Y Wong,⁺⁺*FAMS, MRCP, M Med (Int Med)*

Abstract

The prevalence of human immunodeficiency virus (HIV) infection is increasing in Singapore. The surgical experience however, remains limited.

A retrospective review of 13 HIV-positive patients requiring abdominal surgery within Singapore was done. There were 4 females and 9 males with age ranging from 21 to 44 years. Operations included appendectomy, colectomy, splenectomy, intestinal bypass, gastrostomy and exploratory laparotomy. Pathologic findings directly related to HIV infection were found in two-fifths (5 out of 13) of these patients. A low CD4+ count or signs of full-blown acquired immunodeficiency syndrome (AIDS) were not associated with a higher likelihood of HIV-related pathology, neither did it preclude a successful outcome. There were 2 early postoperative deaths both with HIV-related pathology. Five of our patients who survived their abdominal surgery died on follow-up with a median survival of 17 months.

In patients with typical surgical problems, e.g. appendicitis and torsion of the ovary, early surgery allows for rapid recovery similar to normal surgical patients. Care of these patients is best provided by surgeons with experience and interest in this condition together with infectious diseases physicians. Even palliative surgery offers a respite from acute and often severe problems and improves the quality of life significantly.

Two patients with AIDS presented with sepsis and diffuse abdominal tenderness. Subsequent laparotomy revealed only primary bacterial peritonitis. For patients with AIDS and non-localizing abdominal signs, alternative non-invasive diagnostic modalities such as computed tomographic (CT) scan should be considered.

Ann Acad Med Singapore 1998; 27:759-62

Key words: AIDS, Appendectomy, HIV infection, Laparotomy

Introduction

The prevalence of human immunodeficiency virus (HIV) infection is rising at an exponential rate in Singapore. The surgical experience with this disease remains limited. Increasingly, surgeons are called upon to evaluate HIV-infected patients and perform a variety of procedures both elective and emergency.¹⁻⁸ Common procedures include lymph node biopsies, drainage of abscesses, anorectal operations, vascular access and laparotomies. The HIV patient presents with a variety of abdominal conditions, some of which are frequent amongst the immunocompetent population, while others are directly HIV related.

Patients and Methods

This report is a retrospective analysis of all HIV-infected patients who have had abdominal surgery in Singapore between September 1991 and August 1997. The list was retrieved from the Communicable Diseases Centre's dedicated database and casenotes were retrospectively reviewed for patient characteristics, laboratory results, preoperative presentation, operation performed, pathology and postoperative outcome.

Statistical analysis was performed using the unpaired Student's *t*-test (2-tailed) for means where appropriate.

* Senior Registrar

*** Medical Officer

**** Associate Professor and Head

Department of Surgery

Alexandra Hospital

** Registrar

Department of General Surgery

+ Consultant

++ Head

Department of Infectious Diseases, Communicable Disease Centre

Tan Tock Seng Hospital

Address for Reprints: Dr Edward Foo, Department of Surgery, Alexandra Hospital, 378 Alexandra Road, Singapore 159964.

Results

There were 13 patients (4 females and 9 males) who had abdominal operations. Their ages ranged from 21 to 44 years.

Risk factors included intravenous drug abuse in 1 patient, homo/bisexual contact in 2 patients and heterosexual contacts in the others.

Operations included right hemicolectomy, intestinal bypass, splenectomy, feeding gastrostomy, salpingo-oophorectomy, exploratory laparotomy with liver and lymph node biopsy, and 7 appendicectomies (Table I).

Pathological findings directly related to HIV infection were found in 5 patients—cytomegalovirus (CMV) colitis/appendicitis in 2, non-Hodgkin's lymphoma (NHL) in 2 and spontaneous bacterial peritonitis with salmonella and *Mycobacterium avium* intracellulare (MAI) in 1 (Table I). The mean CD4+ counts were lower in the group with HIV-related pathology (Table II) although this was not statistically significant. No differences were found with preoperative haemoglobin level or total white cell count.

Four had semi-elective surgery and the rest were done

emergently. All patients who had non-emergent surgery survived while there were 2 postoperative deaths (within 30 days) in the emergency group. These 2 deaths were in the group with HIV-related pathology (CMV appendicitis and spontaneous bacterial peritonitis) (Table I). All survivors recovered from their operations without significant complications.

