Medical and Surgical Treatment of Rheumatic Mitral and Aortic Valve Disease

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Despite the decline in the incidence of acute rheumatic fever[1], substantial numbers of patients continue to attend hospitals suffering from chronic rheumatic valvular heart disease. The Registrar General’s figures for 1978[2] show 15,000 hospital admissions in England and Wales for chronic rheumatic heart disease, and detail 5,536 deaths directly attributed to this cause.

In considering the treatment of chronic rheumatic heart disease, it is clear that increasing expertise in open heart surgery coupled with the development of improved valve substitutes have improved the morbidity and mortality of surgical treatment. The last decade has also seen a corresponding improvement in medical treatment brought about by the widespread use of powerful loop diuretics and vasodilator therapy. Previously published reports comparing the benefits of surgical and medical treatment of valvular heart disease[3-8] date from a time when options for surgical treatment were restricted. For example, closed valvotomy may have been preferred to valve replacement for reasons other than the mitral valve anatomy. Second, the reports mostly came from cardiac surgical units which, as a result of referral policies, see selected cases. It seems appropriate, therefore, to compare the respective benefits of surgical and medical treatment as seen from the viewpoint of a district general hospital.

Patients and Methods

The case notes of all patients with valvular heart disease seen at Huddersfield Royal Infirmary between June 1971 and June 1981 were reviewed. Patients who were symptomatic (at least Grade II of the New York Heart Association (NYHA) classification) at some time during the period of follow-up, with rheumatic valvarul heart disease and with at least one year of follow-up data available were included in the study. A past history of rheumatic fever was not regarded as necessary for inclusion if the valve lesion was typical of that produced by rheumatic heart disease. However, an attempt was made to exclude dual pathologies and a patient who presented with a clear history of coronary artery disease and a mitral systolic murmur would have been excluded.

A group of 194 patients was thus identified. Their clinical data and the nature of the valve lesion are summarised in Table 1. Of the patients, 53 had mitral stenosis, 19 had isolated mitral regurgitation and 49 had a mixed mitral lesion. Of 37 patients with aortic valve disease, 17 had aortic stenosis, 3 had aortic regurgitation and 17 had a mixed lesion. Thirty-six patients had both mitral and aortic valve disease.

Sixty-three patients underwent surgical treatment and 131 patients were managed medically. The latter group consisted of those who were thought not to have reached a stage of deility requiring surgical treatment, those who had been offered but had refused surgery, and those in whom the presence of an associated medical or psychiatric disorder was thought to provide a relative contraindication to surgical treatment. The surgical group consisted of those patients who had accepted the offer of surgery. Following successful surgery, the patients continued to be seen at intervals at Huddersfield Royal Infirmary and thus all patients in both the medical and surgical groups were seen by one of the authors (E. T. H.) through most of the follow-up period. Standard NYHA criteria[9] were used in assessing symptoms.

It is pertinent to comment on the broad policies determining referral for surgical treatment during the period covered by this survey. Age greater than 65 years was considered a relative contraindication to surgery. The nature of the valve lesion was thought important in deciding the timing of surgical referral. Patients with clinically significant isolated mitral stenosis without calcification (as assessed by X-ray screening or echocardiography) were referred early, particularly if there was a history of embolism or if the patient was a young woman contemplating pregnancy. Patients with mitral and/or aortic regurgitation were referred for surgery only when dyspnoea greater than NYHA Grade II had appeared, or alternatively if progressive cardiac enlargement was de-
Mitral Stenosis

Results

Table 1. Clinical data of patients included in the study.

