

defects may be reconstructed in a single procedure with well vascularised tissue and minimal upset to the donor site. This is particularly useful for mandibular and intraoral defects but has many other applications in the head and neck. The concept of functional free muscle transfer—in which a muscle is moved to a new site, revascularised, and re-innervated by microsurgical techniques—allows dynamic reconstruction for facial palsy.<sup>11 12</sup> Tissue expansion—a remarkably simple idea in which a silicone bag slowly filled with saline through a subcutaneous valve is used to stretch skin—allows some defects to be filled by local tissues rather than by a distant flap.<sup>13</sup> It may be combined with traditional techniques. For example, if the skin of the forehead is to be used to reconstruct a large nasal defect expansion of the donor site beforehand will facilitate its direct closure, so eliminating the need for an ugly skin graft in an obvious site.

The past 15 years have seen radical developments in reconstructive methods. The full range of available skills can be offered only by specialist units, but patients, especially children, gain most if they are seen at an early stage since the timing of surgery may have a critical effect on the end result.

BARRY M JONES

Consultant Plastic and Reconstructive Surgeon,  
Centre for Facial Anomalies,  
Hospital for Sick Children,  
Great Ormond Street,  
London WC1N 3JH

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## Dilated cardiomyopathy, myocarditis, and the bioptome

Cardiomyopathies are defined as "heart muscle diseases of unknown cause."<sup>1</sup> Our lack of knowledge has acted as a catalyst to extensive research in Europe, Japan, and the United States. In dilated cardiomyopathy cases are recognised as forming a heterogeneous group probably with several aetiologies. For example, recent research in the United States has been looking at the density of  $\beta$  adrenergic receptors<sup>2</sup> and at microvascular changes<sup>3</sup> which result in damage of an ischaemic type with in each case a final outcome of dilated cardiomyopathy.

The infectious-immune pathogenesis has also been studied for several years. Causal relations are difficult to establish since the clinical course of dilated cardiomyopathy is far from

clear. A few reports of incidence have been published giving estimates of some eight to 10 cases per 100 000 population—but these studies were based on patients with symptoms and may represent the tip of an iceberg.<sup>4-6</sup> Nevertheless, there is evidence to suggest that in some patients at least the likely mechanism is that a viral infection induces an immune reaction which eventually causes irreversible heart failure.

Pivotal to the clinicopathological approach has been the recovery of fresh endomyocardial tissue by bioptome. This instrument is essentially a catheter provided with a cutting device at one end, so that after standard cardiac catheterisation samples of right or left ventricle may be obtained with ease and safety.<sup>7 8</sup> Morphological examination of such tissue from patients clinically suspected of having dilated cardiomyopathy has shown the presence of myocarditis. The morphological diagnosis of myocarditis is difficult (as indeed is the clinical diagnosis), for the mere presence of some inflammatory cells in the myocardium is not enough: concomitant changes in the interstitium and adjacent myocardial fibres must be present before the diagnosis can be made.<sup>9</sup> Published reports of the incidence of myocarditis have varied between 2% and 63%.<sup>10</sup> This wide variation may be due to selection of patients or the underdiagnosis or overdiagnosis of myocarditis, which is often focal. Nevertheless, if five or more biopsy specimens from one or both ventricles are obtained these small tissue samples have been shown to reflect changes in the entire ventricular muscle.<sup>11</sup>

In 1980 an international meeting defined myocarditis as "the presence of inflammatory cells in the myocardium with evidence of fraying of adjacent myocardial fibres but without concomitant sequential fibre necrosis (as it is seen in ischaemic heart disease)."<sup>12</sup> Sequential biopsies in patients under treatment for active myocarditis have led to a classification into three main groups.<sup>13</sup> More recently a panel of (predominantly American) pathologists met in Dallas and the definition and classification were reworded, amended, and extended.<sup>14</sup> Depending on the relation of the inflammatory cell infiltrate, which may be sparse, to the myocardial fibres, the presence of necrosis, and the presence or absence of interstitial fibrosis the three main forms are: active, resolving (healing), and resolved (healed). This categorisation has important therapeutic implications. Patients with active myocarditis confirmed by biopsy have been treated with prednisolone and immunosuppressive agents with resolution of the inflammation and concomitant clinical improvement.<sup>15 16</sup> In the healing stage, too, treatment is beneficial, particularly if there are obvious foci of activity (judged by necrosis) and if the clinical outlook seems poor. If the patient is not severely disabled no more than close follow up may be needed. Once the "healed" phase is reached, however, irrespective of the clinical condition treatment by these agents is useless and if the condition is far advanced cardiac transplantation may offer the only hope.