Discussion

High mortality and morbidity rates had been reported in various studies on abdominal surgery in HIV-infected patients.² Our mortality rate of 15% (2 out of 13) is similar to reported rates of 19% to 48% in AIDS patients.^{3-5,9} Twelve out of 13 of our patients had AIDS as defined by the Centres of Disease Control in 1987 and by the expanded definition of a CD4+ count of <200/ μ L.^{10,11}

HIV-infected patients can present with abdominal conditions found in the immunocompetent population e.g. appendicitis, pelvic inflammatory disease and torsion of the ovary. Asymptomatic HIV-infected patients recover well from surgery and do not appear to suffer delayed healing.^{9,12} Lowy et al¹³ have pointed out the

TABLE I: PATIENTS BY PATHOLOGY, INDICATION, OPERATION AND OUTCOME

Operative findings	CD4 counts (/mm ³)	Symptom	Indication for operation	Preoperative HIV status	Operation	Emergency/Elective	Outcome
HIV-related							
CMV colitis	28	Change in bowel habits	Preop diagnosis of caecal carcinoma	Unknown	Rt hemicolectomy	Elective	Alive
Non Hodgkin's lymphoma, pancreas	150	Obstructive jaundice	Preop diagnosis of pancreatic carcinoma	Unknown	Intestinal bypass	Elective	Alive
Non Hodgkin's lymphoma, tonsils	42	Dysphagia	Access for feeding	Known	Feeding gastrostomy	Elective	Alive
Spontaneous peritonitis, MAI	-	Acute abdomen	Intra-abdominal sepsis	Unknown	Exploratory laparotomy	Emergency	Died
CMV appendicitis	63	Abdominal pain	Appendicitis	Known	Appendicectomy	Emergency	Died
Non HIV-related							
Appendicitis	175	Abdominal pain	Appendicitis	Known	Appendicectomy	Emergency	Alive
Appendicitis	78	Abdominal pain	Appendicitis	Known	Appendicectomy	Emergency	Alive
Appendicitis	185	Abdominal pain	Appendicitis	Known	Appendicectomy	Emergency	Alive
Appendicitis	23	Abdominal pain	Perforated appendicitis	Unknown	Appendicectomy	Emergency	Alive
Mesenteric adenitis	484	Abdominal pain	? appendicitis	Known	Appendicectomy	Emergency	Alive
Pelvic inflammatory disease	133	Abdominal pain	? appendicitis	Unknown	Appendicectomy	Emergency	Alive
Torsion of ovary	194	Abdominal pain	? appendicitis	Unknown	Salphingo-oophorectomy	Emergency	Alive
TB spleen	146	Fever	Splenic abscess	Known	Splenectomy	Elective	Alive

CMV: cytomegalovirus; HIV: human immunodeficiency virus; MAI: *Mycobacterium avium intracellulare*; Preop: preoperative; TB: tuberculosis

TABLE II: MEAN CD4+ COUNTS BY PATHOLOGY

Pathological findings	Mean CD4+ counts
HIV-related	71 ± SD 47 cells/μL
Non HIV-related	177 ± SD 137 cells/μL

HIV: human immunodeficiency virus; SD: standard deviation
 $P = 0.12$, not significant

intuitive notion that profound immunodeficiency is associated with poor prognosis is almost certain to be correct. The literature however, is scant in quantifying recommendations. Wexner and colleagues¹⁴ were the first to correlate wound healing with preoperative total leukocyte count. Many relevant data predate the clinical measurement of CD4+ counts which is now recognised as the main prognostic indicator of outcome in patients with HIV infection. The failure of more recent reports to include these or similar data is disappointing.¹³ We have attempted to correlate CD4+ counts to outcome and have found a lower CD4+ count in the patients with HIV-related pathology which was however, not statistically significant. Patients with low CD4+ counts were not more likely to have HIV-related pathology and can do well postoperatively. However, in the group with HIV-related pathology, mortality can be high (40% or 2 out of 5 in our case series). We acknowledge however, that the small study population makes it susceptible to a Type II error.

Abdominal pain in the HIV-infected patient is a difficult diagnostic and therapeutic problem. Many HIV-infected patients complain of abdominal pain during the course of their illness. A large proportion of such complaints are caused by organomegaly, lymphadenopathy, opportunistic enteric infections and spontaneous bacterial peritonitis which do not require surgery. The surgeon's dilemma is in differentiating these conditions from surgically treatable pathology. Like others,^{4,13} we have noted that relative leukopaenia is common especially in advanced HIV disease, making full blood count and differential white cell count unreliable. A careful history and repeated physical examination is useful, with attention directed towards detecting diarrhoea, past history of neoplasm or opportunistic infection and the presence of organomegaly and lymphadenopathy. Laboratory investigations should be thorough and include full blood count, serum urea and electrolytes, serum amylase, liver panel, urinalysis and radiography of the chest and abdomen.