|                  | Mitral stenosis | Mitral regurg. & mixed mitral valve disease | Aortic valve disease | Mixed mitral and aortic valve disease | All patients |
|------------------|-----------------|---------------------------------------------|----------------------|---------------------------------------|--------------|
|                   | Medical         | Surgical                                   | Medical              | Surgical                              | Medical      | Surgical |
| Males             | —               | 3                                           | 11                   | 5                                     | 32           | 27        |
| Females           | 32              | 18                                          | 10                   | 5                                     | 99           | 36        |
| Total             | 32              | 21                                          | 21                   | 16                                    | 131          | 63        |
| Mean age at last follow-up (yrs) | ± 10.6*         | ± 9.9                                       | ± 13                 | ± 12.6                                | ± 12.8       | ± 10.8    |
| Mean period of follow-up (yrs)   | ± 3.0**         | ± 2.4                                       | ± 2.6                | ± 3                                   | ± 2.9        | ± 2.9     |

*Mean age ± standard deviation
**Mean period of follow-up ± standard deviation

Results

There were 135 females and 59 males in the series. Follow-up ranged from 1.3 years to 10 years, with a mean of 6.6 years. Actuarial survival (Fig. 1) in the surgical group was 81 per cent (standard error (SE) ± 7 per cent) at 10 years and significantly lower in the medical group at 56 per cent (SE ± 8.5 per cent) (P = <0.005). There were 45 deaths (23 per cent), 7 in the surgical group and 38 in the medical group. This gave linearised death rates of 1.7 per cent p.a. in the surgical group and 5.5 per cent p.a. in the medical group. Cardiovascular causes accounted for 42 (93 per cent) of the 45 deaths.

Mitral Stenosis

Of the 53 patients with mitral stenosis, 21 were surgically treated, the procedures being closed mitral valvotomy (16 patients), open mitral valvotomy (1 patient), multiple closed valvotomies (1 patient) and mitral valve replacement (3 patients). The 10 year actuarial survival was 86 per cent (SE ± 10 per cent) in the surgical group and 68 per cent (SE ± 17.6 per cent) in the medical group (Fig. 2). The functional classification in both groups at time of diagnosis and at last follow-up are shown in Fig. 3. Seventeen patients (81 per cent) of the surgical group were in Grades I and II at last follow-up compared with 21 patients (66 per cent) of the medical group (P = NS). The 10 year actuarial survival of patients in NYHA Grades III and IV treated medically was 48 per cent (SE ± 24 per cent). All except one of these patients were in atrial fibrillation at last follow-up. The incidence of atrial fibrillation was 57 per cent in the surgical group and 69 per cent in the medical. Actuarial survival of patients in
the medical group in atrial fibrillation at 10 years was 47 per cent (SE ± 21 per cent). All embolic episodes occurred in patients in atrial fibrillation. Three embolic episodes occurred post-operatively in the 21 patients treated surgically—an embolic rate of 0.64 episodes p.a. By contrast, the medically treated group of 32 patients sustained 13 embolic episodes, giving an embolic rate of 6.32 episodes a year. All embolic episodes occurred before patients had started anticoagulants or while they were off anticoagulant therapy.

**Mitral Regurgitation and Mixed Mitral Valve Disease**

Seventeen of 69 patients received surgical treatment. Fourteen patients had mitral valve replacement and three patients had a closed mitral valvotomy. Actuarial curves for survival are shown in Fig. 4. There were no deaths in the surgical group but there were 14 deaths in the medical group, giving a 10 year actuarial survival of 63 per cent (SE ± 13 per cent). When only NYHA Grades III and IV in the medical group are considered, five-year survival was 40 per cent with no patients alive at 8 years.

Of the 17 surgically treated patients 14 (82 per cent) were in NYHA Grades I and II at last follow-up compared with 24 (47 per cent) of the 51 medically treated patients ($P = <0.05$) (Fig. 3). The incidence of atrial fibrillation was 75 per cent (39 patients) in the medical group and 53 per cent (9 patients) in the surgical group.
The latter group experienced 4 embolic episodes (linearised rate 3.8 per cent p.a.) while the medical group sustained 17 such episodes (linearised rate 6.0 per cent p.a.). All but one episode in each group occurred while patients were not on anticoagulant therapy.

