To operate or not on elderly patients with aortic stenosis: the decision and its consequences

Bouma, B.J.; van den Brink, R.B.A.; van der Meulen, J.H.P.; Verheul, J.A.; Cheriex, E.; Hamer, J.P.M.; Dekker, E.; Lie, K.I.; Tijssen, J.G.P.

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To operate or not on elderly patients with aortic stenosis: the decision and its consequences

B J Bouma, R B A van den Brink, J H P van der Meulen, H A Verheul, E C Cheriex, H P M Hamer, E Dekker, K I Lie and J G P Tijssen

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To operate or not on elderly patients with aortic stenosis: the decision and its consequences

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Abstract
Objective—To evaluate the application of guidelines in the decision making process leading to medical or surgical treatment for aortic stenosis in elderly patients. Design—Cohort analysis based on a prospective inclusive registry. Setting—205 consecutive patients (> 70 years) with clinically relevant isolated aortic stenosis and without serious comorbidity, seen for the first time in the Doppler-echocardiographic laboratories of three university hospitals in the Netherlands. Results—The initial choice was surgery in 94 patients and medical treatment in 111. Only 59% of the patients who should have had valve replacement according to the practice guidelines were actually offered surgical treatment. These were mainly symptomatic patients under 80 years of age with a high gradient. Operative mortality (30 days) was only 2%. The three year survival was 80% in the surgical group (17 deaths among 94 patients) and 49% in the medical group (43/111). Multivariate analysis showed that only patients with a high baseline risk, mainly determined by impaired left ventricular function, had a significantly better three year survival with surgical treatment than with medical treatment. Conclusions—In daily practice, elderly patients with clinically relevant symptomatic aortic stenosis are often denied surgical treatment. This study indicates that a surgical approach, especially where there is impaired systolic left ventricular function, is associated with better survival.

Keywords: aortic stenosis; elderly people; clinical decision making

The most frequent valvar lesion in elderly people is degenerative calcified aortic stenosis, with a prevalence of 2.5% at the age of 75 years and almost 8% at 85 years. More than 9% of the Western population is now over 70 years of age. As the proportion of elderly people is still rising, aortic stenosis is becoming an increasingly important health problem. Aortic valve replacement for aortic stenosis in the elderly can be performed with an acceptable operative mortality and morbidity and with good long term results. However, the writers of these reports did not consider patients who did not have surgery, and they did not measure the difference in outcome between surgical and medical treatment. We studied a cohort of elderly patients with clinically relevant aortic stenosis on Doppler echocardiography and without major comorbidity to determine the following: the clinical characteristics that determine the choice of surgical treatment in elderly patients with clinically relevant aortic stenosis; mortality in the medical and surgical treatment group; and possible differences in the long term survival of surgically and medically treated patients after adjustment for baseline risks. To our knowledge, our cohort study is the first to examine the decision making process leading to medical or surgical treatment as well as the outcome of treatment.

Methods
We studied the records of 280 consecutive patients aged 70 years or older, in whom a diagnosis of clinically relevant aortic stenosis was made for the first time by Doppler echocardiography. The patients were diagnosed in three university hospitals (Amsterdam, Groningen, and Maastricht) in the Netherlands between January 1991 and December 1993. All had cross sectional and Doppler echocardiography. Isolated aortic stenosis was defined as an aortic valve area of < 1.0 cm² or a maximum gradient of > 50 mm Hg and a maximum aortic regurgitation of grade II or IV as assessed by Doppler echocardiography. Patients with serious concomitant valvar disease, for example mitral regurgitation exceeding grade 2, were not included.

Seventy five patients were excluded: nine (3%) refused aortic valve replacement and 45 (16%) had major non-cardiac comorbidity according to Greenfield’s definition. Three patients (1%) lived in a nursing home. Eight patients (3%) with very poor cardiac status at the time of echocardiography, in whom surgical treatment was not a realistic option, were excluded; these were mainly patients with extensive acute myocardial infarction. The medical records of 10 patients (4%) could not be traced. Ultimately, the records of 205 patients were analysed. Follow up was achieved in 202 patients (99%). Two patients moved abroad and were censored at the date of the last contact. Follow up ended in May 1995. In patients who died, relevant data about the death were obtained from the municipal office (99% complete). Information about functional class and Rankin score were collected from the general practitioner (98% complete).

