

The response of general surgeons to HIV in England and Wales

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The prevalence of HIV in the UK has been estimated to be 1 in 1000 of the population. Surgeons are at particular risk of occupational transmission from infected blood. To determine the effect of HIV on surgical practice we sent a questionnaire to 681 general surgeons in England and Wales; 450 replied (66%).

Of those who replied, 42% were aware of having operated on an HIV-infected patient at least once, and 28 had recognised self-injury in such circumstances; 79% attempted to identify HIV-infected patients preoperatively, though many depended on clinical suspicion alone, which is known to be unreliable. Of those who had operated on a seropositive patient, 90% reported taking special precautions to avoid blood contact and minimise sharps injuries for such cases. The majority wore double gloves, eye protection and fluid-resistant gowns, but only a minority reported changes in surgical technique. Half had made no changes in procedures or technique when operating on patients not identified as being at risk of HIV infection. Among a wide variety of comments made by the surgeons, the commonest was a call for facilitation of HIV testing prior to surgery.

This survey indicates that surgery on HIV-infected patients is not restricted to specialist centres. We review the means of identifying HIV-infected patients, the precautions that can be taken to minimise HIV transmission during surgery, and the possible influences of HIV status on surgical decisions. We conclude that the prevalence of HIV among surgical patients is being underestimated at present, that several simple changes in surgical technique should be adopted generally, and that there is limited value in preoperative HIV testing, though this may become more useful in the foreseeable future.

Management of patients infected with Human Immunodeficiency Virus (HIV) is currently concentrated in only a few hospitals in England and Wales. Therefore, despite discussion in the medical literature, most health workers are still unclear of the appropriate infection control precautions and are anxious about HIV. Of those involved in health care, surgeons are potentially most at risk from HIV transmission. We have sent a questionnaire to all general surgeons in England and Wales to determine the perceived level of risk and the precautions being taken. We hoped to obtain information, including new ideas from those whose experience might differ from ours, and also to provoke a reconsideration of the issues from those whose exposure has been minimal up till now.

Materials and methods

The questionnaire is shown in Fig. 1. This was sent with a reply-paid, addressed, return envelope.

General surgeons in England and Wales were identified from a mailing list of UK surgeons supplied by a commercial company, who aimed to keep the list up-to-date within a few months. A total of 706 questionnaires were sent out, of which 19 were returned by the Post Office, two were returned by surgeons outside the study area and four by surgeons working outside general surgery. Of the remaining 681 questionnaires, 450 were returned (66%). No attempt was made to identify the respondents (though some identified themselves); the area of the country from which the reply came was identified from the postmark on the envelope, which was legible in 92% of cases.

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SURGERY AND HIV INFECTION

Since HIV can be transmitted in blood it is of particular concern to surgeons as the prevalence of the virus increases. Having already developed a substantial experience of surgery in HIV +ve patients, we are concerned that any reasonable precautions that could be taken to minimise the risks to surgeon and assistants be identified and implemented early. We would therefore appreciate your completing this questionnaire, which is being sent to all General Surgeons in England and Wales. Complete anonymity is assured. Please return in the enclosed reply-paid envelope.

- 1 Are you aware of having operated on patients carrying HIV?

never	[]
once	[]
≤10 times	[]
>10 times	[]

- 2 Are you aware of having been exposed to definite risk while operating?

no	[]	
by needle stick injury	[]	no. of times []
injury with a sharp instrument	[]	no. of times []
conjunctival splash	[]	no. of times []
contamination of open skin lesion	[]	no. of times []
other	[]	no. of times []

- 3 Do you attempt to identify patients at risk of being infected by the HIV?

no	[]
by clinical suspicion	[]
by direct questions	[]
by questionnaire	[]
other	[]

- 4 Have you changed your surgical technique for:

(a) those at risk or infected with HIV		(b) all patients
no	[]	[]
double gloves	[]	[]
use of eye protection	[]	[]
fluid-resistant drapes	[]	[]
fluid-resistant gowns	[]	[]
avoiding using knives	[]	[]
avoiding hand-to-hand passage of sharps	[]	[]
removing needles before hand-tying sutures	[]	[]
other	[]	[]