A patient with a clinical picture suggestive of a surgically treatable condition like appendicitis should be offered surgery as appendectomy may be performed with minimal mortality and acceptable morbidity. We had 5 patients with appendicitis (1 perforated) who did well postoperatively. The single death was in a patient who had advanced HIV disease with CMV enterocolitis

and appendicitis. The other patients operated for possible appendicitis had mesenteric adenitis, pelvic inflammatory disease and torsion of the ovary, and did well postoperatively.

Tuberculosis (TB) is endemic in our region and cannot be considered an HIV-related disease. In non-endemic populations, it is found in increased incidence amongst immunocompromised patients.^{15,16} Barnes et al¹⁵ reported a patient with TB spleen who had AIDS but recovered uneventfully from his operation.

CMV is the most common opportunistic infection of the gastrointestinal tract and is often the worst as well. It affects the colon most frequently and manifests as abdominal pain, fever and bloody diarrhoea. Histological diagnosis is confirmed by multiple CMV "owl's eye" intranuclear inclusion bodies with intense inflammation seen in colonic tissue. Colonoscopic biopsy of the caecum is more than 90% accurate in establishing the diagnosis.¹⁵ CMV colitis was found in 2 of our patients; 1 had a successful colonic resection but the other had CMV appendicitis with perforation and succumbed to sepsis.

Two patients had non-Hodgkin's lymphoma (NHL) of B cell origin, a well-known AIDS-related malignancy. Lymphoma in an AIDS patient is characterized by a diffuse pattern, frequently extranodal in up to 90% and an aggressive clinical course.¹⁷ The whole gastrointestinal tract is susceptible. Presenting symptoms may include weight loss, abdominal mass, obstruction, perforation and haemorrhage.^{6,7,9} Both our patients had obstruction; one at the oropharyngeal level and the other at the duodenal level. Surgical bypass gave good palliation.

One patient presented with diffuse abdominal pain and sepsis. An emergency laparotomy revealed only ascites, hepatosplenomegaly and lymphadenopathy. Histology revealed that she had spontaneous bacterial peritonitis secondary to salmonellosis and *Mycobacterium avium intracellulare* (MAI). She succumbed to her infection on the second postoperative day despite high-dose, broad-spectrum antibiotics. The prognosis for MAI disease in AIDS is extremely poor, with a median survival of 11 months for localised disease and only 4 months for disseminated disease.¹³ The role of surgery in these patients is restricted to bowel resection or bypass for obstruction of a limited segment, or drainage of a localised abscess not amenable to percutaneous drainage.¹³

We subsequently had another AIDS patient with similar presentation. A 41-year-old HIV-infected woman presented with upper abdominal pain. Physical examination revealed fever of 38.5°C, generalised lymphadenopathy and upper abdominal tenderness. Laboratory investigations showed leukocytosis (20 000/mm³), normal serum amylase and moderately elevated liver enzymes. Perforated viscus and acute cholecystitis were

excluded by serial abdominal examinations and thorough radiological investigations including computed tomographic (CT) scans. She was treated with high-dose, broad-spectrum antibiotics but died of sepsis after four days. Autopsy revealed ascites, hepatosplenomegaly and lymphadenopathy which confirmed the clinical diagnosis of spontaneous bacterial peritonitis. For AIDS patients presenting with non-localizing signs, alternative diagnostic modalities such as CT scans or diagnostic peritoneal lavage should be considered as some patients may be spared unnecessary laparotomies.^{15,18}

Preoperative knowledge of the HIV status was available in just over half (7 out of 13) of our patients (Table I). This highlights the need for operating room precautions which are broadly grouped as:

Universal precautions:

Waterproof gown, shoes, gloves and mask
 No hand-to-hand passage of sharps
 Sharps not to be resheathed
 Finger not to be used as needle guide
 Eye protection from blood/tissue aerosols
 Disposal of sharps into an appropriate sharps container

Extra precautions with high-risk cases:

Double gloves
 Eye protection
 No hand-held needles
 Footwear protection

Five of our patients who survived their abdominal surgery died on follow-up with a median survival of 17 months. Acceptable morbidity and mortality rates are achievable in this immunocompromised group. In patients with typical surgical problems e.g. appendicitis and torsion of the ovary, early surgery allows for rapid recovery similar to normal surgical patients.^{7,8,19} It can be difficult to distinguish these conditions from atypical HIV-related diseases, some of which do not require surgery. Even patients with limited lifespans can benefit from palliative surgery. Often it offers a respite from acute and often severe problems and improves the quality of life significantly. Care of these patients is best provided by surgeons with experience and interest in this condition together with infectious diseases physicians.