We collected the clinical characteristics and sociodemographic data—such as sex, age, and place of residence (independent, home for the
elderly, or nursing home)—at the time of the Doppler echocardiography. Clinical symptoms included angina pectoris, dyspnoea (according to New York Heart Association (NYHA) grade), syncope, history of myocardial infarction (enzyme levels, ECG), and cardiac surgery.

We used the following criteria. Congestive heart failure was present if pulmonary oedema or pulmonary vascular congestion was diagnosed by auscultation or radiographically at the time of echocardiography. ECG data included atrial fibrillation and left ventricular hypertrophy.13 Left ventricular function was qualitatively assessed from the cross sectional echo image and defined as “good” or “impaired,” that is, asynery of two or more segments or ejection fraction below 45%.14 15 The maximum and the mean instantaneous gradients across the aortic valve were determined by continuous wave Doppler echocardiography with multiple acoustic windows.16 17 Aortic regurgitation was determined by colour Doppler flow imaging.18 We also collected information about valve replacement and, if recorded, the arguments leading to the decision to operate or to treat medically.

In all surgical procedures, cardioplegia was achieved by antegrade perfusion of the coronary arteries with St Thomas’ Hospital solution. After excision of the aortic valve and, if necessary, careful annular debridement of calcium, the largest prosthesis that could be fitted was implanted.

All patients with a mechanical prosthesis received lifelong anticoagulant treatment (target international normalised ratio 3 to 4.5). In all surgical procedures, cardioplegia was achieved by antegrade perfusion of the coronary arteries with St Thomas’ Hospital solution. After excision of the aortic valve and, if necessary, careful annular debridement of calcium, the largest prosthesis that could be fitted was implanted.

Patients who were not operated on were treated medically with diuretics and digoxin. The attending cardiologist decided whether or not a patient was eligible for aortic valve replacement. The ultimate decision was made during one of the weekly cardiovascular surgical meetings. Patients were considered to have been treated surgically when the decision to replace the aortic valve was taken within 180 days of the echocardiography. The day of the decision was considered to be the start of follow up. Thus patients who died while on the waiting list remained in the surgical group according to the intention to treat principle. All other patients were considered as being treated medically. The median time to operation was 29 days. Three days of the echocardiography. The day of the decision was considered to be the start of follow up. Thus patients who died while on the waiting list remained in the surgical group according to the intention to treat principle. All other patients were considered as being treated medically. The median time to operation was 29 days. Three
patients died while on the waiting list for an operation. A concomitant bypass procedure was performed in 34 of the 91 operated patients (37%). No other concomitant procedures were done. Eleven patients received a bioprosthesis (11 of 91, 12%). The medical treatment group comprised 111 patients. After 180 days it was decided to perform aortic valve replacement in 18 of these 111 medically treated patients (16%), mainly because of deteriorating condition.

THE DECISION MAKING PROCESS

The main predictors of surgical treatment, in order of decreasing importance, were: maximum gradient across the aortic valve ≥ 75 mm Hg (relative risk 4.07); angina pectoris or dyspnoea of NYHA class III or IV (relative risk 2.73); age 80 years or older (relative risk 0.42); left ventricular hypertrophy on the ECG, syncope, no history of myocardial infarction, and absence of atrial fibrillation (table 1). Impaired left ventricular function at the time of Doppler echocardiography did not play a significant role in the decision to offer surgical treatment (relative risk 0.81, 95% confidence interval 0.59 to 1.13).

A decision to perform aortic valve replacement was made in 10 of the 44 patients without symptoms of angina or dyspnoea (NYHA class I). Three of these died during follow up, while all 34 medically treated patients survived.

Twenty six patients were in class II, of whom 21 were treated medically and five surgically. None of these patients died.

