If I Had . . .

Gangrene of the toes

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Two centuries or so ago John Hunter made his famous observation that "... in general when large vessels are obliterated their office is vicariously performed by the enlargement of others which had previously existed."¹ But what if collaterals fail and ischaemic changes develop? Nowadays successful arterial reconstruction has considerably reduced the primary amputation rate, but atherosclerosis is still a progressive and generalised disease and about one quarter of all patients with peripheral arterial occlusion are dead within five years.²

History (fictitious)

I am approaching 60, having smoked heavily since medical school days, enjoyed my food tremendously, and exercised very little.

Shortly after my fifty-sixth birthday I started to feel pain in my left calf after walking about 200 yards, or climbing three flights of stairs too fast. The pain started in the calf and ascended to my thigh. At this stage, I became alarmed, and when I attempted to feel my femoral pulses I could not on the left side. I reassured myself by recalling that many patients with iliac occlusion had little disability. After all, I had no rest pain: apart from slight coldness of the left foot there was nothing else to worry about. On several occasions I had solemnly sworn to stop smoking but always succumbed to temptation after two or three weeks. The thought of using vasodilator drugs crossed my mind, but was quickly dismissed. For the next 18 months I went on convincing myself that matters were static rather than deteriorating, until one cold winter evening I suddenly developed agonising pain in the left calf extending down to the foot. My heart sank—I knew it, I must have occluded the femoropopliteal segment as well. I became panic stricken, went home immediately, and had a large gin and tonic. Over the next two hours the calf pain improved, but I felt sharp pains in the left third and fourth toes; gradually they became cold and numb. I had to take some analgesics that night, but slept very little. Next morning it was obvious that I had two severely ischaemic toes. My claudication distance deteriorated to less than 30 yards. I became depressed and irritable. Active surgical treatment was mandatory.

My toes became discoloured. I called my GP who was sympathetic and, after examination, we decided to seek the help of an experienced vascular surgeon. Immediate admission was arranged. I was glad; the rest pain was becoming intolerable. My surgeon came to see me and, as I feared, he confirmed that

I had iliac occlusion on the left side, with recent occlusion of the femoropopliteal segment. It was painfully obvious then that my two toes were becoming gangrenous. He discussed my condition with me in a reassuring manner.

My prognosis should be reasonably good, I consoled myself—I am neither a diabetic nor hypertensive. So far, I have not suffered from any cardiac problem and am relatively young. With vascular reconstruction I should have a 75% chance of successful limb salvage by the end of the first year. Even after five years I have a 50% chance of enjoying a useful limb.³ I also knew that the chances of my long-term survival were not bright. Over the next few hours I recalled patients with similar problems in whom either vascular reconstruction had failed or who, despite successful grafting, had succumbed in a relatively short time to coronary thrombosis or stroke. Mercifully, as images flickered across my mind, I recalled many more success stories.

What I would like done

I would have opted for a translumbar aortogram under general anaesthesia—this procedure is much safer than transfemoral catheter aortography, particularly in the presence of major iliac disease; a chest radiograph and an ECG are mandatory, and I should want full blood count, including platelet count, and morphology. It would be unfortunate to miss primary thrombocythaemia, which could present with gangrene of the toes, since the ischaemic changes could be reversed by oral busulphan.⁴ I would also expect serum urea and electrolytes, liver function tests, and, of course, serum lipids.

"Angiography confirmed extensive occlusion of left common and external iliac arteries, occlusion of the left femoropopliteal segment. The opposite side was also diseased." In view of these findings, I should certainly prefer to have an aortic bifurcation trousers graft and bilateral lumbar sympathectomy. Personally, I dislike thromboendarterectomy for an extensive occlusion, particularly when it includes the external iliac artery. Its value is in short segment occlusions of the common iliac artery. Successful grafting depends on many vital points during the operation including avoidance of hypotension during induction of anaesthesia and in the course of the operation.

Like most surgeons, I have strong views on the technical details of the procedure. I should want systemic heparinisation after performing the bilateral lumbar sympathectomy and before cross clamping the aorta. My choice would be a knitted dacron velour graft, simply because they handle better—and I would certainly prefer a modern synthetic vascular suture such as prolene.