If the first biopsy specimen shows interstitial fibrosis and foci of fibrous replacement the pathologist may surmise only that the patient had myocarditis in the past. A finding of a hypertrophied, dilated myocardium with varying degrees of fibrosis, though morphologically non-specific, may be diagnosed as dilated cardiomyopathy—provided that other causes of hypertrophy and dilatation have been ruled out.

Virological studies have shown raised antibody titres to Cocksackie B virus in patients with dilated cardiomyopathy and myocarditis, but raised titres may also be found in patients without any evidence of active myocarditis or myocarditis in the past.<sup>17-19</sup> Myocarditis may also be found in biopsy specimens from patients in whom the results of

virological investigation are negative. These data suggest that though virus may be causally related the mechanism is more complex than straightforward viral myocarditis; some immunological idiosyncrasy seems likely.

Immunological studies in dilated cardiomyopathy have shown preferential binding of IgG and IgA.<sup>20</sup> Studies of cell mediated immunity have shown abnormal transformation of lymphocytes to phytohaemagglutinin,<sup>21</sup> that the percentage of circulating T lymphocytes is reduced,<sup>22</sup> that leucocyte migration is inhibited,<sup>23</sup> and that T suppressor cell function is defective.<sup>24-25</sup> A more recent study found that in two fifths of patients the ratio of helper to suppressor cells was higher than in normal controls.<sup>26</sup>

These studies and other experimental evidence strongly suggest that viral infection evokes an immunological response that results in dilated cardiomyopathy.<sup>27-29</sup> Possibly the viral infection may trigger antibody production directed at suppressor cells. These antibodies might then affect T cell receptors, which modulate  $\beta$  cell function; the result would be increased  $\beta$  cell activity and production of autoimmune antibodies. Dysfunction of T suppressor cells might also affect cell mediated immunity.<sup>23</sup> Nevertheless, by no means all workers accept the autoimmune hypothesis.<sup>30</sup>

Other avenues of investigation need to be explored in patients with dilated cardiomyopathy, but an infectious-immune mechanism seems likely to be the cause in about half.

With rare exceptions,<sup>19</sup> searching for virus in the myocardium using the standard techniques has failed even when immunofluorescence techniques specific for Coxsackie virus have been used. This is not altogether surprising: replication usually takes place early on, and by the time the patient comes to the physician morphologically recognisable virus may no longer be present.<sup>31</sup> Recently a pilot study using a deoxyribonucleic acid hybridisation probe technique to detect ribonucleic acid sequences specific for Coxsackie B virus has yielded promising results when applied to endomyocardial tissue recovered by biptome. Even if myocarditis is not present evidence may be found of virus in the myocardium.<sup>32</sup> This may even apply to patients whose biopsy specimen has shown no evidence of active myocarditis or myocarditis in the past.

The pieces of the jigsaw are now beginning to fall into place, but much work is still necessary. Central to all studies is examination of tissue obtained by biptome and the accurate diagnosis of myocarditis. Newer diagnostic techniques such as two dimensional echocardiography, Doppler ultrasonography, magnetic resonance, and scintigraphy (particularly gallium scanning) may help in the diagnosis of myocarditis. These techniques are, however, unlikely to replace the study of specimens obtained by biptome in monitoring the response to treatment. So far as treatment is concerned the studies have been without proper controls. Patients with myocarditis may recover spontaneously<sup>28</sup> and hence a multicentre controlled trial is mandatory.

ECKHARDT G J OLSEN

Consultant Histopathologist,  
National Heart Hospital,  
London W1M 8BA

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## Whatever happened to the Black report?

Like the Bible, the Black report on inequalities in health is much quoted, occasionally read, and largely ignored when it comes to action.<sup>1</sup> Six years after its publication virtually none of its 37 recommendations have been implemented (even the 23 that would have cost little or nothing), and all the data available suggest that the gap between the rich and poor—both in their income and in their health—is widening.

Worried by the plight of the growing number of poor in Britain, the British Medical Association, the Trades Union Congress, and the Health Education Council joined together last week and held a conference to try to find a way forward. The mood of the conference was that radical measures were necessary, and Sir Richard O'Brien, formerly chairman of the Manpower Services Commission and speaking at the conference in his role as chairman of the Archbishop of Canterbury's commission on urban priority areas,<sup>2</sup> suggested

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