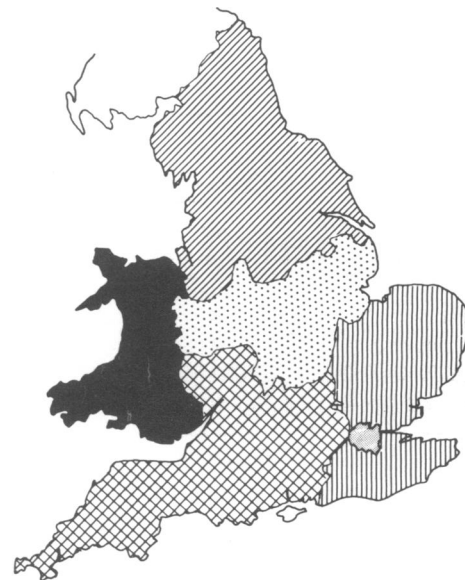
- 5 State any specialty in your practice eg Vascular
- 6 Do you have any comments on surgery in those who may be or are infected with HIV? Please write overleaf.

Figure 1. The questionnaire.

Results

The geographical distribution of the 450 respondents is shown in Fig. 2; 30% could be identified as coming from the South (excluding London); 21% from London; and 37% from the Midlands, the North of England and Wales. Most surgeons (81%) reported one or more special fields of interest. The most common were vascular surgery (116) and gastroenterology (111); 61 reported urology as a specialist interest and 49 reported coloproctology.

More than one-half of the respondents (58%) were unaware of ever having operated on an HIV seropositive patient (Table I). Of those who had done so more than once, one-half (50/112) came from the London area, although only 95 (21%) of the replies came from that area. Respondents generally reported frequent personal injuries during routine surgery. Considering only operations on HIV seropositive patients, 28 surgeons reported one or more incidents during surgery that put



Wales	22	4%	London	95	21%
South West	71	15%	Midlands	61	13%
South East	70	15%	North	94	20%

37 replies (8%) from geographical areas not identified

Figure 2. Numbers of replies received from the various geographical areas within England and Wales.

them at risk of HIV infection; one-half of these were needle sticks (Table II).

Of all respondents, 21% made no attempt to identify patients at risk of harbouring the virus (14% of those who had operated on HIV seropositive patients). Of the majority who did try to identify such patients, 286 used clinical suspicion and 167 relied on this alone; 174 used direct questions and only three used a questionnaire (Table III). Twenty-eight used other methods of identification: previous HIV test (13); information provided by the referring source, eg a genitourinary clinic (5); 10 did not specify.

Of the 187 who had operated on a seropositive patient once or more, only 19 reported making no change in their

Table I. Reported experience of operating on HIV seropositive patients for different geographical areas of England and Wales. Numbers in brackets are percentages of the total number of replies from that area

No. of operations on HIV +ve patients	Geographical area			Total* (n = 450)
	London (n = 95)	SE & SW (n = 141)	Midlands, N & Wales (n = 177)	
Never	28 (29)	95 (67)	115 (65)	263 (58)
One	17 (18)	22 (16)	33 (18)	75 (17)
≤ 10 times	33 (35)	19 (13)	26 (15)	85 (19)
> 10 times	17 (18)	5 (4)	3 (2)	27 (6)

* Includes those from an unknown geographical area

Table II. Reported incidents during surgery on HIV seropositive patients according to experience with operating on such patients

Perioperative incidents	No. of operations on HIV + ve patients		
	One	≤10	>10
None	70	77	21
Needlestick	3	6	4
Sharp instrument	2	6	1
Conjunctival splash	1	2	1
Skin wound splash	0	2	0

Table III. Methods used to identify patients at risk of HIV infection

Method of identification of at-risk patients	No. of operations on HIV + ve patients			
	None	One	≤10	>10
None	67	9	15	2
Clinical suspicion	163	55	51	18
Direct questioning	181	35	40	18
Questionnaire	1	0	0	2
Other method	10	4	6	8

surgical procedures for such cases. Double gloves were worn by 135, 134 wore eye protection, 101 used fluid-resistant drapes, 106 wore fluid-resistant gowns, 18 reported avoiding the use of knives in surgery, 63 avoided hand-to-hand passage of sharps and 43 removed needles before hand tying sutures. Sixteen other reported precautions included using diathermy for dissection, avoiding hand needles, substituting staples for sutures, using a closed irrigation system and video camera for urological procedures, minimising the use of drains, and the use of autotransfusion.

