Surgical Treatment of Atrial Septal Defect of Secondary Type in Patients over the age of 50 years. Ten years follow-up

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From 1979 to 1989, 100 patients (61 males and 39 females) underwent operations for atrial septal defects of secondary type (ASD-sec). Among these, 20 patients were over the age of 50 years (eight males and 12 females). The mean age was 56.3 years (51–66 years). In 17 patients the defect was closed directly and in the remaining patients the defect was closed by a patch. No operative deaths were seen, and all improved their functional class. The mean follow-up time was 4.65 years (1–10 years). Two late postoperative deaths were seen—one at 1½ years due to sepsis and the other at 6 years due to duodenal bleeding. One patient underwent a second operation 4 years later for chronic tricuspid insufficiency and recurrent ASD. We conclude from this study that surgical treatment of ASD using a heart-lung machine in patients over the age of 50 years is a safe procedure and the chances of subjective benefit and functional recovery are high.

The commonest congenital anomaly of the adults is atrial septal defect of the secondary type (ASD-sec).1 Despite improved diagnostic facilities a haemodynamic inter-atrial shunt may still escape detection until old age, either because of minor symptoms or unobtrusive physical signs.2,3 A significant shunt produces symptoms that gradually become worse over a long period of time. Effort dyspnoea, tiredness, myocardial hypertrophy, pulmonary hypertension, right-sided heart failure, increased lung vasculature and atrial fibrillation are the commonest findings among these patients.

Patients and Methods

From 1979 to 1989, a total of 100 patients (61 males and 39 females) underwent operation for ASD-sec in Gothenburg. The mean age was 26.4 years (ranging between 8 months and 66 years). Twenty patients (eight males and 12 females) were over the age of 50 years.
Their mean age was 56.3 years (ranging between 51 and 66 years).

Information regarding the preoperative condition and the early postoperative course of the patients was collected from the hospital charts. The check-up in hospital included a complete clinical examination, a 12-lead electrocardiogram, chest X-rays, routine laboratory tests, lung function tests and an echocardiographic examination. The diagnosis of ASD was confirmed in each patient by right heart catheterization. No postoperative heart catheterization was performed.

Each of the 18 patients alive in September 1989 was contacted and questioned regarding the late postoperative course and the present condition. The causes of death of the non-survivors were determined from the documents of their original hospitals. The survivors were asked to participate in a hospital follow-up and investigations similar to preoperative ones were done except for right heart catheterization.

Operative technique
All the patients had a secondum type of ASD. In two cases it was of sinus venous type and in 18 cases of simple secondum type. The operations were carried out via a median sternotomy. The defect was repaired using a cardiopulmonary bypass during which cold crystalloid cardioplegia was used for myocardial protection. In 17 patients, direct closure of the defects was achieved using 3/0 prolene continuous sutures. The defect was closed in the remainder using pericardial patches sutured with 4/0 prolene.

Results
Preoperative findings
Effort dyspnoea (18 patients), palpitation (12 patients) and chest pain were the most predominant symptoms. Three patients were in New York Heart Association (NYHA) class I before surgery, seven patients were in NYHA class II, and 10 patients were in NYHA class III (Fig. 1).

Typical pulmonary ejection murmurs and a constant, widely split ejection second heart sound were heard in all patients. The radiologic heart size divided by body surface area ranged from 480 to 1820 cc/m² (mean 890 cc/m²), and the pulmonary arterial shadows were plethoric in all patients. The electrocardiogram (ECG) revealed either complete (nine patients) or incomplete (seven patients) A-V block. Sixteen patients were in sinus rhythm and four in atrial fibrillation. The left-to-right shunt ratio ranged from 1.7 to 4.7 (mean 2.6).

The mean right atrial pressure was 11 mmHg (range 4–20 mmHg). The mean pulmonary artery pressure was 18 mmHg, and mean pulmonary artery wedge pressure was 12 mmHg (range 2–24 mmHg). The mean pulmonary arterial resistance was 2.4 units (range 0.5 to 8.0 units).

Early and late outcome
The mean follow-up time was 4.85 years (range 1–10 years). The actuarial 10-year survival among these patients was 81.5% (Fig. 2). Serious major early postoperative complications were not seen. Cardiac arrhythmias were recorded in nine patients, but did not pose any major therapeutic problems. Two patients died late, one at 1½ years postoperatively by sepsis following a prostatic abscess, and the other in the sixth postoperative year following duodenal bleeding accompanied by congestive heart failure. Of the survivors, 15 patients were in NYHA class I and the majority were clearly in an improved general condition (Fig. 1).

One patient suffered from angina pectoris 6 years later, one patient from mild congestive heart failure and one from chronic bronchitis. The last patient underwent a second operation 4 years later for chronic tricuspid insufficiency and for a recurrent ASD which was closed by direct suture.

The laboratory tests were non-revealing. The exercise capacity was better than preoperatively, or had persisted in class I in all patients except four. The radiologic heart size was smaller than it was before operation in the majority, and the change in the mean value was from 890 cc/m² to 650 cc/m². Chest X-ray revealed that four patients still had clearly plethoric vascular shadows, of whom one had a minimal residual shunt. Echocardiographic examination showed that three patients including the one mentioned earlier had a minimal left-to-right shunt that did not need any surgical interference. ECG findings showed that six of the nine patients retained their complete A-V block and eight patients had incomplete A-V block of whom one developed this after surgery. Thirteen patients
were in sinus rhythm and five patients had atrial fibrillation compared to 16 and 4 patients respectively preoperatively.

Discussion
Closure of atrial septal defect is generally recommended in the absence of symptoms to prevent known complications such as pulmonary hypertension, congestive heart failure, intractable arrhythmias, bacterial endocarditis and systemic as well as pulmonary embolism.4,5 The operative results in children and young adults are excellent and surgery is universally considered when the shunt is judged as severe and might lead to the above mentioned complications.6-8

Atrial septal defects can impose greater psychologic impairment, disability and operative risk in older patients.9 However, age should not contraindicate operative treatment in patients with ASD, and previous reports have indicated acceptable operative mortality and symptomatic improvement following surgery.2-3

The present study and other recent reports2-3 have shown that even elderly patients can undergo surgical closure of ASD with an acceptable early mortality (0-6%) and generally favourable long-term results.

If one agrees that the primary concern and long-term object is to improve the quality of life, then the extremely low risk imposed in operating upon elderly patients with ASD is unquestionably justified. Surgery is recommended even in symptomless patients with medium to large defects. The average age of death in patients with ASD who have not undergone operation ranges from 36 to 49 years.10 In our series no operative death was seen. This improved survival appears to be a reflection of improved operative technique and postoperative care. The option that only cardiopulmonary bypass should be employed in preference to hypothermia can be supported by the absence of operative mortality in this series. The cause of the two late deaths were not related to the operation. In the remainder, the majority had an improved functional class and the incidence of late complications was low.

Because the mean follow-up time was about 5 years, the actuarial survival data beyond this period represented six patients only and thus cannot be used as an accurate measure of survival beyond the 5 years. Deductions about what happens beyond the first 5 years must be considered as tentative only until further data become available.

It is concluded from this study that ASD diagnosed in adults warrants surgical closure because surgery carries a very low mortality and the chances of subjective benefit and functional recovery are high. Recent advances in surgical and extracorporeal techniques and improved postoperative care have decreased the morbidity and mortality of the operation to the extent that surgical closure at any age is now justified.

References