### Table 1  Baseline characteristics of 205 elderly patients with aortic stenosis, and the determinants of surgical treatment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total</th>
<th>Medical</th>
<th>Surgical</th>
<th>Univariate analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(n) (%)</td>
<td>(n (%))</td>
<td>RR</td>
</tr>
<tr>
<td>Total</td>
<td>205</td>
<td>111</td>
<td>94 (46)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;80 years</td>
<td>138</td>
<td>60</td>
<td>78 (57)</td>
<td></td>
</tr>
<tr>
<td>≥ 80 years</td>
<td>67</td>
<td>51</td>
<td>16 (24)</td>
<td>0.42</td>
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<tr>
<td>Sex</td>
<td></td>
<td></td>
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<tr>
<td>Male</td>
<td>73</td>
<td>35</td>
<td>38 (52)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>132</td>
<td>76</td>
<td>56 (42)</td>
<td>0.81</td>
</tr>
<tr>
<td>Syncope</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>178</td>
<td>101</td>
<td>77 (43)</td>
<td>1.46</td>
</tr>
<tr>
<td>Yes</td>
<td>27</td>
<td>10</td>
<td>17 (63)</td>
<td>0.64</td>
</tr>
<tr>
<td>Angina or dyspnoea</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>NYHA I/II</td>
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<td>55</td>
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<td>79 (59)</td>
<td>1.44</td>
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<td></td>
</tr>
<tr>
<td>No</td>
<td>147</td>
<td>80</td>
<td>67 (46)</td>
<td>0.89</td>
</tr>
<tr>
<td>Yes</td>
<td>58</td>
<td>31</td>
<td>27 (47)</td>
<td>0.97</td>
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<td>Previous infarct</td>
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<td>No</td>
<td>169</td>
<td>85</td>
<td>84 (50)</td>
<td>0.83</td>
</tr>
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<td>Yes</td>
<td>36</td>
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<td>10 (28)</td>
<td>0.88</td>
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<td>No</td>
<td>119</td>
<td>73</td>
<td>46 (39)</td>
<td>0.64</td>
</tr>
<tr>
<td>Yes</td>
<td>86</td>
<td>38</td>
<td>48 (56)</td>
<td>0.83</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>170</td>
<td>86</td>
<td>84 (49)</td>
<td>0.89</td>
</tr>
<tr>
<td>Yes</td>
<td>35</td>
<td>25</td>
<td>10 (29)</td>
<td>0.97</td>
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<td>AS ≥ 75 mm Hg</td>
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<td>No</td>
<td>97</td>
<td>50</td>
<td>47 (49)</td>
<td>1.02</td>
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<td>Yes</td>
<td>108</td>
<td>51</td>
<td>57 (53)</td>
<td>0.82</td>
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<tr>
<td>LV function</td>
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<td></td>
</tr>
<tr>
<td>Normal</td>
<td>130</td>
<td>66</td>
<td>64 (49)</td>
<td>0.83</td>
</tr>
<tr>
<td>Impaired</td>
<td>75</td>
<td>45</td>
<td>30 (40)</td>
<td>0.62</td>
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<tr>
<td>Mitral regurgitation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>Grade 0 or I</td>
<td>111</td>
<td>63</td>
<td>48 (43)</td>
<td>1.31</td>
</tr>
<tr>
<td>Grade II</td>
<td>94</td>
<td>48</td>
<td>46 (49)</td>
<td>1.13</td>
</tr>
</tbody>
</table>

AS, aortic stenosis (maximum gradient across aortic valve); CI, confidence interval; LV, left ventricular; LVH, left ventricular hypertrophy; NYHA, New York Heart Association class; RR, risk ratio.

In 79 of the 135 patients (59%) with severe symptoms of angina or dyspnoea (NYHA class III or IV) at the time of Doppler echocardiography, a decision to offer surgical treatment was taken within 180 days. Reasons for not proceeding with surgical treatment in 56 seriously ill patients, as recorded from their clinical records, were: impaired systolic left ventricular function in eight (14%), advanced age in seven (13%), comorbidity in seven (13%), symptoms attributed to coronary artery disease in six (11%), and decrease in symptoms after starting medical treatment in five (9%). Other reasons for not proceeding with surgical treatment were obesity, a recent myocardial infarction, and insufficient vitality.

OUTCOME OF TREATMENT

The operative mortality within 30 days after the operation was 2.2%. During the first six months the survival in both the surgical and the medical group decreased to about 85%. In the following 2.5 years the survival curve in the surgical group levelled off (three year survival 80%, 95% confidence interval 72% to 89%), whereas the measured survival in the medical group continued in a steep decline (three year survival 49%; 37% to 61%) (fig 1).

