

# Myocarditis Caused By Echo Type 11 Virus\*

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Following the isolation of the Coxsackie group of viruses from the myocardial tissue, many cases of viral myocarditis in the neonatal period have been diagnosed.<sup>1-3</sup> Even though the Echo group of viruses may possibly cause myocarditis only three cases have been reported previously.<sup>4-6</sup> This report presents the clinical and pathological investigations from a 9-year-old girl clinically diagnosed as having myocarditis and pericarditis due to Echo, type 11 virus who died 15 days after the onset of the illness. This case is of special interest as there have been few similar reported cases and to the best of our knowledge it is the first from Turkey in which the Echo 11 virus has been isolated from the myocardium by the use of the explant tissue culture technique.<sup>7</sup>

## *Case Report*

A 9-year-old girl was admitted to Hacettepe Children's Hospital in September, 1974, with complaints of vomiting and pains in both arms, legs, stomach, and chest. Fifteen days prior to admission, she was febrile with a sore throat and swollen tonsils, previously she had not experienced such symptoms. Before admission, administration of ampicillin and procaine penicillin had been ineffective and she then developed leg pain associated with pitting edema.

Physical examination revealed a girl who was conscious and in good general condition although she assumed the fetal position constantly. Slight dyspnea and peripheral cyanosis were present. She was febrile, tachypneic (30 resp./min), tachycardiac (148/min), and hyposensitive

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(60/40 mmHg). Jugular veins were distended, throat was hyperemic. Gallop rhythm was present at the apex and pericardial friction rub was audible. Liver was palpable 2 cm below the right costal margin.

Routine laboratory findings were within normal limits, throat, CSF and blood cultures were all negative. Telecardiograms revealed left ventricular enlargement. ECG showed a left bundle branch block, S-T changes and left ventricular hypertrophy.

Digitalis and oxygen were given for cardiac failure and peripheral cyanosis. Despite aggressive measures, the hypotension and tachycardia persisted and 9 hours after the admission she experienced an irreversible cardio-respiratory arrest.

Complete post-mortem examination was carried out. The pathological findings were as follows: The heart weighed 150 g (normal weight for this age 125 g), the pericardial surface was grayish-white, shiny and slippery. The pericardial cavity revealed a separate sac containing approximately 50 cc of clear yellow fluid. The myocardium was pale red and loose in consistency with petechiae on the epicardial surface. The endocardium was grayish-white. All heart chambers were moderately dilated.

Microscopic examinations of the myocardial sections of both sides revealed varying types of degenerative changes such as, fatty degeneration with small vacuoles, fragmentation, loss of striations, necrobiosis, necrosis, and hyalinosis of myofibrils associated with slight interstitial mononuclear cellular infiltration (Figure 1).

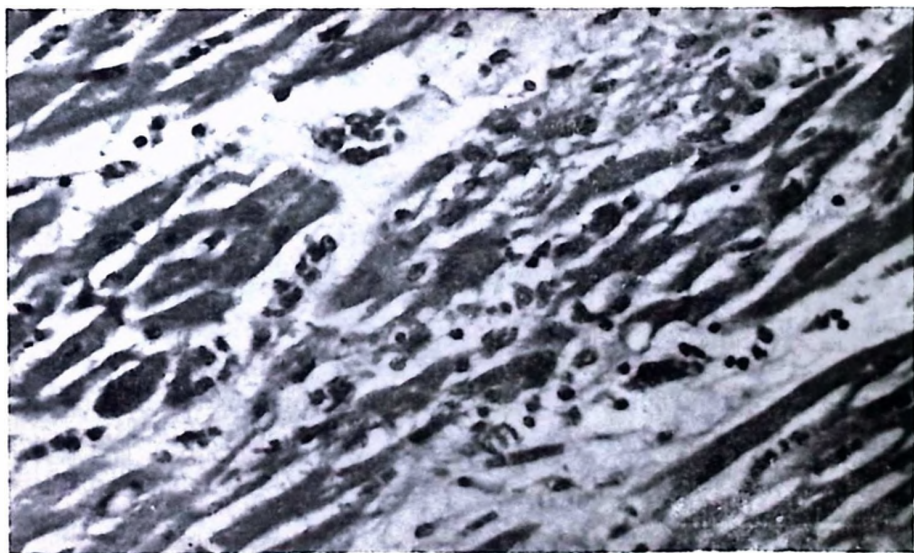


Figure 1

Patchy infiltrates of mononuclear cells in the subendocardial and perivascular areas and fibrous endocardial thickening of the left atrium were also present. Morphological changes in brain sections showed loss of neurons, neurophagia and perivascular edema consistent with encephalitis. The cerebellum and the leptomeninges were not involved. Other pathological findings were marked stasis of the liver, pulmonary edema, congestion of the viscerae which was more pronounced in the mucosa of the gastrointestinal tract.

Neither Aschoff nodules nor granulomas were found. A virological study of the myocardial tissue examined by the explant tissue culture technique isolated the Echo type 11 virus.

### *Discussion*

Both Coxsackie and Echo viruses belong to the RNA-containing enterovirus group. Echo virus infections are more frequently seen in the myocardium, and often go into spontaneous remission, making it difficult to isolate.<sup>8-10</sup> On the other hand, the Coxsackie group are more virulent and fatal and usually isolated in the post-mortem examination.

Coxsackie, like Echo viruses, can cause myositis and acute myocarditis in newborn mice.<sup>11, 12</sup> In Glasgow, the Echo virus was isolated in 833 patients and clinically analyzed.<sup>13</sup> Echo 6, 11, 12, 19 and 25 were found to exist in pleurodynia and cardiac diseases on serological examination. According to WHO's virus unit 13, 400 Echo virus infections have been reported, with type 19 being entirely cardiac and Echo 6 related to muscle disease.<sup>13</sup> In studies on newborn mice, Echo 6 type caused a disease similar to the Coxsackie A and B types of illnesses. Echo viruses rarely cause epidemics. During aseptic meningeal epidemics, it was reported in some cases that the causative agent was thought to be viral in nature since there were abnormal ECG segments showing ST elevation, T-wave changes, and transient A-V block.<sup>14</sup> The same changes were shown in the ECG's of the patients in whom Echo 6<sup>15-20</sup> Echo 9<sup>15, 19, 20, 22</sup> Echo 11,<sup>18</sup> and Echo 22,<sup>5</sup> had been isolated. ECG findings of our patients, showing the same changes support these reported findings.

The incidence of Echo viral myocarditis is probably higher than clinically diagnosed since clinical presenting symptoms are lacking and even when other organs are affected few pathomonomic indications exist.<sup>20</sup> Up to today, Echo 9 and 22 viruses have been isolated from myocardium only from 2 patients and Echo 24 from the pericardial fluid of one patient,<sup>4-6</sup> whereas, Echo 6 infection, as shown by four-fold antibody titer increase is said to be the cause of myocarditis and pericar-

ditis in four of 513 patients.<sup>21</sup> One myocarditis patient's throat and stool cultures revealed Echo type 11,<sup>2</sup> and in another patient with endocarditis, Echo type 19 was isolated.<sup>22</sup> In our case, Echo type 11 virus was isolated from the myocardium of a 9-year-old girl with severe myocarditis, strongly suggesting the necessity for etiological Echo virus investigation in patients having this disease.

### *Summary*

This is a case report of the clinical, pathological, virological, and post-mortem investigations of a 9 year old girl who was clinically and histopathologically diagnosed as having myocarditis and pericarditis caused by a viral agent. Post-mortem isolation of Echo type 11 virus from only the myocardium using the explant culture technique was performed for the first time in Turkey on this case.

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