What was the impact of the introduction of extracardiac completion for a single center performing total cavopulmonary connections?

BACKGROUND: Creation of an extracardiac cavopulmonary connection has been proposed as a superior alternative to the lateral intracardiac tunnel for the completion of total cavopulmonary connection.

METHODS AND RESULTS: We made a retrospective review of our experience with 125 patients undergoing a total cavopulmonary connection between June 1994 and January 2003. Our experience with the extracardiac connection for completion began in 1999. Since 1994, we have constructed an intracardiac tunnel in 50 patients, and an extracardiac connection in 75. Of the total number, 83 had undergone an earlier partial cavopulmonary connection. Additional intracardiac procedures were performed in 43 patients at time of completion, in 25 of those undergoing extracardiac completion, and in 18 of the patients having an intracardiac procedure. The mean size of the tube used for completion was 19 mm. The mean cross-clamp time for placement of the intracardiac tunnel was 77 min, with a median of 80.5 min, and a mean cardiopulmonary bypass time of 139 min, with a median of 131 min. For construction of the extracardiac connection, a mean cross-clamp time in 24 of the 75 patients was 54 min, with a median of 54 min. Mean cardiopulmonary bypass time for all the patients with an extracardiac connection was 100 min, with a
median of 88 min. Reoperations were needed in 10 patients, 6 having intracardiac and 4 extracardiac procedures. Of these, 5 were early and 5 late, including one take down. None of the patients died after these interventions. Taken overall, 8 patients died, with 5 early deaths. In the multivariable analysis, cardiopulmonary bypass time of more than 120 min, atrioventricular valvar replacement, and banding of the pulmonary trunk prior to the total cavopulmonary connection, all reached statistical significance for early death, whereas only heterotaxy syndrome remained as the sole risk factor for late death. There was no significant difference in survival between the modifications used.

DISCUSSION: Whereas we could not identify any clinical superiority for the extracardiac approach in the short-term, the concept of extracardiac completion has helped to simplify the overall procedure. Longer follow-up will be required to elucidate any potential advantages.