REFERENCES

- Vipond M N, Ralph D J, Stotter A T. Surgery in HIV-positive and AIDS patients: indications and outcome. *J R Coll Surg Edinb* 1991; 36:254-8.
- Burack J H, Mandel M S, Bizer C S. Emergency abdominal operations in the patient with acquired immunodeficiency syndrome. *Arch Surg* 1989; 124:285-6.
- Robinson G, Wilson S E, Williams R A. Surgery in patients with acquired immunodeficiency syndrome. *Arch Surg* 1987; 122:170-5.
- LaRaja R D, Rothenberg R E, Odom J W, Mueller S C. The incidence of intra-abdominal surgery in acquired immunodeficiency syndrome: a statistical review of 904 patients. *Surgery* 1989; 105:175-9.
- Deziel D J, Hyser M J, Doulas A, Bines S D, Blauw B B, Kessler H A. Major abdominal operations in acquired immunodeficiency syndrome. *Ann Surg* 1990; 56:445-50.
- Davidson T, Allen-Mersh T G, Miles A J C. Emergency laparotomy in patients with AIDS. *Br J Surg* 1991; 78:924-6.
- Wilson S E, Robinson G, Williams R A, Stable B E, Cone L, Sarfeh I J, et al. Acquired immune deficiency syndrome (AIDS): Indications for abdominal surgery, pathology and outcome. *Ann Surg* 1989; 210:428-33.
- Dietrich N A, Cacioppo J C, Kaplan G, Cohen S M. A growing spectrum of surgical disease in patients with human immunodeficiency virus/acquired immunodeficiency syndrome: Experience with 120 major cases. *Arch Surg* 1991; 126:860-6.
- Ming K Y, Saunderson A, Scott D F. Abdominal surgery in HIV/AIDS patients: Indications, operative management, pathology and outcome. *Aust N Z J Surg* 1995; 65:320-6.
- Centers for Disease Control. Revision of the CDC surveillance case definition for acquired immunodeficiency syndrome. Council of State and Territorial Epidemiologists; AIDS Program Center for Infectious Diseases. *Morb Mortal Wkly Rep* 1987; 36(Suppl):S3-15.
- Centers for Disease Control. 1993 revised classification system for HIV infection and expanded surveillance-case definition for AIDS among adolescents and adults. *Morb Mortal Wkly Rep* 1992; 41(RR-17):1-19.
- Buehrer J L, Weber D J, Meyer A A. Wound infection rates after invasive procedures in HIV-1 seropositive versus HIV-1 seronegative hemophiliacs. *Ann Surg* 1990; 211:492-8.
- Lowy A M, Barie P S. Laparotomy in patients infected with human immunodeficiency virus: indications and outcome. *Br J Surg* 1994; 81:942-5.
- Wexner S D, Smithy W B, Milsom J W, Dailey T H. The surgical management of anorectal diseases in AIDS and pre-AIDS patients. *Dis Colon Rectum* 1986; 29:719-23.
- Mueller G P, Williams R A. Surgical infections in AIDS patients. *Am J Surg* 1995; 169(5A Suppl):34S-38S.
- Barnes P, Leedom J M, Radin P R, Chandrasoma P. An unusual case of tuberculous peritonitis in a man with AIDS. *West J Med* 1981; 144:467-9.
- Levine A M. Lymphoma and other miscellaneous cancers. Chap 13. In: DeVita L T, editor. *AIDS: Etiology, Diagnosis, Treatment and Prevention*. Philadelphia: JB Lippincott, 1992.
- Savioz D, Lironi A, Zurbuclen P, Leissing C. Acute right iliac fossa pain in acquired immunodeficiency: a comparison between patients with and without acquired immune deficiency syndrome. *Br J Surg* 1996; 83: 644-6.
- Hammund R, Achrafi H, Megegaux F, Caumes E. Abdominal surgical emergencies in human immunodeficiency virus (HIV) infected patients. Apropos of 34 cases. *Ann Chir* 1995; 49:922-7.