The majority reported no changes in the way they operated on patients in general: no changes were reported by 166/263 (63%) who had never knowingly operated on an HIV seropositive patient, and 86/187 (46%) who had.

One hundred and forty-seven respondents made 163 additional comments. These could be divided into six broad categories:

- 1 Twenty-three surgeons commented on the perceived incidence of the problem in their area. Examples ranged from 'It doesn't happen in Suffolk' to 'All patients are infected with unwelcome viruses . . .' and 'The danger is not the known case but the unsuspected one'. Surgeons commented on the increased incidence in patients from Regional Haemophilia Centres, a prison, and one operated from time to time in East Africa where he assumed most patients carried the HIV.
- 2 The effect of HIV status on indications for surgery were discussed by 20 respondents. Again a range of opinions was expressed. At one extreme were those

who stated 'If I know they are HIV positive, I will not operate on them' and that surgery should be 'for life-saving conditions only', balanced by 'It is important that the clinical approach is not changed by HIV'. Other comments included 'When the occasion arises my criteria for surgical intervention will shift toward non-surgical management', 'I would have grave doubts doing very major vascular surgery on HIV patients', '. . . avoid unnecessary surgery', 'Only for essential surgery and only if a clear clinical benefit is likely'.

- 3 Precautions were commented upon by 48 surgeons. Four felt that at-risk surgery should be performed by the most experienced surgeon available: 'I am 55 and my family complete; I will not delegate HIV-risk surgery', 'Not to be done by juniors'. One surgeon stated 'I treat every case as potential HIV. I have significantly slowed down my surgical technique and reduced the number of cases on each list as protection to myself and all theatre staff' (he reported never having knowingly operated on an HIV seropositive patient). Another commented '. . . whatever confidentiality can be maintained must be maintained'. We were reminded of the greater infectivity of the hepatitis B virus and the value of vaccination in this context.
- 4 The role of specialist centres, where patients could be referred and as sources of education, was mentioned in 10 replies.
- 5 The place of HIV testing was commented upon most frequently. Among 51 such references, 50 indicated that HIV testing should be more readily available preoperatively, that the present law exposed health care staff to unfair and unnecessary risk, or that it should be possible to test for HIV infection just as for syphilis or hepatitis B without asking the patient's permission. Some suggested that HIV testing should be routine prior to any operation; others indicated that it should be used for patients identified as being at risk of infection, or for all patients prior to major surgery. 'The medical profession, in particular surgeons in high risk areas, need protection as well as HIV patients. It should be much easier to test any patient; it should be law that such a condition is declared by the patient when known.' 'I think that sooner or later (and the sooner the better) all patients going for surgery should be tested for HIV status.' 'Serological tests for those considered to be possibly infected . . . should be mandatory and not subject to patient consent.' 'Avoiding testing, and identifying risks is unfair to the operating team. Testing produces some false-negatives but when a few surgeons have contracted HIV and Health Authorities are faced with legal action, common sense may prevail.' Only one respondent felt that HIV screening would at present be disadvantageous overall: 'Risks of contracting HIV from patients are underplayed by the Department of Health. Negative blood test means nothing: most worrying. Screening for HIV would

lead to a false sense of security; when an antigen test is available it should be mandatory. . . .'

- 6 Ten surgeons made general statements on the level of anxiety produced by HIV.

Discussion

The overall prevalence of HIV infection in England and Wales was estimated at around 1 in 1000 population in 1987 (1), with a higher proportion infected in London than elsewhere (2). The increased awareness of surgeons in London is therefore predictable. Elsewhere surgeons also seem aware that it is only a matter of time before the problem becomes more general, particularly as heterosexual spread increases.

The frequency of personal injury to the surgeon and, to a lesser extent, his assistants, is perhaps greater than is generally recognised. Hussain *et al.* (3) documented accidental injury to staff in 5.6% of operations, the risk being higher in long operations and at the time of laparotomy wound closure. Lowenfels *et al.* (4) reported a lower injury rate, but their figure was based on retrospective estimates. The Center for Disease Control, Atlanta, estimates one HIV seroconversion for every 200 contaminated needlesticks (5). Although blood contact can be minimised by precautions taken at surgery there is evidence that, even when a patient is known to be HIV positive, there is still a finite level of exposure which cannot be avoided (4,6).