Impaired systolic left ventricular function (hazard ratio 4.8) was the main independent risk factor for mortality in the medically treated patients (table 2). In the surgical treatment group, impaired left ventricular function was not an independent risk factor for mortality (hazard ratio 1.7, 95% confidence interval 0.64 to 4.4). In these surgically treated patients, a previous coronary bypass operation, moderately impaired renal function (creatinine 110–250 µmol/l), age ≥ 80 years, and a history of myocardial infarction were associated with mortality.

Independent risk factors for mortality in the medically treated patients were impaired systolic left ventricular function, moderate (grade 2) mitral regurgitation, and symptoms of angina

---

Figure 1  Survival in elderly patients with aortic stenosis stratified by treatment.
or dyspnoea class III or IV. These factors in addition to age (>80 years) and sex (female) were used to calculate an individual risk score for all 205 patients (table 2). Sixty eight patients were at low risk, 68 were at intermediate risk, and 69 were at high risk (table 3). The risk score discriminated well in the medically treated group, with a three year mortality of 17% in the low risk patients and 75% in the high risk patients.

In the group with a high individual baseline risk score, medical treatment carried a higher risk than surgical treatment (relative risk 3.1, 95% confidence interval 1.6 to 6.1) (table 3). In the intermediate and low risk categories there was no significant difference between the outcomes of medical or surgical treatment. This was also reflected in the survival curves (fig 2).

Patients with surgical treatment had a much better NYHA classification at follow up than at baseline (table 4). Ten patients (11%) had the same Rankin score at baseline and follow up.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Determinants of mortality during follow up in 111 medically treated elderly patients with aortic stenosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Total (n) Died (n (%))</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>111</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;80 years</td>
<td>60</td>
</tr>
<tr>
<td>≥80 years</td>
<td>51</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>76</td>
</tr>
<tr>
<td>Syncope</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>101</td>
</tr>
<tr>
<td>Yes</td>
<td>10</td>
</tr>
<tr>
<td>Angina or dyspnoea</td>
<td>55</td>
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<tr>
<td>NYHA III</td>
<td>56</td>
</tr>
<tr>
<td>NYHA III/IV</td>
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</tr>
<tr>
<td>Heart failure</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>31</td>
</tr>
<tr>
<td>Previous infarct</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>26</td>
</tr>
<tr>
<td>LVH on ECG</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>38</td>
</tr>
<tr>
<td>Atrial fibrillation</td>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
<td>25</td>
</tr>
<tr>
<td>AS &gt;75 mm Hg</td>
<td>No</td>
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<td>Yes</td>
<td>31</td>
</tr>
<tr>
<td>LV function</td>
<td>Normal</td>
</tr>
<tr>
<td>Impaired</td>
<td>45</td>
</tr>
<tr>
<td>Mitral regurgitation</td>
<td>Grade 0 or I</td>
</tr>
<tr>
<td>Grade II</td>
<td>48</td>
</tr>
</tbody>
</table>

AS, aortic stenosis (maximum gradient across aortic valve); CI, confidence interval; HR, hazard ratio; LV, left ventricular; LVH, left ventricular hypertrophy; NYHA, New York Heart Association.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Mortality in patients with low, intermediate, and high risk score, stratified by treatment group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
<td>Medically treated</td>
</tr>
<tr>
<td>Low risk score</td>
<td>68</td>
</tr>
<tr>
<td>Intermediate risk score</td>
<td>68</td>
</tr>
<tr>
<td>High risk score</td>
<td>69</td>
</tr>
</tbody>
</table>

*Risk ratio for mortality in medically treated patients and surgically treated patients.

Risk score model contained impaired left ventricular function, mitral regurgitation, New York Heart Association class, sex, and age.

CI, confidence interval; RR, relative risk.

![Figure 2](heart.bmjournals.com)
Surgery for aortic stenosis in elderly patients

Low up.

