Correction of Single and Common Atrium, with Reference to Simplified Terminology*


The anatomic, clinical, radiologic, electrocardiographic, and hemodynamic features of five cases of surgically proved complete absence of the atrial septum are presented. Technical details of the method of correcting this malformation are described. At follow up, all are alive and well. It is suggested to subdivide this entity into two: single atrium, when complete absence of the atrial septum is found but the atrioventricular valves are normal, and common atrium, in which, in addition to the absence of atrial septum, endocardial cushion defect is also present.

Complete absence of the atrial septum is rare and is considered to be the least common variety of atrial septal defect. In the literature there would appear to be some nosologic confusion in the use of terms such as cor tripartite-biventriculare, common atrium, or single atrium.

In this article, the term single atrium is used to denote the condition comprising: 1) complete absence of the atrial septum, 2) absence of malformation of the atrioventricular valves and 3) absence of interventricular communication.

The term, common atrium, is used to denote the condition of complete absence of the atrial septum, accompanied by malformation of the atrioventricular valves, with or without interventricular communication.

The conditions of common atrium and ostium primum defect may therefore be considered to constitute two varieties of the partial or complete atrioventricular communis defects.

This report concerns five patients with complete absence of the atrial septum. One case was of the single atrium type, four were of the common atrium variety.

Material

During the period 1967-1970, five patients with complete absence of the atrial septum underwent corrective surgery in our department. Their ages ranged from 8-34 years. There were two males and three females.

*From the Thoracic Cardiovascular Surgery Department, Beilinson Hospital, Petah-Tiqva, and University of Tel-Aviv Medical School, Israel. Reprint requests: Dr. Levy, Beilinson Hospital, Petah-Tiqva, Israel

Symptoms of fatigue, dyspnea and peripheral cyanosis were present in all four patients with common atrium, while the patient with single atrium was asymptomatic.

The physical findings in the four patients with common atrium were a fixed split second pulmonary sound, a soft tricuspid diastolic flow murmur; a soft systolic murmur over the pulmonary area; and a grade 2/6 systolic murmur over the cardiac apex, radiating towards the axilla.

In the patient with single atrium the physical findings were similar, except for the absence of the apical systolic murmur. The ECG in all five patients showed a prolonged PR interval, left axis deviation and evidence of right ventricular hypertrophy. The catheterization data are shown in Table 1.

Surgery

Repair was undertaken using extracorporeal circulation, according to techniques previously described. Through a wide right atriotomy, the inter-atrial septum was reconstructed employing a Teflon or Dacron patch in all the cases. A cleft in the septal cusps of the mitral valve was present in all four patients with common atrium, and this was repaired first, using three to five interrupted sutures. Thereafter, reconstruction of the atrial septum was effected by a patch, the lower end of which was anchored by three sutures to the tissues between the two atrioventricular valves, and its remaining borders sutured in a continuous fashion to the atrial walls, thus separating the two atria and leaving the coronary sinus in the right atrium.

Temporary atroioventricular dissociation, which converted spontaneously to normal sinus rhythm on the second postoperative day, occurred in one patient. No early or late deaths occurred. All the patients are asymptomatic at follow-up three to six years after surgery.

In three patients with common atrium, an apical murmur of mild mitral incompetence, without hemodynamic significance remained after operation.

Discussion

Ellis et al consider complete absence of the atrial septum a variety of atrioventricular canal deformity and believe that atrioventricular valve anomalies are always present in this condition.

We believe that complete absence of the atrial septum may exist alone as a specific entity and unassociated with malformations of the atioventricular valves. The first report of this condition was made by Lewis et al., who used the term "continuous defect" of the atrial septum. Watkins and Gross described two instances of complete absence of the atrial septum among 43 patients who underwent surgical correction of atrial septal defects by a closed technique. Similar cases were also reported by Probyn-Williams, Cunningham, Dubost and Blondieu, and Munoz-Armas et al. In none of their cases was an associated anomaly of the atrioventricular valve present. We believe that the term, single atrium, should be restricted to the condition of complete absence of the atrial septum, without endocardial cushion defect.