Application of precautions to minimise transmission of blood-borne viruses increases financial costs because of the additional equipment and disposables required and the increased time necessary for each case. Also, the quality of the surgery performed may be reduced, since, for example, it is more difficult to feel through two gloves than through one, and suturing may be more difficult if the surgeon is attempting to keep his fingers out of the immediate area. Vision may be impaired when eye protection is worn, particularly in endoscopic work. Visors attached to a head frame, which may be less prone to misting than other forms of eye protection, impair sound transmission and may significantly affect communication between the members of the operating team, which can be dangerous for both them and the patient. Thus, there are practical disincentives to applying infection control precautions.

If precautions are to be taken only for selected cases, patients carrying the virus, or those at risk of carrying it, must be identified. In the UK the virus is still largely confined to identifiable risk groups: male homosexuals and bisexuals, intravenous drug abusers, haemophiliacs and other recipients of HIV-infected blood or blood products, and the sexual partners and babies of any of these groups (2). Kelen *et al.* (7) demonstrated that clinical suspicion is not sufficient to identify patients from these groups, and the surgeons who are relying on clinical suspicion will be underestimating the numbers of their patients at risk. Direct questions or the use of a questionnaire are much more reliable. Patients may, of

course, deny at-risk behaviour (8), but such denial appears relatively uncommon.

Many surgeons feel that HIV testing should be available before surgery. The HIV serology of our patients has sometimes been determined for other reasons, but we have not asked for testing as a preliminary to surgery. This is because the initial period of seronegativity after HIV infection, of 3 months or sometimes much longer (9), would result in some false-negatives. Most of our at-risk patients must be assumed to continue their risk activity: a negative test at some time in the past would not exclude recent infection and so precautions would remain appropriate for any patient known to be at risk. An exception to this is the HIV seronegative haemophiliac who is now unlikely to receive contaminated blood products.

As HIV is spread through more sections of the community, a natural consequence of the fact that transmission can occur via heterosexual intercourse (10–12), it will be increasingly difficult to define the groups at risk of being infected. The long incubation time between HIV infection and clinically recognisable sequelae such as acquired immunodeficiency syndrome (AIDS) will result in a growing population of asymptomatic HIV carriers who cannot be detected without testing. Simultaneously, the cohort of infected patients will be ageing and more will become candidates for such procedures as major vascular reconstruction or coronary artery bypass grafting, where the risks of blood contact and staff injury are high. For these reasons the suggestion of testing prior to major surgery deserves consideration, if only as part of future strategy, though adoption of precautions in all operations would do more to improve safety.

What precautions should be taken during surgery? (5) The wearing of double gloves reduces the number of perforations of the pair next to the skin, and therefore reduces contamination of the skin by blood (13). Double gloves probably do little or nothing to prevent gross penetration of the skin by needle or scalpel, and it may be that only these events are important. Needlesticks occur particularly when a suture is being placed through tissue directly supported by the opposite hand. This manoeuvre can be avoided or a thimble or other protective shield can be placed over the distal left index finger (in right-handed surgeons), which is the site most often penetrated (14). Needlesticks also occur when a suture is being tied with the needle still attached; removing the needle before hand tying is a simple precaution, with the small cost of greater suture usage. Similarly, a no-touch technique in which the tissue is held with forceps and the needle in a holder is much safer than the use of hand needles. Where possible, staples should be used for bowel anastomosis and skin closure, despite the increased expense.

The epidermal cell initially infected by the HIV appears to be the Langerhans' cell (15). This cell is infrequent on the surface of intact skin, which is further protected by a layer of dead, keratinised tissue, but occurs on the surface of intact mucous membranes,

including conjunctiva. Thus eye protection is appropriate to prevent conjunctival splash (16). Precautions to minimise mucosal contact with blood-containing aerosols, such as those generated by orthopaedic drills and reamers, and by cautery, are also rational, though no HIV infection has as yet been documented to have occurred in this way.

It could be argued that fluid-resistant drapes and gowns should be used for all major cases, regardless of infectivity, since it is well recognised that the sterility of the operative field is lost once drapes and gowns are wet through. In HIV seropositive patients the containment of spilled blood and the minimisation of skin contact with blood have obvious logic.