Two patients missing at follow up; † one patient missing at fol-

practice guidelines.6 20–24 published reports and are contrary to current

treatment. These factors are not supported by

decrease in symptoms after starting medical

tricular function, advanced age, symptoms

the medical records—was impaired left ven-

operative mortality of 2.2%. The motivation

patients with clinically relevant aortic stenosis

aortic stenosis and angina or dyspnoea of

lowed in only 79 of the 135 patients (59%) with

The guidelines for surgical treatment were fol-

Discussion

The guidelines for surgical treatment were fol-

in only 79 of the 135 patients (59%) with aortic stenosis and angina or dyspnoea of

NYHA class III and IV. A strict selection pro-

cedure for the surgical treatment of elderly

patients with clinically relevant aortic stenosis is a possible explanation for the strikingly low

operative mortality of 2.2%. The motivation

for not offering surgical treatment—as given in

the medical records—was impaired left ven-

tricular function, advanced age, symptoms

attributed to coronary artery disease, and
decrease in symptoms after starting medical
treatment. These factors are not supported by

published reports and are contrary to current

practice guidelines.6–20-24

This cohort study is the first to be directed at
the decision making process leading to medical or surgical treatment as well as at the
outcome of treatment in patients aged 70 years or
more with clinically relevant aortic stenosis.
We found that patients with serious symptoms
(NYHA class III or IV) who were younger than 80 years, had a high transvalvar gradient
(⇌ 75 mm Hg), left ventricular hypertrophy,
and no previous myocardial infarction, were
those predominantly selected for surgical

In our study, impaired systolic left ventricular
function carried a high mortality risk in the medical group (hazard ratio 4.8), while it was not an independent risk factor for mortality in
the surgical group. However, studies with a
longer follow up, focusing on the outcome of
surgery in aortic stenosis,5 20 have shown that impaired left ventricular function is a determin-
ant of late mortality. This difference probably
reflects the relatively short follow up.

LIMITATIONS OF THE STUDY

It is not clear whether current practice
guidelines4 can be extrapolated to elderly

patients. Although many studies describe good
results of aortic valve replacement in elderly
people, our knowledge of the natural history of
aortic stenosis originates from studies that in
most cases contain only a few or no elderly

patients.5 20–29 In our study, impaired left

ventricular function was a much more potent
predictor than functional class of mortality in
medically treated patients. It can be speculated
that in elderly patients the onset of symptoms is
delayed because they already have a decreased
activity level and because they alter their
lifestyle more easily than younger patients.
Therefore it may be better to look for prognos-
tic factors other than clinical symptoms to
guide treatment decisions in elderly

patients, for example echocardiographic indices of left

ventricular function, or to use a more specific
activity scale than the NYHA classification to
estimate functional capacity of elderly

patients.24

We used qualitative and semiquantitative
cross sectional echocardiography to assess
systolic left ventricular function, as this is the
way left ventricular function is determined in
the majority of cases in clinical practice. Quali-
tative assessment has been shown to have a good correlation with left ventricular ejection
fraction determined by nuclear angiography.16
As coronary angiography was performed in
only a few of the medically treated patients, the
influence of this clinical characteristic on the
treatment strategy and outcome could not be
analysed.

CONCLUSIONS

Our study of 205 elderly patients with clinically
relevant aortic stenosis and without serious
comorbidity in three Dutch university hospitals showed that only 59% of the patients who
should undergo valve replacement according to
the practice guidelines were actually offered
surgical treatment. Severely symptomatic pa-
tients (NYHA class III or IV) less than 80 years
old, with a high maximum transvalvar gradient
(⇌ 75 mm Hg) and no previous myocardial
infarction, are the most likely to be selected for
surgical treatment. Impaired left ventricular
function played no clear role in the decision
making process. However, our study indicates
that the outcome in patients with impaired left
ventricular function is better after surgical

**Table 4** New York Heart Association class at baseline and at end of follow up, by treatment

<table>
<thead>
<tr>
<th>Class</th>
<th>Baseline</th>
<th>Follow up</th>
<th>Baseline</th>
<th>Follow up</th>
</tr>
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<tbody>
<tr>
<td>I</td>
<td>23</td>
<td>23</td>
<td>5</td>
<td>44</td>
</tr>
<tr>
<td>II</td>
<td>27</td>
<td>14</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>III</td>
<td>28</td>
<td>13</td>
<td>56</td>
<td>12</td>
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<tr>
<td>IV</td>
<td>23</td>
<td>8</td>
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<td>0</td>
</tr>
<tr>
<td>Death</td>
<td>0</td>
<td>42</td>
<td>0</td>
<td>18</td>
</tr>
</tbody>
</table>

Values are percentage of patients in each group.