**Aortic Valve Disease**

Sixteen of 37 patients with aortic valve disease underwent aortic valve replacement. Ten year actuarial survival, as shown in Fig. 5, was 70 per cent (SE ±23 per cent) in the surgical group and 39 per cent (SE ±20 per cent) in the medical group. There were two deaths in the surgical group, including one early post-operative death, and 9 deaths in the medical group (P = NS). Functional classification in the two groups at diagnosis and at last follow-up are shown in Fig. 6. Of the surgically treated patients 81 per cent were in Grades I or II at last follow-up compared with only 57 per cent of the medical group (P = NS).

**Mixed Mitral and Aortic Valve Disease**

This group comprised 36 patients. Nine patients were surgically treated, 4 having mitral and aortic valve replacement, 4 having mitral valve replacement alone and one patient having a closed mitral valvotomy. Actuarial survival at 10 years was 62.5 per cent (SE ±20 per cent) in the surgical group and 54 per cent (SE ±16 per cent) in the medical group (Fig. 7). Functional grades at diagnosis and at last follow-up are shown in Fig. 6. Six (67 per cent) of the 9 surgically treated patients were in Grades I and II compared with 14 (52 per cent) of the 27 medically treated patients (P = NS).

**Discussion**

Within the limitations of its retrospective nature this study suggests superiority of surgical treatment over continued medical therapy in symptomatic rheumatic mitral and aortic valvular heart disease. A comparable study reported in 1975[12] described a group of 410 patients followed medically and after surgery showing a 76 per cent actuarial survival at 5 years in the surgical group compared to 52 per cent in the medical group. Our data show a similar magnitude of benefit in favour of surgical treatment, although overall survival was higher—corresponding figures at 5 years being 91 per cent for surgical treatment and 83 per cent for medical treatment. Munoz et al.[12] did not report survival beyond five years but in the present series the benefit in favour of the surgical group was maintained with survival at 10 years being 81 per cent in the surgical group and 56 per cent in the medical group (P<0.005).

Many previous studies compared the results of surgical and medical treatment of valvular heart disease but they commonly referred to a particular type of valve lesion of differing aetiology rather than the full spectrum of rheumatic valvular heart disease alone. The benefits of mitral valvotomy in mitral stenosis are well established, and improved survival in those patients with severe symptoms (Grades III and IV NYHA Classification) has been demonstrated[4,12-14]. Our figures for survival 10 years...
after mitral valvotomy (81 per cent) are similar to those reported in a large series by Rowe and Bland[7].

There are surprisingly few data which directly compare medical with surgical treatment in patients with mitral insufficiency, mixed mitral valve disease and double (mitral and aortic) valve disease. Munoz et al.[12] found a difference of 14 per cent in survival at five years in patients with mitral insufficiency and mixed mitral valve disease between surgical (60 per cent) and medical treatment (46 per cent). More recently, Haerten et al.[14] compared patients in NYHA Grades III and IV with the same valvular lesions and found at 10 years the difference to be 12 per cent (surgical 57 per cent and medical 45 per cent).

Looking at aortic valve disease, the uniformly poor prognosis in symptomatic aortic stenosis treated medically is well documented[8,15-17], as is the favourable outcome with surgical treatment[12,16-18]. As regards survival, the benefits of surgery in patients with moderate aortic insufficiency are not so obvious[17,19]. The present series shows the actuarial survival curves for these valve lesions over 10 years to be progressively diverging and after five years becoming increasingly in favour of surgical treatment, although the numbers in the individual groups are not large enough to reach statistical significance.