Avoiding knives in general surgery requires imagination, but is often possible. Even the skin incision can be made with cautery, with the added advantage of reduced capillary bleeding; scalpel and cautery wounds may be indistinguishable within a few days of surgery. With a little practice, much dissection can also be performed with a hand diathermy, as routinely used by American surgeons. Other sharp dissection can be done with scissors. We have performed laparotomies on HIV seropositive and at-risk patients without a scalpel on the table. We also avoid other sharp instruments such as sharp-toothed, self-retaining retractors and skin hooks.

Avoiding the hand-to-hand passage of sharps, particularly scalpels, is easily done by always placing them in a receiver such as a kidney dish. This should almost completely prevent the assistant or scrub nurse being cut by a blade, and should, we think, be a standard part of surgical technique in all cases.

Of the other precautions suggested by our respondents, perhaps the most important is the choice of an experienced surgeon to perform the operation (3). In practice this may do more than any other precaution to control spread of the patient's blood and other body fluids, and therefore the virus. Prompt cleaning of blood spills should be routine in all circumstances. Whether special cleaning routines, followed by a 'rest' period, are really necessary needs to be determined, since this aspect of control of blood-borne infection has a major impact on surgery scheduling.

Those who are concerned that prejudice should not restrict the health care of those who are HIV seropositive have rightly been concerned that appropriate surgery may be refused, ostensibly because of the risk to staff. There are clearly some surgeons who would wish to avoid any operation on an HIV seropositive patient, a position which is difficult to defend. However, the opposite extreme view, that HIV seropositive patients should have decisions made about surgery as if they did not harbour the virus, is equally untenable. An AIDS patient with fever, right iliac fossa pain and tenderness should not be treated in the same way as a patient of similar age and sex who is HIV seronegative, since the former's symptoms are likely to be HIV related and an unnecessary laparotomy in a patient with CMV colitis, TB or cryptosporidiosis has a high morbidity and mortality with little or no benefit (17). The median survival of a patient with

AIDS is 1 year (18); a near-terminal patient will not benefit from surgery to an asymptomatic hernia or varicose veins. However, the long interval between HIV infection and AIDS, a median of 10 years in recent reports (19), means that surgery will be necessary for a variety of conditions. Striking the balance between avoiding unnecessary or inappropriate surgery and failing to operate when surgery is the best form of treatment may sometimes be difficult, as it can be in the elderly. The additional complication of the risk to staff when a patient is scheduled for operation should be kept in perspective and not allowed to weight the surgical decision unduly.

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Book review

Benign Disorders and Diseases of the Breast. Concepts and Clinical Management by L E Hughes, R E Mansel, D J T Webster with collaboration of I H Gravelle. 212 pages, illustrated. Baillière Tindall, London. 1989. £39.50. ISBN 0 7020 1290 4

This book fulfils a need. There are few books devoted entirely to benign breast conditions, despite the fact that these account for 90% of clinical presentations, and the authors aim to make good the deficiency in this publication.

Malignant disease is not discussed at all, apart from a brief reference to the national screening programme for breast cancer, which has already resulted in a huge increase in the number of patients being seen for breast problems. This has highlighted a need for greater appreciation of normality and minor aberrations.

The authors place considerable emphasis on a better understanding of normal processes and benign breast disorders based on pathogenesis. A generic term is advocated, 'Aberrations of Normal Development and Involution' (ANDI), which is in keeping with the concept that many disorders are 'non-disease'.

Duct ectasia, periductal mastitis, and epithelial hyperplasia are terms that have a fixed place in terminology. It is probably sensible to continue to regard these as specific, but the authors are tempted to extend the concept of ANDI and to include these conditions also as aberrations of normal development and involution.

A small grumble about the chapter on breast imaging, with particular reference to the radiographs. No criticism at all about the quality and clarity of the examples which are excellent, but one cannot help but note that they are all xerograms. Sadly most district general hospitals have to use conventional X-ray film for their mammograms on the grounds of cost and availability. I suspect xerograms are simply not available for the majority of clinicians who deal with breast problems. The text states that radiography has been in use for over 30 years and it is a pity that there are no illustrations of conventional radiographs.

The book is well set out. It is comprehensive and covers all aspects of benign breast disease. There is a good chapter on the approach, assessment and management of breast lumps. We are given helpful advice on the problems of breast pain and how to cope with cysts of the breast. A number of rare conditions are described that most clinicians are unlikely ever to see. As such it is a valuable reference book. More and more hospitals are running dedicated breast clinics and this book deserves a place on the shelves of the hospital library.

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