In atrioventricular canal with complete absence of the atrial septum, partial development of the septal elements may have occurred, but the atrioventricular endocardial cushions have failed to grow adequately, and as a consequence, the endocardial cushions and primitive septal structures failed to fuse. The inevitable tension on the septal structures resulting from further growth of the

9 Cohn LH, Mason DT: Determinants of the left atrial contraction wave in mitral stenosis. Am J Cardiol 18:724-728, 1966
he heart, we believe, leads to a progressive increase in the size of the defect between the atrial septal structures and the atrioventricular endocardial cushions. Thus, the principal factor in the causation of this defect would seem to be abnormal development of the A-V endocardial cushions with secondary regression of the atrial septal structures. In such cases, complete absence of the atrial septum will be associated with endocardial cushion defect, and we propose that this condition should be termed common atrium.

The clinical picture of single atrium is quite different from that of atrioventricular canal with common atrium. In single atrium, the clinical picture does not differ from that of a large atrial septal defect at the level of the fossa ovalis. Exercise tolerance may be quite reasonable and the only symptoms may be physical underdevelopment, dyspnea on effort, and frequent upper respiratory infections. Patients with common atrium, however, show a decrease in exercise tolerance early in life, increased fatigability, shortness of breath, mild cyanosis or obvious heart failure.

The physical findings in single atrium are typically those of atrial septal defect of the fossa ovalis type. There is prominence of the precordial area, a soft systolic murmur at the pulmonary area and a constant wide split of the pulmonary second sound. In common atrium, however, show a decrease in exercise tolerance early in life, increased fatigability, shortness of breath, mild cyanosis or obvious heart failure.

The path followed by the catheter is characterized by a very large atrial defect, the lower border of which is formed by the atrioventricular elements. The catheter moves freely within the atrial cavity and often slips into the left ventricle to a very low position, resting on the atrioventricular plane. This feature is characteristic of both types, although the mobility of the catheter and the ease with which it penetrates into the left ventricle is more marked in single atrium.

All five of the cases presented above were successfully operated on, four being of the common atrium and one of the single atrium type.

**REFERENCES**


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**Table 1**

<table>
<thead>
<tr>
<th>Case</th>
<th>Single Atrium</th>
<th>Common Atrium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>SVC 66</td>
<td>SVC 70</td>
</tr>
<tr>
<td>RA 5.6</td>
<td>IVC 79.5</td>
<td>IVC 78</td>
</tr>
<tr>
<td>RV 39.3</td>
<td>SVC 75</td>
<td>SVC 75</td>
</tr>
<tr>
<td>PA 38.8</td>
<td>RA 82</td>
<td>RA 3</td>
</tr>
<tr>
<td>PC 9.1</td>
<td>LA 8.7</td>
<td>LA 4.6</td>
</tr>
<tr>
<td>LV 105/9</td>
<td>RV 30/10</td>
<td>RV 38/4</td>
</tr>
<tr>
<td></td>
<td>PC 96</td>
<td>PC 12</td>
</tr>
<tr>
<td></td>
<td>LA 130/10</td>
<td>LA 98</td>
</tr>
<tr>
<td></td>
<td>LV 94</td>
<td>LV 90</td>
</tr>
</tbody>
</table>

SVC = superior vena cava; IVC = inferior vena cava; RA = right atrium; RV = right ventricle; PA = pulmonary artery; PC = pulmonary capillary.; LA = left atrium; LV = left ventricle.

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...the atrioventricular node and the initial portion of the bundle of His a have a location and course similar to...
Intermittent Therapy for Extrapulmonary Tuberculosis*

Michael Cynamon, M.D. and Joseph Herold, M.D.

Intermittent supervised chemotherapy has been shown to be effective in the treatment of pulmonary tuberculosis. Seven Apache Indian patients with extrapulmonary tuberculosis were treated with an intermittent regimen of isoniazid and streptomycin following an initial course of daily therapy. It was concluded that intermittent supervised chemotherapy is, also, an effective alternative to daily self-administered medication in the treatment of extrapulmonary tuberculosis.

