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### **Cerebral Microemboli Detection during Transcatheter ASD Closure**

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#### **Introduction:**

The aim of this prospective study was to determine the frequency and composition of cerebral microemboli in a paediatric population during transcatheter closure of atrial septal defects.

#### **Methods:**

A middle cerebral artery in 23 patients (median age 3 years 1 month) was monitored for microembolic signals (MES) using multifrequency transcranial Doppler. MES were automatically identified and differentiated according to their composition; gaseous or solid. The procedure was divided into five periods: right cardiac catheterization, left cardiac catheterization, pulmonary angiography, sizing & sheath placement and device placement. Timing of all catheter manipulations and MES were registered and compared.

#### **Results:**

MES were detected in all patients. The median number of signals was 63, (range 242 to 9). Over 96% of all MES were gaseous. The total number of signals detected during two periods, sizing & sheath placement, and device placement, was not significantly different (median: 18 and 25) but was significantly higher than each of the other three periods ( $p < 0.001$ ). 37.4% of all emboli were detected during sizing & sheath placement, 47% during device placement. In eight patients the device was opened more than once and the number of embolic signals decreased each time. There was no correlation between number of signals and fluoroscopic time, duration of procedure, age or device size.

#### **Conclusion:**

This is the first study to investigate the timing and composition of cerebral microemboli in a paediatric population during cardiac catheterization. Microemboli were related to specific catheter manipulations but were not associated with fluoroscopic time or duration of procedure.