The proximal aortic anastomosis would be end-to-side—barring unforeseen difficulties. At the end of the operation the aortic clamp should be released gradually, again to avoid sudden hypotension and myocardial ischaemia. Heparin would be reversed with protamine at this stage.

A week after the operation the two gangrenous toes should be disarticulated (perhaps with a few skin stitches), and I would hope to start long-term anti-platelet drugs—for example,

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sulphinpyrazone and dipyridamole. Although long-term patency of these grafts is excellent (80%) at seven years,⁵ I think the presence of concomitant distal occlusion justifies using anti-platelet drugs. Complete cessation of smoking is important. Indeed an aortofemoral graft is three times more likely to occlude if the patient continues to smoke more than five cigarettes a day. I hope I would be one of the few lucky ones occasionally seen in follow-up clinics with a 15-year-old patent graft.

So far so good, but what if things had not turned out this way? I should dread infection, because an infected graft is the most serious and potentially lethal complication. Fortunately, this complication is now rare. I believe prophylactic antibiotics in arterial grafting are important, particularly when gangrene is present. Indeed, I would like to have started antibiotics the day before operation. If this complication developed, I suppose my only hope would be proximal aortic ligation and axillobilateral femoral graft. If successful grafting were not possible, either due to technical failure, infection, or poor run off, and amputation is

unavoidable, I should prefer a stump that would heal without any further trouble. My choice would be a Stokes-Gritti amputation if it is clear that it will heal—and most do heal very well—leaving a powerful and reliable stump.

Having lived through this imaginary experience, I intend to stop smoking, reduce my weight, and start jogging two miles a day. I would have no leg to stand on—literally—if I carry on as I am and really do experience this in 20 years time.

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Today's Treatment

Use of antibiotics

Management of frequency and dysuria

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Many women and girls suffer from frequency of micturition accompanied by discomfort or pain. A survey in South Wales showed that nearly half of an unselected group of women aged 21-65 had experienced these symptoms at some time. In the year before the survey 22% of the women had experienced them but only half had sought medical advice. The younger women tended to see their doctors more often than the older ones, who accepted their symptoms perhaps after numerous fruitless consultations. Much can now be done to alleviate both symptoms and fears, and since only half the women with symptoms consult their doctor greater public awareness of the frequency and dysuria syndrome is clearly needed. Lay organisations such as the "U and I" club, which seek to improve the quality of life for women who are made miserable by the symptoms, should be regarded as a helpful form of public education rather than a slight on medical practice.

There is still much to be learnt about the pathogenesis of the frequency and dysuria syndrome. Its management is therefore largely empirical and success cannot be guaranteed.

Pathogenesis

Only half of the women who present with frequency and dysuria have bacteriuria. Clinically culture-positive and culture-

negative patients are indistinguishable. Dipslides for diagnosing urinary tract infection have made "on the spot" culture possible during attacks. This method shows that about half the women with initially sterile cultures develop bacteriuria during subsequent attacks. On bacteriological grounds patients with the frequency and dysuria syndrome can therefore be classified into bacteriuric, intermittent bacteriuric, and non-bacteriuric types. This classification is important since the non-bacteriuric patient generally fails to improve after antibacterial treatment, whereas the bacteriuric patient usually does. A precise bacteriological diagnosis is possible if patients are given dipslides to inoculate during attacks. Unfortunately, dipslides are not so far available on prescription. Unnecessary, expensive, and sometimes dangerous antibacterial treatment for non-existent infections might be avoided if dipslides were made freely available.

Management

HISTORY AND EXAMINATION

Careful history taking is of utmost importance in formulating management. It is a difficult task that requires tact and time. In young girls evidence of vulvovaginitis such as vulval soreness, pruritis vulvae, and vaginal discharge should be sought. Wearing nylon underwear, using bubble baths, and swimming in heavily chlorinated pools may all act as precipitating factors in this age group. Poor perineal hygiene is often at the root of the trouble; this may result from enuresis or "overflow wetting"—a habit that results from delaying micturition because sanitary facilities at school or in the house are inadequate. Prepubertal girls have vaginal secretions with a higher pH than adults, which may encourage bacteria to colonise the perineal floor and so lead to urinary tract infection. Patients are sometimes found to have

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