The efficacy of intermittent chemotherapy for pulmonary tuberculosis has been well documented.1,2 There are no reports which consider the efficacy of this regimen in extrapulmonary tuberculosis, although a recent report by Hudson and Sbarbaro3 of patients treated with twice-weekly therapy included four patients with extrapulmonary tuberculosis (three with lymph node and one with peritoneal). In contrast to the situation with pulmonary tuberculosis, patients with extrapulmonary involvement do not usually present a serious infectious threat to the community. The treatment of either type of infection is generally similar, consisting of administration of two or three drugs for a period of 18 to 24 months. If longterm therapy is not taken regularly and for an adequate period, relapse often occurs, frequently with the emergence of drug-resistant organisms. The difficulties with self-administered chemotherapy in pulmonary tuberculosis are thoughtfully reviewed by Fox.5 Intermittent supervised therapy for pulmonary tuberculosis equals the effectiveness of the best daily inpatient regimen; exceeds daily unsupervised outpatient regimens; avoids the irregularity of self-administered oral regimens due to greater supervision; and has a lower rate of adverse reactions because of the lower total weekly dose of intermittently administered drugs.1

Case Reports

The patients discussed in this report include all patients with culture-proved extrapulmonary tuberculosis treated at the USPHS Whiteriver Indian Hospital on the Fort Apache Indian Reservation as part of an intermittent ambulatory chemotherapy program.6 The patients were hospitalized locally or at a contract sanatorium for diagnosis and for the initial period of treatment. Initial therapy consisted of daily isoniazid (INH), streptomycin (SM), and either paraaminosalicylic acid (PAS) or ethambutol (EMB). All patients were discharged to their reservation homes for outpatient intermittent therapy; no treatment options were given. They attended clinic twice-weekly for the medications—INH (15 mg/kg), SM (24 mg/kg), and pyridoxine (50 mg) for the duration of the treatment period. Patients were evaluated monthly by a physician in chest clinic during the first year and then, every three months during the second year.

Table 1—Summary of Cases

<table>
<thead>
<tr>
<th>Case No</th>
<th>Age (yrs.)</th>
<th>Sex</th>
<th>TB Type</th>
<th>Skin test PPD 5 TU (mm)</th>
<th>Source of positive culture for M tuberculosis</th>
<th>Radiographic findings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>37</td>
<td>F</td>
<td>Cervical lymphadenitis</td>
<td>20</td>
<td>lymph node</td>
<td>bilateral hilar calcification with fibrosis RUL</td>
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<tr>
<td>2</td>
<td>34</td>
<td>F</td>
<td>Cervical lymphadenitis</td>
<td>14</td>
<td>abcess drainage</td>
<td>normal chest</td>
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<tr>
<td>3</td>
<td>42</td>
<td>F</td>
<td>Miliary</td>
<td>40</td>
<td>sputum and lymph node</td>
<td>chest miliary pattern IVP—unremarkable</td>
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<tr>
<td>4</td>
<td>43</td>
<td>M</td>
<td>Renal</td>
<td>20</td>
<td>urine</td>
<td>IVP—deformed R kidney with irregular pelvis and poorly delineated calyces</td>
</tr>
<tr>
<td>5</td>
<td>61</td>
<td>M</td>
<td>Perirectal abcess</td>
<td>10</td>
<td>abcess drainage</td>
<td>chest basilar scarring IVP—unremarkable</td>
</tr>
<tr>
<td>6</td>
<td>44</td>
<td>F</td>
<td>Peritonitis</td>
<td>15†</td>
<td>peritoneal fluid</td>
<td>normal chest abdomen—ascites</td>
</tr>
<tr>
<td>7</td>
<td>63</td>
<td>M</td>
<td>Genitourinary (urethroperineal fistula)</td>
<td>20</td>
<td>urine</td>
<td>scattered fibrosis RUL and LUL IVP—unremarkable</td>
</tr>
</tbody>
</table>

*At time of initial diagnosis
†Previously known positive not retested

Definition of abbreviations: PPD = purified protein derivative; TU = tuberculin units; RUL = right upper lobe; RLL = right lower lobe; LUL = left lower lobe; IVP = intravenous pyelogram.

CYNAMON, HEROLD

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