*Two patients missing at follow up; † one patient missing at follow up.

worsened and in 51 (55%) it had improved,
while 17 patients (18%) died.

In the medically treated group, many symp-
tomatic patients had died (table 4). Twentyeight patients (26%) had the same Rankin
score at baseline and at follow up. In 19
patients (17%) the Rankin score had worsened,
and in 16 (15%) it had improved, while 46
patients (42%) died.

The guidelines for surgical treatment were fol-

in only 79 of the 135 patients (59%) with aortic stenosis and angina or dyspnoea of

NYHA class III and IV. A strict selection pro-

cedure for the surgical treatment of elderly

patients with clinically relevant aortic stenosis is a possible explanation for the strikingly low

operative mortality of 2.2%. The motivation

for not offering surgical treatment—as given in

the medical records—was impaired left ven-

tricular function, advanced age, symptoms

attributed to coronary artery disease, and
decrease in symptoms after starting medical
treatment. These factors are not supported by

published reports and are contrary to current

practice guidelines.6–20-24

This cohort study is the first to be directed at
the decision making process leading to medical or surgical treatment as well as at the
outcome of treatment in patients aged 70 years or
more with clinically relevant aortic stenosis.
We found that patients with serious symptoms
(NYHA class III or IV) who were younger than 80 years, had a high transvalvar gradient
(⇌ 75 mm Hg), left ventricular hypertrophy,
and no previous myocardial infarction, were
those predominantly selected for surgical

In our study, impaired systolic left ventricular
function carried a high mortality risk in the medical group (hazard ratio 4.8), while it was not an independent risk factor for mortality in
the surgical group. However, studies with a
longer follow up, focusing on the outcome of
surgery in aortic stenosis,5 20 have shown that impaired left ventricular function is a determin-
ant of late mortality. This difference probably
reflects the relatively short follow up.

LIMITATIONS OF THE STUDY

It is not clear whether current practice
guidelines4 can be extrapolated to elderly

patients. Although many studies describe good
results of aortic valve replacement in elderly
people, our knowledge of the natural history of
aortic stenosis originates from studies that in
most cases contain only a few or no elderly

patients.5 20–29 In our study, impaired left

ventricular function was a much more potent
predictor than functional class of mortality in
medically treated patients. It can be speculated
that in elderly patients the onset of symptoms is
delayed because they already have a decreased
activity level and because they alter their
lifestyle more easily than younger patients.
Therefore it may be better to look for prognos-
tic factors other than clinical symptoms to
guide treatment decisions in elderly

patients, for example echocardiographic indices of left

ventricular function, or to use a more specific
activity scale than the NYHA classification to
estimate functional capacity of elderly

patients.24

We used qualitative and semiquantitative
cross sectional echocardiography to assess
systolic left ventricular function, as this is the
way left ventricular function is determined in
the majority of cases in clinical practice. Quali-
tative assessment has been shown to have a good correlation with left ventricular ejection
fraction determined by nuclear angiography.16
As coronary angiography was performed in
only a few of the medically treated patients, the
influence of this clinical characteristic on the
treatment strategy and outcome could not be
analysed.

CONCLUSIONS

Our study of 205 elderly patients with clinically
relevant aortic stenosis and without serious
comorbidity in three Dutch university hospitals showed that only 59% of the patients who
should undergo valve replacement according to
the practice guidelines were actually offered
surgical treatment. Severely symptomatic pa-
tients (NYHA class III or IV) less than 80 years
old, with a high maximum transvalvar gradient
(⇌ 75 mm Hg) and no previous myocardial
infarction, are the most likely to be selected for
surgical treatment. Impaired left ventricular
function played no clear role in the decision
making process. However, our study indicates
that the outcome in patients with impaired left
ventricular function is better after surgical
treatment than after medical treatment. We suggest there should be more liberal indications for surgical treatment in elderly patients with clinically relevant aortic stenosis, especially in the presence of impaired systolic left ventricular function.


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