Apart from survival, it is important to consider the degree of symptomatic improvement achieved by surgi-
Table 2. Summary of previously reported literature on survival of patients with mitral stenosis treated medically.

| Authors              | Year | No. of patients | Survival % At 5 yrs | Survival % At 10 yrs |
|----------------------|------|-----------------|---------------------|----------------------|
| Grant[23]            | 1933 | 238             | 73                  | 58                   |
| Wilson and Greenwood[24] | 1954 | 171             | 52                  | 33                   |
| Rowe et al.[7]       | 1960 | 250             | 74                  | 60                   |
| Olesen[6]            | 1962 | 271             | 58                  | 36                   |
| Rappaport[8]         | 1975 | 133             | 80                  | 60                   |
| Haerten et al.[14]   | 1980 | 43              | 57                  | 50                   |
| (NYHA Grades III and IV only) |      |                 |                     |                      |
| Present series       | 1983 | 32              | 86                  | 68                   |

ises the reported 10 year survival of patients with mitral stenosis treated medically. Our 10 year survival figure of 68 per cent shows only a modest increase when compared with the 58 per cent reported by Grant[23] in 1933.

Summary

A retrospective study of 196 patients with rheumatic mitral and aortic valve disease seen at a district general hospital was carried out. Patients having surgical intervention for their valvular disease had a better survival at 10 years (81 per cent ± 7 per cent) compared to those managed medically (56 per cent ± 8.5 per cent). This superiority was maintained, both for survival and symptomatic improvement, when individual valve lesions were considered.

References

1. Stollerman, G. H. (1975) Rheumatic Fever and Streptococcal Infection. New York: Grune & Stratton.
2. Registrar General’s figures for England and Wales (1978) DHSS OPCS series MR4, No. 12.
3. Wood, P. (1954) British Medical Journal, 1, 1051,113.
4. Ellis, L. B., Singh, J. B., Morales, D. D. and Harken, D. E. (1973) Circulation, 48, 357.
5. Roy, S. B. and Gopinath, N. (1968) Circulation, 37, 38(Suppl. V), 68.
6. Olesen, K. H. (1957) British Heart Journal, 16, 700.
7. Rowe, J. C., Bland, E. F., Sprague, H. B. and White, P. D. (1960) Annals of Internal Medicine, 52, 741.
8. Rappaport, E. (1975) American Journal of Cardiology, 35, 221.

9. New York Heart Association (1964) Disease of the heart and blood vessels, 6th ed. Boston: NYHA.
10. Anderson, R. P., Bonchek, L. I., Grunkemeier, G. L. et al. (1974) Journal of Surgical Research, 16, 224.
11. Peto, R., Pike, M. G., Armitage, P., et al. (1977) British Journal of Cancer, 35, 1.
12. Munoz, S., Gallardo, J., Daz-Gorrin, J. R. and Medina, O. (1975) American Journal of Cardiology, 35, 235.
13. McBoyle, D. (1961) British Heart Journal, 23, 377.
14. Haerten, K., Dohn, V., Dohn, G. et al. (1980) Zeitschrift für Kardiologie, 69, 611.
15. Frank, S., Johnson, A. and Ross, J. (1973) British Heart Journal, 35, 41.
16. Haerten, K., Dohn, G., Dohn V. et al. (1980) Zeitschrift für Kardiologie, 69, 757.
17. Schwarz, F., Baumann, P., Manthey, J. et al. (1982) Circulation, 66, 1105.
18. Copeland, J. G., Gripp, R. B., Stinson, E. B. and Shumway, N. E. (1977) Journal of Thoracic and Cardiovascular Surgery, 74, 875.
19. Heggelin, R., Scheu, H. and Rothlin, M. (1968) Circulation, 37, 38, (Suppl. V), 77.
20. Ionescu, M. I. and Tandon, A. P. (1979) In Tissue Heart valves, p.203. (ed. M. I. Ionescu) London: Butterworth.
21. Bjork, V. O. and Henze, A. (1979) In Tissue Heart valves, p.1 (ed. M. I. Ionescu) London: Butterworth.
22. Tepley, J. F., Grunkemeier, G. L., Sutherland, L. E. et al. (1981) Annals of Thoracic Surgery, 32, 111.
23. Grant, R. T. (1933) Heart, 15, 275.
24. Wilson, J. K. and Greenwood, M. B. (1954) Canadian Medical Association Journal, 71, 323.